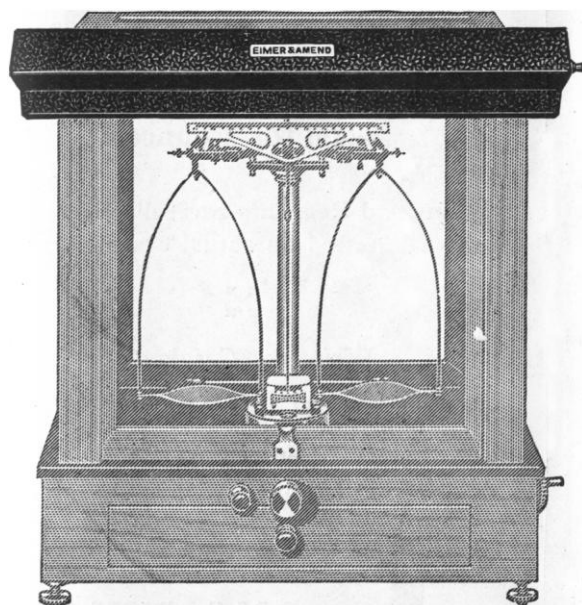


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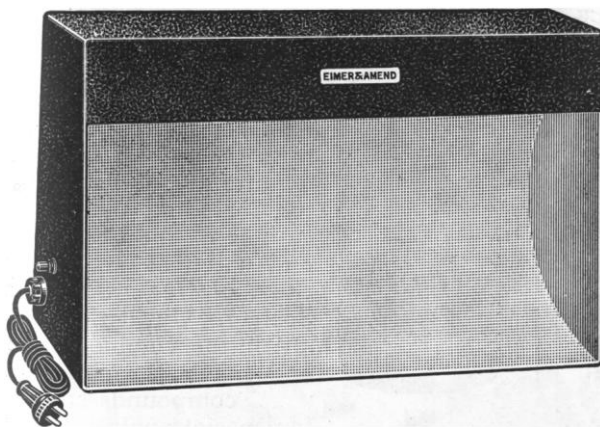
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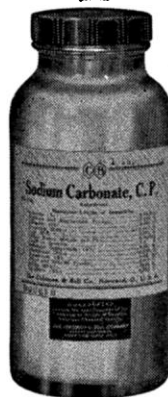
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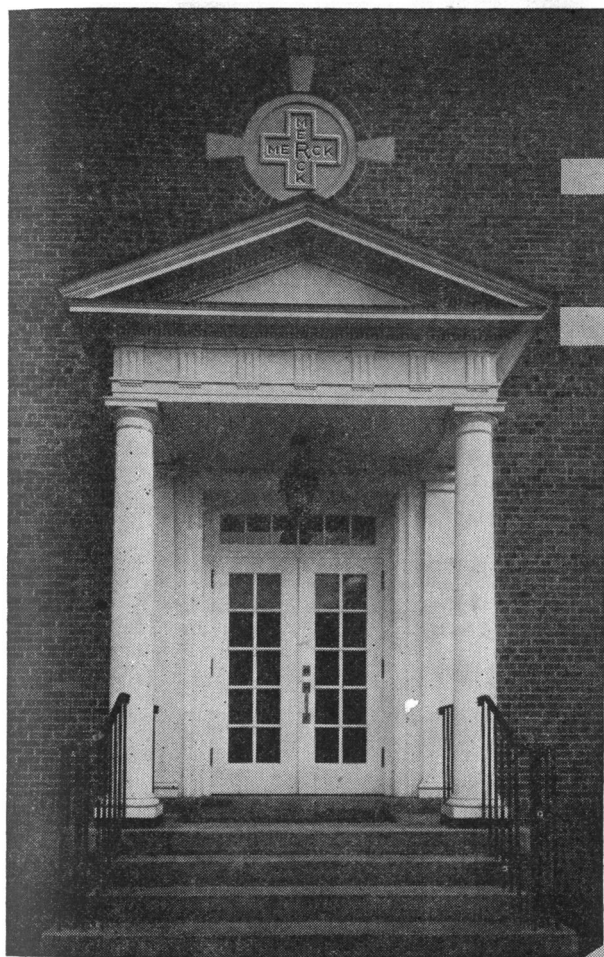
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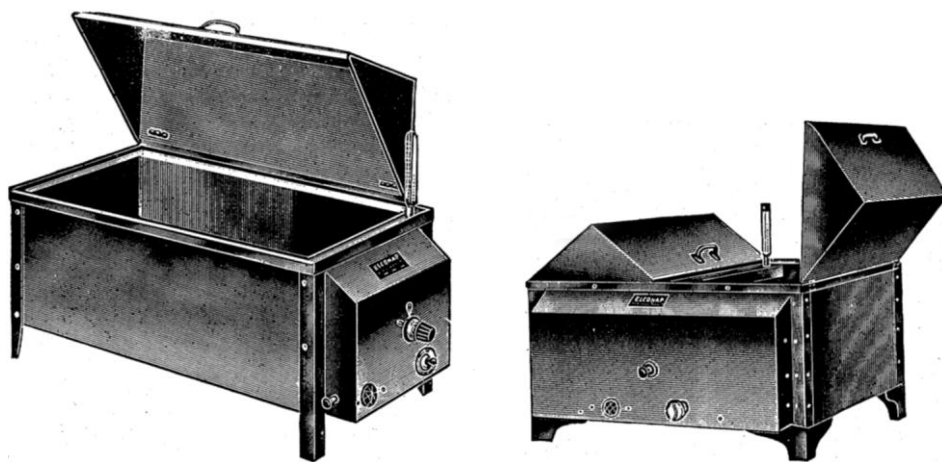
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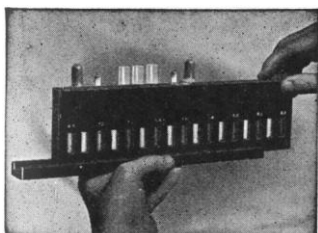
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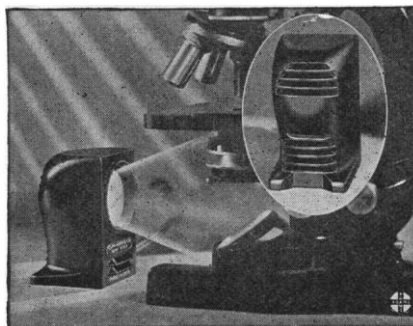
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SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. McKEEN CATTELL and published every Friday by

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DIVERGENT PATHWAYS IN SEXUAL DEVELOPMENT¹

By Professor WESLEY R. COE

OSBORN ZOOLOGICAL LABORATORY, YALE UNIVERSITY

AMONG the outstanding achievements in biology during the past few years are those relating to the physiology of reproduction. Experimental studies on the identification, analysis, preparation and physiological effects of the so-called sex hormones in the various classes of vertebrates have been particularly noteworthy. It is well known that these internal secretions are responsible for the functional development and activation of the sex glands and their associated structures, for when they are properly administered, either by uniting two embryos together or otherwise, the sexual differentiation and sexual function of the developing individual can often be diverted in either the male or the female direction, as desired.²

¹ Address of the retiring vice-president and chairman of the Section on Zoological Sciences, American Association for the Advancement of Science, Columbus, December 29, 1939.

² B. H. Willier, E. Witschi, L. V. Domm and C. H. Danforth, in "Sex and Internal Secretions," second ed.,

The effects may be scarcely appreciable or decidedly profound, depending upon the species, the sex and the period of administration. In some of the amphibia complete functional sex reversal is possible. In birds and mammals the effects of treatment with hormones of the opposite sex have been thus far limited to alterations in the sex glands or to the accessory sex organs, or both, without achieving complete functional development. Apparently normal germ cells of the opposite sexual type have been experimentally obtained in the fowl, and the production of fertile sex-reversed individuals in the near future appears to be highly probable.

In certain species of amphibia the sex can be controlled merely by regulating the temperature, by delaying the fertilization of the egg or by other means, but I know of no satisfactory evidence that success

1939 (Allen, Danforth and Doisy, editors): Richard Avery Miller, *Anat. Rec.*, 70, 1938.

out along the y axis, and then for a single vessel and a particular gas the slope of the curve is established by determining from equation (2) the value of k at an arbitrary value of V_F (e.g., 5,000 cu. mm or 5.0 cc), and plotting this point on the chart. A straight line through this point and the corresponding intercept point gives the calibration curve for the particular vessel and gas. Lines parallel to this are now drawn through the intercept points for the other vessels, and the complete chart for one gas and for all the vessels is thus obtained. The curves for a second gas may then be drawn on the chart in like manner.

Similar charts may be prepared for a number of different temperatures, but it should be noted that a change from one temperature to another will alter not only the slope of the curves but also the intercept, since both components of the right-hand side of equation (3) are functions of temperature.

J. MACLEOD

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DETERMINATION OF RELATIVE HUMIDITY WHILE MEASURING RESPIRATION IN A GAS TRAIN SYSTEM¹

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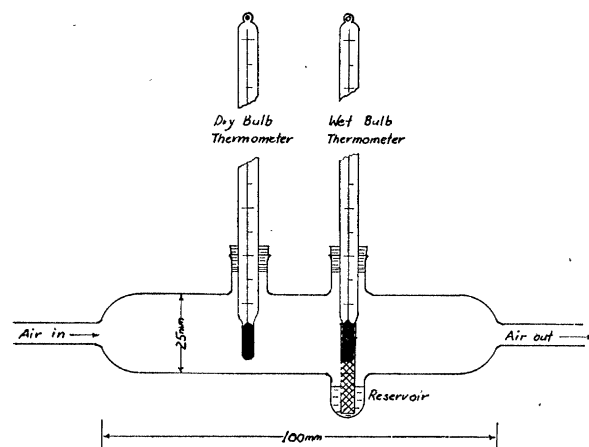


FIG. 1

¹ Published with the approval of the director as Technical Paper No. 54, Hawaii Agricultural Experiment Station.

ratus shown in Fig. 1 served this purpose. It is constructed from a glass tube 25 mm in diameter and approximately 100 mm long. Two openings in the tube take No. 0 stoppers to hold the thermometers, and a small bulb blown opposite one of the openings serves as a reservoir for the wet bulb thermometer. The ends are brought down to a diameter of 8 mm and tubing of this size is sealed to each end. The apparatus is then sealed in the gas train system and may be immersed in a water bath at any desired temperature. The air in this apparatus should be circulated at a speed of approximately 15 feet per second to obtain accurate readings on the wet bulb.

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