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SIR JOSEPH LARMOR AND MODERN MATHEMATICAL PHYSICS

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SIR JOSEPH LARMOR, MATHEMATICAL PHYSICIST

ON May 19th last the scientific world lost a notable mathematical physicist, Sir Joseph Larmor, Lucasian professor of mathematics at Cambridge, England, from 1903 to 1932, successor to Sir George Stokes in this celebrated chair once held by Sir Isaac Newton. After being graduated from Queen's College, Belfast, Larmor took highest honors in the Cambridge Mathematical Tripos of 1880 at about 23 years of age, J. J. Thomson being second wrangler in the same year. Larmor was called at once as professor of natural philosophy to Queen's College, Galway, where he remained until 1895. He then returned to St. John's College, Cambridge, as lecturer, and was named for the Lucasian professorship in 1903. From 1901 to 1912 he was secretary of the Royal Society, and was awarded the Copley Medal of the society in 1921. Always deeply attached to his native country, Ireland, he entered Parliament in 1911 as Unionist representative of Cambridge University and served there for eleven years. He received various distinctions besides those mentioned.

Larmor grew to scientific maturity at a time when every attempt was being made to explain all physical phenomena on a dynamical or at least a quasi-dynamical basis, involving the concepts of absolute space (the ether), of absolute time and simultaneity, of to atmospheric pressure, extends into reservoir (f) and the tube is adjusted so that its lower end will be at the level of spout (e). The operation of the device depends on this adjustment. Valve (h) releases air trapped when filling reservoir (f) with water.

The intake of an air pump to be calibrated is connected to valve (d) and this valve closed to the pump and atmosphere. Valve (b) is closed and valve (h) opened. Reservoir (f) is then filled with water through tube (g). As reservoir (f) is being filled an amount of water will flow through spout (e) into

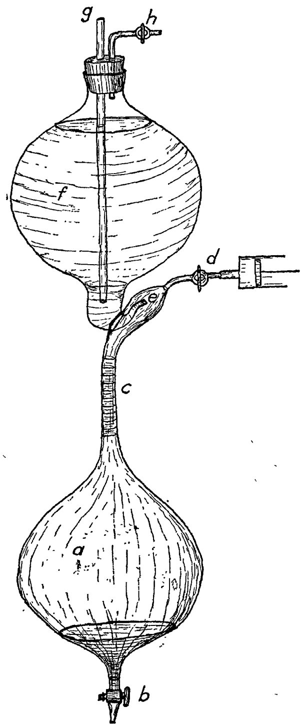

FIG. 1.

flask (a) which maintains air pressure in flask (a) equal to the head of water above spout (e). When reservoir (f) is full valve (h) is closed and the three position valve (d) opened to the atmosphere. Releasing the air pressure in flask (a) causes pressure readjustments in reservoir (f) and sufficient water will drain from the reservoir to establish less than atmospheric pressure above the water in the reservoir and atmospheric pressure at the surface of the water in spout (e) and the end of tube (g). The excess water in flask (a) is drained to a zero mark on the stem of valve (b). Valve (d) is closed to the atmosphere and opened to the pump. The apparatus is now ready for a pump calibration.

As the pump exhausts air from flask (a) the pressure in flask (a) tends to decrease, but a spontaneous adjustment of pressures in the system takes place which maintains atmospheric pressure in flask (a). The process of adjustment is: decreasing pressure on the surface of the water in spout (e) forces water from reservoir (f) into flask (a) until the pressure in flask (a) is brought back to atmospheric pressure. At the same time water flowing from reservoir (f) decreases the water pressure in reservoir (f) and air will be forced into reservoir (f) through tube (g) until atmospheric pressure is again reached in the water at the level of spout (e). Thus the device maintains atmospheric pressure in the flask (a) and any volume of air pumped from this flask will be replaced by an equal volume of water.

For a calibration the pump is run until the water flowing into flask (a) has reached the graduations on stem (c), from which its volume can be determined. This volume divided by the number of strokes made by the pump during the operation gives the volume per stroke of the pump.

The pressure of the air enclosed in the system is affected by any temperature change, and any variation in this pressure affects the accuracy of the device. To eliminate this source of error all parts of the system should be at a uniform temperature, and as the enclosed air responds more rapidly to temperature changes than the water the temperature range, during a run, should be kept to a minimum. Another source of error is incomplete water drainage from flask (a) between runs. This can be avoided by keeping the glass chemically clean.

J. C. OWEN

CLIMATIC AND PHYSIOGRAPHIC DIVISION,
SOIL CONSERVATION SERVICE

BOOKS RECEIVED

Addresses and Proceedings of the Eightieth Annual Meeting of the National Education Association of the United States—1942. Pp. 558. National Education Association.

ALLEN, ROBERT PORTER. *The Roseate Spoonbill.* Illustrated. Pp. xviii + 142. National Audubon Society. $2.50.

American Geophysical Union Transactions of 1942: Proceedings of the Twenty-Third Annual Meeting. Illustrated. Pp. 567. National Research Council.

BATESON, GREGORY and MARGARET MEAD. *Balinese Character, A Photographic Analysis.* Illustrated. Pp. xvi + 277. New York Academy of Sciences. $3.75.

BOYD, WILLIAM C. *Fundamentals of Immunology.* Illustrated. Pp. xiv + 446. Interscience Publishers, Inc. $5.50.

EDDY, W. C. and OTHERS. *Wartime Refresher in Fundamental Mathematics.* Pp. viii + 248. Prentice-Hall, Inc. $1.40.

MAYR, ERNST. *Systematics and the Origin of Species.* Illustrated. Pp. xiv + 334. Columbia University Press. $4.00.

STARR, VICTOR P. *Basic Principles of Weather Forecasting.* Illustrated. Pp. xxvi + 299. Harper and Brothers.

VON BERNEWITZ, M. W. *Handbook for Prospectors.* Fourth edition. Illustrated. Pp. x + 547. McGraw-Hill. $4.00.