

heritance from previous life habits. A cœnotelic character of previous life-zone habitus often becomes a palæotelic character in a subsequent habitus. The "somatic habitus" is generally the expression of the latest life habits.

HENRY FAIRFIELD OSBORN

SCIENTIFIC MEETINGS IN WAR TIMES

A NUMBER of our scientific societies have deemed it advisable "on account of the war" to either cancel or postpone their future meetings and conventions. The American Electrochemical Society disapproves of this action and at its recent board meeting adopted resolutions encouraging rather than discouraging the holding of meetings.

Modern warfare is not so much a matter of prowess at arms as it is a stupendous engineering undertaking. To hasten this war to an early and victorious close our many thousand engineers must bring to bear every possible effort. However, individual, independent effort is not desirable at this time: *concertive* action is absolutely essential for the most efficient service.

In order to expedite the solution of many of the new problems that have arisen as a direct consequence of our martial state, unrestricted discussion of the problems (with but few exceptions) at scientific meetings is bound to give all of us a clearer understanding of the real points at issues, of the urgent needs of our country at this momentous hour.

Meetings of scientific and technical societies have ever served as a great stimulus for their members and have been a "clearing house" for many of the best thoughts and ideas of our professional men.

Let us follow the good example set us by England. Let us encourage rather than discourage the holding of scientific meetings in these war times. When England found herself confronted with a very serious shortage of sulphuric acid, glass, dyes, electrodes, brass, furnaces, etc., the scientific societies arranged symposiums on these subjects and invited not only all of the members to attend, but, further, urged those factory men who were not members to come to the meetings to give their views and

experiences and to learn all they could in return.

Just as a large business corporation depends upon the organized effort and efficiency of the several units and departments, so does our government, now more than ever, look to the organized concertive effort of its large engineering bodies for quick and efficient results. Let us continue our meetings and hold them more frequently than ever before.

COLIN G. FINK

THE PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES

THE fourth number of Volume 3 of the *Proceedings of the National Academy of Sciences* contains the following articles:

"A Re-determination of the Value of the Electron and of Related Constants:" R. A. Millikan, Ryerson Physical Laboratory, University of Chicago. The values for the charge on the electron, the Avogadro constant, etc., are given with estimates of the accuracy of the result.

"Body Pigmentation and Egg Production in the Fowl:" J. Arthur Harris, A. F. Blakeslee and D. E. Warner, Station for Experimental Evolution, Cold Spring Harbor, New York. A strong negative correlation exists between the October ear-lobe pigmentation and the egg production of the year.

"Variability of Germ Cells of Sea Urchins:" A. J. Goldfarb, College of the City of New York, and Department of Marine Biology, Carnegie Institution of Washington. The varying behavior of the eggs in the experiments of Loeb, Lillie, Wasteney and others, was apparently due in large part to variation in the physiologic condition of the eggs they used.

"Transplantation of Limbs:" Ross G. Harrison, Osborn Zoological Laboratory, Yale University. The experiments confirm previous ones, showing that the limb bud is a self-differentiating body: they also show that the laterality of the fore limb may be affected by its new surroundings.

"The Shapes of Group Molecules Forming the Surfaces of Liquids:" Irving Langmuir,

Research Laboratory of the General Electric Company, Schenectady, New York. Cross-sections and lengths are calculated for a variety of molecules. Various theoretical conditions are developed.

"The Importance of the Water contained in the Deeper Portions of the Subsoil:" F. J. Alway and G. R. McDole, Minnesota Agricultural Experiment Station. The moisture of the deeper subsoil will be able to move upward only so slowly and through such a short distance in a single season that it will be at most of no *practical* benefit to annual crops.

"The Transformation of Pseudoglobulin into Euglobulin:" William N. Berg, Pathological Division, Bureau of Animal Industry, Washington, D. C. The loss of pseudoglobulin in the heated sera corresponds almost quantitatively with the gain of euglobulin in the same sera.

"A Case of Normal Embryonic Atresia of the Esophagus:" H. E. Jordan, Department of Anatomy, University of Virginia. A description of the phenomenon for turtles.

"Studies of Magnitudes in Star Clusters, V. Further Evidence of the Absence of Scattering of Light in Space:" Harlow Shapley, Mount Wilson Solar Observatory, Carnegie Institution of Washington.

"The History of the Primordial Germ Cells in the Loggerhead Turtle Embryo:" H. E. Jordan, Department of Anatomy, University of Virginia.

"Studies of Magnitudes in Star Clusters, VI. The Relation of Blue Stars and Variables to Galactic Planes:" Harlow Shapley, Mount Wilson Solar Observatory, Carnegie Institution of Washington. The stellar distribution in the so-called globular clusters has an underlying elliptical symmetry; therefore not only certain nebulae, our solar system, and the whole galactic system, but even the globular clusters have the oblateness that is general and fundamental in the dynamics of stellar groups.

"Zuñi Chronology:" Leslie Spier, American Museum of Natural History, New York. It has been found possible to establish a chronological scale with applications to American culture-history.

"The Age of the Bolivian Andes:" Edward W. Berry, Geological Laboratory, Johns Hopkins University. There is definite evidence that parts of the high plateau and of the eastern Cordillera stood at sea level in the late Tertiary.

"Large Current-Ripples as Indicators of Paleography:" Walter H. Bucher, Department of Geology, University of Cincinnati. A study of the Cincinnati Anticline.

"The Bearing of Selection Experiments with *Drosophila* upon the Frequency of Germinal Changes:" Edwin Carleton MacDowell, Station for Experimental Evolution, Carnegie Institution of Washington. A study of extra bristles indicating that they are primarily occasioned by one germinal unit and that no change of evolutionary or practical significance has occurred during fifty generations.

"Pressure Phenomena accompanying the Growth of Crystals:" Stephen Taber, Department of Geology, University of South Carolina. Many phenomena connected with the metamorphism of rocks, the growth of concretions, and the formation of mineral deposits are difficult to explain under any other hypothesis than that growing crystals have made room for themselves by exerting pressure on the surrounding material.

"A New Method of Transforming Esters of α -Aminoacids into their Corresponding Isothiocyanates:" Treat B. Johnson and Arthur A. Ticknor, Sheffield Scientific School, Yale University.

"The Geology of the Fiji Islands:" Wilbur G. Foye, Department of Geology, Middlebury College, Middlebury, Vermont. It can not be said that the modern reefs of Fiji fully support Darwin's theory.

"Dominance of Linked Factors as a Means of Accounting for Heterosis:" Donald F. Jones, Bussey Institution, Harvard University.

"Chemically Induced Crowngalls:" Erwin F. Smith, United States Department of Agriculture. Small tumors have been produced by the application of various chemicals.

"Dynamical Systems with Two Degrees of Freedom:" George D. Birkhoff, Department of Mathematics, Harvard University.

"National Research Council." Membership of committees. EDWIN BIDWELL WILSON

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THE DECIMAL POINT

STUDENTS of the history of science are continually impressed by the fact that we are truly in scientific achievements the heirs of all the ages with progenitors not limited by any bounds of time or place. The historian John Fiske in one of his essays¹ pertinently remarks:

The thinker who elaborates a new system of philosophy, deeper and more comprehensive than any yet known to mankind, though he may work in solitude, nevertheless does not work alone. The very fact which makes his great scheme of thought a success, and not a failure, is the fact that it puts into definite and coherent shape the ideas which many people are more or less vaguely entertaining, and that it carries to a grand and triumphant conclusion processes of reasoning in which many persons have already begun taking the earlier steps.

The late and lamented Pierre Duhem in that wonderful work, "Le Système du Monde," with the fifth and concluding volume fortunately completed in manuscript before his recent death, opens his work with a statement to the effect that to trace the origin and genesis of great scientific ideas one is gradually led back to the point where history ceases.

The development of decimal fractions furnishes an excellent illustration of the process mentioned. This story was well told in the *Teachers College Bulletin* of 1910 by David Eugene Smith, in an article entitled, "The invention of the demical fraction." I propose in the present paper to discuss briefly one point of the development, namely the appearance of the decimal point itself; I am adding also an early approach to decimal fractions not known to writers on the subject, based upon a study of a Vienna manuscript of the fifteenth century.²

¹ "A century of science, and other essays," New York, 1899.

² Codex Vindobonensis 4770.

N. L. W. A. Gravelaar, in discussing Napier's works³ ascribes to Napier priority in the use of the decimal point. In a further article, "De notatie der decimale breuken," Gravelaar⁴ purports to show that Napier was not familiar in 1616 and 1617, with the editions of the "Trigonometry" of Pitiscus which appeared in 1608 and 1612, containing the first appearance in print of the decimal point after Stevin's systematic exposition of the subject of decimal fractions in 1585. To me the whole procedure of Gravelaar borders so closely on the absurd that it would not merit discussion, if it had not been accepted somewhat seriously by other writers.⁵

Eneström, the editor of the *Bibliotheca Mathematica*, refers⁶ to Gravelaar's work, as follows: "Nach Herrn Gravelaar ist Neper der erste, bei dem das Komma (Rhabdologia, 1617) und das Pünktchen (Constructio, 1616) als wirkliche Dezimalzeichen vorkommen; Pitiscus hatte zwar schon ein Pünktchen angewendet, aber dies ist nur als ein Scheidezeichen anzusehen." That the point used with decimal significance in Pitiscus is used with full appreciation by Pitiscus should be evident simply from the fact that at this time the work of Stevin on decimal fractions was widely known; further Pitiscus who uses a bar in the text of his "Trigonometry" of 1608 and of 1612, 13/00024 where the point is used in the Tables, explicitly says of 13/00024, "fractione scilicet 24/100000 neglecto," meaning that in place of 13.00024 he uses 13 as an approximation. Among others von Braunnmühl, in his "Vorlesungen über Geschichte der Trigonometrie,"⁷ mentions the use of the point in decimal fractions by Pitiscus.

The further fact should be noted that the Constructio of 1616 is the English transla-

³ *Verh. d. Koninkl. Akad. v. Wetenschappen*, Amsterdam, 1899, Deel. VI., No. 6.

⁴ *Nieuw Archief voor Wiskunde*, Amsterdam, 1900.

⁵ Notably by Glaisher and others in the "Napier Tercentenary Volume."

⁶ *Bibliotheca Mathematica*, Vol. VI., third series, pp. 108-109.

⁷ Vol. I., p. 225.