Science News a Century Ago

Mode of Operation of Poisons

IN a paper entitled "Experimental Researches on the mode of operation of Poisons" read to the Royal Society on June 6, 1839, J. Blake gave an account of experiments undertaken to show with what rapidity the blood is circulated through the body. He summarized his conclusions as follows:

"(1) The time required for a substance to penetrate to capillary vessels may be considered as unappreciable. (2) The interval elapsing between the absorption of a substance by the capillaries, and general diffusion through the body, may not exceed nine seconds. (3) An interval of more than nine seconds always elapses between the introduction of a poison into the capillaries, in veins, and the appearance of its first effects. (4) If a poison be introduced into a part of the vascular system nearer the nervous centres, its effects are produced more rapidly".

The Great Lakes of North America

AN American correspondent of the *Athenæum*, writing from New York on June 7, 1839, referred at some length to the theories of rain put forward by the meteorologist J. P. Espy (1786–1860). He then went on to remark: "The water subject reminds me of an interesting statement respecting our great north-western lakes, which appears in the last Report of the *Michigan State Geologist*—a region, by the way, which has been but two or three years a *State*. Such facts show that practical science, as I have hinted before, like practical literature, is really exciting some attention amongst us. The following is the only authentic tabular view of these waters I have seen; it may be of novelty to some of your readers.

	Mean Length	Mean Breadth	Area Sq. Miles
Superior ..	400	80	32,000
Michigan ..	220	70	22,000
Huron ..	240	80	20,000
Green Bay ..	100	20	2,000
Erie ..	240	40	9,600
Ontario ..	180	35	6,300
St. Clair ..	20	14	360

"The same tabular statement exhibited also the depth and the elevation of each above tide water.

	Mean Depth Ft.	Elevation Ft.
Superior	900	596
Michigan	1,000	578
Huron	1,000	578
St. Clair	20	570
Erie	84	563
Ontario	500	232

"It is computed that the lakes contain about 14,000 cubic miles of water, a quantity more than half of all the fresh water on the earth."

American Convention of Civil Engineers

THE *Mechanics' Magazine* of June 8, 1839, had a note to the effect that the American civil engineers, after various preliminary meetings, resolved to form a society similar in its aims to the Institution of Civil Engineers, in London. The Franklin Institute, Philadelphia, offered its co-operation, the headquarters of the convention were to be at the Franklin Institute and the *Franklin Journal* was to be the recognized organ of the new body. Mr. Benjamin H. Latrobe, of Maryland, was elected president.

Societies and Academies

Dublin

Royal Irish Academy, April 24.

W. H. MCCREA: Matrices of quaternions and the representation of Eddington's E-number. An 'algebra' consists of the body of theorems which can be proved true of a set of 'elements' or 'quantities' obeying stated rules of addition and multiplication. For example, we have the well-known algebras of real numbers, of complex numbers, and of Hamilton's quaternions. It is known that under certain conditions the quantities of one algebra may be represented by 'matrices' composed of the quantities of another algebra. In recent years Sir Arthur Eddington has given a formulation of quantum theory and relativity theory based upon the algebra of what he calls 'E-numbers'. The main object of the present paper is to show how Eddington's algebra may be represented by matrices of quaternions.

Edinburgh

Royal Society of Edinburgh, March 6.

ENID CHARLES: Differential fertility in Scotland. (2). The mining and metal industries were associated with either average or very high gross reproduction rates. Low fertility was associated with (*a*) textile industries, (*b*) commerce and finance, (*c*) personal service. In the predominantly agricultural counties, high rates were found in the north-eastern district and Wigtown, low rates in the typically crofting counties and those with large sheep farms. Some correspondence was found between high fertility and intensity of cultivation. All regions with a high proportion of women gainfully employed exhibited low fertility. In general, high fertility of married women was associated with a high nuptiality rate.

R. S. BARCLAY and W. O. KERMACK: The fertility of Scottish married women, with special reference to the period 1926–1935. An investigation has been made of the applicability to Norway and Scotland of the 'Diagonal law', previously found to hold in respect of the specific legitimate fertility rates of certain European countries. The specific legitimate fertility rates for Scotland, 1931, have been employed to calculate standardized general legitimate fertility rates for various regions of Scotland for the period 1926–1935. The results are summarized in various tables and maps.

H. P. DONALD: Sources of variation in human birth weights. On the basis of birth weights of 3,000 full-term infants, it is concluded that those born in summer are slightly heavier than those born in winter. The effect of sex is greater than that of month of birth, is about the same as that of birth order but accounts for comparatively little of the total variation. Age of mother and time between births had no demonstrable effect. By far the greatest source of variation arose from differences in the family averages, an intra-familial correlation of 0·5 being found. This is of significance in connexion with infant mortality, and mental and physical development.

E. L. INCE: Relations between the elliptic cylinder functions. As the elliptic cylinder functions may be regarded as generalizations of the circular functions, the question arises as to whether there corresponds to the addition theorems for the circular functions