UNIVERSITY OF ROCHESTER FIJI EXPEDITION

THE University of Rochester expedition under the auspices of the Bernice P. Bishop Museum was organized for geological research in the Lau Islands of eastern Fiji for the months of February to September of this year. These islands are particularly interesting because of their limestones. Many of the limestones have been considerably altered by atmospheric agencies but careful examination has brought to light localities where they are unchanged. As a result excellent collections of fossil foraminifera, corals, echinoids, mollusks and other organisms have been obtained. A study of these will undoubtedly disclose the geological age of the islands and relate them to other land areas of the Pacific region. Geological maps have been prepared of the five islands of the Exploring Group in northern Lau and Mango, Tuvuthá and Katafanga. In all 18 islands have been studied in some detail from Ongea in the southern end of the group to Vanua Mbalavu in the northern. Preparation of the findings will be made at the University of Rochester and the U. S. National Museum. Publication will be made by the Bishop Museum of Honolulu.

J. EDWARD HOFFMEISTER
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SCIENTIFIC APPARATUS AND LABORATORY METHODS

RATIONAL TRAY SIZES FOR GEOLOGIC SPECIMENS

MANY types of geologic and other natural history materials require display and storage trays of various sizes, even for the same class or group of specimens. As used in laboratories and museums these trays commonly have dimensions fixed by local custom but usually not systematically related in the various sizes nor determined by an inclusive rational arrangement. The following scheme of tray sizes was recently devised and provides the following characteristics:

(a) Trays of all sizes have a rectangular shape, the length being about 40 per cent. greater than the width and the ratio the same for all sizes. The trays are thus all geometrically similar figures.

(b) The sizes are so arranged that the length of one size is equal to the width of the next larger size.

(c) The length and width, respectively, of a given tray are doubled and the area quadrupled in the tray second larger in the series.

As a necessary consequence of the specifications above, the following relations appear:

(d) The ratio of length to width for all trays is the square root of two, approximately 1.414.

(e) The ratio of homologous linear dimensions in successive trays of the series is the same, 1.414, and of the areas is 2.000.

(f) Moreover, each tray not only has half or twice the area, respectively, of the trays next larger or smaller but can be fitted exactly into the same space by turning through ninety degrees.

(g) The area relationship and possibility of fitting into common space extends to the second removed, larger and smaller sizes with the area ratios of four and indefinitely according to the same geometrical law.

Any base size may be used in starting the series, though in a given museum the various departments should have little difficulty in agreeing on a common series, since the size ratio is small and the member nearest to a given traditional or precise requirement will differ but little from it. The table below gives dimensions for such a series based on the approximate length of one decimeter or four inches and recorded in both English and metric units.

RATIONAL SCHEME OF TRAY SIZES
(LINEAR RATIO $\sqrt{2}$, AREA RATIO 2)

Tray designation	English decimal (inches)			English fractions (inches)		Metric (centimeters)		
	Width	Length	Area	Width	Length	Width	Length	Area
a	1.4	2.0	2.8	1–13/32	2	3.5	5.0	17.7
b	2.0	2.8	5.6	2	2–13/16	5	7.1	35.4
c	2.8	4.0	11.3	2–13/16	4	7.1	10	70.7
d	4.0	5.6	22.6	4	5–19/32	10	14.1	141
e	5.6	8.0	45.2	5–19/32	8	14.1	20	283
f	8.0	11.3	90.4	8	11–5/16	20	28.3	566
g	11.3	16.0	181	11–5/16	16	28.3	40	1131
h	16.0	22.6	362	16	22–19/32	40	56.6	2262
i	22.6	32.0	723	22–19/32	32	56.6	80	4525

For greatest convenience the drawers in cabinets in which such trays are placed should have the inside dimensions of one of the larger members of the series, such as 22.6 by 32 inches. Or, one of the dimensions of the drawer can be taken as a base on which to determine the submultiple tray sizes. Fig. 1 shows a

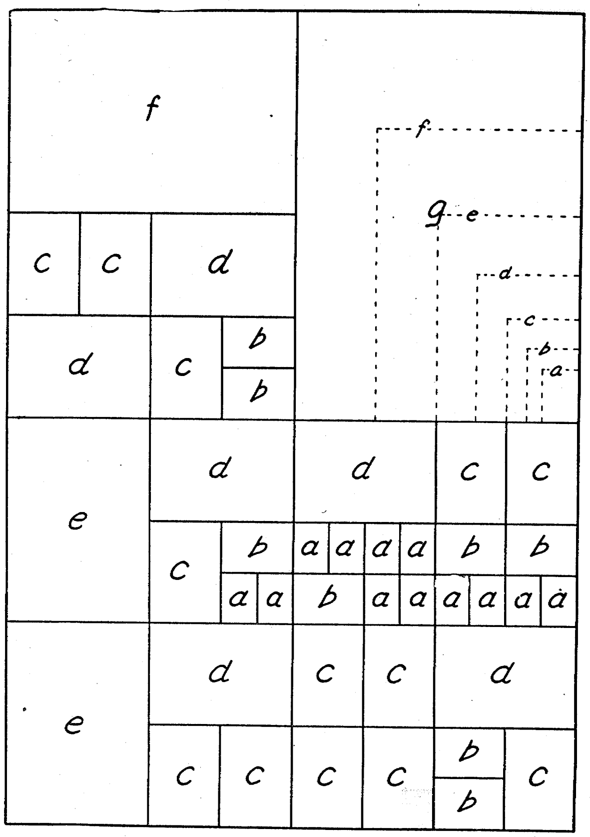

FIG. 1.

drawer of size *i* in which various sized trays of this series from *a* to *g* are fitted. Within the space *g*, the relative sizes of other trays are shown in dotted lines. No doubt such an arrangement or one in part comparable to it has been devised and used by some one long since, but since the basic scheme does not seem to have been generally in use, the foregoing presentation may be of value to others. The advantages of the plan are apparent; adaptations to special requirements are readily worked out.

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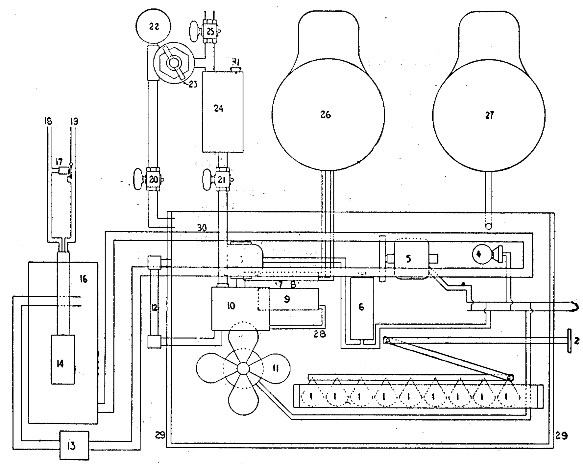
APPARATUS FOR STUDYING THE EFFECT OF INCREASED ATMOSPHERIC PRESSURE UPON THE DEVELOPING HEN EGG

A STUDY of the effects of unequal mechanical pressures upon developing amphibian eggs was among the earliest investigations of the experimental embryologists, but so far as I know no studies, other than those reported by the writer, have been made upon the effects of increased atmospheric pressure upon the avian egg. The apparatus described herein is the outgrowth of several years of experiment, the earliest reports of which were published in 1927.[1] Without describing all the failures and fruitless experiments I shall pass to the present apparatus, which serves its purpose reasonably well. Naturally if one should build a completely new apparatus it would be more compact and convenient than the one described here. The illustrations presented herewith were drawn to



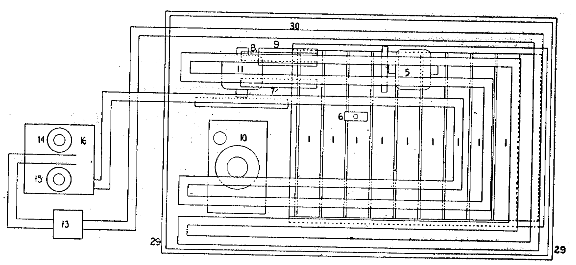


Fig. A. Schematic drawing of incubator with front wall removed. Fig. B. View from above with the lid removed. 1, Egg turner; 2, lever arm for egg turner; 3, electric circuit 110 v; 4, light (for illumination only); 5, fan to drive air over thermometer bulbs; 6, humidity control; 7, bulb of wet bulb thermometer; 8, bulb of dry bulb thermometer; 9, water reservoir for wet bulb thermometer; 10, reservoir of humidifier; 11, fan for circulation of air in incubator; 12, water gauge (outside of incubator); 13, water pump; 14, thermoregulator; 15, electric heater; 16, hot water supply tank; 17, mercury switch (6 volts through thermoregulator); 18, 6 volt line; 19, 110 a. c. to heating element; 20, air valve; 21, air valve; 22, air gauge; 23, pressure regulator; 24, water receptacle; 25, air valve; 26, dual recording thermometer; 27, recording air pressure gauge; 28, tube to supply water to thermometer reservoir from the humidity reservoir; 29, casing; 30, hot water coils; 31, port of entry for water.

[1] *Jour. Elisha Mitchell Sci. Soc.*, 42: 188.