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## A PORTABLE INSTRUMENT SHELTER FOR ECOLOGICAL STUDIES

In studies of an ecological nature, it is often desirable to make records of temperature or humidity on the site of the particular study. A standard instrument shelter, as used by the U. S. Weather Bureau (U. S. Weather Bureau 1941), is heavy, bulky and not adapted for short term use on field projects.

This paper describes a small light instrument shelter, large enough to hold a single hygrothermograph and adapted for mounting on a single post. This shelter has been in use housing hygrothermographs, thermographs, and maximum-minimum thermometers for more than a year in connection with a study of the ecology of ruffed grouse in northern Idaho.

## DETAILS

The portable shelter gains its lightness through the use of aluminum "Shade-screen"<sup>1</sup> for the side panels. The screen has a series of small slits with the portions between the slits being bent to form louvres which admit light from only one direction. This type of screen is manufactured by several aluminum companies. The side panels and the door are constructed of 1" x 2" lumber framing and are then covered by the shade screen. The bottom is of 3/4" lumber and the double roof is constructed of 8" wide lap-siding. The shelters are assembled with light, cement-coated nails and heavy tacks. Light hinges and turn buttons attach the door. The completed shelter is mounted on a single post with 3 angle brackets and brass screws. Figure 1 shows the details of the completed structure mounted 2 feet above the surface of the ground on a single post. Any length of post may be used depending upon the purpose of the study.

## THE EFFECTIVENESS OF THE SHELTER

For nearly a year, a shelter of this general type was exposed beside a standard Weather Bureau shelter in order to obtain a direct comparison. During this period, temperatures ranged from below 0° F. to 97° F. With the first shelter used in the comparison, the temperature within the portable shelter varied less than 1° from the instruments in the standard Weather Bureau shelter in the range below 70° F. The original shelter was from 1.5° to 2° F. above the instrument in the standard shelter, in the range from 80° to 90° F. This difficulty was corrected by adding the double roof to the shelter as shown in Figure 1. Continued comparisons with closely calibrated instruments in the double-roof shelter and the standard Weather

<sup>1</sup> "Shade-screen" is a trade name of the Kaiser Aluminum Company.

Bureau shelter exposed at the same height above the ground show that the portable shelter is comparable throughout the range from 0° to 97° F.

## CONSTRUCTION

Construction can be varied to suit the purpose of the shelter. Corrugated fasteners are satisfactory for joining the 1" x 2" pieces to form the door and the side panels. Pieces of "Shade-screen" are then cut to fit and tacked securely to these panels where a solid non-collapsible shelter is needed. The panels are then nailed to the bottom piece and to each other. A collapsible shelter can be constructed by using large brass screws to fasten the side panels and the back to the bottom and to fasten the side panels to the back panel. Small brackets with brass screws fasten the top to the side panels and hinges with removal pins make the door detachable. By removing 7 screws and the hinge pins this shelter is completely collapsible. The shelter illustrated has a single brass screw as a door handle to which a small aluminum tag is attached.

Overall dimensions of the shelter are 16" wide, 9 1/8" deep and 14 7/8" high at the front. Rear height is 12". The upper roof is 20" by 13 3/4" and is 1" above the lower roof which is 1" smaller in each dimension. For those wishing to duplicate the shelter, blueprints are available, at cost, from the author.

The shelter, as illustrated, was painted with a good grade of outdoor white, floor enamel before the shade screen was attached. The shade screen does not need painting except to cover the heads of the tacks where the screen is attached. Brass stripping and copper tacks may be used to cover edges of the screening. Care should be taken to fasten the screen in proper position, with the small louvres slanting downward to the outside.

## LIST OF MATERIALS

- 1 1" x 1" 2' long
- 1 1" x 8" 14 1/2" long
- 1 piece 7" lap siding 76" long
- 1 1" x 2" 16' long
- 1 pair brass butts
- 2 turnbutton fasteners
- 2 doz. flat head brass screws (to fit hardware)
- 3 angle brackets (for single post mounting)
- 1/2 lb. cement coated box nails
- 1 box copper or brass tacks
- 1 piece "shade-screen" 25" x 20"



FIG. 1. Instrument shelter in use housing a hygrothermograph. The shelter here is mounted on a single post, two feet above the ground.

2 doz. corrugated fasteners  
 ½ pint outdoor white enamel

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#### A METHOD OF PLANT DISPERSAL BY A MAMMAL

Animals aid in the dispersal of plants chiefly by consuming the disseminules and passing them out of their digestive tracts or by carrying them attached in some manner to the outer surface of their bodies. The method reported upon here concerns the spreading of a plant by means of cuttings made by a small mammal, a method which so far as I know has not previously been reported.

While carrying out an ecological life history study of the bog lemming (*Synaptomys cooperi*) in the sphagnum bogs of the New Jersey pine barrens, I frequently ob-

served the cuttings left by these mice, to help determine their food habits and relative abundance. The cuttings, most often about 40 mm. to 50 mm. in length, were commonly of the stems and leaves of various grasses, sedges, and rushes, and the green twigs of certain shrubs. These plant parts were cut and partially consumed at the foot of the plants or carried first to a nearby place of concealment a few inches or yards away. In some areas, the ground was heavily littered with cuttings. During the first week of September, 1954, in two bogs in southern