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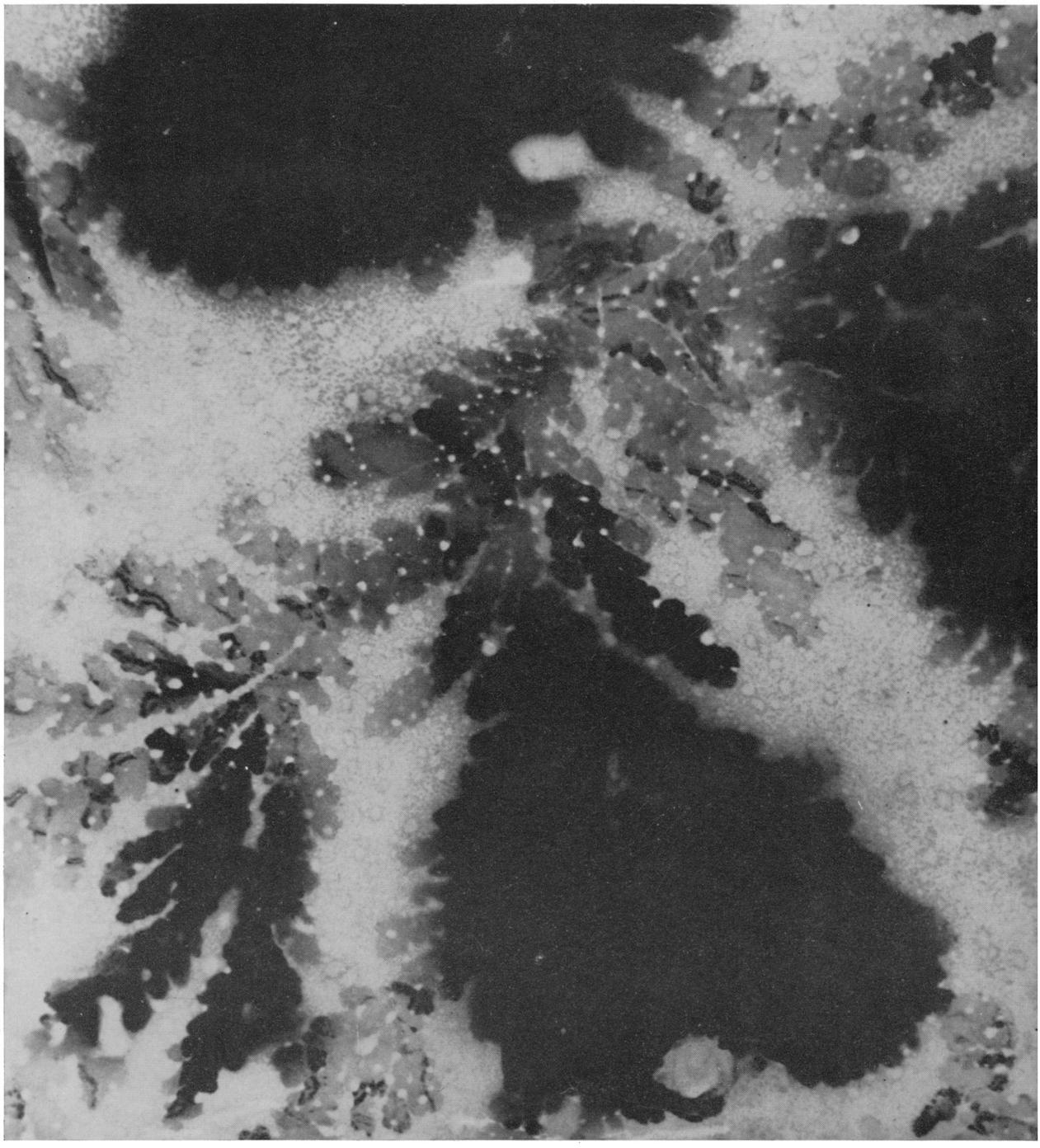

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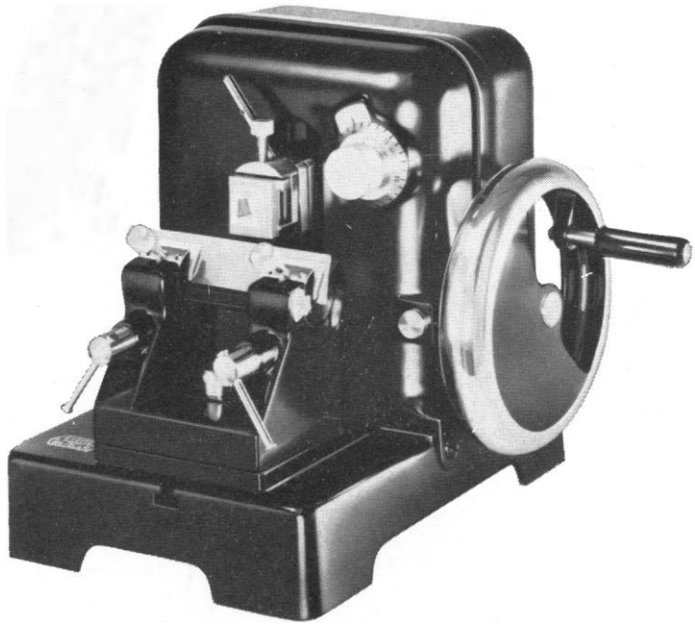

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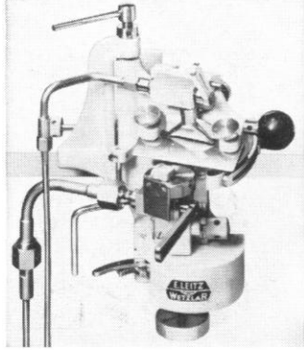

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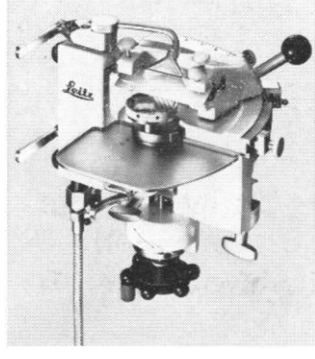

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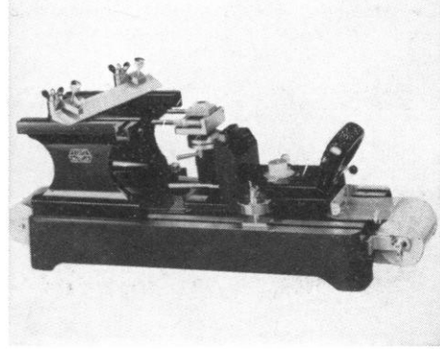

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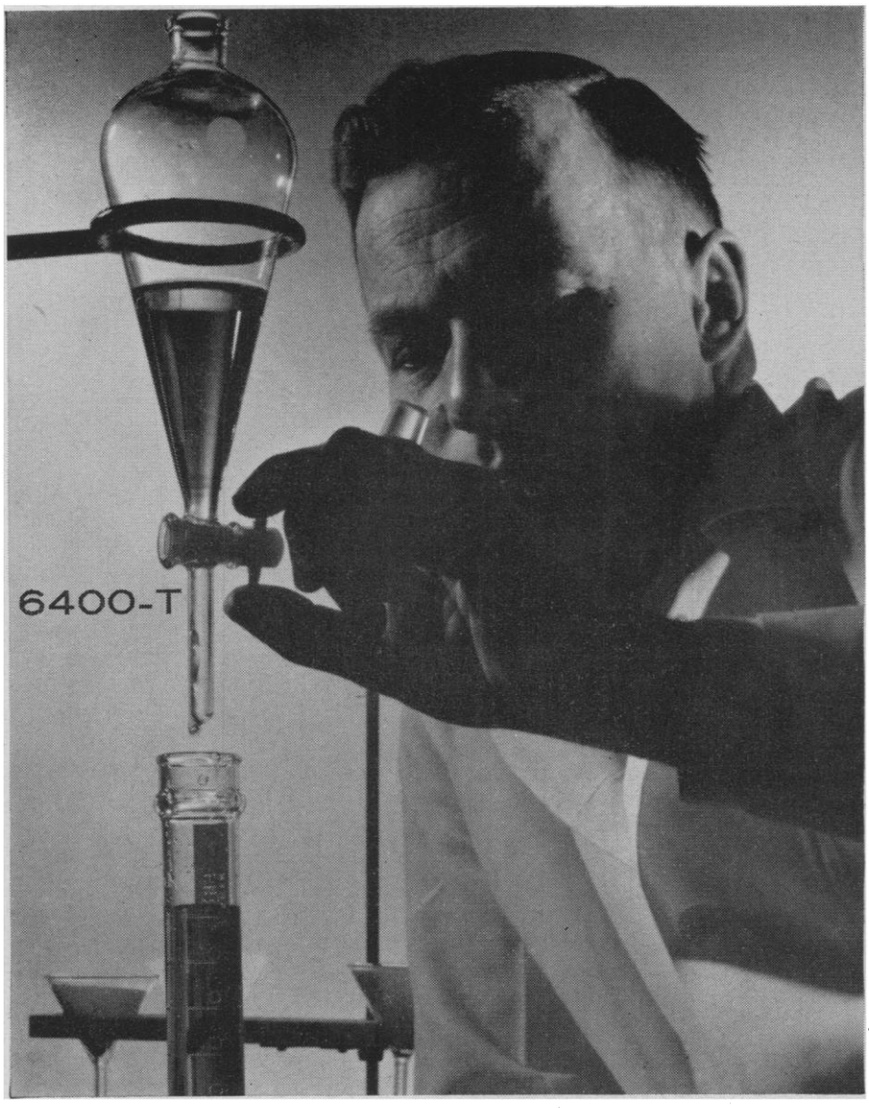

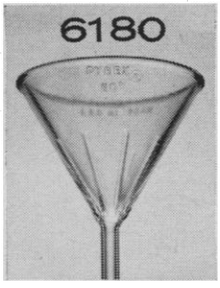

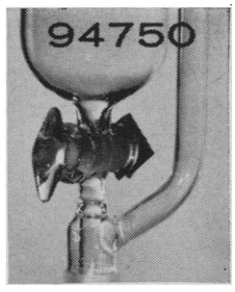

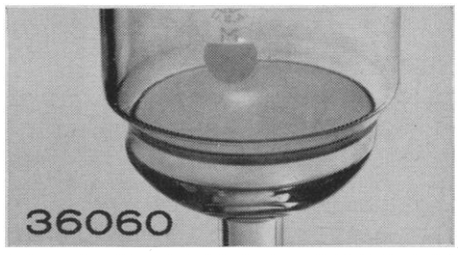

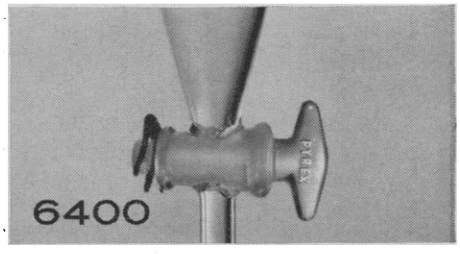

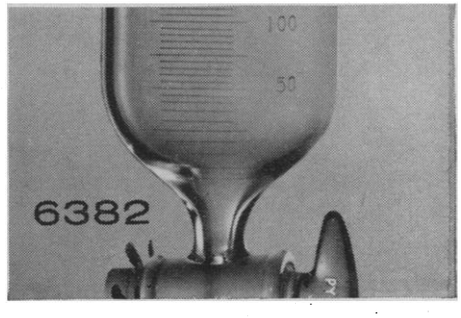

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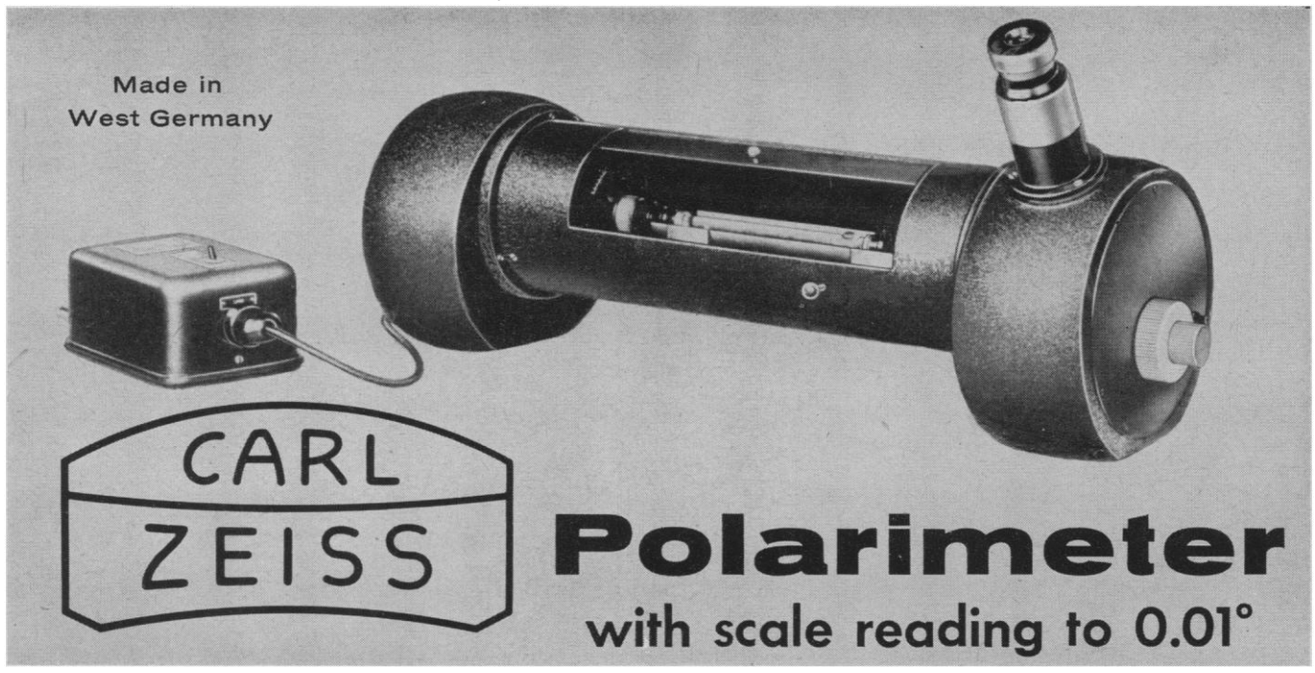
Electron micrograph of petroleum-bearing strata in the East Texas oil fields (× 60,000) [Courtesy of the American Potash Institute, Inc.]



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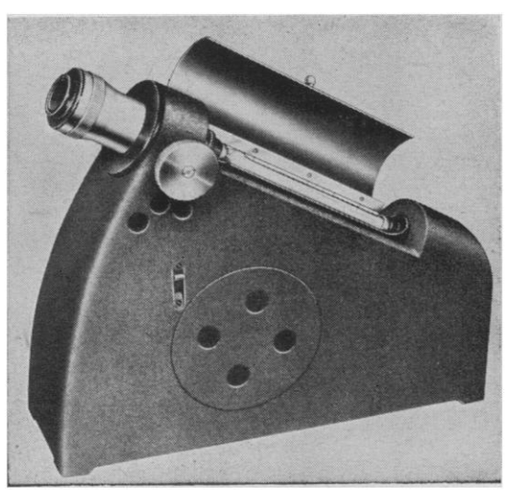

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About Science

Every week a good many letters, some critical and some laudatory, come into our office. This is all to the good, for it gives us a running impression of reader reaction and stimulates us to decide whether we have sinned and should sin no more or whether we have in fact not sinned at all. But this kind of information is likely to be one-sided: those who are indignant are more inclined to let us know than are those who are pleased.

In order to get a wider and more representative view of reader reaction, we recently sent out a questionnaire to approximately 6200 of our 62,000 subscribers. More than 3500 people have now returned the forms, and of these, more than 2000 wrote short comments to amplify their views. They made scores of suggestions—for possible modification in different sections of the journal, for the introduction of new sections, and for ways in which policy should be determined. Although every shade of opinion was expressed, it is clear that most readers heartily approve the "Current Problems in Research" series of articles, the new type face, the cover design, and the cover picture.

The questionnaire not only tells us how well we are meeting the needs of our readers and what changes might be desirable but also tells us much about our readers. Our composite reader is intelligent, literate, articulate, thoughtful, critical, and constructive. But a composite reader is a convenient fiction; our readers are decidedly individuals. Fifty-three percent of them spend, on the average, an hour each week reading *Science*, and 52 percent pass their copies along to one or more additional readers. On the basis of this information we can estimate that, without counting those who read *Science* in libraries, we have at least 130,000 readers. Eighty-three percent usually read the editorials; 78 percent read the articles; 67 percent, the book reviews; and 63 percent, the technical reports. Doubtless the percentage who read the news falls somewhere in this range, but our questionnaire was poorly designed in some respects, as many pointed out ("next time get a professional to plan your questionnaire") and did not shed much light on reader use of the news section.

We also asked whether each section should be enlarged, left as it is, reduced, or eliminated. "Left as it is" won out in every case, but there were many votes (percentages in parentheses) for enlarging the following: leading articles (20), news (13), book reviews (15), and reports (22).

Few readers shared the view of the one who said that if we needed the kind of advice we asked for we were incompetent and ought to resign. On the contrary, almost all took the opportunity to express constructive suggestions or well-considered criticisms, all of which will be of great help to us in charting our future course. A few typical comments were: "Make no drastic change; one does not like to see a familiar friend change too much too quickly"; "I depend on *Science* to keep me current in fields other than my own"; "I enjoy *Science*, but selectively"; and finally (and there were many like this), "*Science* is fine as it is."—G.DuS.

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Letters

On the Origin of Life

Many papers have appeared in recent years, several in *Science*, on the topic of the origin of life. I have been somewhat disturbed to note the ever-increasing tendency, especially among biochemists, to identify the event of the origin of life with that of the origin of enzymes or of deoxyribonucleic acid. It appears to me that our greatly increased rate of discovery of facts pertaining to the chemistry of hereditary mechanisms and the relationship of enzyme constitution to genotype has led to a distortion of the basic problem and misled many into this identification.

I do not propose to enter here into a discussion of the problem of the origin of living systems and the possible importance of cyclic factors, which I have treated elsewhere [*Am. Naturalist* **81**, 161 (1947)], but should like, rather, to present an analogy which may serve to make my point.

Consider the problem of the origin of far-flung industrial corporations. To the untrained observer the problem of the origin of such structures might perhaps resolve itself into that of the origin of corporation buildings, machinery, raw materials, capital, workers, sales outlets, and so on. The trained observer would seek his answer in a study of the history of corporations. He would correctly conclude that the corporate giant often derives from the humble garage or basement workshop in which the inventor experiments in his off hours to develop a new product or process. He would then trace the slow process of corporate evolution through the small shop of two or three employees, to the modest factory, to the giant factory, to many factories, and so on and on to the industrial complex with its directing board and many stockholders.

Let us suppose that we can no more trace the history of corporations than we can directly trace the history of life. The trained observer might instead insinuate himself into the inner workings of the corporation until he breached the inner sanctum—the board of directors. He would then discover that the board of directors is the keystone of corporate policy and action, varying the company program, product emphasis, and even the corporate structure in response to changing economic conditions and opportunities, electing the officers who see to the fine details of operation, and so on, and, indeed, that every action of the corporate enterprise traces directly or indirectly to the make-up and actions of the board—to the corporate DNA. In his new familiarity with the manifold operations of the all-powerful board and the consequences of these operations, the solution to the problem of the origin of corporations might suddenly come upon him; dazzled by his suddenly acquired knowledge, he might conclude hastily that the problem of the origin of corporations was to be identified with the problem of the origin of boards of directors!

J. LEE KAVANAU
Department of Zoology,
University of California, Los Angeles

Linear and Higher-Order Curves

In Fig. 1 of the article "Investigations of natural environmental radiation" [*Science* **131**, 903 (1960)] by L. R. Solon *et al.*, there is presented a straight-line regression on the relationship between barometric pressure and the log of radiation level. Even a casual inspection of this graph indicates that a better empirical description would be given by a second-degree curve. This may be inferred from the systematic deviation of the observed points from the fitted line.

As a simple description of the relationship within the range of observations, it would make little difference, but since this line is used for extrapolation, considerable error may result. For example, the 3.8 μr/hr extrapolation for cosmic-ray ionization intensity at sea level for New York City might result in an estimate of 5 μr/hr (or a difference of about 33 percent) if a curved line were used.

MARVIN GLASSER
44 Buswell Street,
Boston, Massachusetts

In his letter Marvin Glasser suggests that a better fit to the data in Fig. 1 of our article could have been achieved by using a higher-order polynomial than the linear regression exhibited.

I agree that a quadratic or higher-degree polynomial would constitute a closer fit to the empirical data. (In fact, since the curve is based on 19 experimental points, an 18-degree polynomial exists which would fit the data perfectly).

I disagree that using a higher-degree polynomial would result in a curve that would be better for extrapolation.

Further, I submit that if a set of empirical points actually obey a linear law, any higher-degree curves—whether they fit the data better or not—almost certainly would be worse for extrapolation. Extrapolation of such a linear relationship depends simply on the slope

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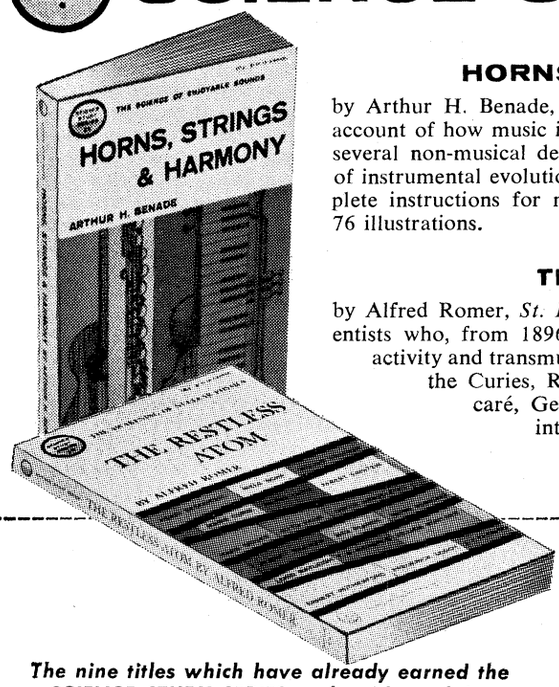

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of the regression line. If extrapolation from the higher-degree curve outside the empirical range gave the same numerical result as a linear least-squares fit, it would merely be fortuitous.

The linear fit is especially suitable for our airplane data. It corresponds physically to an exponential attenuation mechanism well established in cosmic radiation-absorption processes. A quadratic (or higher-degree) fit would not be justified by the physics of the situation.

LEONARD R. SOLON
Health and Safety Laboratory, New York Operations Office, Atomic Energy Commission, New York, N.Y.

Types and Name-Bearers

Shenefelt [*Science* **130**, 331 (1959)] has suggested that proposal of a new species should be primarily by description of a single specimen, the type ("holotype"). Schopf [*Science* **131**, 1043 (1960)] has objected, mainly on these grounds: types are not typical; description of a specimen does not describe or define a species; and the proper function of a type ("holotype") is solely that of name-bearing. I entirely agree with Schopf, and I made the same points at greater length 20 years ago [*Am. J. Sci.* **238**, 413 (1940)]. Since then this attitude has become widespread but, as Shenefelt's note shows, not universal.

Schopf proposes that a type as name-bearer be called "nomenifer." The combining form of *nomen* is *nomin-*, and the word should therefore be *nominifer*. I long since proposed the Greek-derived equivalent *onomatophore*. There is no particular reason to prefer Greek or Latin derivation, but current type terminology is derived from Greek.

I do not myself regularly use the term *onomatophore*, and I do not know of anyone who does. *Nominifer* is not likely to fare better. The term *type*, with all its confusing connotations, is too strongly entrenched in taxonomy. Codes of nomenclature require designation of types, under that name, and there is little or no chance of eradicating that usage.

The onomatophore or nominifer is *the* type of modern taxonomy. Additional designations such as holotype and paratype only perpetuate the idea that types can serve other than nomenclatural functions and hence can be of more than one kind.

G. G. SIMPSON
Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts

Meetings

Neuropathology

The Commission for Neuropathology was founded by invitation in the Salpêtrière Hospital in Paris on 24 October 1959. At this meeting were present Ludo van Bogaert and Pearce Bailey, president and secretary-general, respectively, of the World Federation of Neurology.

The following neuropathologists had been invited and became charter members of this commission: J. Bertrand (France); E. Christensen (Denmark); P. B. Diezel (Germany); W. Girard (France); W. Haymaker (United States); A. C. Løken (Norway); F. Lüthy (Switzerland); W. H. McMenemey (Great Britain); E. Osetowska (Poland); G. Peters (Germany), who was unable to attend the meeting; F. Seitelberger (Austria); P. Sourander (Sweden); J. O. Trelles (Peru); and W. J. C. Verhaart (Netherlands).

F. Seitelberger was elected secretary of the commission. The permanent secretariat has its headquarters at the Institute of Neurology of the University of Vienna (Obersteiner Institut), Schwarzspanierstrasse 17, Vienna 9, Austria.

The commission claims independence for neuropathology as a proper medical discipline and emphasizes the necessity of independent positions for full-time neuropathologists. Therefore the commission will examine the situation of neuropathology and neuropathologists in various countries and consider further action for protecting the neuropathologist's basic interests. In international congresses of the various neurological disciplines, the competence of neuropathology is to be recognized in an appropriate way.

Moreover the commission will be interested in preserving and caring for the valuable neuropathological collections in various places. It will try to make it possible for all interested scientists to use these collections.

One of the main tasks of the commission will be that of effectively promoting scientific activities in the field of neuropathology. For that purpose it is proposed that information be exchanged and personal contacts be arranged within the field of neuropathology and between neuropathology and related and basic scientific disciplines to develop suitable methods of investigation.

Finally, the commission is to be a consultative instrument within the World Federation of Neurology—for example, to promote important projects of investigation.

After a thorough discussion it was decided that an international journal of neuropathology should be published, to be issued in several languages.

The secretary of the Commission of Neuropathology will endeavor to keep the various medical journals informed about the activities of the commission. He welcomes all relevant suggestions from his colleagues interested in this project.

F. SEITELBERGER
Obersteiner Institut, Vienna, Austria

Forthcoming Events

June

22–25. Society of Nuclear Medicine, Estes Park, Colo. (T. P. Sears, V.A. Hospital, Denver 20, Colo.)

25–5. First Intern. Cong. on Automatic Control, Moscow, U.S.S.R. (R. Oldenburger, Mechanical Engineering Dept., Purdue Univ., Lafayette, Ind.)

26–1. American Physical Therapy Assoc., Pittsburgh, Pa. (Miss J. Bailey, 157 N. 79 St., Milwaukee 13, Wis.)

26–1. American Soc. for Testing Materials, Atlantic City, N.J. (R. J. Painter, 1916 Race St., Philadelphia 3, Pa.)

26–1. Mass Spectrometry, 8th annual, Atlantic City, N.J. (V. H. Dibeler, National Bureau of Standards, Washington 25)

26–1. National Education Assoc., Los Angeles, Calif. (W. G. Carr, 1201 16 St., NW, Washington 6)

26–2. American Physical Therapy Assoc., Pittsburgh, Pa. (Miss L. Blair, 1790 Broadway, New York 19)

27–29. Military Electronics, 4th natl. conv., Washington, D.C. (C. M. Crenshaw, Dept. of Army, Office of the Chief Signal Officer, R. & D. Division, SIGRD-2, Washington 25)

27–29. Status of Problems of Molecular Structure, symp., Seattle, Wash. (P. C. Cross, Dept. of Chemistry, Univ. of Washington, Seattle 5)

27–30. Coherence Properties of Electromagnetic Radiation, conf. (by invitation), Rochester, N.Y. (E. Wolf, Optics Institute, Rochester Univ., Rochester)

27–30. Institute of the Aeronautical Sciences, Los Angeles, Calif. (R. R. Dexter, IAS, 2 E. 64 St., New York 21)

27–30. National Assoc. of Power Engineers, annual conv., San Francisco, Calif. (E. J. Schuetz, NAPE, 176 W. Adams St., Chicago 3, Ill.)

27–1. International Assoc. for Bridge and Structural Engineering, 6th cong., Stockholm, Sweden. (P. Lardy, IABSE, Ecole Polytechnique Fédérale, Zurich, Switzerland)

27–1. Reading Conf., 2nd annual, Syracuse, N.Y. (R. A. Kress, Reading Center, Syracuse Univ., Syracuse 10)

28–1. American Home Economics Assoc., Denver, Colo. (Miss M. A. Warren, School of Home Economics, Univ. of Oklahoma, Norman)

29–1. Health Physics Soc., 5th annual, Boston, Mass. (E. E. Anderson, Health Physics Div., Oak Ridge National Laboratory, Oak Ridge, Tenn.)

July

3–5. American Assoc. of Colleges of Pharmacy, Boulder, Colo. (G. L. Webster, College of Pharmacy, Univ. of Illinois, Chicago 12)

4–8. Polarization Phenomena of Nucleons, symp., Basle, Switzerland. (K. P. Meyer, Physikalisches Institut der Universität Basle, Klingelbergstr. 82, Basle)

5–9. Goiter Conf., 4th intern., London, England. (J. C. McClintock, 149½ Washington Ave., Albany 10, N.Y.)

6–15. Entomological Conf., 7th Commonwealth, London, England. (Commonwealth Inst. of Entomology, 56 Queen's Gate, London, S.W.7)

10–14. Pan American Tuberculosis Cong., 12th, Bahia, Brazil. (F. D. Gómez, 26, de Marzo, 1065, Montevideo, Uruguay)

11–12. Response of Materials to High Velocity Deformation, conf., Estes Park, Colo. (AIME, 29 W. 39 St., New York 18)

11–15. British Dental Assoc., annual, Edinburgh, Scotland. (Secretary, British Dental Assoc., 13 Hill St., Berkeley Sq., London, W.1, England)

11–15. Royal Medico-Physiological Assoc., annual, London, England. (A. B. Monro, 11 Chandos St., Cavendish Sq., London, W.1)

11–16. Inter-American Nuclear Energy Commission, 2nd meeting, Petropolis, Rio de Janeiro, Brazil. (J. D. Perkinson, Jr., Inter-American Nuclear Energy Commission, c/o Pan American Union, Washington 6)

(See issue of 20 May for comprehensive list)