TRAPPING METHODS FOR BIRD RINGERS

Revised Edition

by

P. A. D. HOLLOM

and

H. G. BROWNLOW

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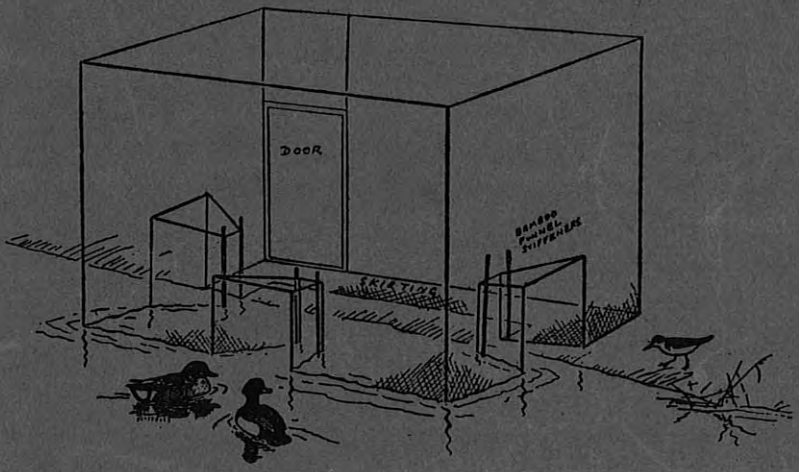

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Revised edition by P. A. D. Hollom and H. G. Brownlow
Illustrated by R. A. Richardson and G. C Johnson

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PREFACE

The first edition of this field guide was published by the Trust in 1950, having been prepared by Mr. P. A. D. Hollom (with illustrations drawn by Mr. R. A. Richardson) at the request of the Bird-Ringing Committee. Lieut.-Colonel H. G. Brownlow, to whom the Committee is indebted for his able execution of the task, has now revised the text in consultation with Mr. Hollom and incorporated much new material. There are several new illustrations by Mr. Richardson and Mr. G. C. Johnson.

Ringing has for many years played an important part in the study of bird movements and life-histories. Increasingly—even during the five years since this field guide first appeared—ringing depends on the trapping of birds specially for the purpose (as distinct from finding young birds not yet able to fly) ; and this is particularly true of the bird observatories, where the possibility of handling the birds is also helpful in the identification of migrants. The need for reliable guidance on methods is therefore greater than ever, and the more so because new designs and methods are always being developed.

Certain designs, however, are advisedly excluded from publication even although they may be quite safe in thoroughly experienced hands. The methods here recommended must of course also be used with proper care, and the text draws attention to particular points. It is important for scientific reasons, and of course essential on humanitarian grounds, that trapping and ringing must not involve injury of any kind to the birds. There is abundant evidence to show that this ideal is attainable ; and it is well known that many birds acquire " the trap habit ", returning repeatedly to the same trap within a short period.

The new Protection of Birds Act, 1954, expressly allows the use of cage-traps or nets for catching birds, irrespective of species, for the purposes of ringing. Artificial lights and rocket-propelled nets, however, may be used only under licence. In case of doubt, information can be obtained from the Secretary of the Bird-Ringing Committee.

LANDSBOROUGH THOMSON,
Chairman, Bird-Ringing Committee.

London, 1955

Chapter 1

GENERAL

The primary object of trapping birds is to determine their species and to ring them for the study of age, local movement, and migration. This field guide is designed to assist ringers recognized by the Ringing Committee of the British Trust for Ornithology who wish to make traps for catching birds. The rules of the Committee governing admission to the ringing scheme are given in Appendix A.

The cardinal principle to be followed by all ringers using any form of trapping is that the minimum possible fright, shock, fatigue, and discomfort must be inflicted on birds, and no damage of any kind must be done to them.

Traps are either direct, or automatic, or a combination of the two. Direct traps are those of which the trapping mechanism is released by the ringer when he sees birds enter. Automatic traps are those which a bird enters, impelled by curiosity or lured by bait, and traps itself. In maze type traps birds enter, often through a funnel entrance, and are unable to find their way out again. In the action types the bird releases the closing mechanism by its own weight on a perch or by pecking at bait ; the closing mechanism may be operated by gravity or by springs.

Direct traps have two immense advantages over automatic traps. Birds are ringed and released as soon as possible after catching, and the closing of the trap is controlled by the ringer.

Birds caught in automatic traps, however, must wait in them until the next visit by the ringer. Birds may be severely damaged or even killed by a prolonged wait in an automatic trap. They may be killed by hunger, injured by struggles to escape, or killed or injured by birds of prey or animals trying to get them out of the trap. In wet weather, too, birds kept even a short time in automatic traps become very wet and bedraggled.

Automatic traps *must*, therefore, be visited very regularly and frequently when set. They should never be left for longer than an hour. If they are left unvisited for any reason, they must be put out of action, either by releasing the closing mechanism so that the trap is shut and no bird can get in, or by fixing a door open so that birds can get in and out freely and easily. It is useless to try to block the funnel entrances of maze traps. Something will force them open sooner or later. Doors of traps with such entrances must be left open and securely fixed.

The closing mechanisms of direct traps must always be released

intelligently and with care by ringers so as to avoid injury to birds. In automatic action traps very great care is required in the selection of type of trap, the design and the siting so as to eliminate danger of injury. These points will be elaborated in Chapter 4.

The danger of injury to birds has deliberately been stressed in this chapter, and indeed if traps of any kind are worked by ignorant, casual, or careless people the danger is very real. Experience has, however, proved that if traps of all kinds are worked intelligently and carefully, thousands of birds may be caught, handled, examined, and ringed without injury and with negligible shock and fright.

Throughout this book, the *front* of a trap means the end at which birds enter, and the *back* the end at which they are taken out by hand.

The names of ornithologists who have given information about trapping methods which has been used in the compilation of this Field Guide are given in Appendix B. As many blocks as possible from the original edition have been used again ; in one or two cases (for example, the catching-box in fig. 5) they are slightly at variance with the latest designs recommended in the text.

Chapter 2

CONSTRUCTION OF TRAPS

The two commonest materials for covering traps are wire netting and string netting. The advantages of wire netting are :—

(i) Greater strength and durability.
(ii) Less likelihood of holes developing which may let birds escape.
(iii) The strength of the wire gives a certain amount of bracing to the framework of a trap and adds to its structural stability.

Its disadvantages are :—

(i) It is a harsh material, and if a bird is retained in a trap for any length of time, or if it is repeatedly trapped, it may suffer abrasion of the forehead.
(ii) Cut edges leave sharp points which, unless properly dealt with, may damage birds or ringers' hands.

The advantages and disadvantages of string netting are the reverse of those of wire netting. An additional disadvantage is that, unless the netting is taut, birds become entangled in their attempts to escape, and may suffer sprains, or even be strangled.

Small traps may also be made of stiff wires inserted into holes drilled in a wooden framework, or welded or soldered to a metal framework. Such an arrangement is approximately comparable with wire netting but, if the wires are arranged vertically, there is less danger of abrasion to birds. Wires must be sufficiently close together to eliminate any danger of birds getting their heads between them and so strangling themselves.

The framework of traps may be made of wood, stiff wire, or metal strips or angles. Amateur trap constructors will probably make the neatest job with wood, and wood is the easiest material with which to make the framework of a sound, bird-proof trap. It is suitable for traps of any size. For portable traps, however, unless they are very small ones, it is apt to be fragile or perish unless unsuitably heavy timber is used. Wire frameworks are suitable for traps with dimensions up to about four feet. 8-gauge galvanized wire is about the lightest that can be used. In order to make a neat trap, bends should be made with a vice and hammer, and constructors should be adept at soldering. The framework for larger, permanently located traps may be made of a variety of materials and, in most cases, design will be dictated by

stocks available, or by the type of material most easily and cheaply to be obtained. The neatest finish will be given by timber, preferably squared and properly framed and jointed, or by small gauge water pipe or electrical conduit connected by the standard bends, T-joints, etc. With care, however, a wren-proof wire-netting cover can be arranged round lashed junctions of poles, or second-hand tubular scaffolding. If timber is used, the whole, or at least the bottom portions, should preferably be creosoted. It is best to get the timber creosoted by pressure plant, but such plant is rare and transport charges may be prohibitive. The bottoms of posts can be treated nearly as effectively by standing them in a tank or cylinder of creosote for 24 hours. Timber posts should be sunk at least 18 in. in good ground. In very loose sand it may be necessary to sink them as much as 5 ft. Metal posts should each be set in a concrete block of not less than one cubic foot volume, poured so that the top of the concrete is flush with the ground.

Use of Wire Netting

The finer the mesh of the wire, the greater will be the expense, and in larger traps (see fig. 5) the greater the resistance to wind and snow. For small traps, and for the final compartment of larger ones, $\frac{1}{2}$-in. mesh at most must be used if Wrens or small warblers are to be retained. For the outer compartments of large traps $\frac{3}{4}$-in. or $\frac{5}{8}$-in. mesh may be used, and for wing walls and roofs of outer compartments of the largest traps 1-in. mesh may be used provided that there is a strip of wire about a foot wide along the edges of the roof of the same mesh as the walls. A coarse mesh for the roof of large traps is advisable so as to avoid trouble in the event of heavy snows. It also allows birds which perch on the roof to filter in, but keeps even the smallest birds inside the trap when being driven. The finer meshed nettings are normally made of wire of rather light gauges, and are not very durable. Netting made of wire of heavier gauges than normal can be obtained by special order from any good ironmonger. It will be more expensive than that normally stocked, but in permanently sited traps will probably prove an economy in the long run.

When covering the framework of small portable traps with wire netting, the selvedge edge should, wherever possible, be placed at the bottom of the walls of the trap, and at other places where birds are most likely to try to escape. The sharp ends of cut edges of netting should be bent outwards, blunted with blobs of solder, concealed behind a wood fillet, or otherwise rendered innocuous. In larger traps, joints between strips of wire netting are best made by sewing with fine wire. The two widths to be joined should overlap by at least three times the mesh of the wire. Stapling the sheets to be joined to a wooden fillet makes a neater job, and is more economical in netting, but a large number of solid opaque parts may tend to deter birds from entering. The wire netting of the walls of permanently located traps

should be set 6 in. into the ground. Baffles are very useful in larger traps, such as fruit-cage or Heligoland traps. They are strips of netting, fixed vertically to the walls and horizontally across the roof, and sloped inwards and backwards, so as to give a lobster pot effect.

Gathering Cages and Collecting Boxes

These are small compartments into which birds are driven from a trap for collection in the hand. A gathering cage is a simple wire-netting box which can be carried round to serve a number of small traps. The cage may be a cube of about 9 in. sides. The top, bottom, sides, and back are covered with wire netting, and at the front there is a sliding door corresponding with similar doors at the back of the traps.

Collecting boxes are more solidly constructed and are normally permanent fixtures on all but the smallest traps. They are normally raised about 3 ft. clear of the ground for easy working by a standing trapper, and because the final section of a trap is preferably sloped upwards. This is because birds usually try to escape by flying upwards. The back is made of some transparent material, so that it seems to the birds a way out. Many people favour some form of transparent plastic for the back panels, since plastic is not such a hard substance as glass for a bird to fly against. Plastics tend, however, to be translucent rather than transparent and quickly become scratched and dirty and more and more opaque. They are more difficult to clean than glass. If the upper part of a glass back panel is properly sloped, however, the bird flying against it receives only a glancing blow and if the last section of the trap is reasonably short, so that the birds do not have room to reach a high flying speed, there need be no fear of casualties. To be effective, the slope must be at least 60 degrees, preferably 45 degrees. A door to the front opening of the box is desirable and this, too, is best sloped, so as to be self-closing. There is no need for a flat top, or a great depth, because trapped birds nearly always stand on the floor of the box. The basic design for a collecting box is therefore a box with horizontal dimensions of 1 ft. to 1 ft. 6 in. and height 9 in. to 1 ft. The back is a glass panel. The "roof", viewed from the side, is like a gable, the back slope being a transparent panel and the front slope a falling door opening to the trap. Internal partitions dividing the box into upper and lower compartments are undesirable, because some birds will perch on them. In large boxes, some method of confining tapped birds to the lower part of the box is an advantage. This is probably best done by a light board hinged along the front inside of the bottom of the box and operated by a stiff wire pusher protruding through a hole in the front of the box into the last compartment of the trap. In the open position it stands vertically against the front of the box. In the closed position it is pushed back to slope against the back glass panel. The depth of a box so fitted must, of

course, be greater than the front to back dimension. A hole 6 in. in diameter is made at the centre of one side of the box, as low as possible, to enable birds to be taken out by hand. It is covered by a cloth "sleeve" or sliding shutter, fixed to the outside of the box. A sleeve is the more efficient device. The main disadvantage of a sleeve is that it becomes unpleasantly wet in rainy weather. This may be overcome by pushing the sleeve through the hole into the box when not in use. If sliding shutters are used they should open vertically. Horizontally opening ones are apt to be opened by wind.

In fitting boxes to traps, two important points are often overlooked. The first is that the netting of the trap must come straight to the actual sides, top and bottom of the box opening, leaving no

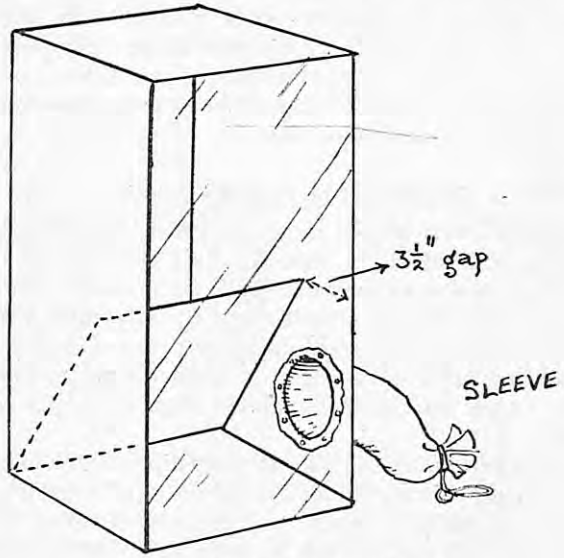


FIG. 1.—SIMPLE COLLECTING BOX

corners into which birds can get. The other is that the door must be made so that birds cannot get behind it in the open position. This point, of course, applies equally to any other doors further forward in the trap. The best way to effect this is to make a small gantry above the roof of the trap and lead the control wire or cord from the bottom of the door, through the trap roof to a ring or pulley on the gantry and so back to the operating point. The door can then be pulled tight against the trap roof. To ensure quick and efficient catching of birds with the hand, the design of the box and its surrounds must be such that the trapper can easily reach all parts of the box floor, and that he can easily see his own hand in the box and the birds he is catching.

A simple form of collecting box is used as a permanent fixture to

many small traps. It is a wire netting box about 9 in. by 9 in. by about 18 in. high, with the open side fixed to a corresponding opening at the back of the trap. A wire netting ramp, about 8 in. long, slopes from the bottom of the opening upwards and into the box. A sleeve or shutter is provided in the back or in one side of the box.

An efficient carrier for birds collected from a number of traps can be made as follows : Cut off the seam at the bottom of a sack so as to make a tube of sacking ; fix one end of the tube securely round the outside of a garden sieve and provide some means of closing the other end. This may be by tapes, or better, a ring of wide elastic, like a child's garter, sewn on to a short length of tape, the other end of which is sewn to the top of the sacking. Other methods are : a copious supply of linen or muslin bags, or a single-cell Potter trap covered with dark cloth, or a cubical wooden box carrier of 15 in. to 18 in. side, made up as follows : Fit a handle or carrying strap to the top ; provide a hole and sleeve at the centre of the bottom of one side ; make a side, adjacent to that side, of glass set slightly in so as to allow room, outside it, for grooves to take an opaque slide.

Camouflage of traps by painting

Traps of all kinds will be more successful if the trap is made as inconspicuous as possible, so that the bait is relatively more conspicuous. In America, experiments have been made with five traps, identical except for colour, placed along the edge of a wood. Each trap was used in each of five positions. 40 per cent of birds were caught in a trap painted black, 28 per cent in a green trap, 12 per cent in a brown trap, 12 per cent in an unpainted trap, and 8 per cent in one painted white.

Painting is best done with a spray or by dipping in a paint bath. If applied by brush, painting should be done to parts before assembly. Black bituminous paint is cheap, can be applied direct to new galvanized wire netting, and is much more durable than ordinary paint ; painted traps last much longer than unpainted ones.

Chapter 3

DIRECT TRAPS

Direct traps may vary in complexity from the child's sieve, stick, and string trap to the big Heligoland trap of a major observatory.

Drop Trap (fig. 2)

The most successful type for general purposes is the drop trap. It is a wire-netting-covered framework of wood or stiff wire about 1 ft. high by 2 ft. 6 in. wide by 2 ft. long. One end is hinged to the roof to make a door, by which birds can enter, and which falls to close

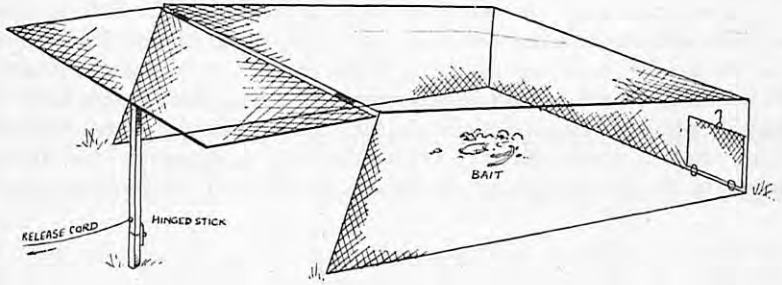


FIG. 2.

the trap behind them. The door is propped open by a short stick to which a release cord is attached. As a refinement, this stick may be in two parts hinged in the middle. This arrangement helps to ensure that the stick immediately falls clear of the door without fouling it. The length of the stick should be two to three times the height of the largest bird for which the trap is set. The smaller the angle through which the door falls to close, the more quickly will it close, the less will it bounce on closing, and the less is the danger of damaging birds. The bottom of the sides should be extended by a minimum of 6 in. so that the door, when closed, slopes at 60 degrees at least. Gravity then keeps it closed, and there is less danger of a big bird, such as a Blackbird, pushing its way out. The trap should have no floor, nor should the framework extend across the bottom at the entrance, as any obstruction there may deter birds from entering. The rigidity of the trap may be improved by attaching wire prongs about 3 in. long to the bottom corners, so that the trap may be firmly anchored by pushing them into the ground. A small door to fit the opening of the gathering cage should be made at one corner of the back. It consists of a rectangular

wire frame covered with wire netting, and should overlap the opening by at least one inch on all possible unhinged sides. It may be hinged at the bottom, and closed by a string with a hook to engage on the back of the gathering cage in the closed position. If it is hinged at the top, the door should be sloped as is the entrance door, with a release cord and hook. So small a door will, however, need a considerable weight fixed to its bottom side to keep it closed. Possibly the best arrangement is a door opening and closing in a vertical plane. This can be done by making the vertical sides of the frame of light metal channels or of built-up wooden channels in which the door can slide.

A collapsible trap of this kind may be made by attaching the sides and door to the top by rings so that they can fold flat for transport or storage. If all the sides are sloped, so that the trap is in the form of a pyramid or truncated pyramid, several traps may be nested for transport. This method of construction may be used for traps as large as the Abberton Trap.

The trap may be operated from several points, such as the upstairs and downstairs windows of a house, by fixing the free end of the release cord to a peg and tying cords, leading to the various points, to the release cord a short distance from the peg. Bait in this kind of trap should be put well clear of the door. Care must be taken that the birds are well inside the trap before the door is dropped. The three points in this paragraph are applicable to all other traps of this type.

Pyramid Trap

This may be either direct or automatic. For convenience, it is described in Chapter 4.

Large Drop-Trap or "Minigoland"

Fig. 3 shows a trap of this type. The portmanteau-word name is taken from a trap of this kind put up at Cley Observatory. Such a trap will probably occupy some semi-permanent site, which requires careful selection, but owing to its greater size, birds enter it more freely and some larger species may be caught. It is preferably fitted with a collecting box. The release cord for the box door is best led to the front of the trap. If possible, it should be sited to back on to a bank, so that the alternative position shown in the inset can be used. Even on a flat site it is better to support the collecting box on stakes and make the floor of the funnel a rigid opaque ramp. A trap of very similar design, which has caught many Starlings, has double front doors swinging through horizontal arcs to close. The doors are closed by the pull of a strong spring. The spring is released by a trigger operated by a release cord. The closing of the doors tends to drive birds further into the trap.

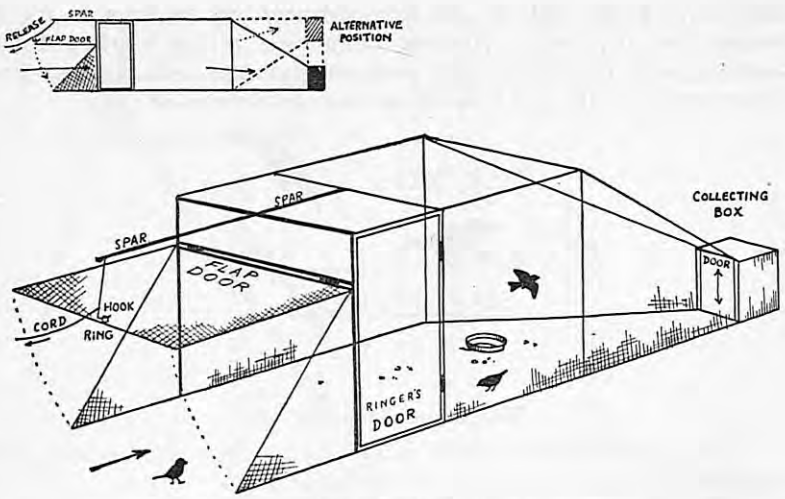


FIG. 3.

Modifications of the simple drop-trap design are :—

(1) The end of the trap tapers to form a funnel leading to the collecting box.

(2) The release for the front door shown in fig. 3 is better than a stick release.

(3) A ringers' door is provided to enable a trapper to enter to deal with recalcitrant birds that will not go into the collecting box. If the door frame is made of wood, a simple device for opening and closing it may be made by boring a hole in the frame at a convenient height, pushing a metal rod through it and bending its ends at right angles close to the upright, so that they can swing to embrace the door. Stops on the door on which they rest in the closed position complete the device, which is easily operated from either side.

Such traps may be made of any size from an overall length of 10 ft. to 12 ft. upwards. The point at which they change from miniature to full size Heligoland traps is indefinite.

Combination Traps

Any direct trap may be made into a combination trap by adding small netting funnels (see Chapter 4) at ground level in the sides, thus making it a combination of a direct and an automatic trap. One form of combination trap is T-shaped in plan, with the front door at the centre of the head of the T and the gathering cage at the end of the tail of the T. The designer states that, when the front door is dropped,

birds tend to fly into the side compartments rather than to try to escape past the door. Another adaptation is the Starling Inlet. Starlings, and other birds, often walk about on the roofs of traps. The device shown in fig. 4 is a useful addition to the roof of a trap.

FIG. 4.

Heligoland Trap (fig. 5)

The trap originates from Heligoland, where it was designed principally to catch migrating passerine birds.

On a barren island or other relatively isolated area visited by migrants but with little cover, a sheltered corner is chosen or provided by erecting walls or other protection from winds; vegetation is encouraged and bushes planted. The whole site is laid out to lead up to a very large wire netting trap with an entrance say 8 ft. high by 24 ft. wide. A plentiful growth of cover and some open water, preferably with a drip-device (see Chapter 7), should be provided inside the mouth of the trap. This automatically attracts birds into the trap, but in approaching it the ringers should work through the cover outside the trap as well, tapping the bushes and driving the birds before them into the trap. Six-foot high wire netting "wings" should extend outwards from the mouth of the trap for 15 ft. or 20 ft. to guide birds into it. From the entrance the trap runs back, narrowing for perhaps 20 ft., and then turns so that the end is not directly visible from the front, and continues to narrow until about 3 ft. 6 in. wide. At this point there is a swing-door which can be closed, when the birds have passed it, by a string from the front of the trap. Beyond the door the trap continues to taper, and finally slopes up to a collecting box. Some Swedish traps are constructed with the walls curving gently all the way, instead of the sudden turns which are usual in British traps. The Swedish traps work excellently and few birds break back. It may well be that the Swedish design is superior to the British.

Several Heligoland traps have been built and operated successfully in this country. The exact shape and size of each trap must vary according to the situation in which it is erected. The valley of a small stream is a good site, providing some shelter, water, and probably cover. Anyone in a position to build and work such a specialized trap, however, is strongly advised not to commence operations without the active assistance and advice of someone with personal experience of

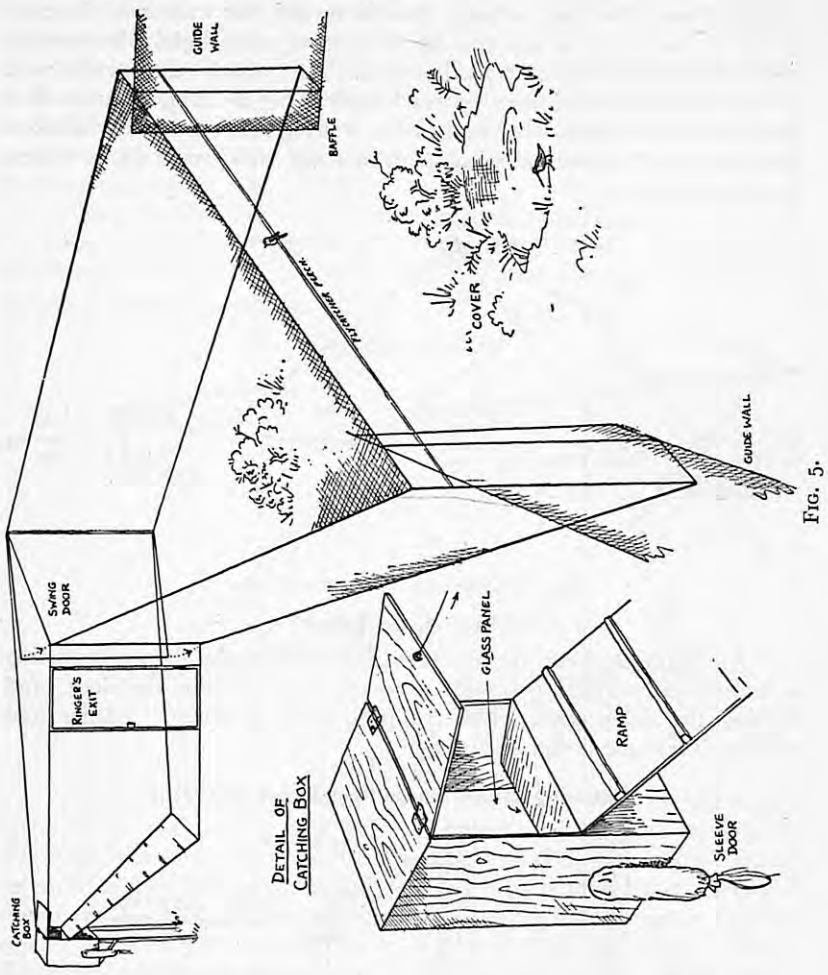


FIG. 5.

a Heligoland Trap. It is advisable, also, to watch the site for at least a year before starting construction, to ensure that it is visited by migrants in adequate numbers of birds and of species.

A stout wire running across the entrance about 18 in. below the top is very useful for deflecting birds into the trap, and as a perch for flycatchers.

Heligoland traps are described in more detail in Brownlow (1952).

Portable Minigoland Traps

Several portable traps on Heligoland lines have been made. Funnels can be made of special light frames in the form of truncated triangles lashed together or connected by rings so that the funnel will

" match box " flat for packing. In one model, the mouth of the trap could be made up to any size by lashing together light wire netting covered frames of about 2 yd. by 1 yd. The mouth can equally well be made of bamboo frames covered with string netting, or any other light and easily transported materials. A design for a portable Minigoland that can be covered with string netting is shown in fig. 6, which is self-explanatory.

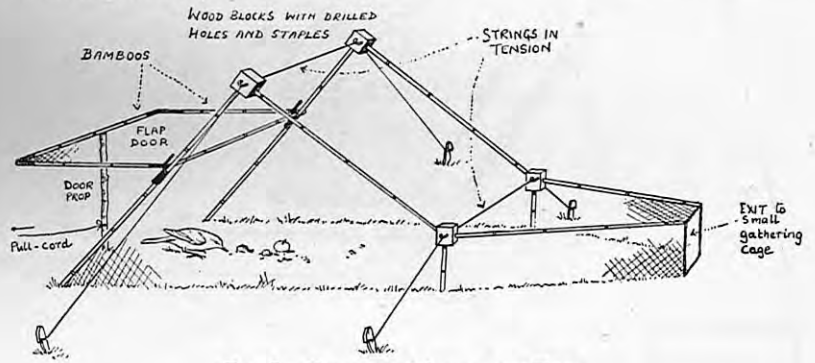


FIG. 6.—PORTABLE MINIGOLAND TRAP

Fruit-Cage Traps

Any fruit cage can be converted into a Heligoland trap by fitting a funnel and collecting box at a corner remote from the door, and leaving the door open when trapping is in progress. Baffles and starling inlets are useful additions.

Catching Birds using Nest-boxes (fig. 7)

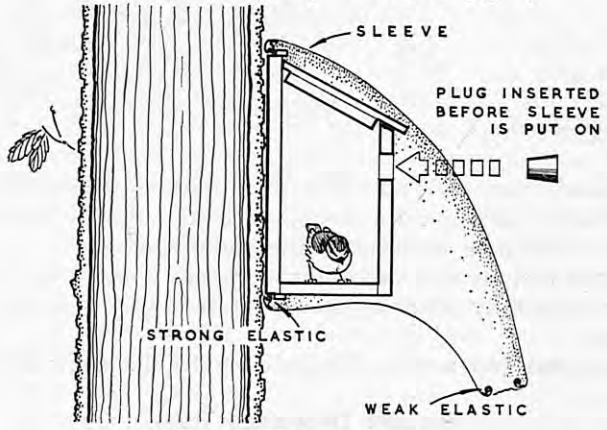


FIG. 7.—NEST-BOX SLEEVE

Birds should not generally be caught at nest-boxes during incubation or the early stages of feeding young. Even if birds roosting in

boxes outside the breeding season are caught, it is liable to make them abandon the box.

Catching is done by means of a wide sleeve of opaque material, with strong elastic at the wide end and weaker elastic at the narrow end. The wide end is designed to fit snugly round the entire nest-box and the narrow end over the wrist. An old pair of dark running shorts, less one leg, makes a good sleeve.

When the bird has entered the box, the entry-hole is plugged and the sleeve is fitted over the box. The observer then slips his hand into the sleeve, lifts the lid, and takes the bird out. Being in the dark it does not attempt to escape.

Fall Trap (fig. 8)

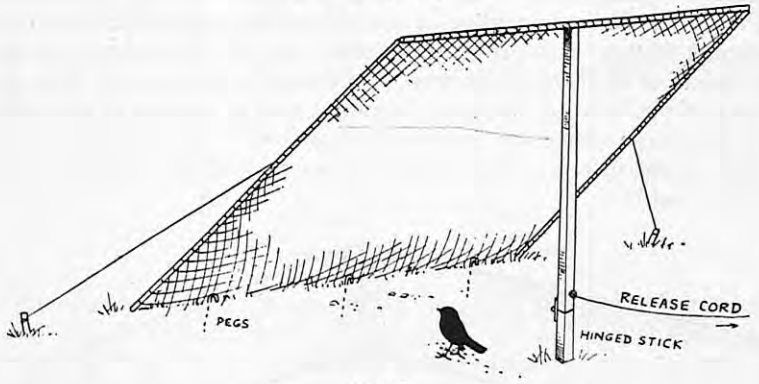


FIG. 8.

This is the simplest form of direct trap, similar in principle to the Drop Trap. It consists of a piece of string netting say 6 ft. square. Through one end a bamboo 6 ft. long is threaded, and is attached at its ends to two bamboos each 5 ft. long which have been threaded down the sides of the netting. The remaining foot of netting is left slack. The two 5-ft. rods are rested on the ground, and the 6-ft. rod is supported on a stick about 3 ft. long, so that the trap stands at an angle of about 35 degrees. A pull-cord is attached to the supporting stick. The two side rods must be guyed by strings attached to the middle of their length and to pegs in the ground in a straight line with the bottom of the net. The back of the netting must be pegged or weighted down with a stick or stones to prevent birds escaping.

Birds enter the trap readily as it is open on three sides, but great care must be taken that they are well under the net before the string is pulled, as there is otherwise risk of the bamboos falling on them. It is better to pull when the bird is facing inwards, not outwards. Ringing may be done through the netting before lifting the trap to release the capture.

Provided the bamboos have not been attached to each other too

rigidly the trap is made readily transportable by folding in the side bamboos against the top bamboo, and rolling the loose netting round them.

One of the disadvantages of this form of Fall Trap is that it is apt to tremble in a wind in a manner that may alarm the birds. This may be overcome, when convenient packing up of the trap is not a consideration, by making the trap (fig. 9) of ½-in. wire netting in the form of an inverted tray 4 ft. square by 4 in. to 6 in. deep. If necessary, greater rigidity (but also increased conspicuousness) will be obtained by strengthening the sides with a framework of wood or wire. A small door should be made in a corner at the back of the trap, through which the birds may be driven into the gathering cage. The trap should be propped open by a stick, preferably hinged, and about 10 in. long. Another method of control, which is very effective when trapping finches, is to drive a stout stake into the ground just outside the centre of the back of the trap, and to lead a control cord from the centre of the front of the trap, through a ring at the top of the stake, and away to a concealed observation position. The trap can then be gently raised to admit birds trying to get in, without releasing those already inside.

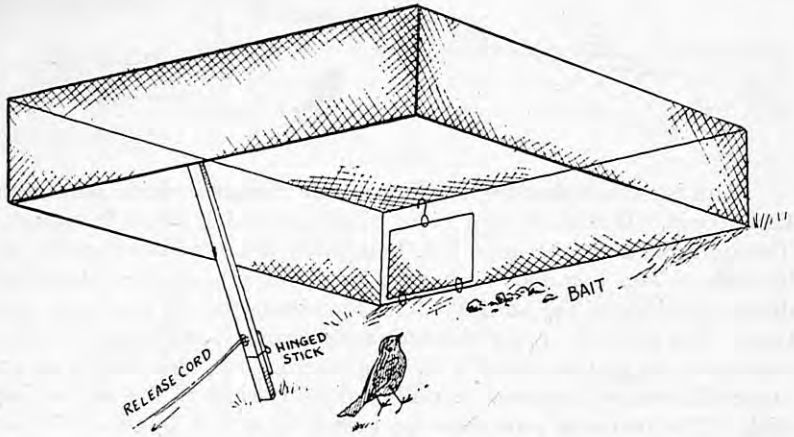


FIG. 9.—BOX-TYPE FALL TRAP

Clap Net (figs. 10 and 11)

A single net, as illustrated, is more simple than a pair of nets, but both may be home-made. The net, laid flat on the ground, is attached on its shorter sides to two light poles. Each of these poles has a hole bored near its base through which a cord is looped, not too tightly. This cord, pegged to the ground, acts as a hinge on which the pole turns. The top of each pole is guyed to a peg which must be in line

with the bases of the poles. The pull cord branches near its end, one branch being attached to the top of the pole nearer to the ringer, the other branch attached to a peg in the ground, just clear of where the pole will reach when the net is pulled over. When the cord is pulled

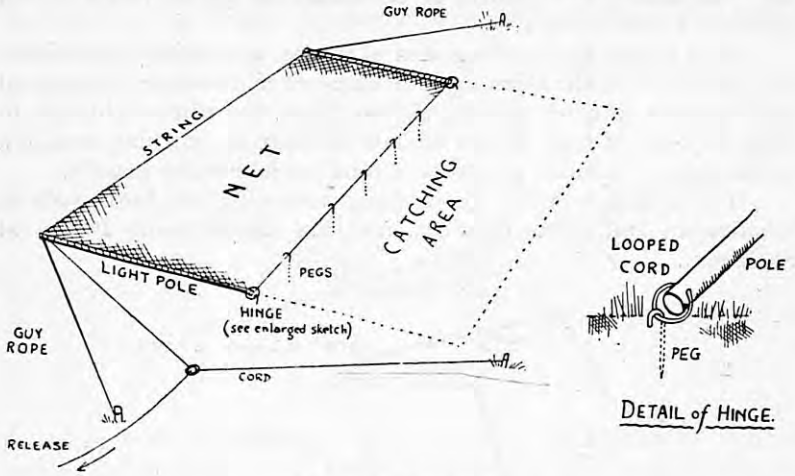


FIG. 10.—CLAP-NET

the tension between this peg and the top of the pole will bring the net over without the assistance of a spring. The bottom of the net is pegged to the ground ; a taut string, tied at each end to the poles, is threaded through the top of the net to keep it from sagging.

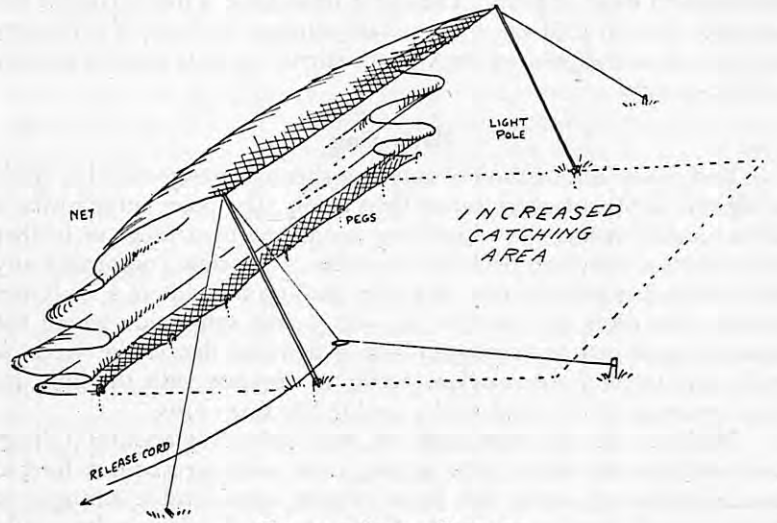


FIG. 11.—LARGE CLAP-NET

As to size, most nets advertised are not smaller than 9 ft. by 4 ft., and go up to three times that area, but a smaller net is also of use.

This method of capture, the main standby of former generations of bird-catchers, appears to be used by few ringers, but it can be used very successfully in a garden, or elsewhere, for species which do not normally frequent cover.

Birds within the catching area of the net are entirely unenclosed from above or at the sides, and the clap-netter, therefore, has special opportunities to catch waders. These birds, sometimes reluctant to enter any sort of trap, do not hesitate to enter the catching area of a single clap net suitably placed on a mud bank or water-margin.

This trap is excellent for catching winter flocking birds, such as Chaffinches and Snow Buntings, and has caught many Puffins at Skokholm.

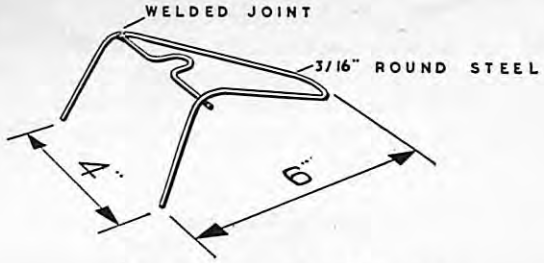


FIG. 12.—STIRRUP FOR CLAP-NET

Fig. 12 shows a " stirrup " that can easily and cheaply be made by any blacksmith. It makes an efficient hinge-pin for the sticks of clap-nets used on mud or sand. The sticks must have a metal ring at the bottom. A short picket, with a suitably-shaped top can, if necessary, be driven in at the point of the V of the stirrup, so as to provide greater holding-power.

Batfowling

Batfowling is a method of catching shrub or hedge-roosting birds at night in a net attached to two light poles, The poles curve inwards to each other at the top, where they are joined by a hinge or leather thong so that they can be folded together, to enclose completely any bird which flies into the net. A beater goes on one side of a bush and disturbs the birds so that they fly out on the other side where the netman, equipped with the net and a light to dazzle the birds, is ready for them. Some workers prefer to dispense with the light for most species, and it should not be used in Starling roosts.

Beginners should use a small net, with poles only about 6 ft. long, until they become skilful. For adepts, 12 ft. poles are about as long as can be efficiently used, but these require considerable strength to manipulate if there is any wind. The bottom 3 ft. of the poles should

be clear of net and the sag in the net when the poles are extended for action should not exceed a few inches. The beginners' short net will later be useful for the adept in sites with low overhanging branches. Rather heavy netting is advisable, because it is more durable and less likely to entangle birds caught. Birds of the thrush family, finches and Linnets may be caught in garden shrubberies or large clumps of

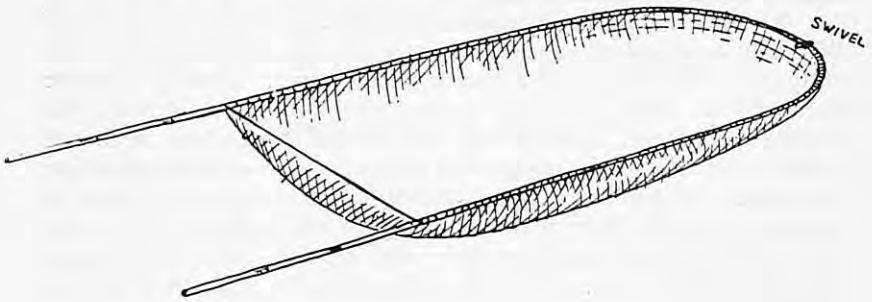


FIG. 13.—BATFOWLING NET

rhododendrons in parks, or on commons. Experience at Oxford proved that common and Portugal laurel are the most productive bushes, and that rhododendron, box, and holly are nearly as good. Young warblers, Blackbirds, etc., can be caught in suitable tall hedges around arable fields in late summer. A really dark night is essential for success. It is useless to try on a moonlight night. Some batfowlers have got the best results on cold or foggy, or even wet nights, but great care should be taken under these conditions not to wet the birds.

The essentials for success are good equipment, good organization, and a practised and well-disciplined team. Powerful torches with new batteries must be used. 3.5 volt bulbs with S-shaped filaments are better than the spotlight type. The cycle headlamp type of torch or other box type of torch is much more handy than the cylindrical types, because they can be lashed to the chest. Rings must be readily available in correct numerical order. This is best done by threading them on to composition knitting needles, no. 4 size for no. 1 rings and no. 3 size for no. 1A. A notebook, with pencil attached on a string, should be prepared in advance with date and ring numbers entered in a column down the left side of the pages, with separate pages or even a separate book for recovered birds. Rings and notebooks are best carried in a haversack. Any tools carried, such as pliers or rules, should be attached to the haversack by strings. Quiet work and the minimum possible low-toned speech are essential. In any team, one person should be detailed as the commander, and as a general rule, he only should speak. The use of a whistle and an agreed code of signals for orders is advisable, because the noise of a whistle disturbs

birds less than speech. Too frequent halts for ringing and recording will be avoided if a carrier (see page 8) is used. Birds can then be taken away to some place outside the working area, where they can be properly examined and ringed in good light, thus eliminating any possibility of wrong identification. This is particularly important when working in a big Starling roost, where it is inadvisable to show any light at all in the working area.

The minimum possible team for working a hedge or a line of bushes in a shrubbery is two, a netter on one side with the torch strapped to his chest, and a beater on the other. Three is a better number, the third member wielding the torch and carrying the ringing equipment. The netting party should move along the hedge a little in advance of the beater, and the torchman should stand behind the netter. In some sites it is advisable to have the torch lashed to a pole so that the light is directed slightly downwards. The beater must approach the bushes quietly and, on the order of the commander, shake them suddenly and vigorously. In order to get all the birds to break cover, it is sometimes necessary to persist with the beating of a dense bush for some moments.

When working large clumps of bushes, a larger party is advisable. It should consist of the commander, with the ringing equipment, a beater, and several pairs of netmen and torchmen. The pairs are stationed round a clump. Torches are switched on and the beater insinuates himself as quietly as possible into the centre of the clump. Some birds will probably fly out during this process. These should be put as quickly as possible into a carrier. When the pairs are again in position and ready with torches switched on, the commander gives the order " shake ", and the beater agitates the bushes as vigorously as he can without doing undue damage. He must be dressed as simply as possible. Old trousers, and an old roll-top sweater are ideal. Canvas shoes are the best footwear in mixed roosts in hedges or shrubberies. In a Starling roost, gum-boots are essential.

Skill with the net is soon acquired. The first thing to learn is that the net must never be swept forward on to the bushes. The results, particularly when there is a bramble growing up the bush, can be left to the imagination. The expert can catch birds in succession, without letting those already in the net escape, and may even throw the net to catch a bird out of reach. As many as thirty-one birds have been ringed from a single netful.

N.B.—Under The Protection of Birds Act (1954) a licence is necessary for batfowling if lights are to be used to dazzle the birds. Applications should be made to the Nature Conservancy, 19 Belgrave Square, London, S.W. 1.

Drag Net

This is a well-known old poaching method of catching ground-roosting birds on dark nights, but ringers appear to have made little

use of it. Some success, however, has been achieved, and species caught have included Skylark, Meadow Pipit, Corn Bunting, Redwing, and Snipe. The net is about 60 ft. long by 14 ft. wide " lock netting ", dragged shoulder high by the forward end without poles. On stubble, corn roots (especially after harrowing) get caught in it and twist it up and, of course, thorn twigs and brambles must be avoided ; thick, old mowing grass is perhaps the best cover to work. On a frosty night water will freeze on it so much that the weight may tear the net.

A dark night, needless to say, is necessary for success.

Winchelsea Starling Net (fig. 14)

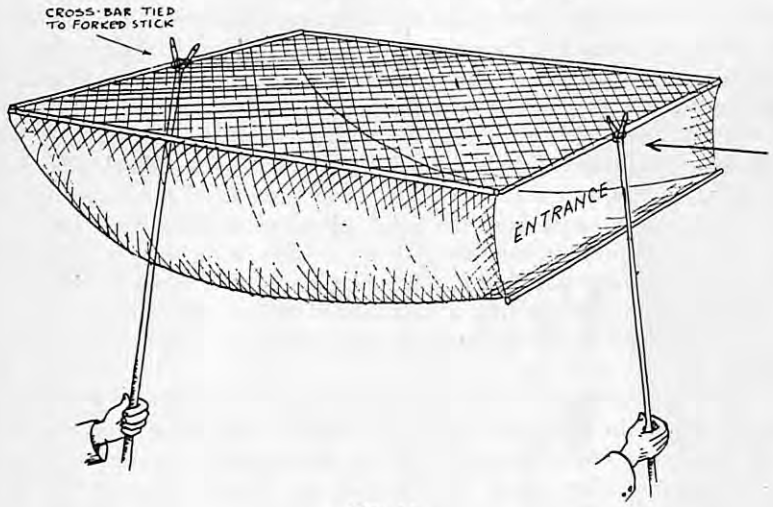


Fig. 14.

So-called as it was developed by the first author to catch Starlings roosting in a reed-grown canal at Winchelsea. The net consists of a bag of netting about 8 ft. long, with a rectangular mouth 8 ft. by 2 ft. 6 in. wide. The bag is held horizontally over the reeds with the bottom of the mouth level with the reed tops. It is supported on a framework of four sticks, each 8 ft. long as shown in the illustration, and a fifth stick of similar length attached to the lower lip of the mouth will ensure that the latter hangs open in the right shape. As the reeds grow about 8 ft. high, in a foot or so of water, it is necessary to have two people to manage the net, one at each end of it, each with a forked stick on which to lift the net above the reeds. A third man is required to act as beater. When the Starlings are disturbed they fly very low over the reed tops and do not seem to notice the net, provided of course that the night is dark.

The net should not be lowered until the main rush of birds is

past, otherwise many will be missed, and those inside the net do not usually immediately find their way out owing to the depth of the bag. When lowered, the net is closed by bringing together the two sticks at its mouth. Where a number of birds are caught together, considerable care and patience must be exercised in extracting them from the netting. Thirty-six birds have been caught in a single drive with such a net.

Dazzle Netting (fig. 15)

The principle is, briefly, to shine a light on roosting birds, and to approach close enough to be able to put a net over them. The description below is based on netting which has been carried out by the first author at reservoirs where gulls roost in large numbers. The majority roost on the water, but a proportion usually spend the night on the concrete banks or paths at the edge of the water, and it is here that they are approached in silence on rubber soles and caught.

Two operators are necessary, one to carry the lamp and the other the net. The most suitable type of lamp is a bicycle acetylene lamp. Electric torches and a car spotlight have been tried but were not so successful, quite apart from the great labour of carrying a car battery. The net is about 8 ft. long by 6 ft. 6 in. wide, attached on its longer sides to two light 9-ft. poles. A string about 6 ft. long is threaded through the top of the net and attached to the tip of each pole to prevent the top of the net from sagging when the poles are stretched apart.

The net- and lamp-bearer walk side by side advancing extremely slowly when the gulls are within the light of the lamp, and the last few yards must not be rushed in spite of the temptation to do so. When a capture has been made the lamp is put down ahead of the net, shining towards the next birds to be caught, so that these shall not be alarmed by the sight of the ringers. The ringing is done in silence in the darkness behind the lamp, with the discreet assistance of a pocket torch. The pre-arrangement of rings in numerical order, of course, saves a lot of time, writing, and flashing of lights.

It is all-important to choose a suitable night. It is generally too light, even if the sky is overcast, between the first and last quarter of the moon. Any wind above a light breeze from any direction will make the birds almost unapproachable, however dark it may be. If there is a breeze the birds should be approached downwind, as they will then take off towards the ringer, and their white breasts as they face the wind catch the eye sooner than their grey backs. The most suitable type of weather, surprisingly enough, appears to be that sort of dark, hazy evening, when smoke hangs low and everything is still and quiet—preferably not too mild. Moderately thick fog does not seem to assist capture.

When conditions are just right it is sometimes possible literally to

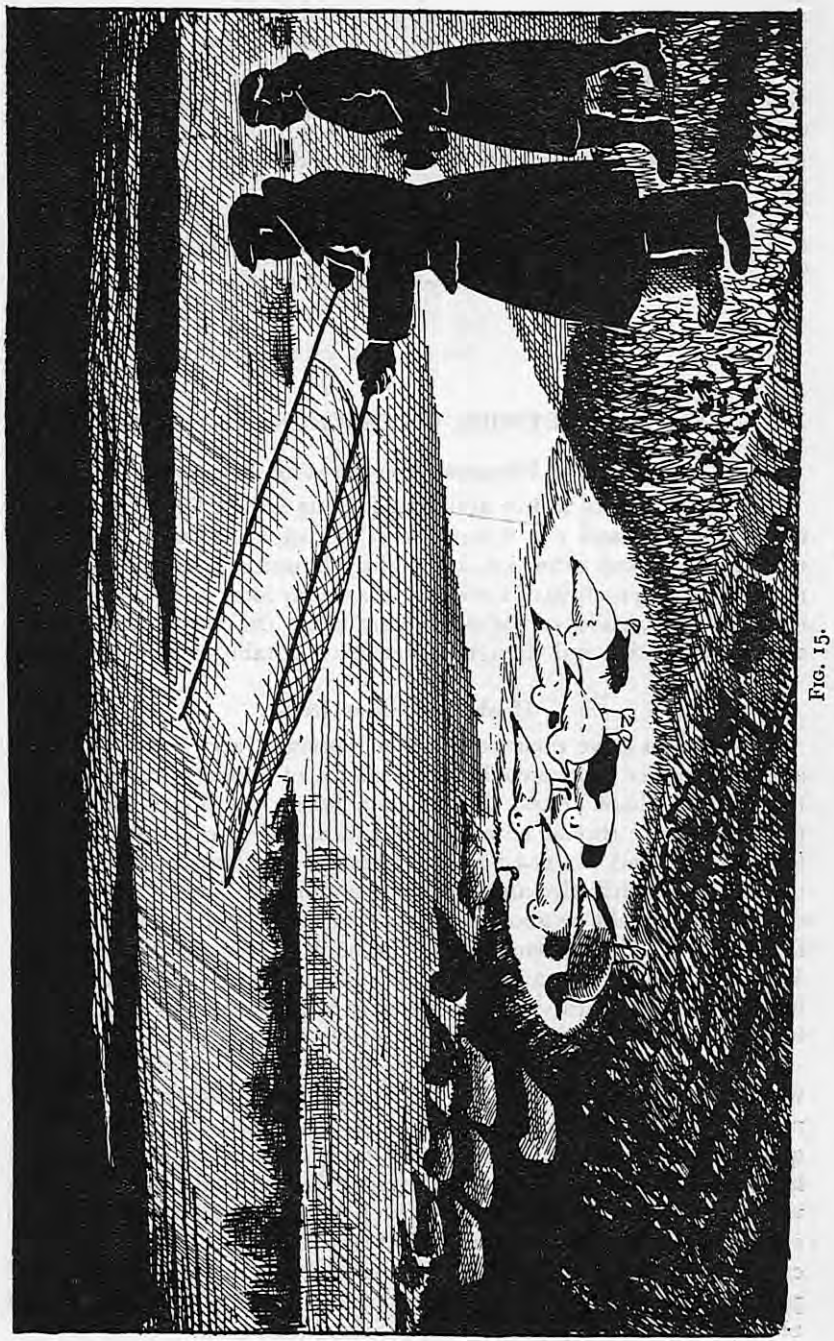


FIG. 15.

walk among the gulls, to lower the net quietly over twenty or so birds, and to pick up by hand others which are still standing at one's feet.

Black-headed, Common, Herring, Lesser, and Great Black-backed Gulls have been caught in this way. The largest number ringed in an evening was 159 (when rings ran out), but an average catch is about twenty. In addition to gulls, Common Sandpipers have been caught on two occasions.

This method has also been used on Skokholm to trap gulls and Oyster-catchers. It can be applied to other roosting waders.

N.B.—A licence is now required before using this method ; see note on p. 20.

SPECIAL METHODS OF CATCHING SEA-BIRDS

The Fleygusting or Fowling Net

This consists of a pole about 15 ft. long with a forked extension, about 3 ft. long and 1 ft. 6 in. wide at the tip, lashed to its end. The rods of the forked extension are slightly bowed so that the ends are nearly parallel, and carry a roughly triangular loose net. It is used for catching auks, gulls, or Fulmars flying along the top of cliffs. Considerable practice and strength is needed to attain proficiency.

Hook and Noose Rods

The auks have characteristics of tameness and curiosity which allow a trapper to approach to a distance of about 15 ft. and catch them with a hook round the leg or a noose round the neck. The catching device should be at the end of a stiff wire about 5 ft. long lashed to the end of a rod 7 ft. to 8 ft. long. The hook may be bent at the end of the stiff wire and should be about 2 in. long. The opening of the hook should be about $\frac{1}{2}$ in. wide for auks, and about $\frac{3}{4}$ in. wide for Gannets. The extreme end of the hook is bent slightly outwards. When it is slipped over a bird's leg, the rod must immediately be pulled in smoothly but quickly. The noose may be a copper-wire rabbit snare lashed to the end of the stiff wire.

The noose might be thought to be a cruel method, but no one who has caught auks with it and felt their excessively strong neck muscles and thick neck-covering of feathers need have any further qualms about cruelty. The trapper, with both these devices, should have ready a cloth to cover the trapped bird's head. An old cap is very suitable. The wings can then be held and the standard neck grip can be achieved without danger of a wound from the bird's bill. Birds can be caught with very little disturbance by these methods, and it is possible to work a colony for a considerable length of time with moves of only about 20 to 30 yards after catching each bird.

Trammel Net

This consists of three nets, 4 ft. by 8 ft. or bigger, hung vertically in likely fly-lines of birds. The outer two are of 6 in. by 6 in. mesh and the middle one of 1 in. mesh hung loosely between the large mesh nets. A bird flying into the device is caught in a bag of the inner fine-mesh net. It is produced commercially and can be used to catch sea birds on the coast, when it is hung from a light line stretched between two guyed posts, or river birds like Kingfishers and Dippers, when it is best hung under a low bridge, so that birds caught can easily be removed by anyone wading in the stream.

Some of the details of trammel nets and hook and noose rods were obtained from Lockley and Russell (1953).

Chapter 4

AUTOMATIC TRAPS

The warning given in Chapter 1 is so important that it is repeated here. Automatic traps *must* be regularly and frequently inspected, and *must* be put out of action if they cannot be so inspected for any reason. Of the traps described in this chapter, the Chardonneret, the Potter, and the commercially produced version of the Government Sparrow trap are probably the most widely used and the most productive ones. Any trapper can, of course, make up equally successful small wire netting traps with funnel entrances and a door or gathering cage according to size.

Government Sparrow Trap (fig. 16)

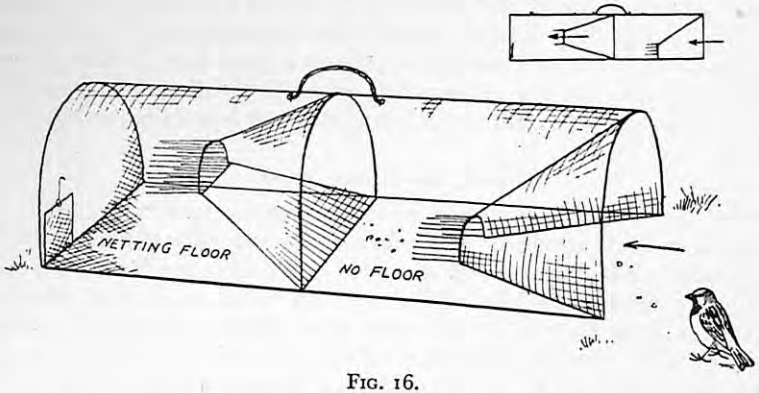


FIG. 16.

This consists of two compartments. The bird enters the first compartment through the funnel entrance. Its search for the way out usually leads it through the next funnel into the second compartment. The second funnel is raised 4 in. or 5 in. off the ground inside the second compartment, and the bird seldom finds its way out again. This compartment has a floor of wire netting, but there is no floor to the outer compartment, except between the funnel and the sides of the trap. There is a small door about 6 in. square at the back of the second compartment through which birds are removed.

Convenient dimensions are 48 in. long, 20 in. wide, 16 in. high. The funnels should project about 12 in. into the trap and the light guard wires a further 4 in. beyond the inner end of the funnels, as shown in the drawing.

This is a useful small maze-type trap in which, in addition to the

ordinary garden birds, such species as Skylark, Redwing, Wheatear, and Black Redstart have been taken.

A commercially produced version of this trap has a floor throughout, and a number of small funnels in the sides of the front compartment, instead of one big one at the end. The main disadvantage of this trap is that, when the trapper puts his hand in at the door at the back of the trap, birds cower into the sharp angle between the internal funnel and the floor and sides of the back compartment. This disadvantage can be overcome by fitting an internal vertical partition of wire netting around the internal funnel, and near its smaller end thus sealing off the useless space. It would be difficult so to modify existing traps, but new ones with the partitions can be obtained from the makers on a special order at small additional cost.

A modification of this trap has been developed by the Frankfurt ringing station (fig. 17). The trap is built in circular form, diameter 40 in., height 18 in., with three funnel entrances which just overlap a plate of water which forms the bait. There is also a trapdoor leading to a gathering cage. The object of making the trap circular is that birds wishing to enter run round it and find a way in more quickly than if they run up and down one side of a rectangular trap. If the dimensions are reduced to 24 in. diameter and 12 in. to 15 in. height, there is no need for a gathering cage, as birds can be taken easily direct from the trap through a door in the top, instead of at the side

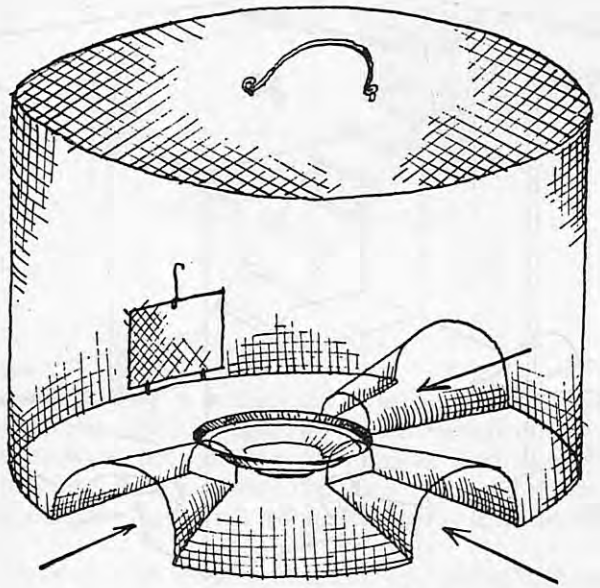


FIG. 17.—FRANKFURT TRAP

of the trap as illustrated. The funnels can then be spaced evenly round the circumference of the trap. A further variant, known as the " Dust-bin ", has been made at the Spurn Observatory. This is similar to the Frankfurt design, but the roof is dished downwards and has a round hole at the bottom of the dish, so that birds that perch on the roof can get in.

Knife-rest Trap

This trap was designed by the Ministry of Agriculture for farmers to trap crows, Woodpigeons, etc., but might well be suitable for smaller birds. It is easy to make. Two crosses of 3 in. by 2 in., or smaller scantlings, are made, to form the ends of the trap, placed like St. Andrew's Crosses. Two longer scantlings, suitably bevelled at the ends, are nailed to them about a foot apart, in the upper Vs. Small slats are then nailed to these, spaced so that the species for which the trap is set can easily drop down between them but cannot easily fly out again. The ends of the crosses are joined by stout wires, and all faces, except the slatted one, are covered with wire netting. A door is provided in one corner for attachment of a gathering cage or collecting box.

House Trap (fig. 18)

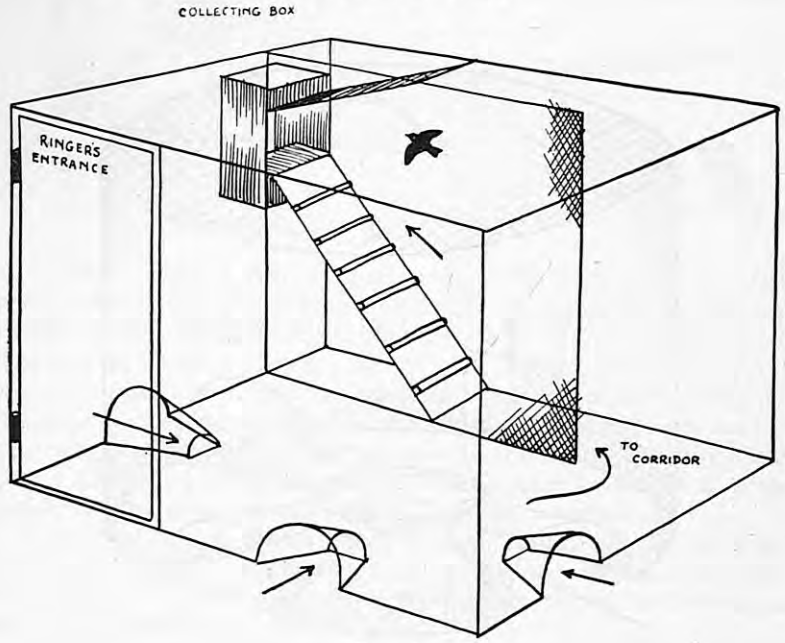


FIG. 18.

This trap is a large one, being a cube of say 6 ft. 6 in. As originally described, birds entered it through a kind of " vestibule ", the doors of which were left ajar, but it has been found that funnel type entrances are much more satisfactory. The House trap of to-day, therefore, is similar to the Combination trap but lacking the trapper-operated door.

A collecting box should be embodied, as illustrated in fig. 18. A partition 2 ft. from one end of the trap extends three-quarters of the way across it. Inside this passage netting from the floor slopes up to the gathering cage, and from the roof down to it. When the observer enters the trap, the birds are driven into the passage and then into the gathering cage, the door of which is shut by a releasing string from the mouth of the passage.

The trap is relatively expensive in materials to construct, but a much cheaper smaller model which may be called the Bungalow trap is useful. Unlike the House trap, it can be moved from place to place. Suggested dimensions are 7 ft. long by 3 ft. 6 in. by 3 ft. 6 in. A few perches should be provided.

Crow Trap (fig. 19)

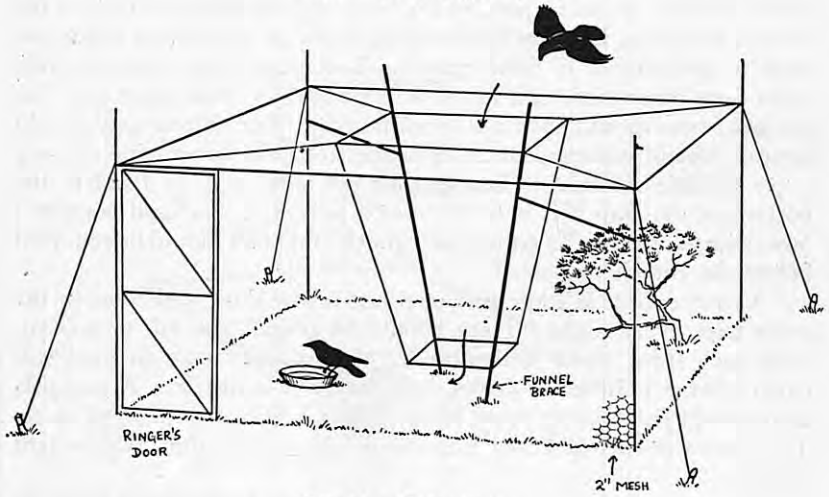


FIG. 19.—CROW-TRAP.

This is a large trap, 6 ft. high and 12 ft. square. Size and correct siting are the essentials ; roughness of construction does not affect efficiency. Crows do not readily go into smaller traps and, when they do, they tend to kill each other. They can live together contentedly in one of correct size for days if fed and watered—and they need a lot of water.

The birds enter through a funnel in the roof of the trap, 4 ft. square at the top, tapering to 2 ft. square at the bottom, which should

be 1 ft. clear of the ground. 2-in. mesh netting is adequate if large birds only are to be trapped ; if 1-in. mesh is used, smaller birds may also be caught. There is a door through which to enter and remove birds.

The trap may be either stationary, with corner posts driven into the ground, or portable, on wheels. In the stationary type, the 4 ft. by 4 ft. edging to the top of the funnel, the connections of that square to the corner posts, and the four outer connections between them may be made of wire. The corner posts must then be guyed. In the portable trap the four sides must be properly constructed and braced frames of 3 in. by 2 in. timber, covered with wire-netting. The most inconspicuous bracing consists of four short diagonal braces at the corners and an additional vertical in the centre. In both types, the funnel should be braced by two inclined stakes, inside the trap and outside the funnel, at opposite corners. In the stationary type, they are driven into the ground. In the portable they are braced to the corner posts by horizontal internal perches. Such perches, about 4 ft. from the ground are necessary in both types so that birds in the trap can be seen from a distance. Corner posts and funnel braces should project about 18 in. above the roof, to make perches for birds approaching the trap. One or two, not more, fir branches should be stuck in the ground inside the trap, to give shelter to birds caught. Too much cover tends to hide them from other birds that might be attracted by their presence. The portable type should have a floor of netting. The wheels may be old aircraft wheels mounted on axles made from old water pipe, or any other suitable materials. Bearings for the axles may be fixed to the bottom of the trap if it is to be moved only in unenclosed country ; otherwise to one side. In either case, wheels and axles should be removed before the trap is emplaced.

Crows collect in large numbers just before dark and roost in the same trees every night. Traps should be placed 100 yd. to 200 yd. from such trees, never under them. A stationary trap so sited will catch a large number of crows, but not all in a district. A portable trap should catch every crow whose haunt is known in a week or so. The above details of Crow traps were abstracted from Wainwright (1934).

Experience at one trap proved that hunks of stale bread were the best bait. No trap is really successful until it contains, as a decoy, a bird of the species which it is intended to catch. The position of live decoys under the Protection of Birds Act (1954) is not very clear. But it seems that species on Schedule Two (unprotected birds) may be placed in traps as decoys, and that other species which enter traps of their own accord may be used temporarily as decoys, provided that they are not tethered in any way and that they are subsequently ringed and released. In any case of doubt, application should be made to the Nature Conservancy, 19 Belgrave Square, London, S.W. 1, for

a licence to trap birds by these means. Decoys should be released and replaced every few days. If they are left too long in a trap, they seem to deter other birds from entering. In one trap, Jays entered first, followed by Jackdaws, and then Crows, the Jackdaws probably acting as decoys to the Crows. Another was operated at irregular intervals and during two periods, each of about a month, in March–April and May–June, Carrion Crows were caught at an average rate of about one a day. In addition, some Blackbirds, Song Thrushes, and five Sparrow Hawks were caught, the last presumably attracted by the smaller birds which entered through the netting.

Jackdaws are most easily caught in the summer as juveniles soon after leaving the nest.

Pole Trap for Tits (fig. 20)

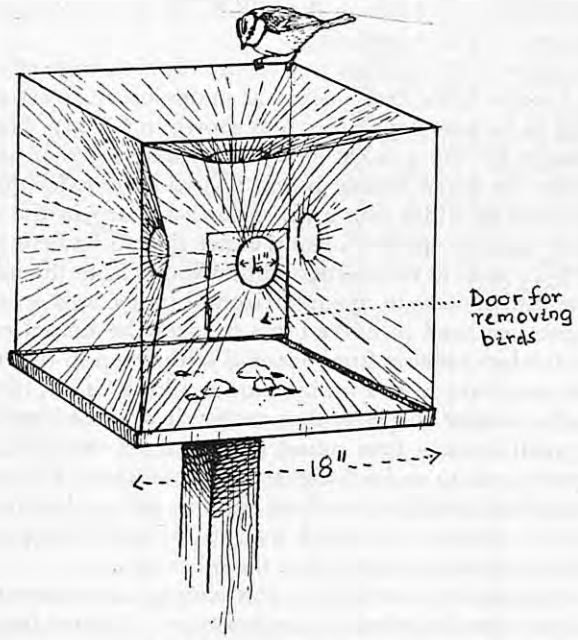


FIG. 20.—POLE TRAP FOR TITS.

This trap consists of a cubical wire netting box, all sides measuring 15 in. One or more of the faces are recessed slightly and a 1½ in. hole is made at the centre of the recess. A door is provided in one unrecessed face for removal of birds. The trap is mounted on a pole and bait suitable for tits is hung in the trap.

The Mason Trap (fig. 21)

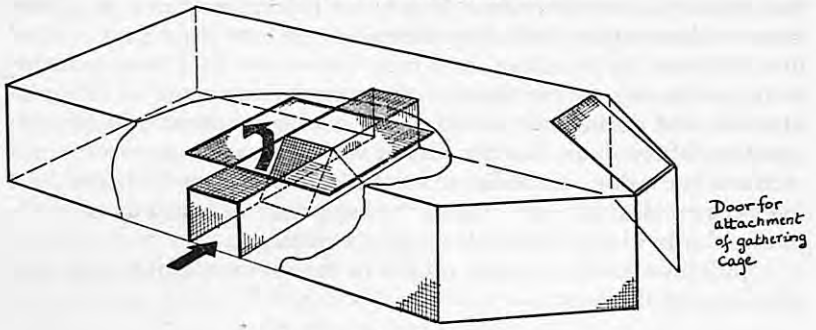


FIG. 21.—THE MASON TRAP.

This trap was designed by the distinguished American ornithologist whose name it bears, and has proved one of the most popular and widely-used automatic traps in the U.S.A. It is easy to make as there are no curves or loose wire fittings.

The essence of the design is a tunnel running from one long side of the trap to the other, but blocked at midpoint by a vertical piece of wirenetting or by two sloped pieces as shown in fig. 21. The tunnel is roofless except for the 3 in. at either end. The piece of wire netting used to make the tunnel should be cut to a width of twice the height of the funnel plus its width plus 4 in. Four 2-in. cuts in the side of the strip enable the 2-in. projections on either side to be bent inwards to make the 3-in. roofs at either end, and outwards from the middle open part of the tunnel so as to make horizontal projections on either side. These projections tend to make birds fly over the tunnel rather than hop on to it when moving from one end of the trap to the other. The tunnel size may vary from 2 in. by 2 in. to 4 in. by 4 in., but the small size limits the variety of species that can get in and the large size leaves room for small birds to turn round in the tunnel and walk out. The best compromise is to make it higher than it is wide. The tunnel may be placed in the middle of the long sides as shown, but may well be put nearer the sloped ends which lead to the collecting box opening, so as to leave more room for bait at the other end.

The traps so far described in this chapter are maze-type traps : the next four types described are action types. It must be a principle in constructing action types of trap that the " trigger " which the bird operates is so well inside the trap that there is no danger of it being injured by the closing mechanism.

Potter Trap (fig. 22)

This is perhaps the best trip-release trap. It may be built as a single or multi-cell trap. Suggested dimensions for a two-cell unit

are height 12 in., length 16 in., width 10 in. The back, sides, top, and the upper 4 in. of the front are permanently covered with wire netting. The doors, each 8 in. square, slide up and down by means of two horizontal galvanized wires which pass through the top and bottom of the door, the ends of which are bent round vertical wires connected to the framework. On the ground inside the mouth of the

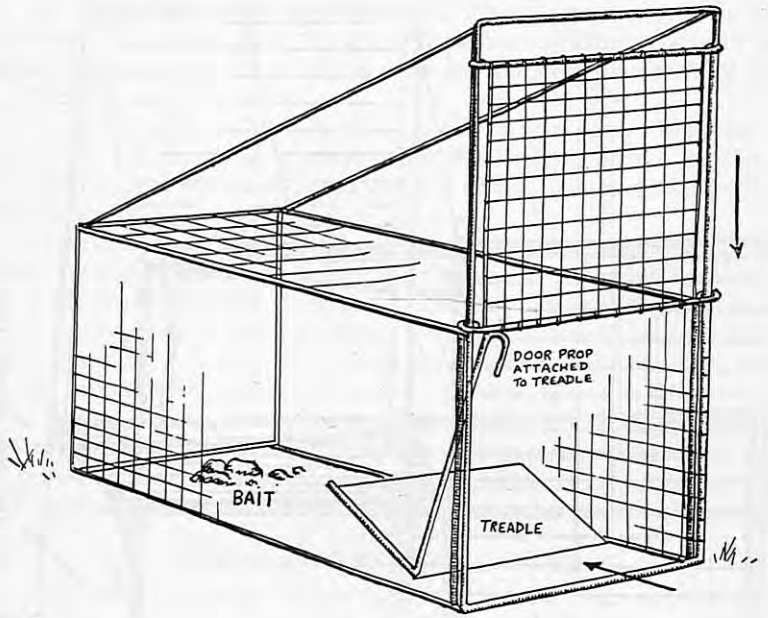


FIG. 22.

trap is a rigid " door-step " of wire netting 7 in. long by 5 in. wide to which is attached at one corner a wire trigger 8 in. long set at an angle of about 70 degrees to the plane of the door-step. The top half-inch of this trigger is bent over to support the door in the open position. The wire netting " door-step " is thus set at an angle so that the weight of a bird on it causes the trigger to cant inwards and release the door.

This trap is often built with four cells but it is seldom found that all four compartments hold captures, especially if the trap is visited as often as it should be. An advantage of a multiple-cell trap is that the first bird caught sometimes acts as a decoy for others, but generally the falling of the first door or the activities of the bird in the trap spring the other compartments. Pinning the trap firmly to the ground reduces this difficulty. It is better, however, to build several single-cell traps rather than one multi-cell trap.

The following modifications give a much improved trap (fig. 23) :

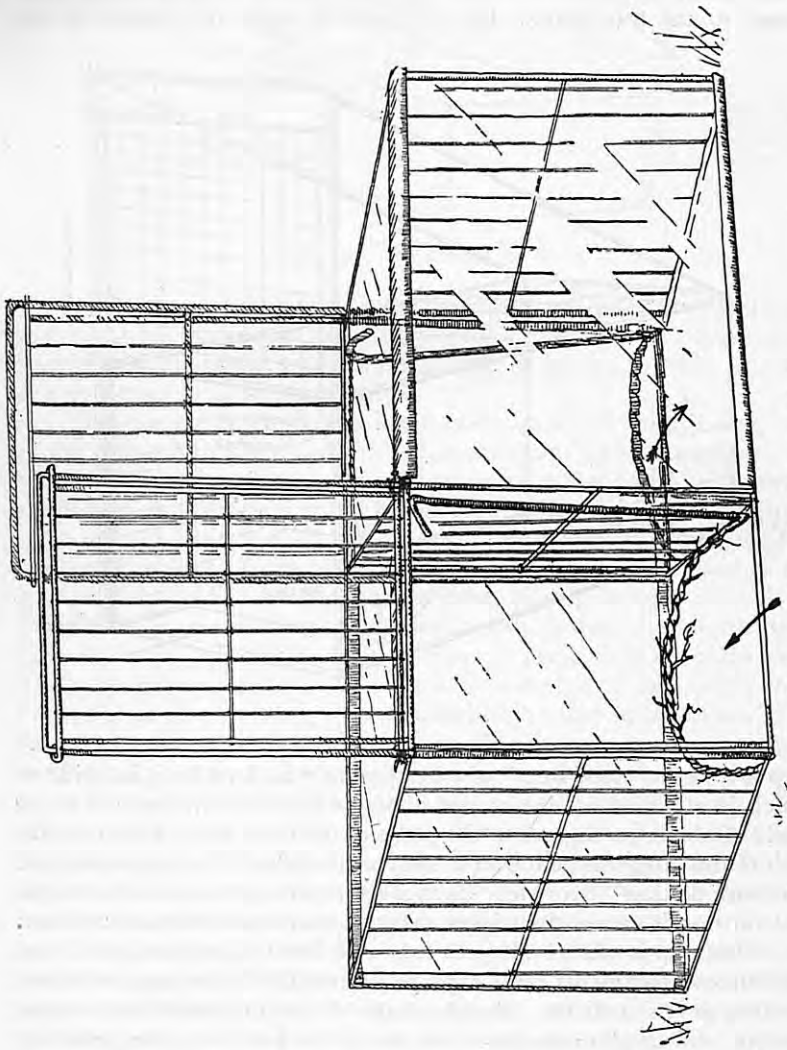


FIG. 23.—IMPROVED POTTER TRAP

(1) The trap should be a two-compartment affair with the door of one compartment at the opposite end of the trap to the door of the other. This is of benefit because the second compartment is less likely to spring when the door of the first compartment falls, and because the first bird caught, frightened by the falling door and inconvenienced by the treadle, tends to keep to the back of its compartment and so it is thither that the next bird will be decoyed.

(2) The trap should be made to appear to open out inside the entrance. To achieve this the back of each compartment should be about twice as broad as the entrance, so that the sides diverge from the entrance towards the back.

(3) The back and top should be made of transparent material—a plastic being preferable to glass as it is less likely to break. This can be held in place by small hooks instead of the flanges shown in the illustration.

(4) Instead of the usual wire-mesh treadle, it is more effective to use a low perch across the inside of the entrance. Hopping birds will perch on it and walking birds kick it, and both spring the trap. The perch is made by binding a pliant twig (e.g. syringa) on to a wire core. The wire is bent into a shallow curve, the points of which rest on the ground and which are inclined towards the back of the trap at an angle of 30 or 40 degrees above the horizontal. On one side of the trap the wire is continued in an upward-reaching arm to form the trigger on which the trap-door rests, and which is released when a bird moves the twig.

Chardonneret Trap (figs. 24 and 25)

Chardonneret traps are small box-traps with the entrance for birds in the roof. This entrance is closed by a flap-door when the bird alights on a perch inside the trap and by its own weight releases the trip mechanism of the door. The trap may be made either two-celled (fig. 24), or single-celled (fig. 25). The door may close by gravity, or elastics may provide tension to support the perch and shut the door. This is a good trap for catching warblers when dripping water is used as bait. A water bait on one side is sufficient for both compartments of the two-celled type. A design for a dripping water device is given in Chapter 7. Food or nesting material baits for tits, Blackbirds, and other garden birds can also be used. With such baits and dripping water it is possible to catch flycatchers, Goldcrests, Redstarts, etc., in addition. The framework of the trap can be made up from light wood battens. Half-inch mesh netting is used for the covering, or 12-gauge wires about $\frac{3}{8}$-in. apart, with the ends in holes drilled in the framework. The wires in the walls of the trap should be vertical. Part of a steel knitting needle or of a bicycle spoke make a suitable hinge-pin for the trap illustrated in fig. 25. The bearings for the pin can be holes drilled in the frame or picture hanging eyelets screwed to it. Alternatively,

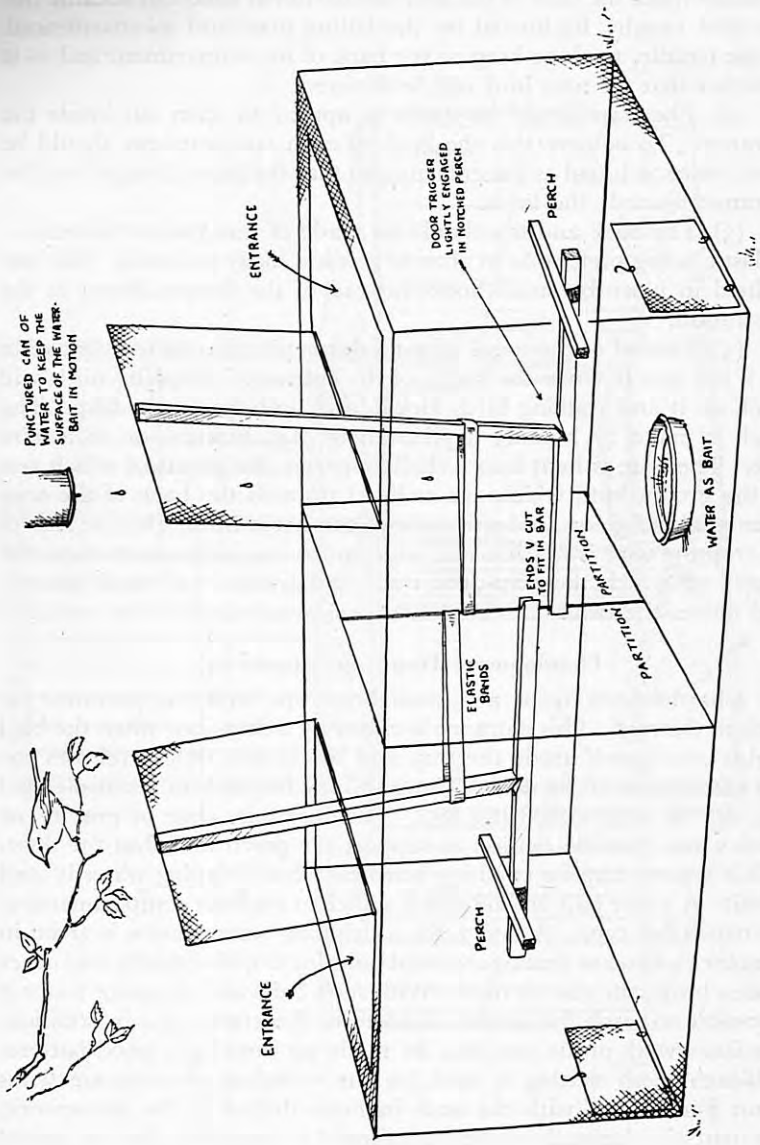


FIG. 24.—TWO-CELL CHARDONNERET

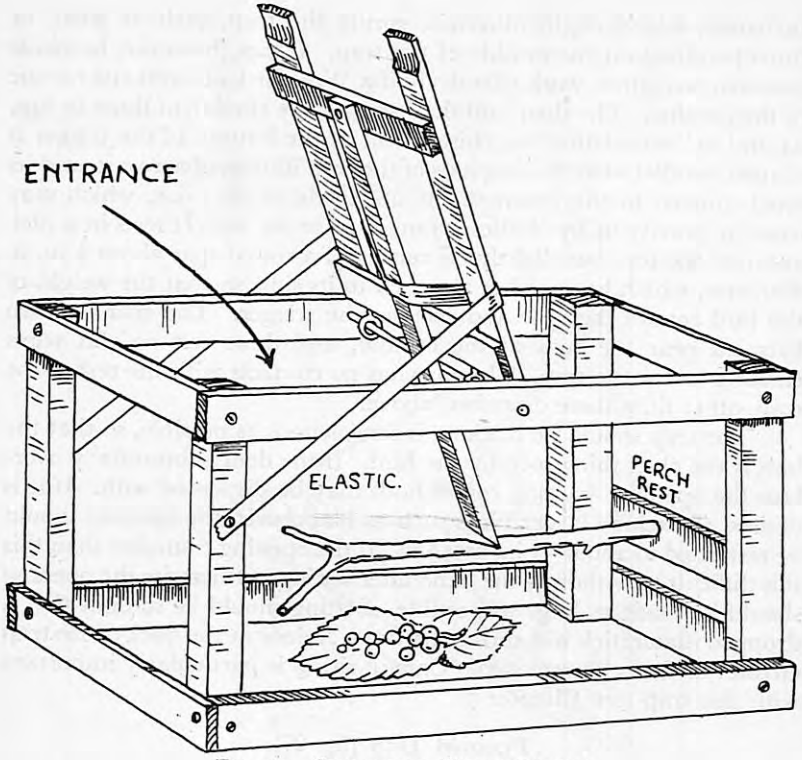


FIG. 25.—SINGLE-CELL CHARDONNERET

the door can be hinged to a cross member in the roof of the trap (fig. 24). In both designs the door-trigger is chisel-pointed and rests in a nick cut in a perch hinged to the back or centre partition of the trap. Fig. 26 shows a rather more elaborate trip mechanism. It has a slight delaying action which tends to damp out the effect of minor dis-

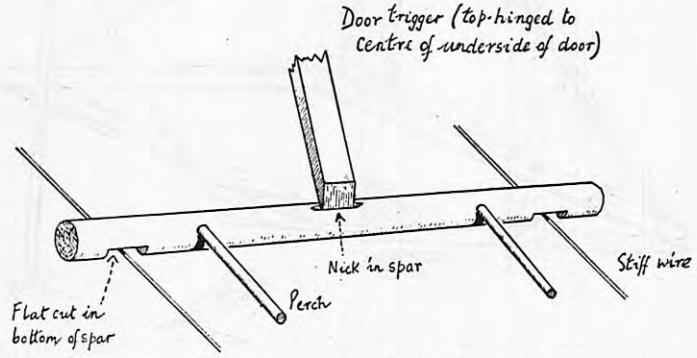


FIG. 26.—TRIP DEVICE FOR CHARDONNERETS.

turbances which might otherwise spring the trap, such as wind, or birds perching on the outside of the trap. It can, however, be made sensitive enough to work effectively if a Wren or Goldcrest sits on one of the perches. The door and door trigger are similar to those in figs. 24 and 25, except that the chisel point at the bottom of the trigger is shaped parallel with the long axis of the trap instead of across it, and its top is hinged to the centre of the underside of the door, which may close by gravity or by elastics arranged as in fig. 25. It rests in a nick cut near the top, but slightly off centre, of a round spar about $\frac{1}{2}$ in. in diameter, which has perches attached to its side, so that the weight of the bird rotates the spar and releases the trigger. The spar has two flats cut near the ends at the bottom, and these rest on stiff wires running across the trap. The spar has no contacts with the rest of the trap, other than those described above.

The trap should be made as inconspicuous as possible, so that the bait is the chief thing seen by the bird. If the door substantially overlaps the opening, framing round both may be dispensed with. If it is desired to exclude larger birds such as Blackbirds, the opening should be restricted to about $5\frac{1}{2}$ in. by $4\frac{1}{2}$ in. If the opening is smaller than this it is difficult to withdraw the hand after setting. Otherwise the opening should be made as large as possible. Setting should be so light that a dropped matchstick will spring the trap. A door at the back of the trap enables birds to be removed. Careful siting is particularly important with this trap (see Chapter 7).

Pyramid Trap (fig. 27)

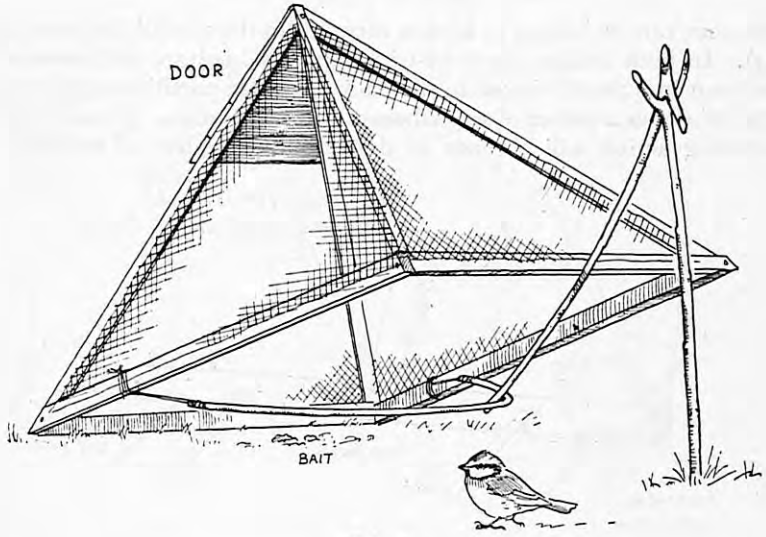
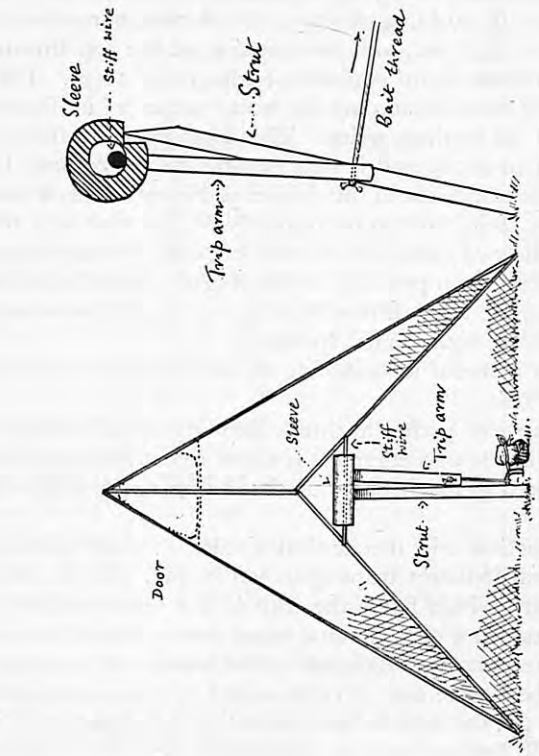


FIG. 27.



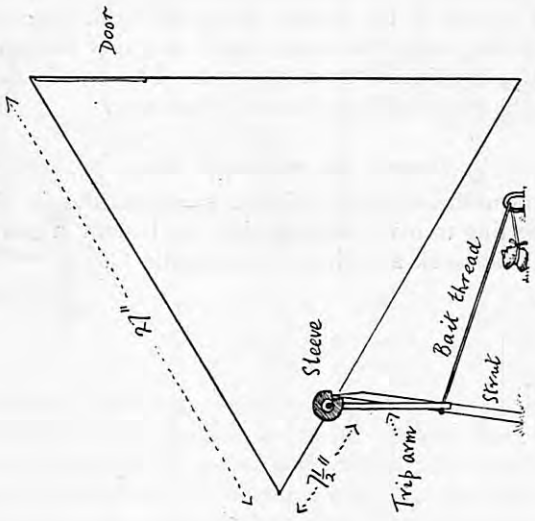


FIG. 28.—TRIP DEVICE FOR PYRAMID TRAP.

The dimensions of the trap illustrated are as follows : the square base measures 2 ft. 10 in. each way ; the sloping bars which form the cone are each 2 ft. 7 in., and the opening at the top through which birds are withdrawn is an equilateral triangle of 12 in. The loop on which the birds tread to actuate the trap reaches 23 in. from the back of the trap at its furthest point. This loop is made from a pliable slender bough or shoot and is held parallel to the ground by a little notch cut in the underside of the shorter of the two hooked sticks which measure about 18 in. and 20 in. respectively. As soon as a bird treads on the loop, the two sticks are thrown free and the trap comes down. The weight of the trap pressing on the shorter hooked stick keeps it in position with quite a small notch cut in it. It can be set very lightly so that a Blue Tit occasionally springs it.

This trap is useful for catching Rooks, Jackdaws, and Jays. An egg is a good bait.

Some trappers prefer a three-sided pyramid, because the 60 degree angles at the corners make it easier to catch trapped birds with the hand. The trap may also be used as a direct trap with a stick-and-string release.

A delay-action trip mechanism similar to that described in the section on Chardonneret traps is shown in Fig. 28. In this case the top of the strut, which holds the trap in the open position, is chisel-shaped and rests in a nick cut in a wood sleeve, which is a slack fit on a stiff wire fixed across one corner of the bottom of the trap. Rigidly attached to the sleeve, and at right angles to it, is a trip arm. When the trap is set up, the strut is inserted in the nick and placed in contact with the end of the trip arm, so that friction between the two prevents the trip from operating. A thread with bait attached to one end is wedged into a saw-cut in the bottom of the trip arm. The baited end is then placed well inside the trap, and a staple is pushed into the ground over it a few inches from the end. The bait is then pulled back towards the strut until the thread is just taut.

Funnels for automatic traps

Some non-mathematically minded trappers find it difficult to cut out wire netting to make funnels. For the benefit of such trappers directions for that work are given in Appendix C.

Chapter 5

TRAPPING OF WILDFOWL

Trapping of duck on a large scale is only possible when the trapper has access to a large sheet of water where they congregate. If the edges of the water are wooded or reeded, the Raft Duck trap or a Duck Decoy are the only known methods. With the former, only small-scale catches are possible, unless a large number of traps be used. A Duck Decoy takes a large amount of labour and materials to build. If the edges are clear, however, Abberton Duck traps can be used. These are relatively cheap to construct, and large scale catches are possible with only one or two traps. Raft and Abberton Duck traps are automatic traps of the maze type, and Decoys are direct traps.

Geese have been trapped with Clap-nets, but catches by this method are likely to be small and infrequent. The only successful large-scale catches have been achieved by the Rocket-net method. This is a very expensive method and can only be undertaken by a large organization such as The Wildfowl Trust, or by wealthy individuals.

Raft Duck Trap (fig. 29)

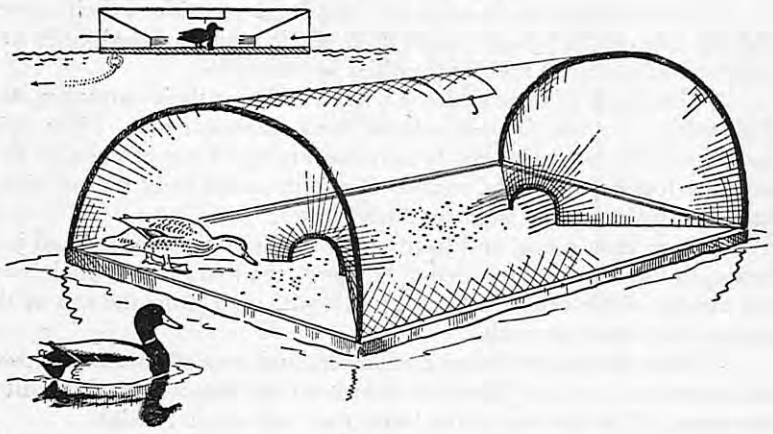


FIG. 29.

This is built on a light wooden raft, say 8 ft. by 6 ft., baited with a little wheat or maize, with a 1 in. beading round the edge to prevent the grain washing off. The raft is floated out down wind on a 20 or 30 yd. cord. Ducks should rest on it and take the grain. When it is found that the grain is being taken, four iron hoops or stout pieces of

curved galvanized wire are placed over the raft and covered with 1 in. or 2 in. wire netting. At each end of the raft a wire netting funnel is formed, tapering to a small hoop 9 in. wide by 6 in. high, screwed to the raft 2 ft. in from the end. These entrances should be protected by trailing wire strands which the duck push inwards and upwards as they enter and which prevent their escape. A door must be cut in the wire at the top, large enough to insert a landing net, for taking the birds out.

It should take Mallard easily on dark nights. The ducks soon get used to it and take grain from it, but nearly always go into the trap during the night. The trap may be more successful on lakes lacking many natural resting places such as sloping banks. Greenfinches and Corn Buntings have also been caught in these traps.

Duck Decoy (fig. 30)

" A piece of open water of from one to three acres, of a uniform depth of two to three feet, though shelving shallower to the sides, and surrounded by trees and shrubs.

" Attached to this open water are from one to eight curving ditches ; the usual number being three to six, seldom less or more.

" Each ditch has a width at its mouth, under the first hoop, of from 18 to 21 ft. ; rarely more than 21 ft., though in some cases a foot or two less than 18 ft.

" These ditches are 60 to 70 yd. long on the outside of their curves, and by degrees they taper away from their wide or pond ends to a width of only 2 ft. at their extremities or tail ends.

" The depth of the ditches is 1 ft. to 18 in. at their entrances, and shallowing to a few inches only at their narrow ends. They twist away from the pond into the brushwood and trees out of sight, so that any one looking in at the mouth of a pipe could only see up about half-way, owing to the way the ditch curves.

" Over each ditch, and fixed on its banks, are placed arched iron hoops, in former times wooden, 5 ft. apart, the first one of which, near the mouth of the ditch, is from 12 to 15 ft. high from the top of the arch to the water beneath.

" These hoops get lower and lower, and also of course narrower and narrower, as they follow at short intervals the course of the ditch they span, till at the end of the latter they are only 2 ft. high.

" Over the hoops is stretched netting, making all appear like a huge serpent-shaped cage. The ditch and net-covered hoops form a decoy pipe.

" Along each pipe, for two-thirds of its length on the outside of its curve, and 2 ft. to 3 ft. distant from its bank, are placed 10 to 12 overlapping reed screens, each 12 ft. long and 6 ft. high, besides a much longer one outside the mouth of the net-covered pipe, known as

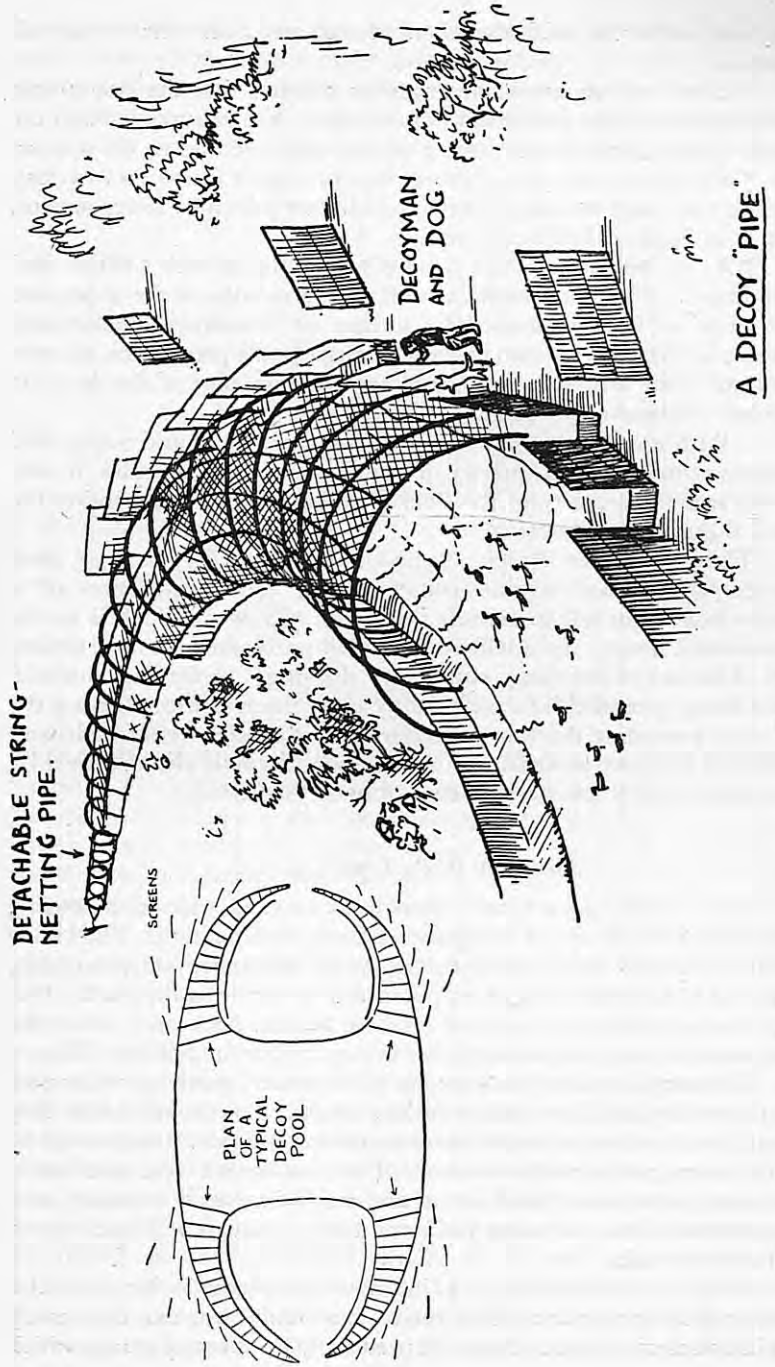


Fig. 30.

the head end screen, and two others beyond this, called the breast-wall screens.

" These screens are so arranged in echelon that the decoy-man can pass along them out of sight of the pipe. Nor can any fowl on the pond, or any birds he is decoying up the pipe, see him or his actions.

" The posts of the 12-ft. screens are 3 ft. apart where they overlap at their ends, and the spaces between them are joined by lower screens, 2 ft. 6 in. high, called dog-jumps.

" At various parts of the pond edge are the smooth banks called ' landings '. The pond itself, as well as the mouths of the pipes, are also more or less surrounded by screens or ' bankings ', judiciously placed, so that the decoyman can, through small peep-holes, observe the birds from behind shelter, or move from one part of the decoy to another unobserved by them.

" With a quiet neighbourhood of meadow, wood and water, and sometimes marsh, for a quarter of a mile or more on all sides, to add to the seeming security of the ducks, we have in this description the general outline of a decoy."

Thus wrote Sir Ralph Payne-Gallwey, in *The Book of Duck Decoys* (1886), and anyone contemplating the construction of a decoy should not fail to consult this book, a copy of which is in the Alexander Library. In it will be found full particulars of construction, and of the art of decoying, either by " dogging " or feeding, the wild birds being preceded into the pipe by tame decoy ducks. During the six years preceding the war 5,870 ducks of 10 species were caught and ringed in this way at Orielton. A successful decoy is also operated by The Wildfowl Trust at the New Grounds, Slimbridge.

Abberton Duck Traps (fig. 31)

These consist of a square framework covered with wire netting. The traps are 6 ft. to 12 ft. square and 4 ft. to 6 ft. high. They have funnel entrances, 2 ft. to 3 ft. square at the entrance, and protruding 3 ft. to 4 ft. into the trap. A trappers' door is made at the back. This acts also as an escape door and must be hooked back open when the trap is not in use. It is useless to try to stop up the funnels (see Chapter 1). The traps are sited on the edge of the water, partly in water and partly on dry land for surface-feeding ducks. For diving ducks they should be in at least a foot of water on the inshore side. They should be in the open, not in reeds or cover. They are baited with small seeds and corn, some on dry land, or on an island of turves if necessary, and some thrown into the water *inside* the trap ; enough will float out to attract the duck.

Details of Construction.—1½ in. mesh is adequate for the wire netting if duck only are the objective, but small birds can then easily get in and steal the bait. It should preferably be of heavy gauge, which

is more durable than netting of the standard gauge. By using 1 in. mesh these traps have caught large numbers of waders, wagtails, pipits, finches, etc., working along the shore line.

If the water level is constant, and traps do not have to be moved, the corner posts and upright supports of funnels can be set into the

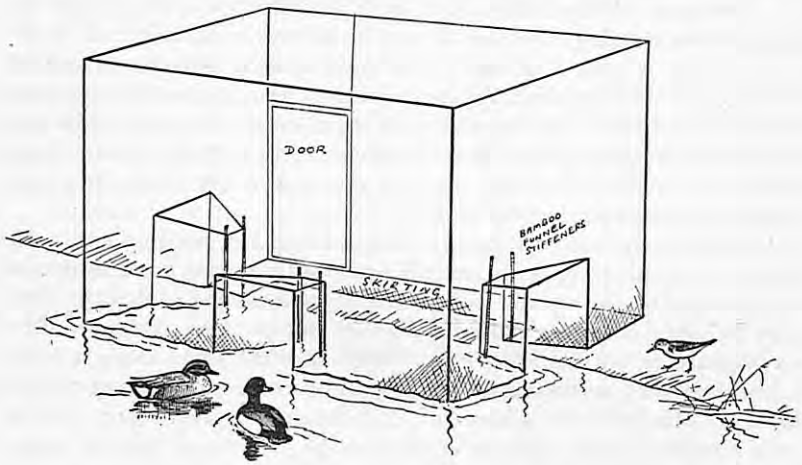


Fig. 31.—Abberton Duck and Wader Trap.

ground. Wood should not be painted or stained. If traps have to be moved, a ground frame of 2 in. by 2 in. timber is required ; 2 in. by 1 in. timber is adequate for other parts of the trap. The side members of this frame should be extended about 9 in. or 1 ft. at each end to act as skids. On large traps, the front and back members should also be extended about 6 in. on each side so that ropes can be attached for pulling. A skirt of wire netting is required all round inside the trap, otherwise duck will splash away the mud and get out under the sides. The skirt should be 2 ft. wide and lie flat on the ground all round the trap.

The traps can be moved by pulling with ropes on the 6 in. extensions of the ground frame, or by lifting and pulling by hand on the front end. One man can easily pull a small trap. If they have to be moved across water, small traps can be carried on a boat and larger ones floated by fixing sealed oil drums to the bottom frame. If they have to be moved by road, it is best to make big traps in four sections, the roof being a sheet of netting laced together which can be removed and rolled up. The funnels should be made detachable, so that the four side sections of the trap can lie flat on a trailer or lorry. Small traps can be carried complete in any suitable vehicle, or have the sides connected to the top by rings so that they can be folded flat for

packing. The funnels have square entrances and a horizontal top. They are tapered so as to leave an opening 3 in. to 4 in. wide at the narrow end. The top of this opening should be 6 in. to 9 in. above water level. Bamboos are threaded through the wire of the funnels vertically near the inner ends, and stuck into the ground, so as to stiffen them.

Operation:—If free ducks can settle undisturbed a short distance away without seeing the trap, it may be visited in daylight. If, however, as on small sheets of water, the trap is visible to ducks out on the water, it should only be visited in darkness. Decoys materially increase chances of catches. Teal are the best species for this purpose ; Mallard are apt to be pugnacious. But see above, p. 30, under Crow Trap. Decoys in the form of stuffed drakes are only effective when the upper plumage is dry and in good order.

Duck in the trap are caught with a large fish landing-net, or by hand. A supply of sacks is needed, each with a wire hook so that it can be hung on the netting wall, and a string attached so that the neck may be tied. All birds caught should be put in sacks, not more than six Mallard or ten Teal to a sack. Then take the sacks away to some convenient shed or shelter for ringing and recording. Ringing cannot be done efficiently in discomfort. Ducks will remain quiet and in good condition in *dry* sacks which are *not too full*, for an hour or more.

When traps are set for diving duck, a supply of clips, e.g. clothes-pegs, must be available, so that the tunnel ends may be closed completely and quickly as soon as the ringer enters the trap. Diving duck can otherwise escape under water through an open funnel. The ringer should preferably have three assistants, clad in wading boots, to guard the outsides of the funnels until the inner ends are closed.

Chapter 6

TRAPPING OF WADERS

No one, so far as is known, has yet devised a satisfactory trap for waders that can be used on the coast or in estuaries, where there are any appreciable tides. The traps described below can, however, be used on inland waters frequented by waders, where there is no appreciable rise and fall in water level, and where there is a well-defined and fairly constant feeding line.

Waders may also be caught by Clap-nets or Dazzle-netting (see Chapter 3), while 1,444 waders of twenty species were caught in Abberton traps between 1949 and the end of 1953.

Skokholm Dunlin Trap (fig. 32)

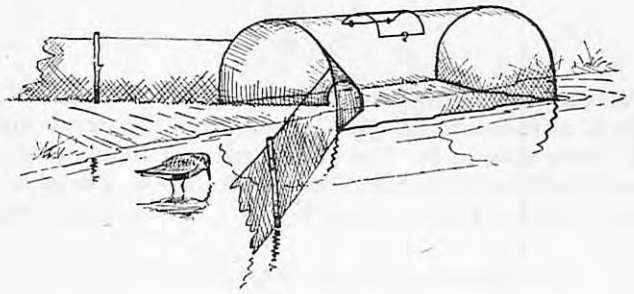


FIG. 32

This trap consists of a gathering cage 18 in. to 2 ft. long with a door for removing birds in the top and a semi-circular hole about 6 in. high with a short tunnel of the same height projecting into the cage. The cage is placed on the feeding line, and two guide walls, consisting of 9 in. wide strips of wire netting with occasional stick or wire supports, are put, one out into the water and one on land at about 60 degrees to each other, so that they guide waders into the cage. The birds can be " walked " gently towards the trap and into it. If rushed, they are apt to fly back.

Swedish Wader Traps

Large-scale ringing of waders is done in Sweden, a country blessed with a practically negligible rise and fall of tide. The two traps described below have given good results.

The Ottenby Wader Trap (fig. 33)

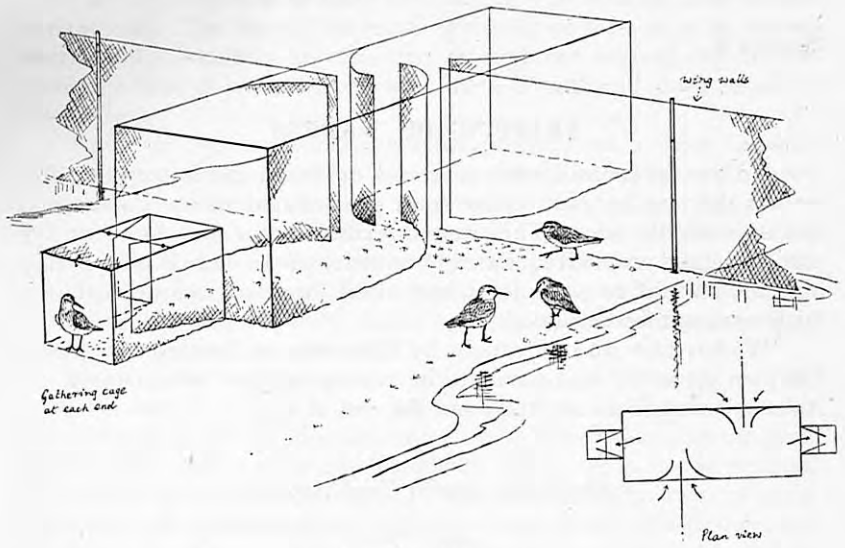


FIG. 33

The main compartments are wire netting cages about 18 in. high and shaped as shown in fig. 33. The length of the trap is about 4 ft. and the width about 2 ft. The gathering cages are about 9 in. high. The guide-walls are preferably sited to span a spit of sand or mud.

Very similar traps have been used in the U.S.A. for waders.

The Revtangen Wader Trap (figs. 34 and 35)

This is a maze-trap in the form of a triangle with one blunt end to take the door for attachment of gathering cage, and a 9 in. by 9 in. funnel entrance in each face. Funnels are about 5 in. long. It is made of a galvanized wire framework covered with wire netting. The

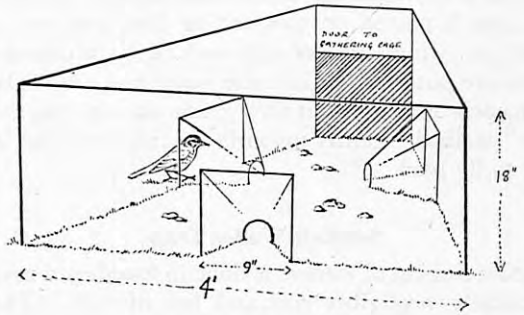


FIG. 34.—REVTANGEN TRAP.

internal exits of the funnels have no edging and can therefore be bent inwards or outwards to suit the size of wader present. A vertically sliding door would probably be an improvement on the Swedish design, because with a hinged door, the gathering cage cannot be positioned until the door is fully open.

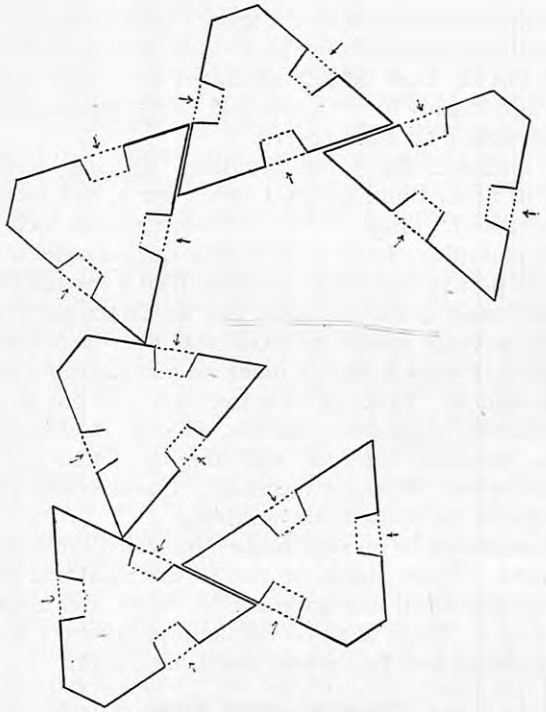


FIG. 35.—BATTERY OF REVTANGEN TRAPS ON RICH SEAWEED FEEDING AREA RAKED OVER TO EXPOSE MAGGOTS.

Fig. 34 shows a single trap and fig. 35 a battery of traps set up on a rich feeding area. At Revtangen, when a large catch was made, the trappers went round stopping the funnel entrance with seaweed before removing captures.

The traps are easily stacked one on top of another and two men can easily carry three or more traps.

Chapter 7

SITING AND BAITING OF TRAPS

Siting of Small Traps

Siting naturally depends on the species for which the traps are set.

A general purposes trap in the average garden should be set on a lawn, but not far from bushes, so that it is available for Starlings, etc., which feed mainly in the open, and Hedge Sparrows and others, which do not forage far from cover.

Traps intended for ground-feeding, flocking birds such as Chaffinches or Snow Buntings must be set out in the open where the birds normally feed. Traps set for cover-loving birds such as warblers need very careful siting. In gardens the best sites, in order of preference, are :—rows of peas or sweetpeas on sticks, fruit trees and bushes, roses of any kind, runner beans on poles, and in winter greens. Traps in rows of peas or beans should be fixed near the top of the plants. If a large number of traps is used, a plank on picket-supports close to the plants saves trouble. Traps in fruit trees are best put in the forks of branches. Outside the garden, sallows, willows, hawthorn, brambles, honeysuckle, hemlock, hogweed, and stinging nettles are favourable feeding places where traps are successful. Places where such growths abut on crops are particularly favourable.

The traps should be set near bushes, by which birds can approach in concealment. There should be two or three natural perches close to the trap so that birds can approach by stages and inspect the bait before going to it. Traps must be visible from tall trees if such species as Wood Warblers and flycatchers are to be caught.

Siting of larger Traps

Bigger traps are best sited at the end of a fairly large patch of cover. If sited in the middle of cover, there will be a tendency for birds to by-pass the trap. The trap should be protected from wind. A high wind in the bushes at the front of the trap usually means no birds. The ideal site is thus in a hollow, protected from all winds. The trap should in any case be protected from the wind prevailing during the most productive trapping periods. Preferably it should back on to a bank, to facilitate raising the collecting box relative to the rest of the trap. Trees immediately in front of a trap are undesirable. Many birds will perch in them, then fly over the trap.

Baiting Traps

Baiting is a very useful improver of catches in large Heligoland traps ; in small traps it is essential. Pre-baiting is usually advisable. Put bait down until birds begin using the site, then set the traps. The

nature of the bait will vary with the species to be trapped. Scraps of bread, small strips of cheese-rind, short lengths of bacon rind, scraps of surplus meat fat, and other kitchen refuse are attractive to Robins, tits, Starlings, and most species that frequent gardens. Apples, in any stage of decomposition, are a useful general bait. For finches, buntings, larks, etc., seed is the best bait. Turnip seed is cheap and efficient. Many farmers, who do not use combine harvesters have large beds of weed seed at their threshing yards, and many kindly allow any ornithologist, who is prepared to bag it, to remove as much as he wants. Such seed is improved by admixture of porridge oats and agricultural mustard seed. A large trap needs seed supply of the order of sacks-full. It is apt to be expensive if seed in such quantities is bought from a corn merchant. Wheat seems to be the best bait for Snow Buntings. A fly in a small corked specimen-tube is a good bait for pipits.

Wireworms, mealworms, or gentles are effective baits for Robins, chats, etc., and for almost any species that is feeding young. Directions for breeding mealworms are given in Appendix D. Such baits are most effective alive and are best put in a dark-painted receptacle, such as a specially painted tin lid, in which they can readily be seen, but from which they cannot easily escape. Green caterpillars are also an effective bait for many species, including Chiffchaffs.

For warblers, and most of the smaller passerines, water is by far the best bait, *but it must be moving*. This is best done by arranging for the water to drip into a shallow receptacle in the trap at a rate of about one drop every three seconds.

In large traps, the water reservoir, dripping device, and receptacle can all be inside the trap. In small traps, such as the Chardonneret, only the receptacle can be in them. The actual source of the drops should be about 9 in. above the surface of the water in the trap, and care must be taken to ensure that birds cannot perch on it and get a free drink without entering the trap. The reservoir should be of reasonable capacity. An old bucket or oil drum is suitable. It should have a cover, to exclude leaves and dirt. Dripping can be arranged by making a small hole in the bottom of the reservoir and plugging it with a wood plug, ill-fitting enough to drip at the required rate. Fig. 36 shows two better devices. In the gravity feed type, a $\frac{1}{4}$-in. copper tube is brazed to the bottom of the reservoir. The upper end has a fine-mesh copper gauze brazed to it, and its lower end is connected by a short rubber tube to a *brass* gas-tap, with which adjustment of drip-rate is easy. Brazing with a blow-lamp and silver solder is easier than normal soldering. The siphon type is easier to make and less likely to become blocked.

A mirror, placed inside a drop trap so that birds can see their own reflections as if inside the trap has effectively increased catches of Starlings.

Campbell (1952) gives interesting information on the attractions of wild berries for birds. In addition to wild berries, he has caught many warblers in Chardonnerets with broad-bean leaf black with fly, caterpillars, raspberries, red currants, and other soft fruit as bait.

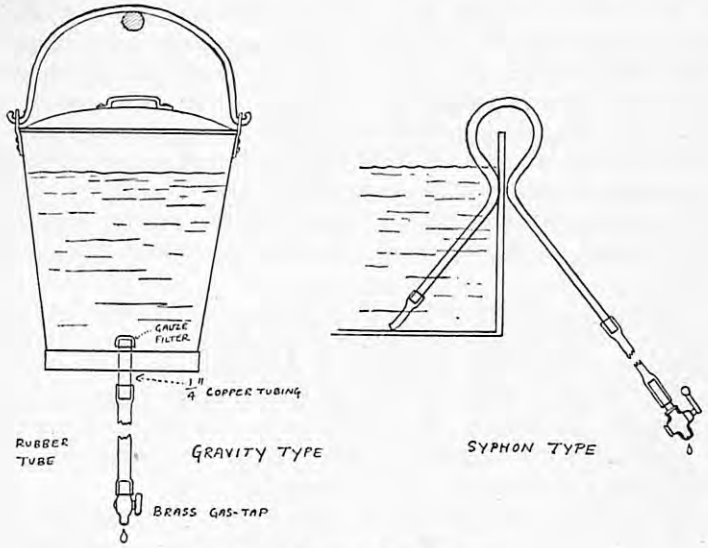


FIG. 36.—WATER DRIP DEVICES.

Such fruit attract a wide variety of birds. Baits and the birds caught with them were :

Bait.	*Birds Caught.*
Grey aphides on greens	Whitethroat, Chiffchaff, Robin, Chaffinch, Sparrows, and tits.
Berries : Black nightshade	Great Tit, House Sparrow, Hedge Sparrow.
Woody nightshade	Great Tit, Blue Tit, Blackbird.
*Wild arum	Blackbird, Whitethroat.
Privet	Great Tit, House Sparrow.
Buckthorn	Blue Tit.
Red Currant	Spotted Fycatcher.
Cornelian cherry (*Cornus mascula*, a garden variety of dog-wood).	Wren.
Honeysuckle	Marsh Tit.

* Poisonous to *Homo sapiens*, but not to *Aves*.

He has also used aphides collected from a variety of plants. Those on roses, yarrow, and knapweed are not the most satisfactory, as they are less adhesive than those on broad beans, stinging nettles, thistles, dock, fat hen, and other *Chenopodium* spp. Shoots or leaves infected with aphides can be placed across perches in Chardonnerets,

or on the floor of traps. Non-adhesive aphides can be shaken off on to raspberry leaves, the dark upper surface for light-coloured ones and the whitish undersurface for black fly. Raspberry leaves are also a good base for berry baits. He has also used nesting material as an effective bait in Chardonnerets in spring. Cobwebs on the perch have caught flycatchers, as has binding twine frayed out and cut into 3 in. lengths. Flock from an old mattress would probably also prove attractive to many species. White fluffy hens' feathers would probably catch Long-tailed Tits in a trap placed near the nest while they are building. Seeding heads of thistles, teasels, etc., are attractive to finches, and in particular to Goldfinches. They must carefully be cut from the growing plant. They are best arranged in small traps by cutting a large potato in half, boring small holes in the rounded upper surface of one half and sticking the seeding heads in the holes.

Baiting of Large Traps

Most of the baits described so far are useful also for large traps. Much can also be done at these traps by planting in the mouth of the trap bushes or plants which have berries or seeds attractive to birds. Hawthorn, wild rose, and blackberry are useful bushes ; plants like yellow loosestrife, mullein, thistles, sea rocket, etc., attract birds in autumn, and even a grass, sweet vernal grass, has attracted Scarlet Grosbeaks at Fair Isle. Rowe (1951) gives lists of trees and shrubs suitable for various habitats, and also valuable information of methods of planting and of taking cuttings.

Appendix A

THE BIRD-RINGING COMMITTEE OF THE BRITISH TRUST FOR ORNITHOLOGY

The composition of the Committee at 1st January, 1955, was :

Sir Landsborough Thomson, *Chairman*, A. W. Boyd, H. J. Boyd, John Gibb, P. A. D. Hollom, Miss E. P. Leach, Guy Mountfort, General C. B. Wainwright, George Waterston ; Lord Ilchester, representing the British Museum Trustees ; C. A. Norris and Bruce Campbell, *ex officiis* ; Robert Spencer, *Secretary*.

The address of the Committee and the headquarters of the Bird-Ringing Scheme is :—

c/o Bird Room,
British Museum (Natural History),
London, S.W. 7.

The conditions for admittance to the Bird-Ringing Scheme drawn up by the Committee in 1954 are :

1. Ringers must be members of the British Trust for Ornithology (or *postal* subscribers to the magazine *British Birds*), and at least 17 years old.
2. An applicant must have received full training in the technique of ringing, either at a recognized Bird Observatory, or with a ringer of standing.
3. Applications must be supported by a referree who is able to testify to the applicant's ornithological knowledge. This referee should be (*a*) a Regional Representative of the British Trust for Ornithology, or (*b*) a responsible officer of a county or regional ornithological organization, or (*c*) an ornithologist known to a member of the Ringing Committee.

The rings, which must not be used outside the British Isles, are made up in packets of 50, and ringers contribute to their cost at a fixed rate, commencing at 9*s*. per hundred for the smaller sizes.

Application forms and detailed instructions may be obtained on request.

Appendix B

Ornithologists who have contributed information on traps and trapping methods :

W. B. Alexander (portable Minigoland traps), H. E. Axell (Knife-rest trap), F. A. Bak (pole trap for tits, swing doors, mirror as " bait "), R. S. P. Bates (nesting traps), E. A. Bergstrom (camouflaging traps, American wader traps, Mason trap), S. Boardman (fruitcage traps and Starling inlet), A. W. Boyd (large drop traps, pyramid trap), Bruce Campbell (sleeve for nestboxes), W. D. Campbell (batfowling, Chardonnerets, siting and baiting of small traps), W. M. M. Chapman (improved Potter trap), G. L. Charteris (batfowling), R. Chislett (portable Minigoland traps), A. Clark (combination traps), E. Cohen (drop traps), C. L. Collenette (crow-traps), P. J. Conder (use of clap-nets for Puffins, amended Dunlin trap), G. B. Corbet (fly baits), R. F. Dickens (Revtangen wader traps), E. A. R. Ennion (control of fall-traps and stirrup-hinge for clap-nets), A. J. Harthan (portable Minigoland traps), R. A. Hinde (breeding mealworms), H. Jenkins (water-drip device), S. Marchant (portable Minigoland traps), E. Marson (T-shaped combination trap), A. Mason (Mason trap), Guy Mountfort (Chardonneret, perches), C. W. G. Paulson (large drop traps), R. A. Richardson (batfowling, fruitcage trap, and Starling inlet), F. Schifferli (portable Minigoland traps), J. Stafford (water-drip device), W. O. Steel (breeding mealworms), I. F. Stewart (trip devices for Chardonneret and pyramid traps), J. Wahlstedt and J. Håkanson (Ottenby wader trap, sock and sieve carrier), C. B. Wainwright (crow-traps, Abberton traps), G. E. Woodroffe (breeding mealworms).

Appendix C

CUTTING OUT WIRE NETTING TO MAKE FUNNELS FOR AUTOMATIC TRAPS

Semicircular funnels

A semicircular funnel is half the surface of a truncated cone. Its flat projection is a figure like the firm lines in Fig. A.

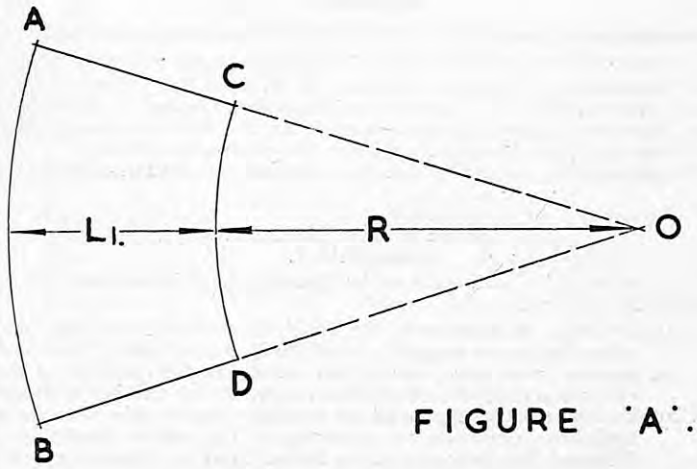


FIGURE 'A'.

The two segments of circles AB and CD have a common centre at O.

Choose the heights of the funnel at entrance and exit, H1 and H2, and the length of your funnel, I. L1, in figs. A and B, is so nearly equal to L that the difference is negligible.

Now consider the side view of your funnel as shown in fig. B.

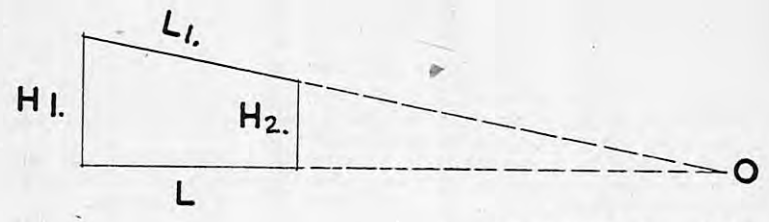


FIGURE 'B'.

By similar triangles, $\frac{H_1}{H_2} = \frac{L_1 + R}{R}$

Assuming that $L_1 = L$, this formula reduces to $R = \frac{L \times H_2}{H_1 - H_2}$ . . (i)

The length of the segment AB in fig. A is $H_1 \times 3.14$ . . . . . (ii)

The easiest way to cut out the wire for the funnel is to make a pattern from a sheet of newspaper and cut the wire as closely as possible to the pattern. Having chosen the three dimensions of your funnel, work R from (i) and strike an arc of a circle of radius R and another bigger one of radius R plus L from the same centre. Work out the length AB from (ii), cut a piece of string to this length, lay it out along your outer arc, mark the ends. Lay a straight-edge from these marks to the centre from which you struck the arcs, and draw lines joining the arcs. The resulting figure, similar in shape to the outline in firm lines in fig. A, is your pattern. It is advisable to make the cut in the wire-netting an inch or two outside the arc AB. Radial cuts in the extra portion enable flaps to be bent up for sewing to the trap-wall with fine wire.

Rectangular Funnels

These are usually of equal height throughout their length, but the sides converge. They are most simply made up of a triangular roof and rectangular sides. The sides are joined to the roof throughout their length. The lower inner ends of the sides can then be bent outwards to make an opening to suit the species for which the trap is set.

Appendix D

Breeding of Meal-worms

Meal-worms are the larvae of the beetle *Tenebrio molitor*. The beetle and larva are briefly described and illustrated in Sandars (1946). Further details can be got from more advanced entomological books if required.

Initial stocks of meal-worms may be bought from shops which cater for bird-fanciers or fishermen, or found in autumn in deserted sparrows' nests, as described in Woodruffe and Southgate (1951), or in cracks of floor-boards of granaries.

Breeding is best done in an old dustbin or bread-bin, provided that it is sound and unholed. A muslin cover should be provided. The breeding-bed may be any farinaceous material. Good results are given by a bed made in two layers. The bottom layer is 4 in. to 6 in. of equal quantities by volume of wholemeal flour and porridge oats, preferably with an addition of 2 per cent by weight of dry brewer's yeast. The upper layer is 3 in. to 4 in. of bran. Alternatively a 3 in. to 4 in. layer of bran covered with felt or cotton-wool may be used. The addition of a few cloves is also believed to hasten breeding. Feeding and moisture are then provided by putting a slice of bread, soaked but not dripping wet, on the bran, and renewing it every two or three days. On a bed containing food, moisture is given by a slice of potato or swede, renewed weekly. The materials must, in both cases, be kept dry and no water must be added. Care should be taken that no other insects are in the bin or bed. Some insects cause fermentation. The bed will require periodical renewing, according to the size of the culture. The stock eventually reduce it to fine powder.

If about 100 beetles are put in the bin, they will produce about 20,000 larvae in three to four months if the bin is kept in a room with a constant temperature of 25 degrees Centigrade (77 degrees Fahrenheit). The bin can be kept in a shed or garage, but the time of production will then be about nine months. If the stock is started with larvae, the above times will be increased by one to two months.

Initially, it is advisable not to disturb the breeding stock. During the period when the breeding-cycle is building up, it is best to keep a small stock, renewed as necessary by further purchases, in a smaller tin (e.g. a large Nescafé tin) with a bran-and-bread bed. Small holes should be punched in the lid. Meal-worms can be taken out of this with a teaspoon.

Removal of larvae from breeding stock is done by putting a folded sheet of paper in the bed. Larvae tend to collect between the folds.

A small tin, that can be carried in the pocket, with small holes punched in the lid and a little bran in it, is used for taking larvae to the traps.

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THE BRITISH TRUST FOR ORNITHOLOGY

The British Trust for Ornithology exists to advance our knowledge of British birds by means of field studies of all kinds. It organizes or supports inquiries into particular species of birds and problems of bird life, it assists research by means of small grants, and it seeks to bring developments in technique to the notice of all bird watchers : the series of Field Guides is a means to this end.

Members may participate in investigations sponsored by the Trust ; can consult the Alexander Library at the Edward Grey Institute, Oxford, one of the best collections of modern bird literature in the world, and can borrow by post from the extensive duplicate library ; they can attend meetings all over the country at which speakers discuss current theories and field work, and bird films and photographs are shown. They can consult the Trust's office on their own research problems and other questions. After training they may be accepted as ringers under the national scheme for marking birds, which is operated by a special committee of the Trust.

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Other Field Guides

No. 2. *How to Choose and Use Field-Glasses*. Revised edition, by J. R. Hebditch, based on the original edition by E. M. Nicholson. 1s. (postage 1½d.).

No. 3. *Nestboxes*. Revised edition, by Edwin Cohen and Bruce Campbell. Over 20 illustrations. 2s. 6d. (postage 1½d.).