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THE ORIGINAL  
'DO-IT-YOURSELF'  
MAGAZINE

# HOBBIES *weekly*

FOR ALL  
HOME CRAFTSMEN

## Plan for building a jet-driven hydroplane

Also in this issue:

MAKING A 2-  
TRANSISTOR RADIO

HOME CHEMISTRY  
AND PHOTOGRAPHY

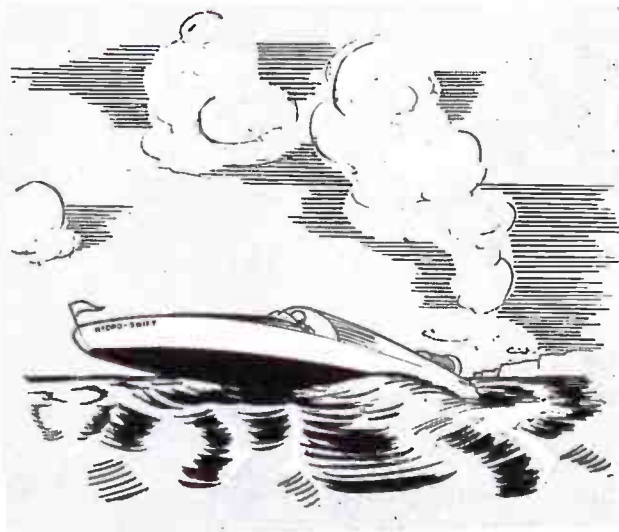
COLLECTORS' CLUB

MORE WINE AND  
MEAT RECIPES

LOOKING AFTER  
A BUDGERIGAR

PATTERNS FOR  
A CRUMB TRAY

ETC. ETC.



## THE 'HYDRO-SWIFT'



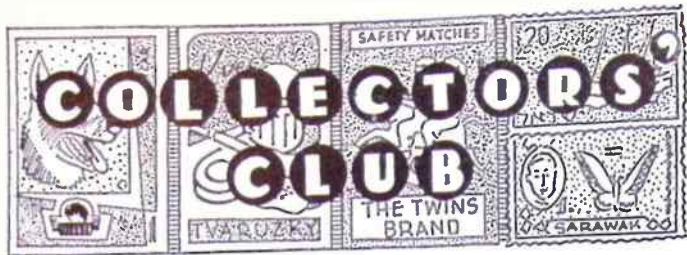
Up-to-the-minute ideas

Practical designs

Pleasant and profitable things to make

World Radio History

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TO be eligible to enter the lists at a tournament or to be admitted to the Order of Malta and of St. John of Jerusalem, a man had to prove four quarterings of arms and eight quarterings for admission to that of the Garter. Some readers may not understand what is meant by this. Begin with your father's family both on his father's and his mother's side, and again on their fathers' and mothers' parents and grandparents, and so back regularly in pairs, and prove the hereditary right of each to bear arms.

Then take your mother's parents and the parents of these, and so trace back their names, family places and distinctions, and the birthright of each one to bear arms, until you have at the top of your ancestral tree, sixteen ancestors.

Owing to the many wars and invasions to which Britain has been subjected, it is difficult to trace back a simple paternal pedigree for more than four or five hundred years (not to speak of quarterings), yet there are some who can do so.

It must also be remembered that while a name may be shared with some historic family (for instance, one inscribed on the 'Battle Roll') to establish a claim to the honour of a connection with it, a genealogy should be produced in an unbroken line to the man there immortalized.

The term 'Blazonry' had its origin in the trumpet-blast given when a knight entered the lists at a tournament. The officers of arms (heralds) proclaimed his armorial insignia so that any to whom his shield was obscurely visible should know who he was, especially if his visor were closed. The German word 'blazen' signifies to blow a blast on a horn or trumpet.

In English, 'to blazon' means to proclaim, to make public far and wide. Shakespeare uses it in his phrase, 'Thyself thou blazonest'. But it also means 'to shine', to be brilliant or conspicuous.

Next week's free design will be for making a model of a charming Irish Jaunting-Car.

MAKE SURE OF YOUR COPY

Thus, in the double use of this word it is equally pertinent to the subject whether in reference to the blast of the trumpet or the brilliant colouring or glittering of the metals with which the shields were resplendent.

Marshalling, like blazoning, was a herald's duties and denoted the prepara-

## HERALDRY—4

tion of a new escutcheon or coat of arms. This consisted of a distinct composition or grouping of two or more subjects to form a complete design. It was also the herald's duty to arrange the association of the helm, crest, and mantling, so as to produce (did reason exist) a more elaborate yet single composition.

There are five different kinds of arms, and two supplementaries.

1. Arms of Patronage, borne by lords of manors, governors of provinces, and others.

2. Arms of Dominion, belonging to nationalities and borne by their respective sovereigns.

3. Arms of Community, borne by bishops, cities, guilds, trades, and societies.

4. Arms of Pretension, borne by a ruler who (as a suzerain or otherwise) has a claim on a territory belonging to another, and who thus adds the arms of that territory to his own.

5. Arms of Family, borne by individuals and their clans, granted for services and deeds of arms rendered to the sovereign, the country or the Christian faith.

These arms of family may be supplemented by Arms of succession obtained on the inheritance of other family estates, and quartered with their own original arms; and likewise Arms of Alliance, borne to indicate the union of families. For example: the family arms of a wife may be impaled on the shield of her husband (that is, they occupy the left side of the shield as it faces the spectator).

This will be seen exemplified on the hatchments placed on houses when the death of one of the heads of the family

has taken place. In this case, one half of the lozenge-shaped escutcheon has a black ground and the other half white. If the master of the house be dead, the heraldic right is black, and if the mistress of the house is dead the heraldic left is black, while the side on which the arms of the survivor are blazoned is white. If both husband and wife are deceased the whole background is black.

The Escutcheon is the shield, bearing upon it, or charged with, the device granted to the bearer. The whole surface of the shield is called the 'field'.

The language of heraldry was derived from the Norman; the metals and tinctures and the ordinaries are of Teutonic origin. Many of the devices were brought from the East, the cradle of the science, by the Crusaders. The first-named, or colours, are traced to the old German race who, according to Tacitus, painted their warriors' shields with gorgeous tints.

Tinctures are divided into colours and furs. The colours employed are: Or, gold; Argent, silver; Gules, red; Azure, blue; Vert, green; Purpure, purple; Sable, black; Tenne, tawny; Sanguine, dark red.

These tinctures are severally indicated on an uncoloured escutcheon by means of dots and lines, thus:

Or is denoted by a powdering of dots. Argent, by a plain white field. Gules, by delicate vertical lines from chief to base. Azure, by horizontal lines from dexter (left seen by observer) to sinister (right seen by observer). Sable, by vertical and horizontal lines crossing each other. Tenne, by diagonal lines crossing each other.

Or stands first in estimation among the metals, and gules among the tinctures.



## Out with a Camera

# MAKE USE OF WATER

WATER is a great picture-maker, whether it be pond, river, fast running stream or the sea. Add to it the photographic possibilities so often found with water — old mills, boats, and shipping, cattle drinking or standing in the cool on a hot summer's day — and you have many possibilities for photographic composition.

Often water can turn a simple subject into one of interest for the album. Take a simple example, such as a leaning willow on a river bank (Fig. 1). Or an

By E. G. Gaze

unpromising metal bridge leading across a river to a mill (Fig. 2). Fig. 3 is rather different: here there is the graceful form of the bridge, the interesting half-timbered house glimpsed behind a foreground bush, and with a background of darker trees. Yet again it is the water that really adds visual interest to the snap for the album.

Once the snapshotter discovers the possibilities of water he's on the look out for it, in all winds and weathers and conditions of lighting. And the beauty of water as a picture aid is that it is so changeable in its appeal.

A few hints may help to save disappointment, especially when using normal monochrome (black and white) film as opposed to colour. Water's moods are as variable as the weather, but the basic thing to remember is that it reflects a tremendous amount of available light, and that its appearance is changed both by the direction of the light and by its own condition — smooth, ruffled, slowly moving, rushing, and tumbling.

Water that is smooth and unbroken in surface will often be so dazzling in a high or a back light that it prints out white. Water that is ruffled will have shadows in the hollows, especially in high or back lighting; more so if there are clouds in the sky to throw shadowed reflections of their forms.

Objects near the water's edge are not reflected clearly if the surface is really broken by movement or wind. A gentle swell or unbroken long ripple gives the reflections a true watery look. Objects in shade themselves will throw dark shadows on the water; objects with frontal lighting on them will reflect with full tonal values.

Look at Fig. 1. Here there is a high,

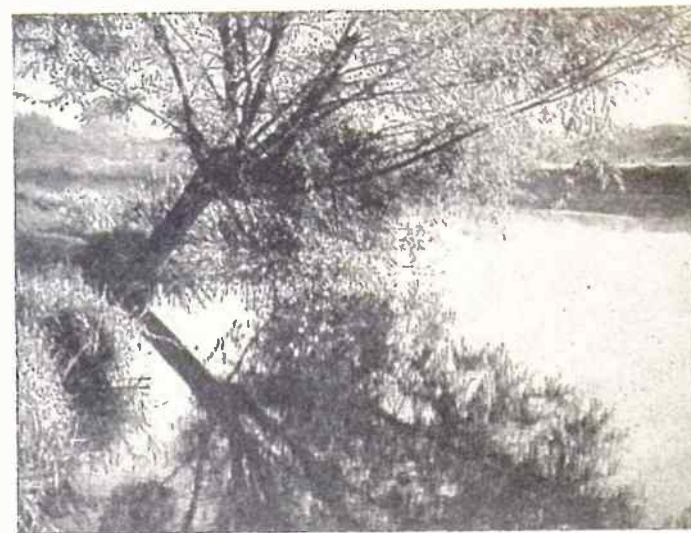


Fig. 1—Simple material made interesting by water

slightly side light in a clear sky. Only the upper surfaces of the leaves catch the light. The dark trunk and underside of the greenery are reflected in almost dark shadow form on the water. Note that in

mid-stream so much light is reflected that even heavy over-printing in the darkroom would produce no life, if more tone. The surface of the water is almost glassy.

In Fig. 3 the front lighting is diffused: not so much light to be reflected or to cause blocking-up in negative. But frontal lighting is falling on the light coloured bridge and the dark trees behind. They are reflected with tonal values; the shadow effect is under the bridge arch, where no light reaches to give tonal reflection. The water is faintly rippled, which gives a watery effect to reflections. Note also the change in tone towards water foreground where clouds overhead darken it.

Figs. 1 and 3 showed points with side and frontal lighting of subject. Fig. 2 is a back-lit shot, against the light. Beyond the bridge so much light is reflected that it would be dazzling to the eye, and prints almost devoid of tone save for a few ripples of wind providing scattered shadows in the broken surface. The silhouette bridge throws a dark shadow, devoid of tone, as no light falls on the bridge, but the foreground water is shadowed also by the tall forms of the bankside buildings; it also has a slight ripple and swell. The two combine to give tone to the water, shading it from the direct back lighting and breaking the

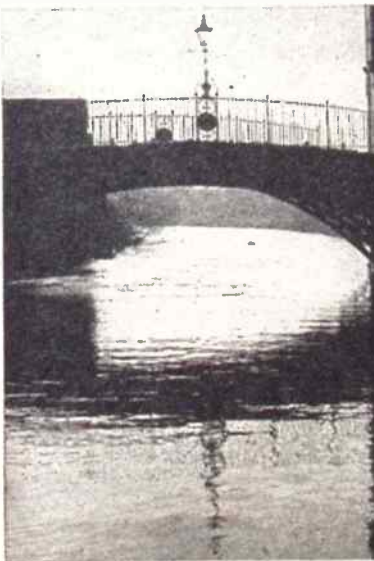


Fig. 2—Against the light shot, an unpromising subject made interesting by water

Continued on page 165

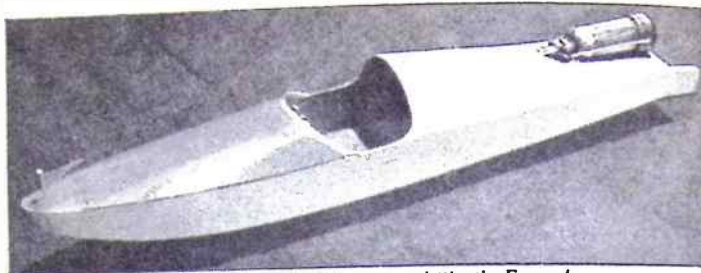
# BUILDING THE 'HYDRO-SWIFT'

THIS jet-driven hydroplane has been specially designed for those who like 'messaging about with model boats' but who at the same time like something novel, not too expensive, and easy-to-build.

The entire structure and covering consists of balsa wood strip and sheet, Bristol board and a single strip of hardwood or obechi (Fig. 1). In addition to these materials you will need a small length of brass tubing to take a rotating fit for a piece of 20 S.W.G. piano wire. A small bottle of banana oil, a similar bottle of plastic enamel, a small tube of balsa cement, and some contact adhesive complete the list of main requirements. Scraps around the model box

By Gordon Allen

will be found sufficient for details. In fact the entire boat, minus the motor, can be finished for less than five shillings. Even the motor, Jetex P.A.A. Loader, which is the most expensive item, is the one for which the 'Hobby Sprite' (in my model aircraft series) was designed. If you built this model the motor, com-



The 'Swift' finished with Humrol Plastic Enamel

the plan as a guide. Mark the positions of the  $\frac{1}{4}$  in. square bulkhead king-posts accurately; these are shown as solid black vertical bars. Draw the bottom curve with a flexible piece of wood held by a second person. Transfer the shape to  $\frac{1}{4}$  in. hard sheet balsa, using a sharp pencil and a piece of flat new carbon paper. Do not forget to include the positions of the king-posts.

Cut the shape out and trim with glasspaper. Then use this first side as a template to cut a second, similar side, and mark the positions of the king-posts

measurements directly from the drawing and using the scale as a guide. All the curves are true radii, represented by the arrows on the plan, and their centres are marked with crosses. Mark accurately the slots and cut-outs in B8 and B9 (the slot is  $\frac{1}{4}$  in. by  $\frac{1}{4}$  in.), and then cut out the bulkheads and trim true.

Bulkhead B10 at the stern is cut from hard  $\frac{1}{4}$  in. sheet balsa, and is chamfered on its top and bottom edges to allow for its slope (see side view of the model).

Assembly of the hull structure begins with the balsa-cementing of B6 and the

of the hull in place with the edges of the bulkheads clipped between the appropriate king-posts. Again allow to set, and then cement B7, B8 and B9 in place in that order, holding the ends of the hull sides between the fingers (in a 'clip' position) until the bulkheads are secure (Fig. 4).

The engine bearer is fitted next — i.e., before B10 is located. Cut a length of  $\frac{3}{8}$  in. by  $\frac{1}{2}$  in. hardwood or obechi, and cut a slope on one end so that it agrees with the angle at which B10 is set. The opposite end should be bevelled slightly on its edges, and should protrude through the slot in B8 for  $\frac{1}{8}$  in. Place the hardwood in position in the slots, and check that its sloping end sits flush against the inside face of B10 when the latter is temporarily located. Before removing the hardwood, mark the position of B9 with pencil lines drawn on the sides of the bearer. Remove the bearer and cement the four pieces of  $\frac{1}{4}$  in. sheet balsa in place, as shown in the detail drawing on the plan. The pencil lines you have drawn indicate the slot position.

Mark the positions of the screw holes for the motor clip on the top edges of the

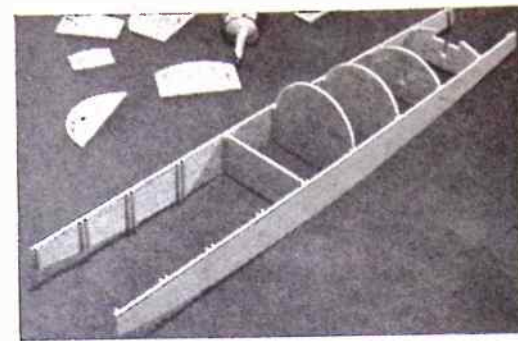


Fig. 4—Fit rear bulkheads first.

bearer, and open up tiny 'pilot' holes either with a pin-drill or a large needle.

Cement the entire bearer in place in the slots of B8 and B9, and finally cement B10 in position against the rear king-posts and the back end of the bearer.

When everything is thoroughly set at the rear, bulkheads B1 to B4 and the top part of B5 are cemented in position. Begin with the latter, which forms the dashboard. If desired you can cover the

face of this with a piece of black gummed paper in which small apertures have been cut to represent instruments. Cement the dashboard-bulkhead to the top edge of B5 at the angle shown on the drawing, then follow this with B4, B3, B2 and, finally, B1. Make sure that each is thoroughly set before fixing the next one.

This completes the basic balsa structure. In the next article we shall be completing the Hydro-Swift ready for the water.

Continued from page 163

## MAKE USE OF WATER

dark shadows in a 'watery' way.

For the best tone-varied realistic reflections, therefore, we need the object reflected to be well lit, and smooth water; though a slight ripple or swell actually often enhances the watery look. Even a diffused lighting with water giving tonal reflections will produce an interesting print where, without water, the weaker lighting would tend to produce a lowering of contrast and, therefore, a visually lifeless print (Fig. 3).

Back lighting will often be so dazzling that it prints uninterestingly — unless we can add interest as in Fig. 2. But back lighting, when the surface is really broken and tumbling (such as a swift stream over pebbles, waves at the sea-side) can be dramatic and very watery as the broken surface produces shadowed troughs and sparkling highlight crests.

The creamy froth of a wave on the beach will look more 'frothy' in strong side or back lighting, to give contrast, than with front lighting, which is flatter in effect.

Incidentally, the terms back, side, and front lighting are used here in reference to the subject. A front-lit subject has the light shining directly on to it — from behind you; a back-lit subject is lit from behind, possibly in silhouette form. The light is facing you and your camera.

Find some water and experiment in

different weather and lighting conditions. It's the best way to be ready to seize a good picture opportunity when it

springs on you. And a simple change of viewpoint, moving around the light, can produce effectively different prints.

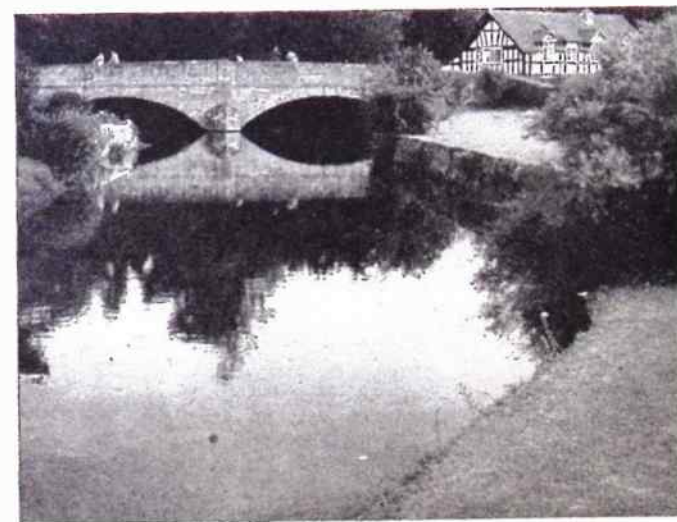


Fig. 3—Diffused frontal lighting.

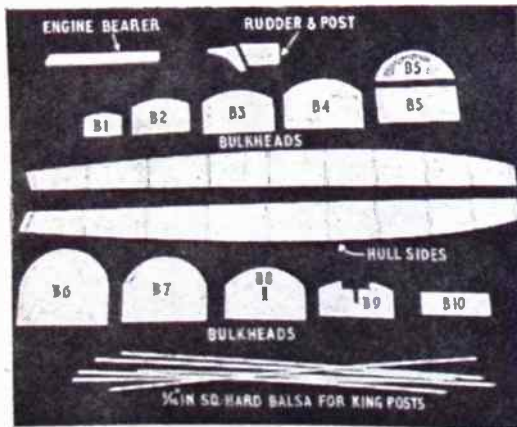


Fig. 1—Basic parts for hull structure.

Fig. 2—(right) Cementing king-posts.

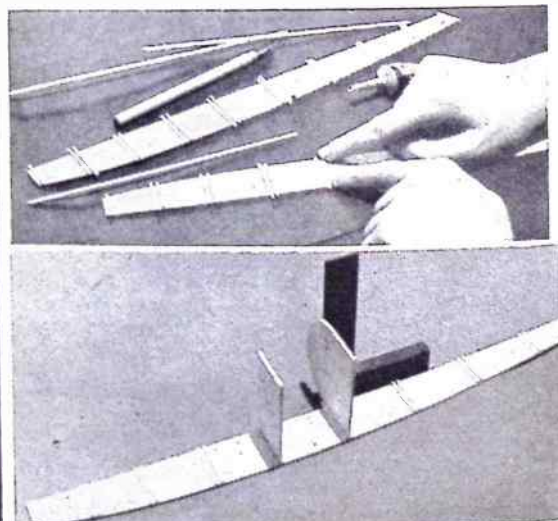


Fig. 3—Checking 'squareness' of B5 and B6.

plete with retaining clip, can be removed and used with equal facility in the 'Swift'. Now, the unit will cost you 18s. 11d.

Plans are on pages 170 and 171.

Draw out the shape of the  $\frac{1}{4}$  in. sheet balsa hull sides on to stiff white paper, using the hatched drawing at the top of

in pencil. Now cement in place the  $\frac{1}{4}$  in. square hard balsa king-posts (Fig. 2). These pieces can extend beyond the sides, and are trimmed flush with the edges when the posts have set.

Draw the shapes of all the bulkheads with the exception of B10 directly on to  $\frac{1}{4}$  in. sheet hard balsa, taking your

lower part of B5 between the king-posts on one of the hull side-pieces (Fig. 3). Check that each of the bulkheads is kept vertical during the setting period by using a small engineer's square or set-square. When they are set, place the assembly in an upright position on a flat surface and cement the opposite side

# BAFFLING 'CHINESE COMPASS'

CHINA is the legendary land of mystery and the origin of many baffling magic tricks. Although it is doubtful whether the 'Chinese Compass' was really invented in the East, the title of this splendid little illusion is certainly apt.

Make the compass from a 2 in. square of stout cardboard. Trim the corners neatly, using sharp scissors, to form a regular eight sided shape. Use Indian ink to draw a large arrow on one side of the octagon and make a second arrow, at right angles to the first upon the reverse side. The instructions are clearly illustrated in the diagram.

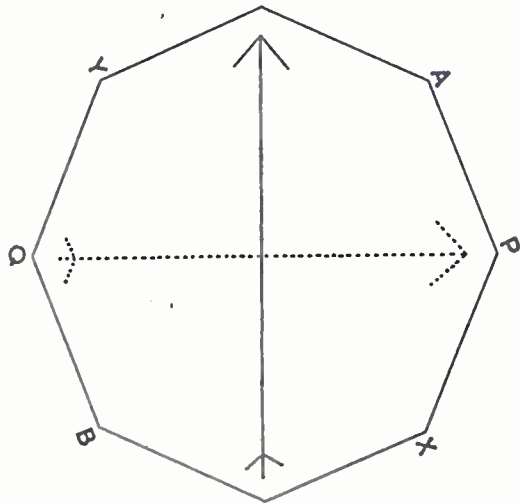
In order to understand how your illusion will work, you must pivot the compass between the thumb and first finger of your right hand and experiment, as follows: Pivot the compass between corners A and B, and turn it around using a finger of your left hand. Notice that the arrows upon both sides will appear to be pointing the same way. When you pivot between corners P and Q and then turn the compass, the arrows will seem to point at right angles to each other. Next, pivot between corners X and Y, and observe that the arrows will apparently point in opposite directions when the compass is turned around.

You will need to accompany your performance with amusing patter, so here are some suggested remarks which you may improve upon, to suit your own personality.

'For centuries the Chinese have navigated by means of a simple compass without magnetism or moving parts'. Show the card and turn it between corners A and B, whilst you say: 'There is an

arrow upon each side and both arrows point the same way'. Pivot between corners P and Q, and continue: 'However, when a Chinaman wishes to go West, he must travel due North.' As you say this, turn the card and show the reverse side arrow pointing upwards (North). Reverse the card again to show an arrow pointing towards the left (West) and pivot between corners X and Y. In conclusion you remark: 'But the Chinaman's compass gives him one great advantage, for not only does it show him which direction he is going (hold the card so that the revealed arrow points towards the left). . . . it also shows him where he has come from'. Your final move—turn card and show the reverse side arrow pointing in the opposite direction.

Neatly presented, your illusion should be very bewildering to watch and the beauty of this little trick is that, even if you place the compass between somebody else's fingers whilst you perform, the effect will be just as puzzling. It should be possible to adapt the effect for a stage performance at a concert, using a large scale compass cut out of a square foot of plywood by means of a fretsaw. Pivot the wooden compass between the palms of an assistants hands whilst you demonstrate. (A.E.W.)



# NANCY'S WEATHER FORECAST

AN anti-cyclone centred over the Azores will maintain fine weather for several days', was the weather forecast, but Farmer Brown's old cow Nancy had a different tale to tell. Now Nancy's rheumatics were particularly bad this morning, and that was a certain sign that rain was coming, and sure enough by tea time it was raining fast.

Many animals have the ability to forecast the weather, and very often with uncanny accuracy. Birds, insects, and even fish, too, are equally good at the job, while quite a variety of flowers are capable of emulating the Meteorological Office.

Little explanation can be given for this remarkable phenomena, and a careful study of the matter forms a most interesting hobby. It is a good idea to have a notebook to record all your observations, and put down as much detail as possible. Very often it is the smallest points which may seem insignificant at the time, but are really the most important.

Details regarding behaviour should be accurately noted, together with the state of the weather, leaving room to fill in the weather that follows these observations. Sketches, too, can be very helpful, and besides adding to the accuracy of the reports, make them much more interesting.

Many country people have great faith in the weather forecasts of cows, and their actions are well worth a careful study. They do not, for instance, exert themselves unduly during hot weather, and when you see them lying down and lazily chewing the cud, you may be sure that it will be a fine day.

Cows, and horses too, become very uneasy when there is rain about, and show this by standing under trees or with their backs to the hedge. It is said that if you see a cow trying to scratch its ear, it means that there will be a shower before very long, but whether this is just a country yarn or not, we leave you to observe the phenomena, and try to find out.

Birds are very good weather forecasters, and we can learn quite a lot from their antics and behaviour. It may be that because they fly high into the atmosphere they are able to get a better view or feeling about the weather. More likely it is that indescribable factor called 'instinct' that gives them the power to predict the weather with remarkable accuracy.

A rookery is not a quiet place at the best of times, but when bad weather is coming, then the noise is really awful. Their weather forecasting power does not stop at bad weather. Rooks flying

high predict fine weather, and when they are late in returning to the rookery, it is a sign of a fine night. They are also well aware of a coming bad night, and on such occasions go to bed early. Windy weather is indicated when rooks sit on a fence or gather together in the tree tops.

Scarlet Pimpernel. It is well known as the poor man's weather glass, and is sometimes more accurate than the barometer, and the forecasts of the Meteorological Office.

Another small flower, the chickweed, is particularly sensitive to rain, and folds up its petals when wet weather is near at hand. Not only does it predict rain, but often its extent, and by half closing, it foretells showery conditions, but complete closure means a rainy day.

The shamrock and some members of the clover family close their leaves in varying degrees before little or much rain falls, and there are other plants which react in similar ways.

The slightest change in the atmosphere affects a large number of flowers, and some are extremely sensitive, the dandelion being a good example of this. The flowers of the dandelion do not like the sun, and when the weather is going to be very hot and sunny, it gives warning by remaining closed. Should the dandelion open early, and close up again by breakfast, it is a sign that the day will be very oppressive.

When the down flies off the heads of thistles and dandelions, and there is absolutely no wind blowing, then we shall have rain before long.

The amount of dew which collects on the grass and plants can also give some indication as to what weather to expect. When there is much dew in the evening, then the next day will be fine, and no dew means wet weather.

These brief notes give some indication of the remarkable powers which animals, birds, insects, and plants possess, and are able to communicate to us about the weather. It is, indeed, a most fascinating hobby, and worth more than just a casual study.

A small notebook which can be carried in the pocket will do to make your rough notes and observations on the spot, and when these have been completed with the kind of weather which follows during the day or into the next they may be transferred to a more permanent book.

There are several ways of making your notes; you could, for instance, head each page with a different animal, bird, etc, and give their weather reactions, thus gradually building up a complete picture of each species. Conversely you might head each page with a particular type of weather, and then noting down how that kind of weather is foretold by the different animals, birds, and plants.

Get talking to other people, especially country folk, about the weather, and they will most likely have many helpful observations to pass on.

## SOME INTERESTING NOTES ON COUNTRY WEATHER LORE

By A. F. Taylor

It is an omen of coming rain when swallows and swifts fly low in search of their food, and this also applies to bats. Actually the atmosphere gets heavier before rain, bringing the insects nearer to the ground, so really they are initially responsible for the weather forecast, and not the birds or bats.

Insects, as we have seen, are susceptible to weather conditions, and are therefore, quite good forecasters, and their behaviour is well worth careful study. When you see gnats dancing high in the air you can be fairly certain that it will be very hot. Sometimes they dance up and down in spiral form in the evening, and this generally means fine weather on the following day.

It is a well-known saying that 'A bee was never caught in a shower', and this has put the bees in a front position as fine weather forecasters. When bees come home in large numbers, but do not come out of the hive again, it is a sign that there is rain in the air. On the other hand bees will wander quite a long way from the hive during a continued spell of fine weather, but they will hurry back at the first sign of a break, and before rain comes.

Fish, to a certain extent, can give us some information about the weather, and their behaviour is well worth a close study. Their forecasting, however, is more confined to certain districts, and in some parts of the country fish do not appear to bite so well before rain.

We must not forget the value of flowers in helping us to forecast the weather, but generally they do not give so much warning as animals and birds.

Many flowers dislike rain, and are very sensitive in this respect. Before rain falls they close up, and certainly the best example of this is the humble little

# TWO-MINUTE QU?Z by Ed. Capper

<p>1 WHAT TYPE OF ROOF LIGHT?</p>	<p>2 WHAT JOINT?</p>	<p>3 IF No 3 equals .2130 WHAT IS .2040?</p>
<p>4 IS SOMETHING 'GOING' HERE?</p>	<p>5 COULD YOU 'FRY' THIS TYPE OF WALL?</p>	

Answers on page 176

For phones or speaker

# A 2-TRANSISTOR RECEIVER

THIS circuit for a two-transistor receiver is particularly intended to give good results with cheap surplus transistors. Such transistors vary a great deal in characteristics, and thus in the voltage which should be applied to the base. To overcome this, the base voltage of each transistor in this receiver is taken from the slider of a voltage divider, so that it is only necessary to adjust each of these dividers for best results. As such potentiometers, or voltage dividers, each replaces a pair of fixed resistors, building costs are only increased by a few pence, when cheap surplus components are used.

## By 'Radio Mech'

For best results, a dust cored coil is recommended, and the .0003 $\mu$ F aerial condenser allows sharpness of tuning to be adjusted to some extent. This is often useful. This condenser also acts as a volume control, as signals can otherwise be too loud for comfort, when using headphones.

**About the parts**  
Any medium wave coil can be used, other windings or tapings, if present,

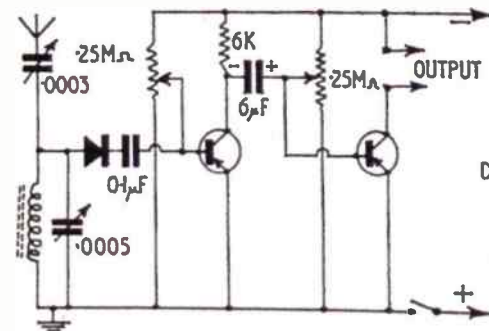
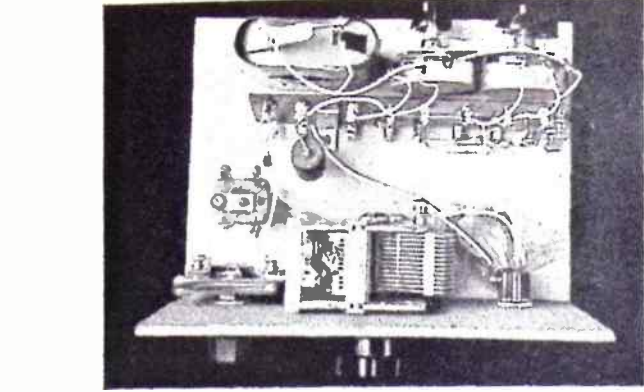


Fig. 1—Receiver circuit.

being ignored. Small, ready-made M.W. coils are suitable. Or one can be wound from 32 S.W.G. or similar wire, employing 55 to 60 turns on a cored former approximately  $\frac{3}{8}$  in. to  $\frac{1}{2}$  in. in diameter. For an air-cored coil, if used instead, 80 turns of 32 S.W.G. or similar wire, or an insulated tube about 1 in. in diameter, will be needed.

The aerial condenser is of the 'reaction' or solid dielectric type, and may be .0002 $\mu$ F to .0005 $\mu$ F. The .0005 $\mu$ F



tuning condenser should be air-spaced, for best reception. Two knobs to fit are secured to the spindles by grub screws. The 0.1 $\mu$ F condenser is a paper type, and 0.5 $\mu$ F is equally satisfactory. The 6 $\mu$ F condenser can be a transistor coupling type, but the capacity is not

driver, if a slot is cut in the spindles. Results depend greatly on an efficient diode, so this should be new, or a surplus diode of guaranteed efficiency. The two transistors are of the 'Red Spot' or other surplus audio-frequency amplifying type.

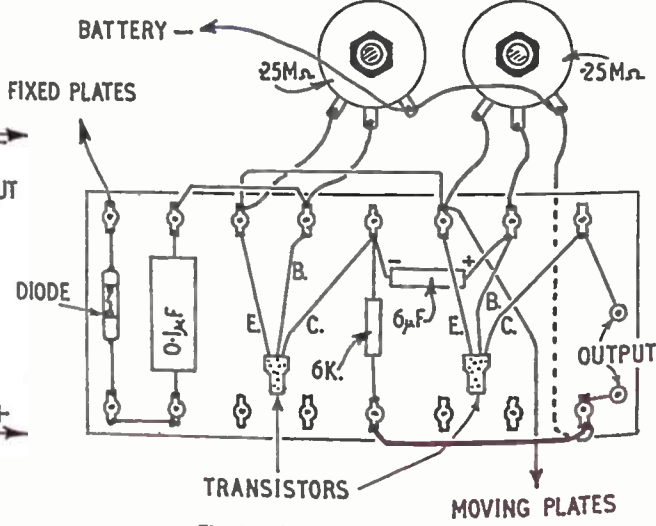


Fig. 2—The transistor amplifier panel.

critical, so other condensers can be used. A value of at least 2 $\mu$ F is best here. Any small on/off switch can be fitted, and the 6K (6,000 ohm) resistor can be  $\frac{1}{2}$ - or  $\frac{1}{4}$ -watt. The two potentiometers are fixed to a metal bracket, which is joined to the earth line of the receiver. Knobs can be fitted to the spindles, or the controls can be adjusted by means of a screw-

Most of the small parts are mounted on a tagboard, which can be about  $5\frac{1}{2}$  in. by 2 in., with two rows of eight tags. This item only costs a few pence. Fig. 2 shows the diode and transistor stages, which are wired up on the tagboard. The wire ends of the parts should not be cut very short, or heat may damage them when soldering. This is very important with the diode and transistors,

the wire ends of which should be left full length. Soldered joints are very easily made if a cored solder is used, and applied simultaneously with the hot iron. The iron is removed immediately the joint is completed.

The transistors have Emitter, Base, and Collector leads, and these are marked E, B, and C in Fig. 2. These connections must not be confused or wrongly made. Some of the tags are unused, and others are joined together, as in Fig. 2. Any thin, insulated wire is satisfactory for these and other connections in the receiver.

The two .25 megohm potentiometers can be placed as shown in Fig. 2, and connected up as indicated. They are afterwards fixed to the bracket behind the tagboard, as in Fig. 3.

Positive and negative ends of the 6 $\mu$ F condenser must be connected as in Fig. 2. Two small terminals at the end of the tagboard allow leads to be taken of 'phones or loudspeaker. The wiring to this section of the set should be carefully checked against Fig. 2, especially to see that transistor connections are correct.

**Panel and baseboard**  
The panel can be about 7 in. by 5 in., of 3-ply or other insulating material. For the baseboard, a piece of wood also 7 in. by 5 in., and about  $\frac{3}{8}$  in. thick, will do well. The panel is screwed to the front of the baseboard, after drilling holes for the variable condensers and switch, which are positioned as shown in Fig. 3.

The tuning coil is wired from the fixed plates of the .0003 $\mu$ F condenser to the moving plates, the latter (which will be the frame with metal-framed condensers) also being connected to the switch. The .0003 $\mu$ F condenser is also wired to the fixed plates of the .0005 $\mu$ F condenser, as in Fig. 3. The aerial lead is taken to the spare tag or terminal of the .0003 $\mu$ F condenser. An insulated lead from the switch goes to battery positive.

When this wiring is completed, the tagboard can be fixed in the position shown in Fig. 3. One or two small angle brackets will do this. The 'fixed plates' lead in Fig. 2 is then connected to the fixed plates of the tuning condenser. In the same way, the 'moving plates' lead in Fig. 2 is taken to the moving plates, or metal frame, of the condenser.

The metal bracket cut to take the two potentiometers can now be screwed down, not forgetting to take a wire from it to the earth line—that is, the moving plates of the .0005 $\mu$ F condenser.

The battery is held by means of a clip bent from metal and screwed to the baseboard. A 4 $\frac{1}{2}$ V. flash-lamp battery is suitable, and the long contact strip is

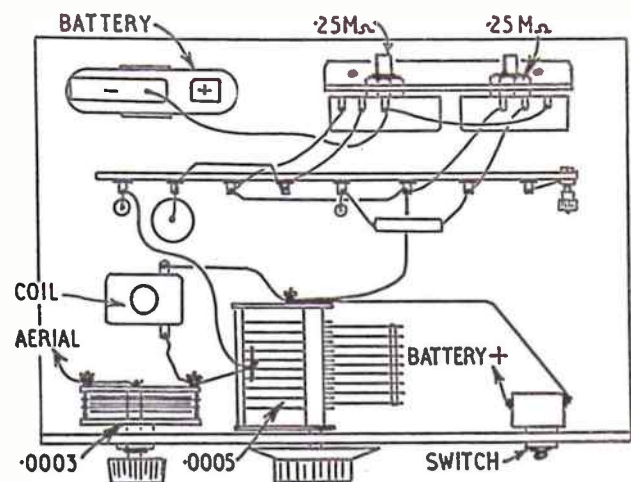


Fig. 3—Receiver layout and wiring

negative, the shorter strip being positive. As the battery lasts a very long time, leads to it can be held with a touch of solder. Connections to the battery must on no account have their polarity reversed.

**Adjustments**  
The two .25 megohm controls are first set to a mid-way position. Reception should then be possible, when the set is switched on. Each control is then adjusted, by screwdriver or the knob, if fitted, for best possible results.

It will be found that if either control is turned too far in either direction, reception falls off, and signals become distorted. The background noise also depends greatly on the setting of the controls. Suitable settings can quite easily be found, however, because it is only necessary to rotate each control slowly, while listening.

Once the controls are set, they do not need adjusting again, unless the output is taken to phones or speaker of different resistance. If this is done, the second control needs re-adjusting, to obtain the best operating conditions.

To reduce volume, or sharpen tuning, the .0003 $\mu$ F condenser is opened—normally by turning the knob anticlockwise. Slight re-tuning, with the central knob, is then necessary.

Enough volume can often be obtained without an earth. If an earth is used, it is taken to the moving plates (frame) of the tuning condensers. This increases the signal strength from distant stations. Or, in some cases, it is convenient to use an earth, and no aerial. If so, the earth may be connected to the 'aerial' terminal of the .0003 $\mu$ F condenser.

A short, indoor aerial wire will usually

suffice. If this is extended in an upwards direction, volume will be improved. A few feet of insulated wire can easily be used as an aerial, without any need for special insulators or fixing.

**'Phones or speaker**  
The usual type of medium impedance or similar 'phone will give good results. For 'phone listening, a very short aerial, and no earth, will usually give enough volume.

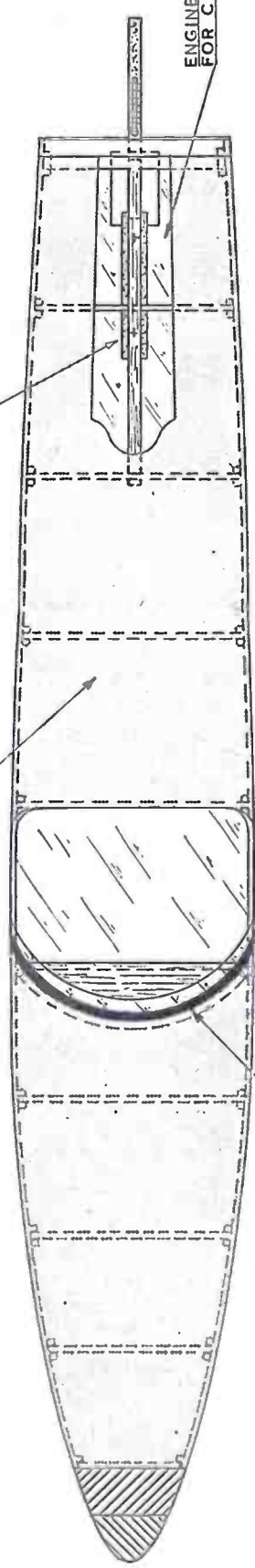
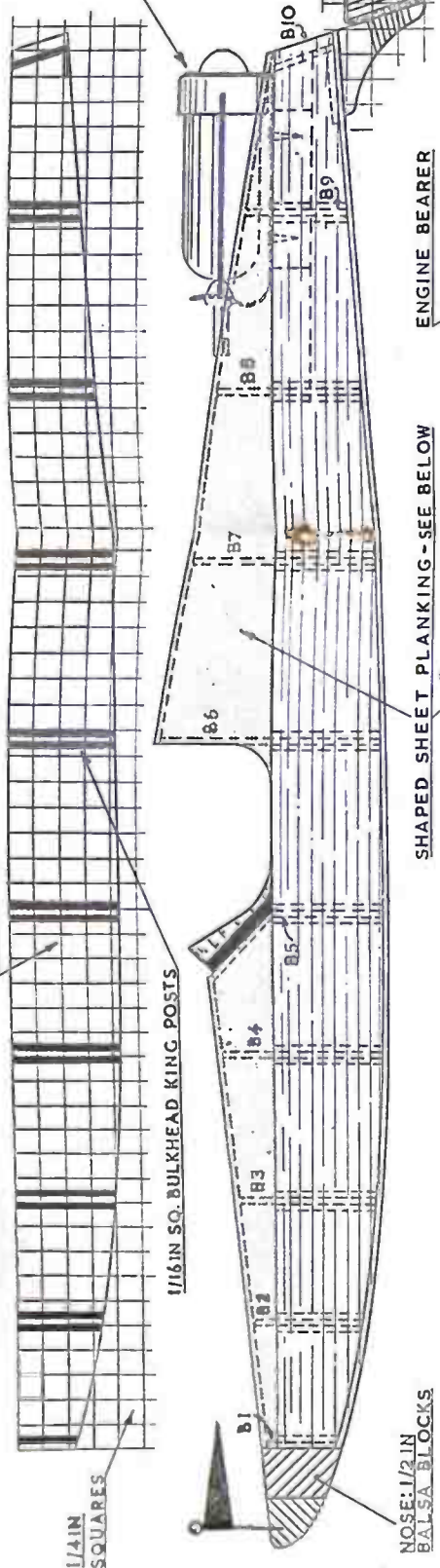
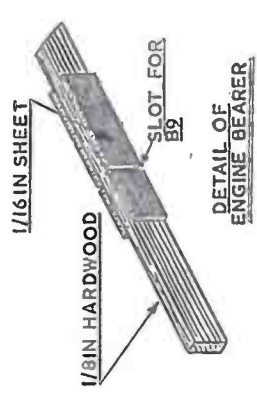
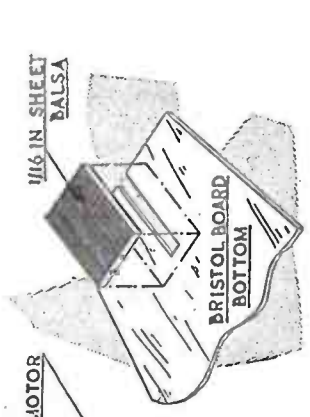
With a reasonably effective aerial, and perhaps an earth, if possible, satisfactory speaker volume can be expected from local stations, in most areas. A sensitive speaker of the kind used in battery receivers, or with transistor portables, will give best volume. A very small speaker is not recommended, one with a cone at least 3 in. in diameter being most satisfactory. The speaker must have a matching transformer. The primary is wired to the receiver, and the secondary to the speaker. For best results, the speaker should be fitted in a cabinet.

Signal strength varies considerably in different parts of the country and according to local conditions. For this reason, it is not possible to give an exact indication of the volume to be expected. Enough volume for 'phones can always be expected, in average circumstances. But speaker results can only be expected if some kind of reasonably efficient indoor or outdoor aerial can be used.

In some parts of the country long wave reception will be needed. A dual-range coil can then be fitted, with a second switch for wavechanging.

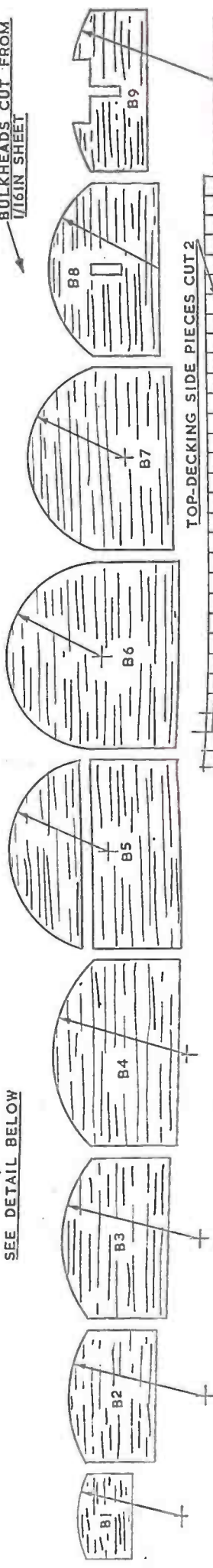
Surplus  $\frac{1}{2}$ -megohm potentiometers can be obtained for 1s. from Alpha Radio Supply Co., 103 Leeds Terrace, Wintoun Street, Leeds, 7, who can also supply all other items necessary, if required.

HULL SIDES 1/16 IN SHEET

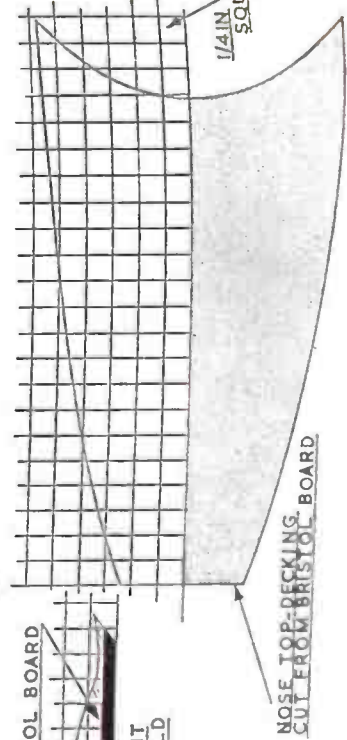


SEE DETAIL BELOW

BULKHEADS CUT FROM 1/16 IN SHEET



1/4 IN SQUARES BRISTOL BOARD



TOP-DECKING SIDE PIECES CUT 2



TOP-DECKING MIDDLE PIECES CUT 2

TOP-DECKING CENTRE PIECE CUT 1



NOSE TOP-DECKING CUT FROM BRISTOL BOARD

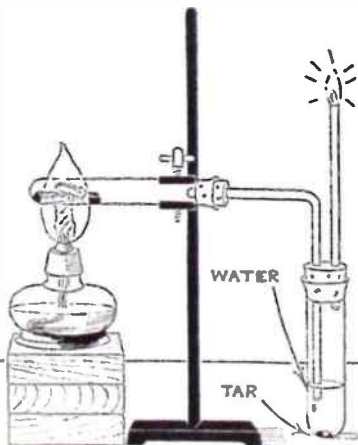
# CHEMISTRY AT HOME

**M**ANY organic, or carbon-containing substances, break down when they are heated into simpler substances. That is, substances which consist of smaller molecules, and hence contain smaller numbers of atoms. These substances are often of great use in everyday life. The distillation of wood and coal, for instance, yield many useful products.

Rig up the apparatus shown in the diagram. In the horizontal test tube, which should be of hard glass, place a few pieces of wood. Heat the tube. The dark vapours which come off the wood pass into the water and tar soon collects. Apply a light to the upright tube. The vapours ignite and a flame appears, and continues to burn until the wood is completely charred.

Dismantle the apparatus. In the hard glass test tube we have charcoal. This is used for purposes as widely separated as the making of indigestion biscuits and gunpowder. Dip a glass rod into the water in the receiver. Touch a slip of blue litmus paper with the rod. The paper is reddened, showing an acid to be present. Put a filter paper into a funnel as for ordinary filtration and wet it. Filter the water from the receiver through it. The tar remains on the filter. This tar has strong antiseptic properties because it contains phenolic compounds. Some of these are separated for various purposes, and the tar itself is used in some ointments and in hair tonics.

Carefully neutralize the filtrate with



sodium carbonate solution. Add the sodium carbonate solution, a drop at a time, until the liquid no longer reddens blue litmus paper but turns it purple. Pour some of the liquid into a test tube and add a few drops of ferric chloride solution. It reddens. Now boil it. A brownish precipitate or turbidity appears. This reaction leads one to suspect the presence of an acetate.

## DESTRUCTIVE DISTILLATION

An acetate is indeed present, for the water from the receiver contained acetic acid which was reacted later with sodium carbonate to produce sodium acetate. Wood distillation is an important source of acetic acid. Acetic acid appears on our table as vinegar, and some vinegar is made by diluting strong acetic acid and colouring it to imitate genuine malt vinegar.

The watery distillate also contains a small amount of methyl alcohol and of acetone, both important solvents. Methyl alcohol from this source is known as 'wood spirit', and is also much used for denaturing ethyl alcohol to make it undrinkable. Hence the term 'methylated' spirit. Without this addition of methyl alcohol we should have to pay a high price for the alcohol we use for so many workshop and domestic purposes, owing to the high duty on pure ethyl alcohol.

The gas which you ignited is used for illumination and heating in some countries where wood is plentiful and coal scarce.

Now try heating some coal in the same apparatus after it has been cleaned. Tar again appears in the water and the gas passing up the upright tube burns. We are on more familiar ground here, for everyone knows that town gas comes from coal. Coal tar contains a great many useful substances, and by fractional distillation we have the familiar benzene (used in some motor fuels as benzol), toluene (used for making T.N.T., saccharin, drugs, and dyes), naphthalene and anthracene (for dyes), naphtha (turpentine substitute), creosote (for wood preserving) and phenol (carbolic acid, a

strong antiseptic and also used for drugs and dyes). The non-volatile residue from the tar distillation is the pitch so familiar on our roads.

Filter the water from the receiver through a wet filter paper. The tar remains on the filter. Test the filtrate with blue litmus paper. Nothing happens. Now try red litmus paper. It is blue, showing an alkali to be present in contradistinction to what we found with wood. The alkali is ammonia, and is derived from the nitrogen contained in coal, whereas wood contains only a trace. This ammoniacal liquid is of the highest importance in making fertilizers, being reacted with sulphuric acid to produce the familiar ammonium sulphate fertilizer. The residue in the hard glass test tube has a familiar appearance. It is in fact coke, whose uses extend far beyond that of a fuel.

Bones consist of mineral matter (mainly calcium phosphate) bound together with organic matter. Such a combination affords some interesting results when distilled. First break up a bone so that the marrow is exposed, and boil the pieces in water. The fat melts and rises to the surface. After allowing the liquid to cool, remove the fat, and dry the degreased bone fragments.

Heat a few pieces in the apparatus used for coal and wood. Again the vapours may be ignited at the tip of the upright tube. A dark liquid collects in the water. Test the water by means of a glass rod dipped into it and then applied to a slip of red litmus paper. The alkaline nature of the liquid is indicated by the blueing of the paper, and is due to the presence of ammonia.

Drain off the water. The residue in the tube is crude bone oil, which is also known as Dippel's oil. It is a highly complex mixture of organic bases and nitriles. One of these bases is pyridine, which is a starting point for some drugs. Dippel's oil — as you will have already noted! — has an extremely fetid smell.

In the hard glass test tube a blackened mass remains which still retains the shape of the bone fragments. About ninety per cent of it consists of calcium phosphate. The rest is carbon. This carbon is in a highly active form, and has the property of removing colouring matters from solutions. Grind and sieve some of it, and add it to some water which has been tinted with cochineal or some other colouring matter. Boil the liquid for some time and filter. The filtrate is colourless, or nearly so, according to the length of boiling.

The sugar industry uses huge quantities of this bone charcoal for decolorizing cane and beet extracts to produce the fine white table sugar. After a time the bone charcoal decreases in

● Continued on page 173



**S**TAN Stennett, the famous comedian, certainly looked flustered when I met him recently writes Ed Capper. All the same, I thought he was joking.

He said: 'The twist in my stairs is sending me round the bend, Mr Capper. And that is too horrible a pun to use in my act. I'm dead serious this time. I just can't get the carpet tidily around the bend in the stairs leading to my attic den...'

Stan's problem is not uncommon. Very amateurish attempts at laying carpet round a twisting staircase are seen everywhere. One sees good carpet needlessly chopped about.

Fold it back

Usually, three angular stair treads are used to negotiate a bend. Two neat backward folds will safely see the carpet around the bend, with the pattern still matching, and requiring no cutting, which would prevent the important repositioning of the carpet, twice yearly, to prevent excessive tread wear forming.

The photograph shows the principle used. The carpet is folded back as shown by the dotted line. The crease of the fold is tucked up tightly under the overhang of the stair tread, and held in place by tacking.

The fold used depends on the extent of the curve being negotiated. Two small folds may be sufficient; on the other hand, two maximum folds as shown in the photograph may be necessary.

Instead of tacking the fold under the bull nose front of the tread, the fold can be sewn along the three edges forming the triangle made. The use of tacks is not then necessary. It is not advisable to stick back the fold with an adhesive, as this would prevent the carpet being repositioned as required.

Fitting the clips

It is seldom possible to get the edges of the carpet square with the risers as the bend is negotiated. This is not so important, however, as matching the pattern, where such a pattern exists.

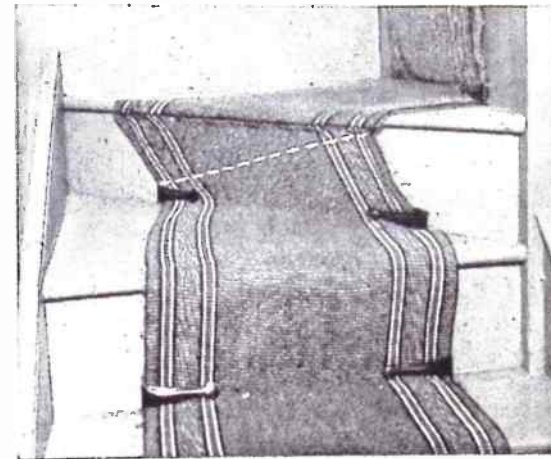
As shown, ordinary stair clips can be used. They should, however, be fitted pair by pair, as the laying proceeds. The reason for this is that the distance apart varies on the three angular treads, and in all cases will be found to be greater than that of the straight treads. If brass or wooden rods are preferred, they also will be of a longer length.

## GO 'ROUND THE BEND' WITH STAN

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

★ Ed. Capper's advice to Stan Stennett on laying stair carpeting should go a long way towards 'straightening out' the famous comedian's difficulties.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★



● Continued from page 172

## DESTRUCTIVE DISTILLATION

decolourizing power. It is then washed with hot water and reheated to restore this property. The char dust removed in the washing is collected and used as an important fertilizer, and for the mineral feeding of farm animals.

The well known pigment Ivory Black used to be made by charring waste ivory. It is now made from bone charcoal. Into 40 c.c. of water stir a like amount of strong hydrochloric acid (the cheap technical grade, 'spirit of salt', will do).

Gradually add 20 grams of powdered bone charcoal. Each addition produces an effervescence, since the mineral matter of the bone contains a small por-

tion of calcium carbonate. When all has been added, leave the mixture to react for a day or two, stirring occasionally. Heat up the mixture for an hour or so in the water bath, and then filter. The yellowish filtrate contains the mineral matter which the acid has dissolved from the bone charcoal.

Note how much diminished is the charcoal in the filter. Wash it well with water until the wash waters are no longer acid to blue litmus paper. Dry the charcoal. This is ivory black. Try grinding a little with weak gum water and paint with it. It has the familiar intensity of the bought ivory black.

# MEAD AND HONEY WINES

**M**EAD is, undoubtedly, one of the finest products of the home-made wine enthusiast, and when properly prepared it can be extremely potent. It is also one of the earliest wines ever to be made, and was known long before grapes were used for wine-making.

Mead is the fermented mixture of honey and water, and can be made in a wide variety of ways. It may be dry, sweet, or sparkling, and sometimes other ingredients are added, generally in small

*By A. F. Taylor*

quantities. When spices are put into the mixture it is known as metheglin, and there are several other variations.

It is not often possible to know exactly what kind of honey we are using. In many cases it will be mixed from various flowers, and the result can be awaited with interest.

## DRY OR SWEET MEAD

This very simple recipe will produce a mead which can be varied from a very dry to a sweet drink simply by altering the amount of honey that is used. By putting two or three pounds of honey to the gallon of water we have a dry mead, but if we increase this amount to from four or even up to six pounds to the gallon the result will be a sweet one.

2-6 lb. Honey  
1 gall. Water  
1 oz. Yeast

Thoroughly dissolve the honey in the water by allowing it to simmer for a short while at a temperature of about 120°F. If you do not possess a thermometer, that is just a little too warm to put your hands into with comfort.

Remove the scum that has collected on the top and allow to cool to blood heat (98°) when you can add the yeast, which has been dissolved in a little of the warm liquid. The fermentation time will vary according to when the mead was made. It will take much longer during the cooler part of the year.

When fermentation has ceased, and this should not be hurried, carefully decant the mead without disturbing the sediment, and cork up lightly. Some types of mead produce a large quantity of sediment, and will need decanting several times at periods of about three months before it clears in a satisfactory manner.

Meads generally improve greatly by

keeping, and the sweet types especially should be excellent after about five years' storage.

## METHEGLIN

6 lb. Honey  
1 gall. Water  
4 Cloves  
1/2 oz. Root Ginger  
1/2 oz. Yeast

Simmer the honey, bruised ginger, and cloves in the water for about an hour. Then strain and add the yeast when the liquid has cooled, and in the same way as for the previous recipe.

Many other spices or herbs can be used in place of the ginger and cloves in this recipe, either singly or in combination. Here are a few suggestions to help you to try out other types of metheglin.

The herbs or spices mostly used are cloves, ginger, mace, cinnamon, balm, marjoram, orange and lemon peel. The quantities used should not be excessive, and in most cases a total of 1/2 oz. of spices to the gallon will be found sufficient.

## FRUIT MELOMEL

Here is an excellent recipe for a mead that can be made from quite a number of different fruits. Particular favourites for this type are blackcurrants, blackberries, and elderberries, but almost any of the usual wine-making fruits can be used with success. The name given to these fruit recipes is Melomel.

3 lb. Fruit  
1 gall. Water  
1/2 lb. Rice  
3 lb. Honey  
1/2 oz. Yeast

Soak the rice in the water for several hours, or overnight if possible, and then boil for about 5 minutes. Strain through butter muslin without squeezing, add the fruit, and boil for a further 15 minutes. Then strain again and while still warm add the honey and yeast and stir until thoroughly dissolved.

Put into jars or bottles and allow to ferment for about three weeks. Spices in small quantities can also be added to this recipe if you like the flavour. Most fruit wine recipes can be made with honey by replacing the sugar with an equal quantity of honey or half of each.

## PYMENT OR GRAPE MEAD

This can be a bit expensive if the grapes have to be bought, but it is well worth it. Many people grow grapes out of doors and these are very suitable for

our purpose. Greenhouse grapes that have not ripened are also excellent.

2 lb. Green Grapes  
1 gall. Water  
2 lb. to 4 lb. Honey  
1/2 oz. Yeast

Squash the grapes and soak in the water overnight. Then bring to the boil and simmer for 15 minutes. Strain, and while at a temperature of 98°, add the honey and yeast, and stir until dissolved. Put to work, and when fermentation ceases, bottle up and cork lightly.

## CRAB APPLE MEAD

Except for making jelly, crab apples have few other uses, but they are, however, excellent for wine-making.

2 lb. Crab Apples  
1 gall. Water  
3 lb. Honey  
1/2 oz. Yeast

After the apples have been well washed they should be chopped up into small pieces. If they can be minced it will help the process considerably. Put them to soak in the water overnight, and next day boil gently for half an hour.

Strain, and then add the honey and yeast at the usual temperature of blood heat, and allow to work for three weeks.

You may like to try a mead made by dissolving the honey in cider instead of water, or you can use half cider and half water. The general proportions of the ingredients are similar to the recipes for other types of mead and little alteration need be made here.

Here is a wholesome wine, differing somewhat from the others, and which should have instant appeal. All the ingredients are very nutritious and will produce an excellent drink.

## ORANGE MELOMEL

8 Oranges  
1/2 lb. Rice  
3/4 lb. Prunes  
3 1/2 lb. Honey  
1 gall. Water  
1/2 oz. Yeast

Soak the rice for several hours in a little water and do the same with the prunes, but keep them separate. Then put the orange pulp and juice in a saucepan with the chopped-up prunes, and simmer gently for half an hour. Now add the rice and continue for another quarter of an hour.

Strain, and while still hot stir in the honey, and see that it is completely dissolved before adding the yeast at blood heat (98°). Allow to ferment for three weeks, decant, and bottle up.

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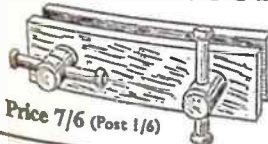


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# HOW TO MAKE MOSAICS

NO doubt you have seen mosaic floorings at the entrances of shops, theatres or cinemas, noticing that small tiles are arranged to form either a pattern or a name. This is an ancient craft, and some of the finest mosaic floorings were laid by the Romans when they occupied this country.

You can buy small mosaic tiles, about 1 in. square, for this interesting craft, but it is much more fun to collect your own. Cracked tiles, bottles, vases, dishes, and plates can be used for this purpose if they are further broken into the size mentioned. But beware when breaking them with a hammer, since pieces are apt to fly. To prevent this lay a piece of cloth over a broken plate, and tap with a hammer. Sort the pieces into various sizes and colours, since it is the contrasts and combinations which help to make attractive designs.

We now need a piece of paper for drawing the design, and we will assume that we are to make a small teapot stand. Draw a 6 in. square on the paper, as shown in Fig. 1. Preparing a suitable design is a matter for your own ingenuity. We suggest various geometric shapes such as squares, circles or combinations of same in different colours. Alternatively, you may sketch a leaf or flower shape, or even an initial, but at the first attempt it is wiser to avoid anything which may be too complicated.

We will assume that you have collected enough material, sorted it out into various colourings, and that the pieces are about 1 in. square, and we are ready to start the project.

Place the paper with the prepared pattern on a board, applying a coating of glue. Then add the mosaics one by one according to your design. For example,

it may be advisable to have a white border all the way round the outside edges of the pattern, and this can be supplied from a broken white dish. A leaf in the centre would require green pieces, while flowers would need more colourful specimens. If you come across small silver or gold pieces so much the better, for these add a real touch of brightness and distinction.

There is one thing you must remember, however, and that is that the face surface — the surface we see in the finished product — must be in contact with the glued surface of the paper pattern. It may be that some of your mosaics are shiny on one side and dull on the other, the glazed side usually bears the colour, and it is this side which must

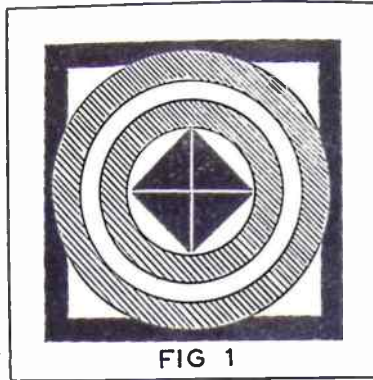


FIG 1

By H. Mann

be laid down on to the paper. Any difference in the thickness of the pieces does not matter at all, for this is taken care of in the next part of the process.

Once the paper design has been covered with the mosaic pieces, and as many odd crevices as possible filled in with small pieces, lay aside to dry, and proceed with the making of a plastering frame. All that is required is a simple frame made from  $\frac{1}{2}$  in. or  $\frac{3}{4}$  in. stripwood about  $\frac{1}{2}$  in. thick and of a size to take the mosaic tile. In this instance we require a frame measuring 6 in. square on the inside. A few panel pins at the corners will be sufficient to hold the frame together, since it will not be subjected to any great strain. At the same time you must be quite sure that the frame is perfectly square.

Place the wooden frame over the design which remains on the board (Fig. 2) and bond together the tiny mosaics to make a tile. Obtain a small quantity of Keene's cement — sometimes known as parian plaster — from a paint shop. A bag containing about 3 lbs. will cost about 1s. 3d. You will require about two cupfuls of the cement, which is mixed with water until it is in such a condition that it will pour freely into the mould.

The mixture must fall into all the little crevices between the mosaic pieces.

Sometimes it helps to push the material into these cracks with a stiff paint brush. This will also dispel any tiny air bubbles. Continue pouring in the mixture until it is level with the brim of the mould, when it should be laid aside to set. If the mixture is too thin it may escape from underneath the sides of the mould, but this can be countered by sealing with Plasticine along the edges.

Your tile will be ready in approximately three to four hours, after which the sides of the mould can be eased away. The paper pattern can be damped with a little water and removed.

Glue a piece of baize to the base to prevent it from scratching a polished surface. Alternatively, the tile may be glued on a wooden base, framed with quadrant moulding with four wooden beads added to act as feet, staining and varnishing as usual.

While Keene's cement is ideal for small novelties of this type, larger pieces require a stronger foundation. For these you should use Portland cement mixed with clean sharp sand in the proportion of 2 parts sand to 1 of cement, adding water to the mixture. When the mixture is sloppy enough for pouring, the procedure is exactly the same as described.

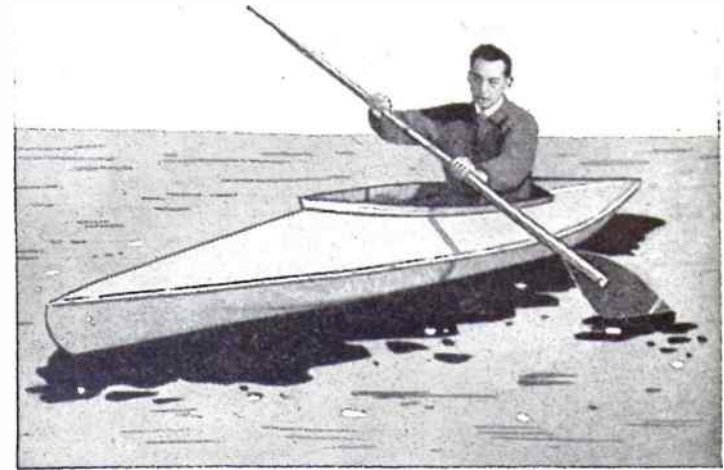
## ANSWERS TO QUIZ

(See page 166).

1. Lantern light; 2. Half-lap dovetail; 3. 6. Like No. 3, it is a twist drill gauge size; 4. Yes. The 'going' in a staircase is the horizontal distance between one riser face and the next; 5. The batter is the sloping or inclined face of a wall!

# Single seat and two seat CANOES

COMPLETE AND READY  
FOR THE WATER — OR  
IN KIT FORM TO MAKE  
YOURSELF



THE PBK 10 SINGLE SEATER

These popular craft are designed by that well-known authority, P. W. Blandford. With canvas skins, they are propelled by double-bladed paddles and are thoroughly at home on lake, river or canal—or even on the sea in experienced hands. They are offered as complete canoes, or as specially prepared kits, which include full building instructions.

## PBK 10

Single seat—11ft. long  
28in. beam—load 300lb.

COMPLETE CANOE **£24.5.0**  
(without paddles) (Part p. & p. £2 extra)

COMPLETE KIT **£15.10.0**  
(except paint and varnish and without paddles) (Part p. & p. 15/- extra)

## PBK 20

Two seater—15ft. long  
32in. beam—load 700lb.

COMPLETE CANOE **£32.10.0**  
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COMPLETE KIT **£22.5.0**  
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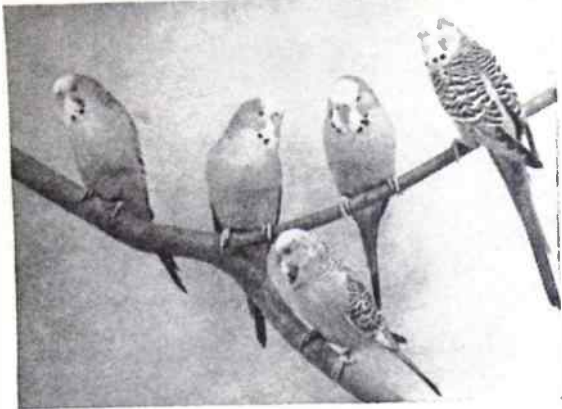
DOUBLE-BLADED PADDLES, 47/6 Complete (Part p. & p. 2/6 extra)

DEREHAM



NORFOLK

# OUR FRIEND, the Budgerigar



IT is strange to realize that budgerigars were unknown as cage pets in their native Australia until they were first exported in 1840. Known as the Shell or Canary Parrot, they lived and moved about in their thousands over the salt marshes, where they fed on seeding grasses. No one there thought of the attractive green and yellow birds as pets. Yet, in Great Britain alone, they now equal if not exceed, the number of canaries kept.

Their popularity really started in 1878, when the first cross-bred blue budgerigar was produced in Belgium by M. Kessell. Soon after, pure yellow birds were bred. By 1926, all shades were being produced and in 1927, a fine pair of blues was sold to Japan for £125. Prices rocketed, but this trend was short-lived because the ease in which budgerigars were produced soon provided a good supply of new colours. Today, the most popular colours are greens, sky blues, cobalts, yellows and whites.

There is no bird quite like the budgerigar with its amusing little habits. They are never sad or sleepy like the larger breeds of the parrot family. They can be taught many tricks, perhaps the best being their ability to talk.

### Choosing a bird

The ideal bird to buy is one around six weeks old. Unfortunately, it is not possible to tell their age until they are a few months old. Some people say cock birds are the best talkers; others say a hen bird. Here again, it is almost impossible to tell the sex of a young bird.

The choice of the bird, therefore, depends on trusting your dealer. The best plan is to acquaint him of your desire and to wait until the next brood arrives. The breeding season is usually from March until August.

The young bird leaves its nest at four weeks old. It is imperative that the bird you buy has only been running with the rest of the birds in the aviary for a week or two after this. Otherwise it will learn 'bird chatter' and will be difficult to teach to talk.

There is no difficulty in sexing a bird aged five months or over. Just above the beak is a fleshy pad with two small nostrils and known as the cere (see Fig. 1). With young birds the ceras are almost identical but, as they mature, the cere turns a bright blue on the cock bird and a rich brown on the hen.

### Feeding

Fig. 1 also shows other differences in a young and an adult bird. On the young bird the 'bars' on the forehead reach right down to the beak top. Note also, that its eye is larger and blacker. Finally, note the black spots on the 'bib' of the older bird compared with the faint marking on the young bird. A fully grown bird can have up to eight of these attractive black spots.

The staple food of the budgerigar is millet and canary seed; the former can be purchased in a spray. Cuttlefish bone should always be in the cage. It provides a source of lime so necessary when the birds are laying eggs and rearing young. Medium grade sand should be sprinkled

over the floor and some kept in a container.

A small supply of water is sufficient, but it should be changed every day. When re-filling the seed container, lift it to mouth level and blow over the top. The empty husks will blow away, leaving the residue of untouched seed at the bottom.

Some green food should be provided for vitamins. Spinach, lettuce, cabbage are all good, so is a little carrot or apple.

## 1—CHOOSING AND FEEDING

From the garden, groundsel, dandelion and seeding grasses are all excellent. A turf of grass, roots and all, is a treat for the budgerigar. Place it in the bottom of the cage but remove it at the end of the day.

Be sure all green matter is fresh. On no account use anything frostbitten.

Do avoid meat, sweets, such as sugar, potato and other food normally eaten by human beings. It may be fun to watch your pet helping himself to your dinner. It is not so funny to find your kindness has killed your pet.

(E.C.)

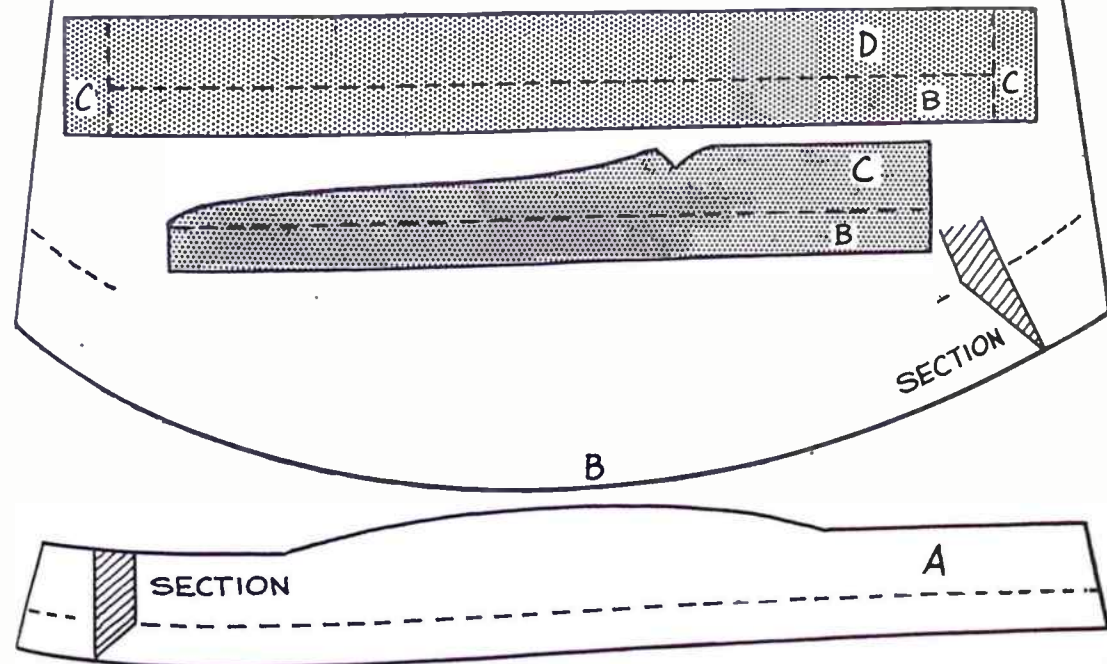
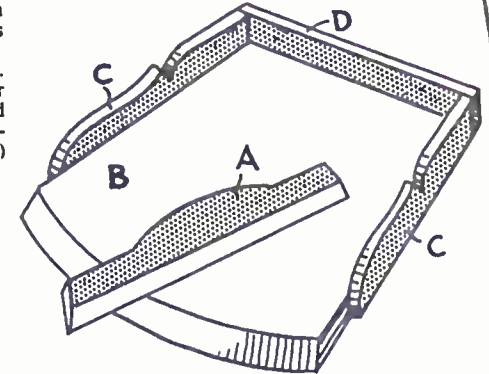


ADULT HEAD  
Fig. 1.

## A USEFUL CRUMB TRAY

THE crumb tray is made from  $\frac{1}{2}$  in. wood. You will need one piece B (the tray), two pieces C (the sides), and one piece D (the back). These pieces are cut from  $\frac{1}{2}$  in. wood with a fretsaw, and are cleaned up with glasspaper. They are glued together, as shown in the inset diagram.

The scraper A is also cut from  $\frac{1}{2}$  in. wood. Note that one edge of the scraper and the front edge of the tray are shaped to the sections shown. Finish by painting or polishing. (M.p)



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## 'DREAM KITCHEN' UNITS

AVAILABLE READY-MADE OR AS KITS

'Winsome' kitchen units are designed and produced by Hobbies Ltd., Dereham, Norfolk, and are available by post direct from Head Office or from all branches. Each unit can be used singly or in conjunction with others, according to size and shape of kitchen.

Designed to give maximum cupboard, drawer, and shelf space, they stand at a comfortable working height of 2 ft. 9 in. on recessed plinths. Sliding doors and durable plastic worktops are other compelling features.

Each unit is available completely finished (with choice of colour) or as a specially prepared kit in its natural state, ready to put together with a screwdriver and glue and finish to your own choice — a simple job.

### 1 END UNIT — No. 57

Complete £5 17s. 6d.  
(part p & p 7/6 extra)

Kit £4 12s. 6d.  
(part p & p 5/- extra)

### 2 CABINET UNIT — No. 51

Complete £8 15s. 0d.  
(part p & p 10/6 extra)

Kit £6 19s. 6d.  
(part p & p 7/- extra)

### 3 CORNER UNIT — No. 54

Complete £8 13s. 6d.  
(part p & p 10/6 extra)

Kit £6 18s. 0d.  
(part p & p 7/- extra)

### 4 SINK UNIT — No. 55 (without sink and taps)

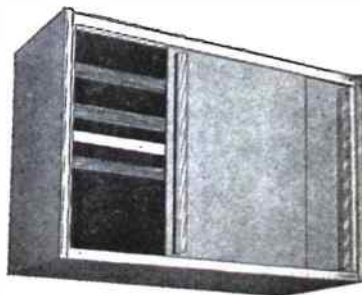
Complete £6 15s. 0d.  
(part p & p 10/6 extra)

Kit £5 10s. 0d.  
(part p & p 7/- extra)

### 5 DRAWER UNIT — No. 52

Complete £8 14s. 6d.  
(part p & p 10/6 extra)

Kit £6 19s. 0d.  
(part p & p 7/- extra)



### WALL UNIT (to match)

No. 53 (36" x 23" x 12")  
Complete £4 10s. 0d. Kit £3 5s. 0d.

No. 56 (36" x 17" x 8")  
Complete £3 12s. 6d. Kit £2 12s. 6d.  
(part p & p unit 7/6, kit 5/-)

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