istry"—the historians of chemistry seem to doubt this as they do the reference to soap. Pp. 934: "In accepting the call (to Johns Hopkins in 1876) Sylvester made one curious stipulation; his salary was 'to be paid in gold.'" *Sic!* Did Sylvester perhaps know more of the current monetary situation than the author seems to? Page 27: "Apollonius is without a peer till Steiner." Some might put in a word for some intervening geometer, though, of course, all such judgments are matters of opinion rather than of fact. Page 446: "The work of Whitehead and Russell in *Principia Mathematica* (1910–1913) was the first to convince any considerable body of professional mathematicians that symbolic logic might be worth their serious attention." It is perhaps clear that the author does not hesitate to express his opinions on a wide range of subjects! I will omit reference to his equally definitely expressed social judgments (*e.g.*, p. 112, ll. 2–3; p. 131, ll. 2–4; p. 130, final ¶; p. 114, ll. 9–14 up)—I am not a competent psychoanalyst.

On pp. 209–212 the author undertakes to explain the "principle of continuity" in geometry. He has here to introduce a variety of concepts, including points at infinity and imaginary points. His illustration is to pull two intersecting real circles apart; he confuses the two finite points of intersection which persist during the process with the two imaginary points at infinity in which the circles intersect whether they cut in real or in finite imaginary points. It is just too bad. While he seems to approve of the principle of continuity as of heuristic value, when he comes to the corresponding algebraic principle he writes (p. 355): "The climax of this credulity was reached in the notorious *principle of permanence of form, . . .*" Is this because he is an algebraist rather than a geometer? We have a way of tolerating suggestive heuristic methods in the matters we know not well but of detesting them in our specialities. It has always been my belief that the geometric principle of continuity and the algebraic principle of permanence of form were essentially correlative, and found a large measure of justification in certain theorems of the theory of analytic functions relating to analytic extension.

The author likes to jolly his reader along as when (p. 5): "As to the amount of mathematical knowledge necessary to understand *everything* . . . it may be said honestly that a high school course is sufficient," or (p. 444) in reference to a 30-page paper by Huntington: "The whole paper is easily understandable by anyone who has had a week of algebra." This is of course ridiculous. Omitting the fact that the author has written of many things he understood all too little himself, it may be pointed out that abstraction of thinking is difficult as one knows when he has had about a week of algebra or, later, when he has had a week or two of vector analysis, and we may well recall that Kummer, apparently one of Bell's greatest heroes, was responsible for Grassmann's not getting a university position because forsooth he did not really understand the Ausdehnunglehre, the whole of which might be said to need "only a few weeks of algebra and of geometry." Incidentally, Grassmann might have been an interesting case to include in "Men of Mathematics"—his was not the pathetic and perhaps psychopathic history of Galois, for he lived on, raised a family and became as well known for his contributions to Sanscrit and for Grassmann's law in phonetics as he later became for his earlier contributions to mathematics.

There are numerous references to Einstein. One can appreciate their "sales value." I can not comment on them all but will raise a question relative to the statements on the top of p. 256. From as early as 1907 to as late as 1912 Einstein was publishing on gravitation, formulating and using his "equivalence-principle" without giving much evidence that he was mastering the tensor calculus—that came later in a joint paper with M. Grossmann—and whether he as a theoretical physicist would have been interested in the intricacies of the tensor calculus if he had happened to hit upon the elegant direct approach of H. B. Phillips (*Jour. Math. Phys.*, 1922, p. 177) can only be left to him to answer.

There is no doubt Bell's work is readable, interesting and generally good; what it needs is some kind friend who will draw a firm blue pencil through an adjective here, a phrase there and occasionally a paragraph to the end that the work might attain that sort of precision of statement which would be in the true spirit of mathematics and to the further end that Eric Temple Bell, member of the section of mathematics of the National Academy of Sciences, might be protected from some of the cheaper vagaries of John Taine. It would be a mistake to assume that the popularity of the book need suffer thereby.

EDWIN B. WILSON
HARVARD SCHOOL OF PUBLIC HEALTH

SOCIETIES AND MEETINGS

THE ROYAL SOCIETY OF CANADA

THE annual meeting of the Royal Society of Canada took place in Ottawa from May 24 to May 27 under the presidency of Dr. A. G. Huntsman, of Toronto. The presidential address on "The Problem of Life" discussed first the life history of the salmon and went on to consider philosophically the relation between the mind and the physical universe.

Dr. Victor Morin, of Montreal, was elected president for 1938–1939. New fellows in the scientific sections were: Dr. W. H. Barnes, McGill University; Dr. R. E. De Lury, Geological Survey, Ottawa; Dr. F. L. Drayton, Dominion Experimental Farm; Professor J. R. Dymond, University of Toronto; Dr. J. E. Gill, Dr. Duncan Graham, University of Toronto; Dr. J. A. McRae, Dr. V. H. K. Moorhouse, University of Manitoba; Dr. E. H. Moss, University of Alberta; Dr. E. G. D. Murray, McGill University; Dr. S. E. Slipper and Dr. Alice Wilson. The Flavelle Medal for outstanding scientific achievement was awarded to Dr. W. Lash Miller.

In the Section of Chemical, Mathematical and Physical Sciences ninety-nine papers were listed. The presidential address of Dr. R. H. Clark, of the University of British Columbia, was devoted to "Enzyme Activators," and among other papers in the chemical subsection may be noted those of Dr. E. W. Steacie and N. W. F. Phillips "On the Mercury Photosensitized Decomposition of Ethane," of Dr. W. Lash Miller on further studies of Wilder's Bios, and a series of nine papers by Professor O. Maass and associates dealing with viscosity, rates of reaction, specific heat and density of various gases and liquids in the vicinity of the critical temperature and critical pressure. Among the physics papers, Professor J. S. Foster and Dr. A. Vibert Douglas reported on a study of the stark effect of helium lines in B stars, demonstrating that the absorption which occurs between known d and f lines can not be explained on the basis of laboratory experiments, Doppler effect, relative intensity changes in absorption as compared with emission or collisional damping. Professor J. A. Gray showed that Radium E emits no primary γ-rays but 1.5 per cent. of the disintegrating atoms emit a secondary γ-ray of varying intensity. Professor J. Satterly reported further experiments on inclined water jets, definitely disproving Levi-Civita's original theory. Professor E. F. Burton communicated several papers, of which one was devoted to the velocity of sound in liquid helium at ultrasonic frequency at temperatures from 4.2° to 1.7° K, and another (by Messrs. Johns and Wilhelm) to the refractive index of liquid helium. Professor A. L. Clark and L. Katz presented a method of measuring the specific heats of gases by a modified Assmann technique, and Professor J. K. Robertson and R. H. Hay one for removal of wall deposits from tubes carrying high frequency discharges. Dr. E. A. Hodgson described variations in the thickness of the earth's crust deduced from earthquake records, and various papers on applied geophysics were presented by Dr. L. Gilchrist, Dr. D. A. Keys and their associates.

Among the mathematical papers were one by Professor S. Beatty "On the Cycles of an Algebraic Equation $f(x) = 0$ Relative to Infinity" and one by Professor J. L. Synge on "The Stability of Plane Poiseuille Motion." Professor R. L. Jeffrey discussed "Integration in Abstract Space." Professor I. W. Campbell considered the lateral support of towers supported by guy wires, Mr. R. Meldrum Stewart described a new time signal clock in the Dominion Observatory, and Dr. R. E. De Lury discussed observations on the redward shift of spectral lines near the solar limit.

In the section on Geological Sciences, Dr. E. S. Moore gave a presidential address on "Some Problems of the Canadian Shield," discussing the Precambrian granites, life in the Precambrian and other topics. Papers on glaciology were presented by J. T. Wilson, describing an area in Nova Scotia where there are 2,300 drumlins, by G. W. H. Norman and by J. T. Wilson on the last Pleistocene ice front and the moraines, beaches, etc., in certain parts of Quebec. R. L. Rutherford reported studies of glaciation in Alberta, Dr. Alice E. Wilson gave an account of gasteropods collected by the Cambridge-Oxford expedition of 1931 on Akpatok Island, Hudson Strait, and Dr. F. H. McLearn of Triassic faunas of the Peace River foothills. Dr. E. M. Kindle described the Devonian succession at the east end of Gaspé, Dr. J. A. Allan occurrences of Cambrian rocks in Jasper Park, Alberta, and Dr. L. S. Russell the skull of *Hemipsalodon grandis,* a giant Oligocene creodont. Professor L. Gilchrist and Dr. J. S. DeLury discussed exploration of ore bodies. Dr. M. Y. Williams presented a paper on submarine channels and orogenic movements on the British Columbia coast. Dr. L. S. Russell offered views on the origin of sandstone dykes in Alberta. A paper by N. B. Keevil showed that the helium method of age determination indicates the length of geological time to be considerably less than is generally believed.

The presidential address in the Section on Biological Sciences, by Professor V. E. Henderson, of Toronto, reviewed the anesthetic problem and considered the good and bad qualities of some commonly employed anesthetics. Six zoological papers, thirteen botanical and 25 on medical and related sciences were offered. Dr. E. M. Walker showed that the primitive insect, Grylloblatta, is more closely related to the Saltatoria than to other Orthoptera. A paper by Professor C. McLean Fraser was devoted to the distribution of hydroids. Dr. E. Horne Craigie reported on vascularization of the hypophysis in salamanders. Frère Marie-Victorin suggested that earlier views regarding the relic flora of Canada require revision. Dr. A. E. Porsild described the flora of Little Diomede Island,

Bering Strait, and Dr. D. C. McPherson gave an account of the formation of air spaces in the root cortex of maize. Professor R. B. Thomson discussed the phylogeny of the cone structure of the yew, and Professor A. H. Hutchinson and Miss Helen Farley described ovule development in alfalfa hybrids. The malting quality of varieties of barley was considered by Dr. J. A. Anderson, of the National Research Laboratories, while Dr. R. Darnley Gibbs described seasonal changes in the composition of white birch trees. A group of papers from the Banting Institute was devoted to researches relating to silicosis. Dr. D. A. Scott reported the preparation of nickel-insulin crystals. The zinc, like protamine, prolongs the action of insulin. Drs. C. H. Best and D. Y. Solandt have been studying coronary thrombosis, while Dr. P. J. Moloney reported investigations of "The Detoxifying Action of Human Bile," showing that this material renders diphtheria toxin harmless. Drs. W. R. Campbell and M. I. Hanna submitted an account of the proportions of the various proteins in the blood plasma of human beings in health and disease. A benign tumor produced by accidental injection of a plant hormone into the human hand was described by Dr. J. H. W. Willard.

E. HORNE CRAIGIE

UNIVERSITY OF TORONTO

THE VIRGINIA ACADEMY OF SCIENCE

THE Virginia Academy of Science held its sixteenth annual meeting on May 5, 6 and 7 at the Virginia Polytechnic Institute with a registration of more than 400 and a reported membership of 809.

All the factors were present for an enjoyable and successful meeting: perfect weather, a beautiful campus, complete preparations, an interesting program.

About 70 members attended the Academy Conference Thursday night, which is an open forum for the presentation of reports and the discussion of any matters pertaining to the work of the academy. All day Friday and Saturday forenoon were given over to sectional meetings, during which 28 papers were presented in the Section of Astronomy, Mathematics and Physics; 34 in Biology; 45 in Chemistry; 14 in Education; 23 in Geology; 22 in Medical Sciences; and 10 in Psychology—a total of 176.

The guest speaker Friday night was Professor John F. Dashiell, of the University of North Carolina and president of the American Psychological Association, who spoke on "Revisions of Our Conception of Learning Demanded by Recent Experimental Findings."

At this meeting Dr. J. Shelton Horsley, Sr., chairman of the research committee presented the academy prize of $50 to Dr. S. G. Bedell, of the University of Virginia, for a paper entitled "Observations on the Lateral-Line Organs of Living Amphibian Larvae with Special Reference to Orange Colored Granules of the Sensory Cells," and the Jefferson Gold Medal to Mr. H. M. Phillips, of the University of Virginia, for a paper entitled "Karyology and the Phyletic Relationships in the Plumbaginaceae."

The following officers were elected for the year 1938–39: Dean Earle B. Norris, of the Virginia Polytechnic Institute, *President;* Professor Ruskin S. Freer, of Lynchburg College, *President-Elect;* and Major W. Catesby Jones, of the Virginia Department of Agriculture, *member of the council.*

The new officers of sections are as follows:

Astronomy, Mathematics and Physics:
Chairman, Charles H. Wheeler, III, of the University of Richmond.
Secretary, A. N. Vyssotsky, of the University of Virginia.

Biology:
Chairman, G. M. Shear, of the Virginia Polytechnic Institute.
Sub-Chairman, W. E. Bullington, of Randolph-Macon College.
Secretary, Lena Henderson, of Randolph-Macon Woman's College.

Chemistry:
Chairman, W. E. Trout, Jr., of Mary Baldwin College.
Secretary, W. J. Frierson, of Hampden-Sydney College.

Education:
Chairman, C. E. Myers, of the Virginia State Board of Education.
Secretary, J. A. Rorer, of the University of Virginia.

Geology:
Chairman, Ernest W. Sniffen, of Hampton, Va.
Secretary, William M. McGill, of the Virginia Geological Survey.

Medical Sciences:
Chairman, Walter B. Martin, of Norfolk, Va.
Secretary, I. D. Wilson, of the Virginia Polytechnic Institute.

Psychology:
Chairman, R. H. Henneman, of the College of William and Mary.
Secretary, W. M. Hinton, of Washington and Lee University.

At the business meeting the following resolution was unanimously passed by the academy:

Recognizing the very great importance of the proper use of animals in research, in the production and testing of therapeutic agents and in the development of surgical procedures indispensable for human welfare, be it

Resolved, that the Virginia Academy of Science gives its unqualified indorsement to the California Society for Medical Research in its efforts to prevent the passage in California of the so-called "State Humane Pound Law"—a measure whose enactment would cripple seriously scientific research into the causes and cures of disease, and be it