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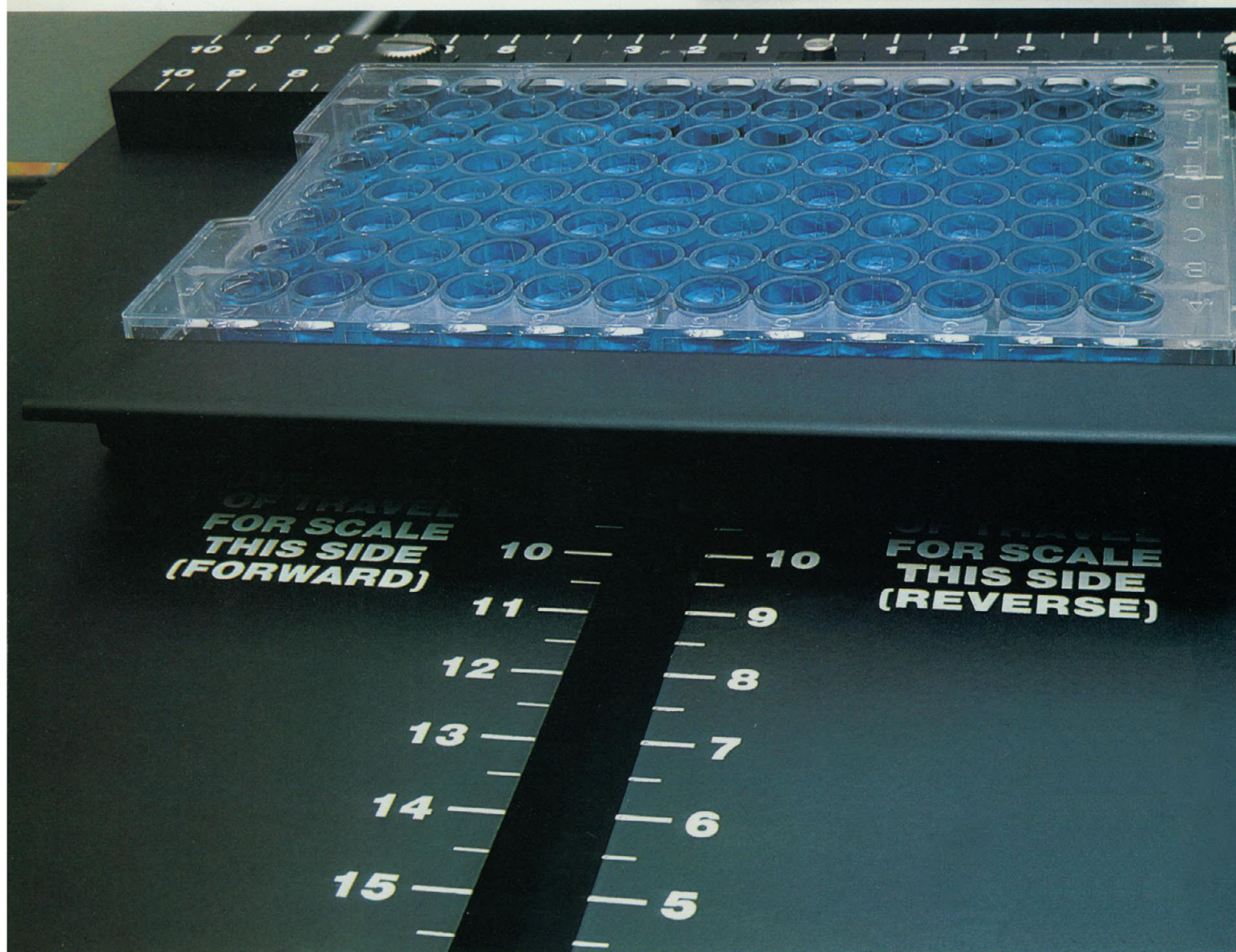
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LETTERS	Berkeley Audit: <i>G. J. Maslach</i> ; Isabelle: Request for Funds: <i>M. S. Lubell</i> ; NIH Funding: <i>J. S. Youngner</i> and <i>K. I. Berns</i> ; Hybridoma Technology: <i>J. Schwaber</i> ; The Potassium Effect: <i>G. Tasse</i> ; Omitted Data: <i>H. Schumann</i> and <i>J. J. Zuckerman</i> ; Asteroid Results: <i>D. P. Cruikshank</i> ; <i>J. Gradie</i>	798
EDITORIAL	Role of Professional Societies in Development: <i>J. T. Ratchford</i>	803
ARTICLES	Ion Beam Spectroscopy of Solids and Surfaces: <i>B. J. Garrison</i> and <i>N. Winograd</i>	805
	Form and Function of Retroviral Proviruses: <i>H. E. Varmus</i>	812
	Amazon Basin Soils: Management for Continuous Crop Production: <i>P. A. Sanchez</i> et al.	821
NEWS AND COMMENT	An Alternative to the MX	828
	<i>Briefing</i> : Livermore Wins Laser Battle; Union Carbide Quits Oak Ridge After 40 Years; Samios Named Director of Brookhaven; U.S. Votes Against Law of the Sea Treaty; Medical Data Bank: A Security Risk?	830
	Why SUM Didn't Add Up	832
	Statistics Suffering Under Reagan	833
	French Reforming Higher Education—Again.	834
RESEARCH NEWS	CERN Resets Particle Hunt to October	836
	A Hole in the Milky Way	838
	How Did Humans Evolve Big Brains?	840
BOOK REVIEWS	A Synthetic History of Biology: <i>D. J. Futuyma</i>	842
	The Work of Dobzhansky: <i>J. H. Gillespie</i>	844
	Products of a Centennial: <i>J. L. Heilbron</i> ; other review by <i>A. Thackray</i>	846
	Science Establishing Itself: <i>A. E. Moyer</i> ; other reviews by <i>R. W. Seidel</i> , <i>C. S. Gillmor</i> , <i>A. F. C. Wallace</i>	850
	A Third Look at Middletown: <i>G. H. Elder, Jr.</i>	854

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Population Patterns: A Reconstruction: <i>D. S. Smith</i>	857
Economic Models Under Challenge: <i>M. N. Baily</i>	859
The Book Industry: <i>H. C. Morton</i>	862
Questions of Ability: <i>L. R. Aiken</i> ; other review by <i>C. B. Cazden</i>	863
Psychology Applied to Law: <i>S. Macaulay</i>	866
Political Developments in Prehistory: <i>G. A. Johnson</i> ; other reviews by <i>G. Urton, M. D. Coe, M. M. Goodman</i>	867
Cladistics in Action: <i>W. L. Fink</i>	872
Adaptive Syndromes: <i>R. S. Hoffmann</i> ; other reviews by <i>T. J. Walker,</i> <i>W. G. Eberhard, R. R. Hoy, F. C. MacIntosh</i>	873
A Harnessing of Electrons: <i>A. Howie</i> ; other reviews by <i>L. M. Brown,</i> <i>W. J. Marciano</i>	878
New Instruments for Exploration: <i>D. Morrison</i> ; other reviews by <i>W. K. Hartmann, W. F. Ruddiman, K. Burke</i>	881
Books Received	884
Books Reviewed in <i>Science</i>	902

REPORTS	Evidence for a Major Meteorite Impact on the Earth 34 Million Years Ago: Implication for Eocene Extinctions: <i>R. Ganapathy</i>	885
	Iridium Anomaly Approximately Synchronous with Terminal Eocene Extinctions: <i>W. Alvarez et al.</i>	886
	Suicide Transport: Destruction of Neurons by Retrograde Transport of Ricin, Abrin, and Modeccin: <i>R. G. Wiley, W. W. Blessing, D. J. Reis</i>	889
	Neurons in the Rat Dentate Gyrus Granular Layer Substantially Increase During Juvenile and Adult Life: <i>S. A. Bayer, J. W. Yackel, P. S. Puri</i>	890
	Cytomegalovirus Antibody in Cerebrospinal Fluid of Schizophrenic Patients Detected by Enzyme Immunoassay: <i>E. F. Torrey, R. H. Yolken, C. J. Winfrey</i>	892
	Transformation Induced by Abelson Murine Leukemia Virus Involves Production of a Polypeptide Growth Factor: <i>D. R. Twardzik et al.</i>	894
	Nerve Fiber Growth on Defined Hydrogel Substrates: <i>S. T. Carbonetto,</i> <i>M. M. Gruver, D. C. Turner</i>	897
	Anticonvulsant Action of Excitatory Amino Acid Antagonists: <i>M. J. Croucher,</i> <i>J. F. Collins, B. S. Meldrum</i>	899

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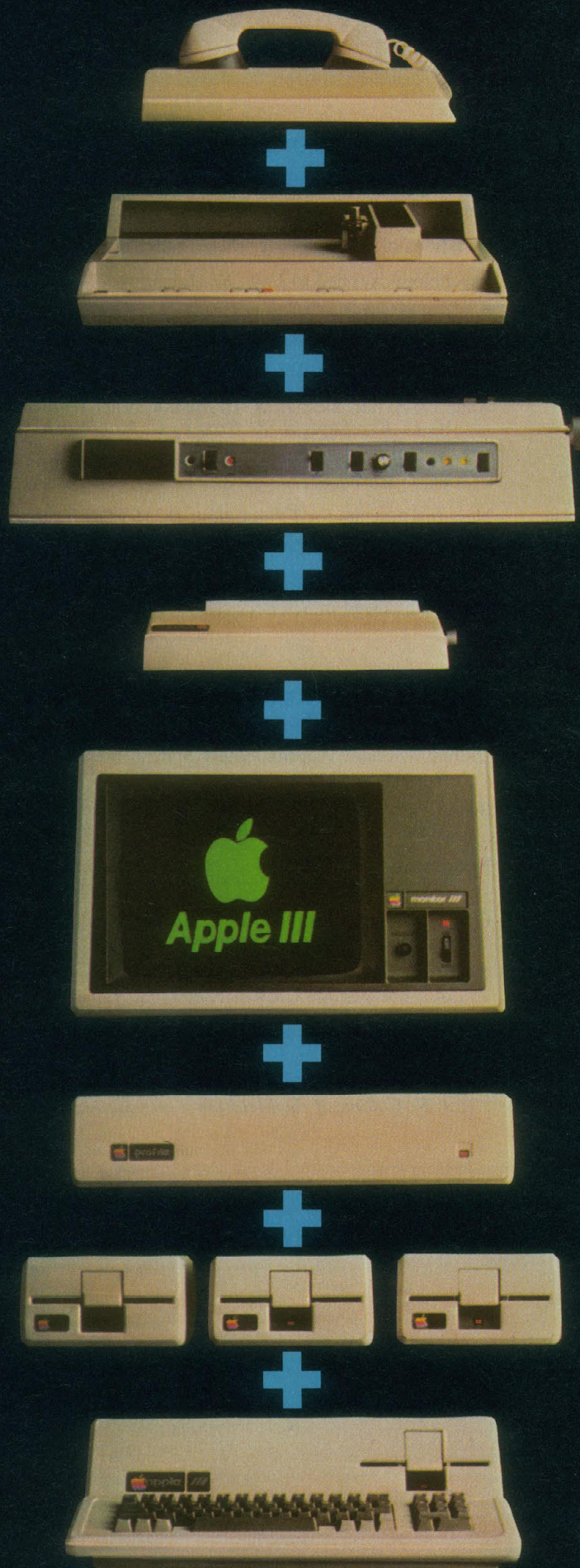
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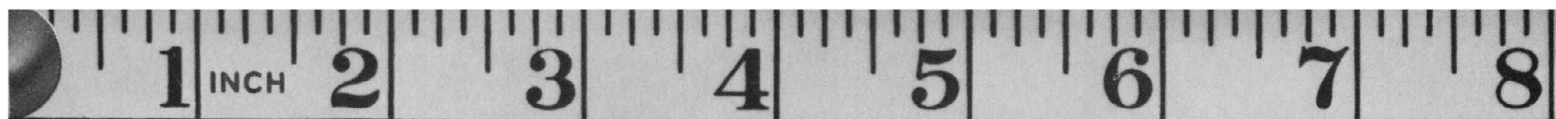
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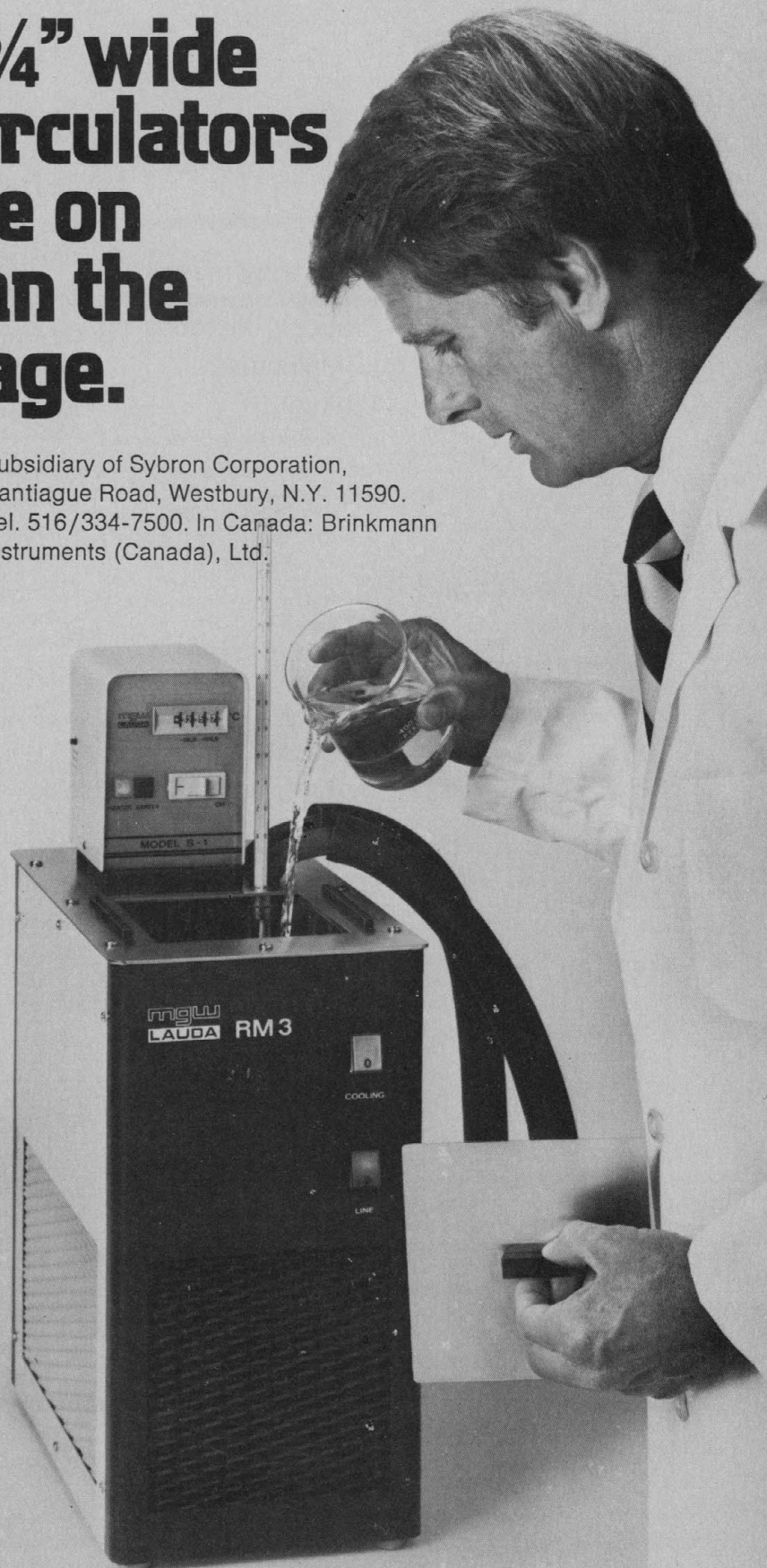
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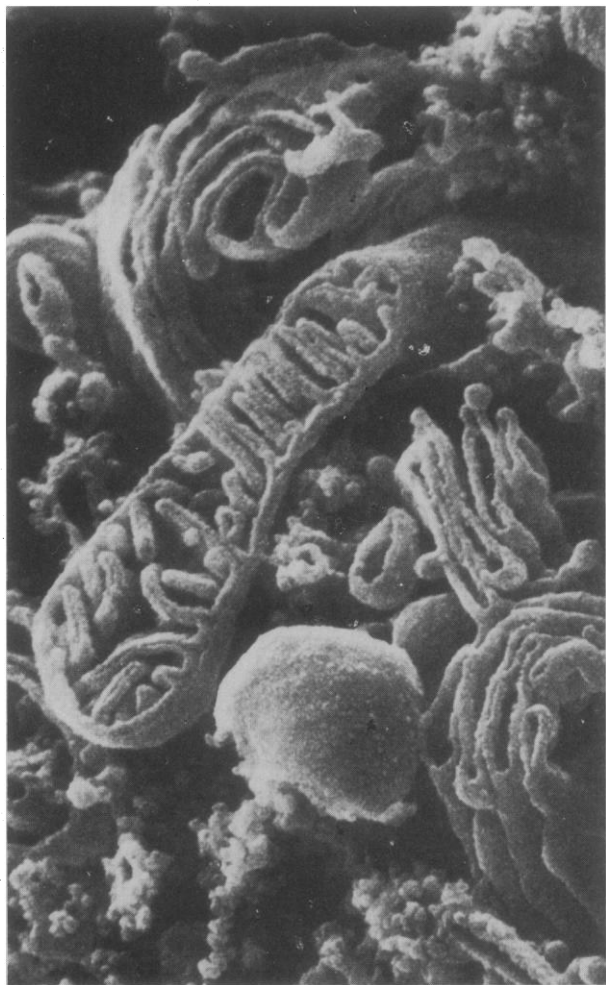
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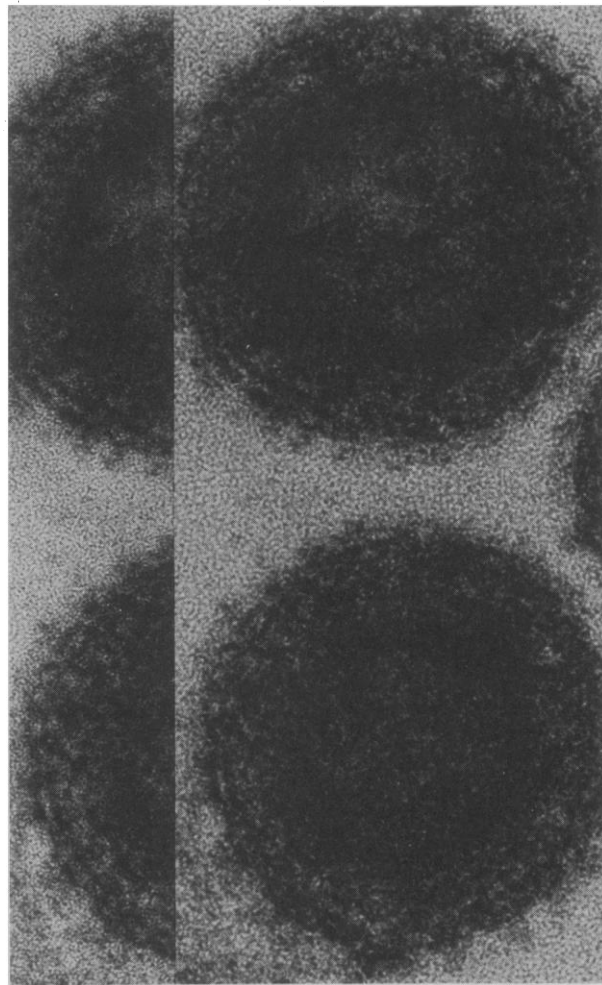
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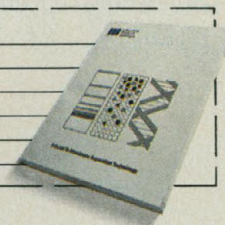
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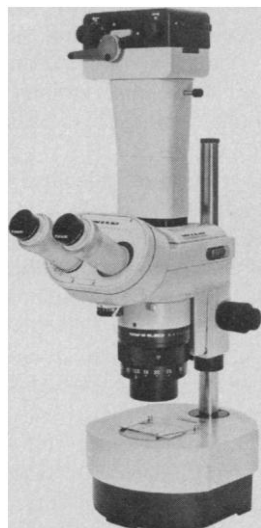
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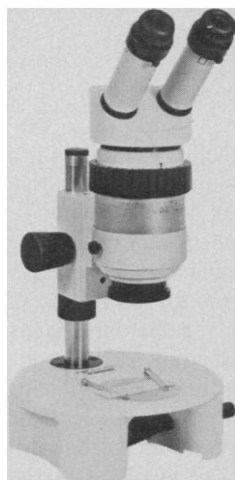
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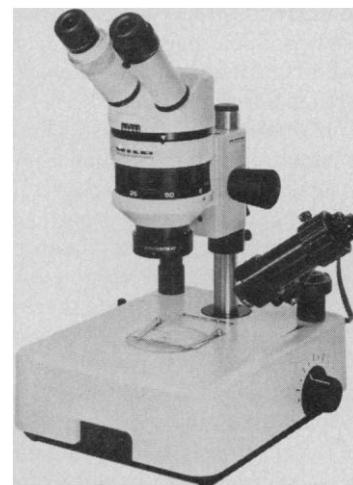


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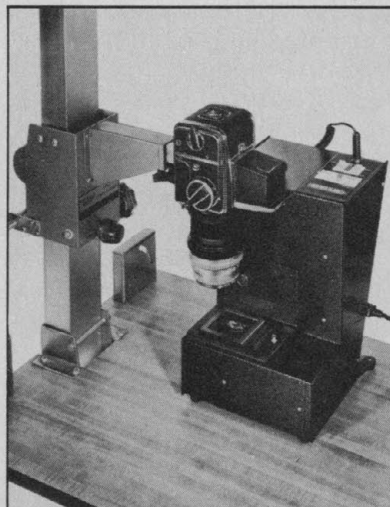
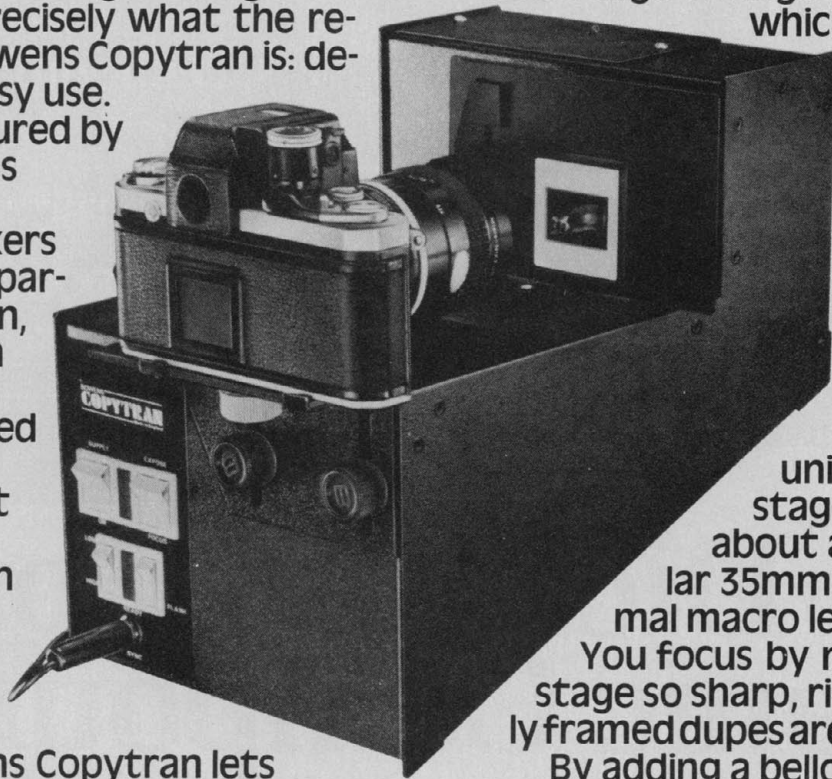
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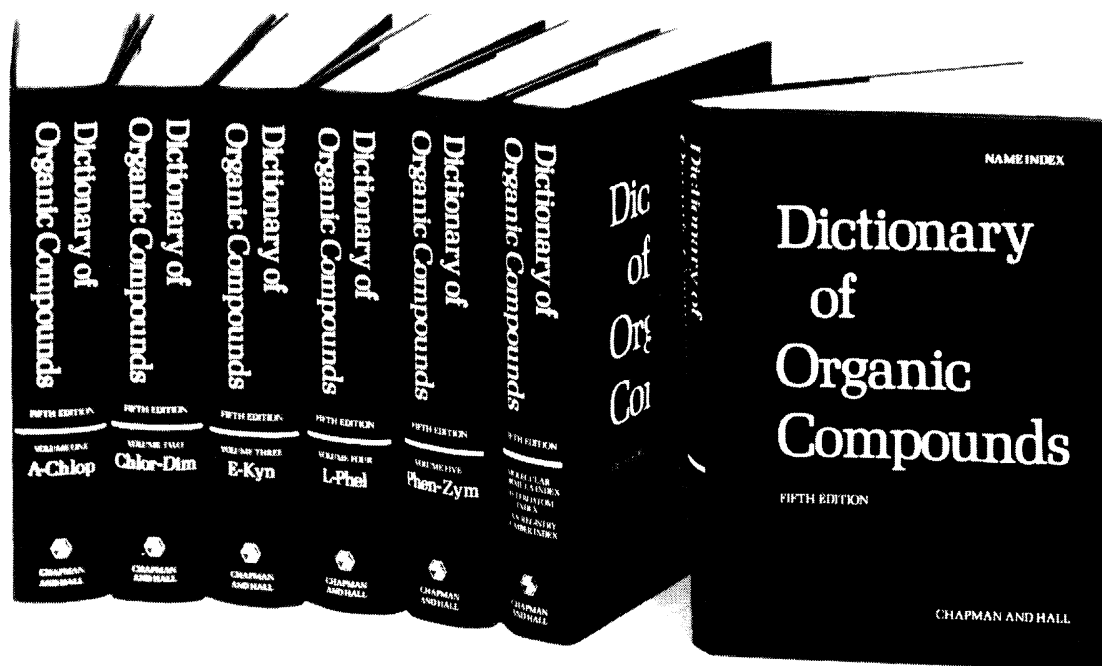
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Role of Professional Societies in Development

Industrialized countries are that way because of science and its translation into productive technology by engineers. Thus science and engineering are crucial to successful development of less affluent nations. But the record of technology as a tool for development is mixed. Technology transfer has been imperfect. Common complaints are that the engineering and science communities in receiving countries are inadequate to the task at hand, or that those individuals involved in the industrialized countries are not at the forefront of their professions. If development is to be effectively fostered, this must change.

Although structures of scientific and engineering communities vary dramatically between nations and economic systems, their components and framework are essentially disciplinary. The disciplinary societies bestow a large portion of the nonfinancial rewards to professionals in many countries: they publish research papers, award fellowships and prizes, elect leaders, and convene prestigious meetings and conferences. In addition, they set professional standards and provide continuing education. Because the societies are influential and do such things well, it makes sense for them to become involved in development activities. In recent years, a number of U.S. disciplinary societies have taken initiatives. For example, the American Chemical Society has held development-related chemistry workshops in Egypt and India. The American Society for Engineering Education has cooperated with engineering educators from many nations in establishing an international network of organizations. The American Statistical Association has arranged seminars in Latin America in cooperation with local groups and assisted them in forming their own associations.

Leaders of professional societies have noted the importance of attracting the highest quality talent to development tasks. D. Allan Bromley, in his AAAS presidential address on 6 January,* stated that "societies can provide channels for the involvement of some of the most talented scientists and engineers in the development process." That same week M. G. K. Menon, in his Indian Science Congress Association (ISCA) presidential address in Mysore,† emphasized the importance of basic research and a self-reliant base of science and technology in national development. Also noting the need for quality, he stated, "Scientific academies, professional societies and those concerned with the publication of scientific and technical journals have an exceedingly important role to play in setting standards of excellence for scientific research."

The first steps toward focusing societies on development problems on a global scale were taken in New Delhi in December 1980 at a seminar organized by AAAS, ISCA, and the Indian National Science Academy (INSA). Cochaired by A. K. Sharma and Kenneth Boulding, respectively ISCA president and AAAS board chairman at that time, the seminar included over 100 leaders from disciplinary, federative, and related institutions from about 40 countries around the world. The participants documented prior activities of the societies in furthering development and identified the capabilities of the societies in this respect. Considering the broad spectrum of participants, the report on the seminar‡ is a unique thesaurus of what societies can do and how they may become involved, and its recommendations lay the groundwork for future action.

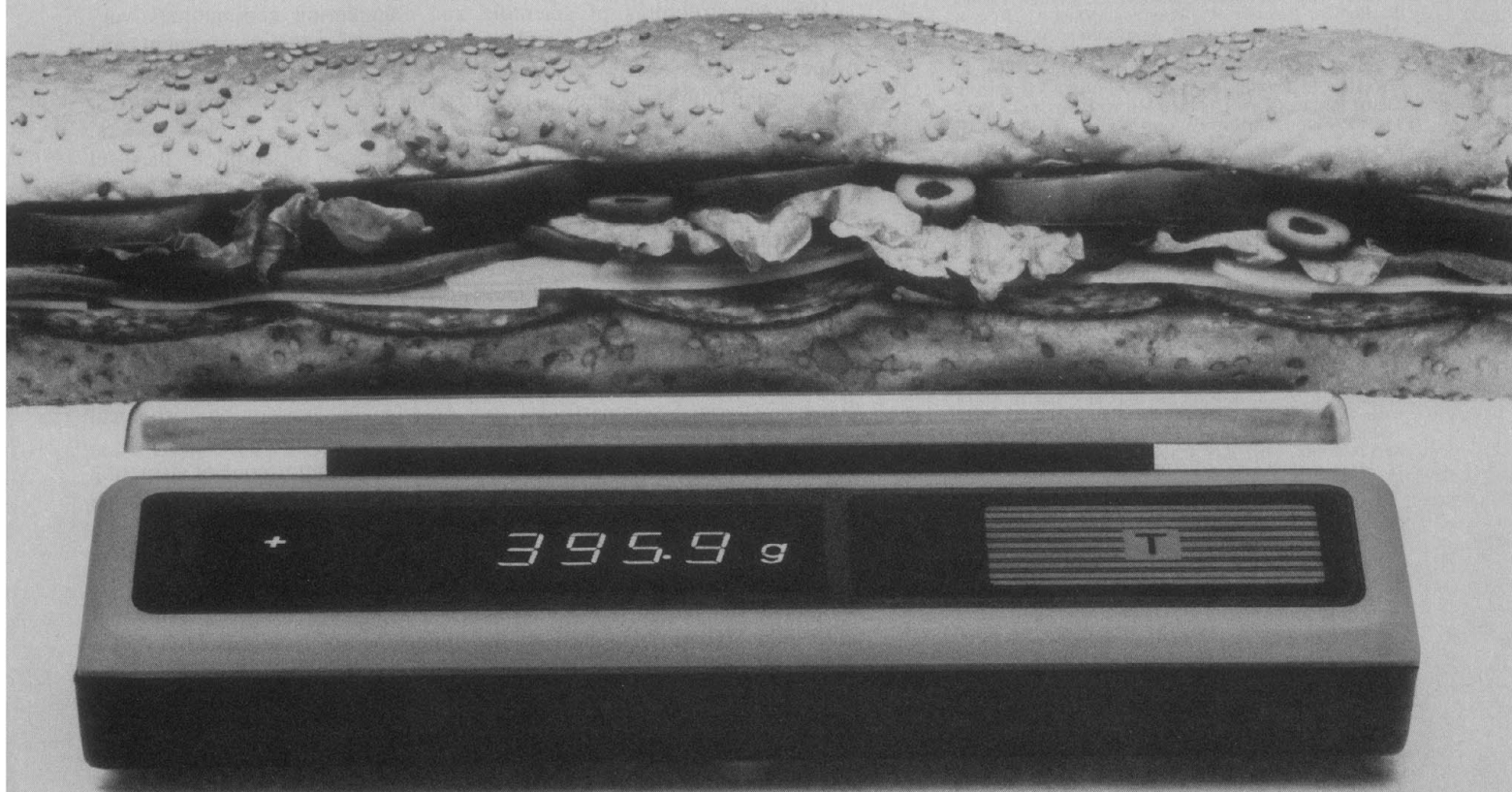
A Continuing Committee on the Role of Scientific and Engineering Societies in Development has been formed to coordinate and guide this effort, and regional meetings are planned to examine the general principles in the context of regional conditions and problems. Thus the scientific and engineering societies have an opportunity to influence the development process in its most sensitive area: the quality of the people involved. The challenge should be met.—J. THOMAS RATCHFORD, *Associate Executive Officer, AAAS*

**Science*, 26 February 1982, p. 1041.

†*Science Today*, February 1982, p. 9.

‡*Report on the Global Seminar on the Role of Scientific & Engineering Societies in Development* (INSA, New Delhi, 1981).

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"wonderfully heuristic"? That population genetics failed to address macroevolutionary phenomena because it did not take a holistic view of the integrated genotype? It is refreshing to see Mayr admit that Sewall Wright recognized the importance of gene interactions and influenced Simpson's development of the idea of quantum evolution; but can we agree that Wright "made little use of this insight in his equations and graphs"? Here and elsewhere one feels that Mayr has been a victim of that same lamentable rift between mathematical theoreticians and naturalists that delayed the arrival of the Modern Synthesis, and that persists still.

Mayr's larger theses, which I believe are on the whole well defended, are important enough to bear examination. Mayr feels strongly that the physical sciences have had an unwarranted influence on the philosophy of science and the prevailing ideas of what constitutes acceptable scientific method; he is vehement in his assertion that attempts to apply in biology the reductionism, elementary mechanistic ideas, and mathematical formulation of general laws that serve physics so well have hindered the development of sound biological concepts. Mathematical theory is useful in physics, but in sciences such as systematics and much of evolutionary biology "the contributions of mathematics are very minor" and often misleading. Biological systems are so complex and so integrated that reductionism is as often a hindrance to progress in biology as it is (as in the case of Mendel) an advantage. Mayr's antireductionism is especially evident in his treatment of population genetics, which, by defining evolution as changes in gene frequencies, cannot explain, he says, the evolution of complex adaptations and the origin of diversity.

Perhaps the major thesis of Mayr's book, and the most important one, is that biology can expand the philosophy of science beyond the limits defined by the physical sciences. Not only are biological systems too complex to admit of simple reductionism; they are too diverse to admit of universal laws and can be described only by "probabilistic" generalizations to which there invariably will be exceptions. Mayr's book is a deeply felt celebration of diversity: the diversity of life that makes biological "laws," or regularities, so different from physical laws; the study of diversity that led naturalists to make so many more contributions to biology than are often recognized (this is, indeed, a major theme); the recognition of diversity with-

Reviewed in This Issue

<i>Advances in Cladistics</i> , V. A. Funk and D. R. Brooks, Eds.	872
<i>Books</i> , L. A. Coser, C. Kadushin, and W. W. Powell	862
<i>Chemical Neurotransmission</i> , L. Stjärne, P. Hedqvist, H. Lagercrantz, and A. Wennmalm, Eds.	877
<i>Chromosome Constitution of Races of Maize</i> , B. McClintock, T. Angel Kato Y., and A. Blumenschein	871
<i>Code of the Quipu</i> , M. Ascher and R. Ascher	869
<i>Concise Dictionary of Scientific Biography</i>	849
<i>The Criminal Justice System</i> , V. J. Konečni and E. B. Ebbesen, Eds.	866
<i>Dictionary of the History of Science</i> , W. F. Bynum, E. J. Browne, and R. Porter, Eds.	849
<i>Dobzhansky's Genetics of Natural Populations, I-XLIII</i> , R. C. Lewontin, J. A. Moore, W. B. Provine, and B. Wallace, Eds.	844
<i>Dynamics of Passive Margins</i> , R. A. Scrutton, Ed.	884
Einstein centennial works: a collection	846
<i>Emulation and Invention</i> , B. Hindle	853
<i>Fifty Years of Electron Diffraction</i> , P. Goodman, Ed.	878
<i>The Growth of Biological Thought</i> , E. Mayr	842
<i>Indian Clothing before Cortés</i> , P. R. Anawalt	870
<i>The Language of Children Reared in Poverty</i> , L. Feagans and D. C. Farran, Eds.	865
<i>The Mammalian Radiations</i> , J. F. Eisenberg	873
<i>Marine Geology</i> , J. P. Kennett	883
<i>Middletown Families</i> , T. Caplow, H. M. Bahr, B. A. Chadwick, R. Hill, and M. H. Williamson	854
<i>The Nature of Matter</i> , J. H. Mulvey, Ed.	881
<i>Neurobiology of the Leech</i> , K. J. Muller, J. G. Nicholls, and G. S. Stent, Eds.	877
<i>New Eye for the Navy</i> , D. K. Allison	852
<i>Night Thoughts of a Classical Physicist</i> , R. McCormmach	880
<i>The North American Grasshoppers</i> , vol. 1, D. Otte	875
<i>The Population History of England, 1541-1871</i> , E. A. Wrigley and R. S. Schofield	857
<i>The Psychology of the Courtroom</i> , N. L. Kerr and R. M. Bray, Eds.	866
<i>Rational Expectations and Econometric Practice</i> , R. E. Lucas, Jr., and T. J. Sargent, Eds.	859
<i>The Rise and Fall of National Test Scores</i> , G. R. Austin and H. Garber, Eds.	863
<i>The Rise of Robert Millikan</i> , R. H. Kargon	851
<i>The Roving Naturalist</i> , T. Dobzhansky	844
<i>Science in America</i> , N. Reingold and I. H. Reingold, Eds.	850
<i>The Sea Floor</i> , E. Seibold and W. H. Berger	883
<i>Spider Communication</i> , P. N. Witt and J. S. Rovner, Eds.	876
<i>Studies in Business-Cycle Theory</i> , R. E. Lucas, Jr.	859
<i>The Surface of Mars</i> , M. H. Carr	882
<i>Telescopes for the 1980s</i> , G. Burbidge and A. Hewitt, Eds.	881
<i>The Transition to Statehood in the New World</i> , G. D. Jones and R. R. Kautz, Eds.	867