research into the relation between the emotional and organic factors in certain physical disorders.

THE Drexel Institute of Art, Science and Industry, Philadelphia, will change its name to Drexel Institute of Technology, subject to the approval of the State Department of Public Instruction.

THE new research laboratories of the British Institution of Automobile Engineers on the Great West Road at Brentford were opened on March 18 by Lord Rutherford, chairman of the Advisory Council of the Department of Scientific and Industrial Research.

IT is proposed to establish an Institute of Experimental Psychology at the University of Oxford and if this is approved to accept from an anonymous donor a gift of £10,000 as a contribution towards its foundation. The name to be submitted to the congregation as the first director will be that of Dr. William Brown until he ceases to be Wilde reader in mental philosophy.

IT is reported in the London *Times* that a donor, who wishes to remain anonymous, is placing funds at the disposal of the University of Birmingham for an investigation, by Professor W. N. Haworth, head of the department of chemistry, into the possibility of producing an improved form of insulin. Professor Haworth has consented to be responsible for this investigation, on condition that he is assured of adequate cooperation in certain directions.

THE London Office of Works has presented to the Zoological Society a strip of land near Broad Walk, Regent's Park, and the society proposes to use it for the building of a Children's Zoo, complete with a restaurant of its own.

THE U. S. Civil Service Commission announces open competitive examinations for the positions of senior agricultural engineer, at $4,600 a year; agricultural engineer, at $3,800 a year; associate agricultural engineer, at $3,200 a year; assistant agricultural engineer, at $2,600 a year. Vacancies in these positions in Washington, D. C., and in the field, and in positions requiring similar qualifications will be filled from these examinations, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer or promotion. The salaries named above are subject to a deduction of 3½ per cent. toward a retirement annuity.

Industrial and Engineering Chemistry reports that the tenth anniversary of the establishment of the Division of Organic and Fibrous Materials of the National Bureau of Standards was celebrated on the evening of March 5 by an open house in the Industrial Building of the bureau. Warren E. Emley, who has been chief of the division from the beginning, acted as host to the director of the bureau, Dr. Lyman J. Briggs, and the bureau's staff, as well as to a considerable number of invited guests representing the Department of Commerce and scientific and technical bureaus and organizations in Washington. The members of the staff, which numbers 66, 14 of whom have been with the division since it was started in 1926, helped to give an idea of the wide variety of work carried on. Among the interesting exhibits were the experimental paper mill in operation; the machines for testing the durability of tires, shoes and hosiery; and the equipment for determining the best conditions for the preservation of important records. The newest section is studying transparent organic plastics for use as windows in airplanes, and had an exhibit showing how the resistance of these materials to abrasion and weathering is studied.

DISCUSSION

TRANSGRESSIONS IN THE ATLANTIC OCEAN[1]

THE term "transgression" was first introduced into oceanographical literature by Le Danois.[2] He defines a transgression as a periodic movement, of variable amplitude, of Atlantic waters of tropical origin, bringing a momentary encroachment of these waters upon the waters of polar origin and especially upon the continental waters.

The theory of the causes of these transgressions and their periodicity is seemingly interlinked with the theory of "internal waves," as developed by Petterson.[3] This theory, based on an analysis of astronomical forces, deals with the vertical component of the tidal force, which component has been considered as of negligible interest heretofore. Consequently, the theoretical treatment has not been readily accepted. Nevertheless, the observational data of Petterson, Le Danois and others (*loc. cit.*) offer a mass of evidence in support of their theoretical considerations.

The subject of transgressions, aside from its fundamental importance, promises to be a most important development in oceanographical research, particularly from the standpoint of the fisheries. From the fundamental point of view, the establishing of a cyclic phenomenon in our ocean waters soon leads to its

[1] Published with the permission of the Biological Board of Canada.

[2] Ed. Le Danois, *Revue des Travaux de l'Office des Pêches Maritimes* 7: 4, 370–462, 1934.

[3] Otto Petterson, *Geografiska Annaler*, 12: 261–322, 1930.

proper explanation and offers further insight into the general oceanographical problem. From the standpoint of the fisheries, if an established cyclic phenomenon can be correlated with a cyclic change in the nature of a fishery, a method of forecasting is at the disposal of those concerned.

The cyclic nature of the transgressions as elucidated by Le Danois (*loc. cit.*) is indicated in Fig. 1, wherein

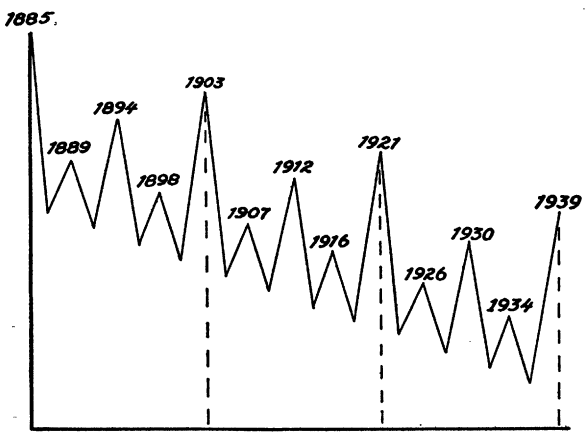

FIG. 1. Diagram (after Le Danois), illustrating magnitude and periodicity of transgressions.

the magnitude and periodicity of the various components (aside from an annual one) are illustrated as follows: (1) A transgression with a period of 111 years and whose maximum, according to Le Danois, occurred last in 1885; (2) a transgression with a period of 18½ years and whose maximum occurred last in 1921; (3) a transgression with a period of 9¼ years and whose maximum occurred last in 1930; and (4) a transgression with a period of 4½ years whose maximum occurred last in 1934.

Oceanographical investigations by the governments of Newfoundland[4] and France[5] have indicated the importance of these transgressions to the cod fishery of the Grand Banks. The Biological Board of Canada[6] has been concerned with an investigation of the waters of the Scotian shelf for the past few years (1932 to date). An invasion of marginal waters over the Scotian shelf occurred in 1934,[7] and the importance of such invasions to the general oceanographical problem was strikingly apparent.

As the year 1939 is approached, according to the theoretical considerations herein presented (see graph), transgressions of somewhat greater magnitude will take place. An organized effort on the part of various oceanographical investigators on the Atlantic coast might be the means of assessing the importance of the theory of transgressions to North American Atlantic waters.

Our observations of 1934, on the Scotian shelf, offer some further confirmation of the considerations of Le Danois (*loc. cit.*) with reference to the effect of these transgressions over the continental plateau. Bottom waters of higher temperatures and salinities (as compared to observations in the years 1932, 1933 and 1935) invaded the area during the summer months. This invasion by bottom waters culminated in a flooding of the area in late autumn by surface waters of comparatively high temperature and salinity. The distribution of these surface waters of comparatively high temperature and salinity was seemingly determined, to some extent, by the submarine physiography of the Scotian shelf.

As a matter of interest, it might be recorded here that the disaster to the tilefish in the Gulf of Maine (as recorded by Bigelow and Welsh[8]) occurred in 1882, just three years previous to the theoretical date of the transgression of the greatest amplitude within the past fifty years. According to Bigelow and Welsh (*loc. cit.*), the disaster to the tilefish is generally ascribed to a sudden but only temporary flooding of the bottom along the warm zone (inhabited by the tilefish north of Delaware Bay) by abnormally cold water. It is readily conceded that a transgression may have been responsible for the displacement of a cold body of water from the northeast to the area referred to.

H. B. HACHEY

ATLANTIC BIOLOGICAL STATION,
ST. ANDREWS, N. B.

TERTIARY FLORAS

IN the *Journal of Paleontology*, October, 1935, Mr. R. W. Brown refers to the "close relationship between the Green River flora and that of the Florissant lake beds." The Green River is considered to be Eocene, the Florissant beds Miocene. The relationship referred to has been noticed before, and I only allude to the matter now in order to beg the paleobotanists to consider the evidence afforded by the insects. With regard to the relationships of the Tertiary plants, it must be remembered that the generic types are very constant over vast periods of time. The Florissant flora is very similar indeed to that now living, but many of the genera no longer exist in Colorado. Yet the Florissant insects, very numerous in species, show many distinctive features and constitute an essen-

[4] H. Thompson and A. M. Wilson, *Newfoundland Ann. Rep. Fish. Research Lab.* (1934), 15–19, 1935. H. Thompson, *ibid.*, 23–31, 1935.

[5] Ed. Le Danois, *Proc. N. American Council on Fish. Invest.* (1921–30), No. 1: 35–56, 1932.

[6] H. B. Hachey, *Prog. Rep. (Atl.) Biol. Bd. Canad.*, No. 16, 1935.

[7] A. H. Leim and H. B. Hachey, *Trans. Amer. Fish. Soc.* (in press).

[8] Henry B. Bigelow and William W. Welsh, *Bull, U. S. Bur. Fish.*, 40: part 1: 1924.