

SCIENCE

27 September 1974

Vol. 185, No. 4157

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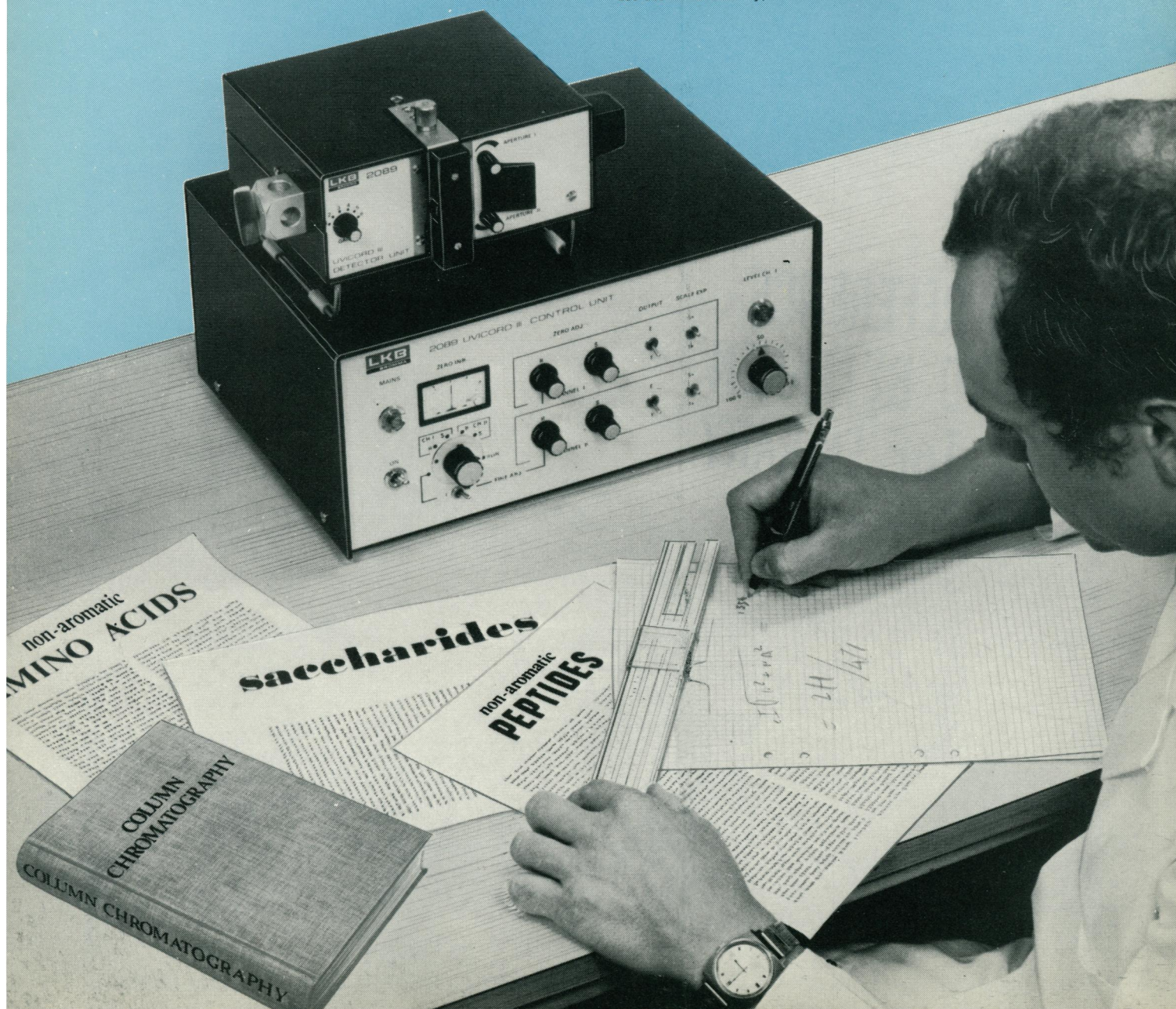
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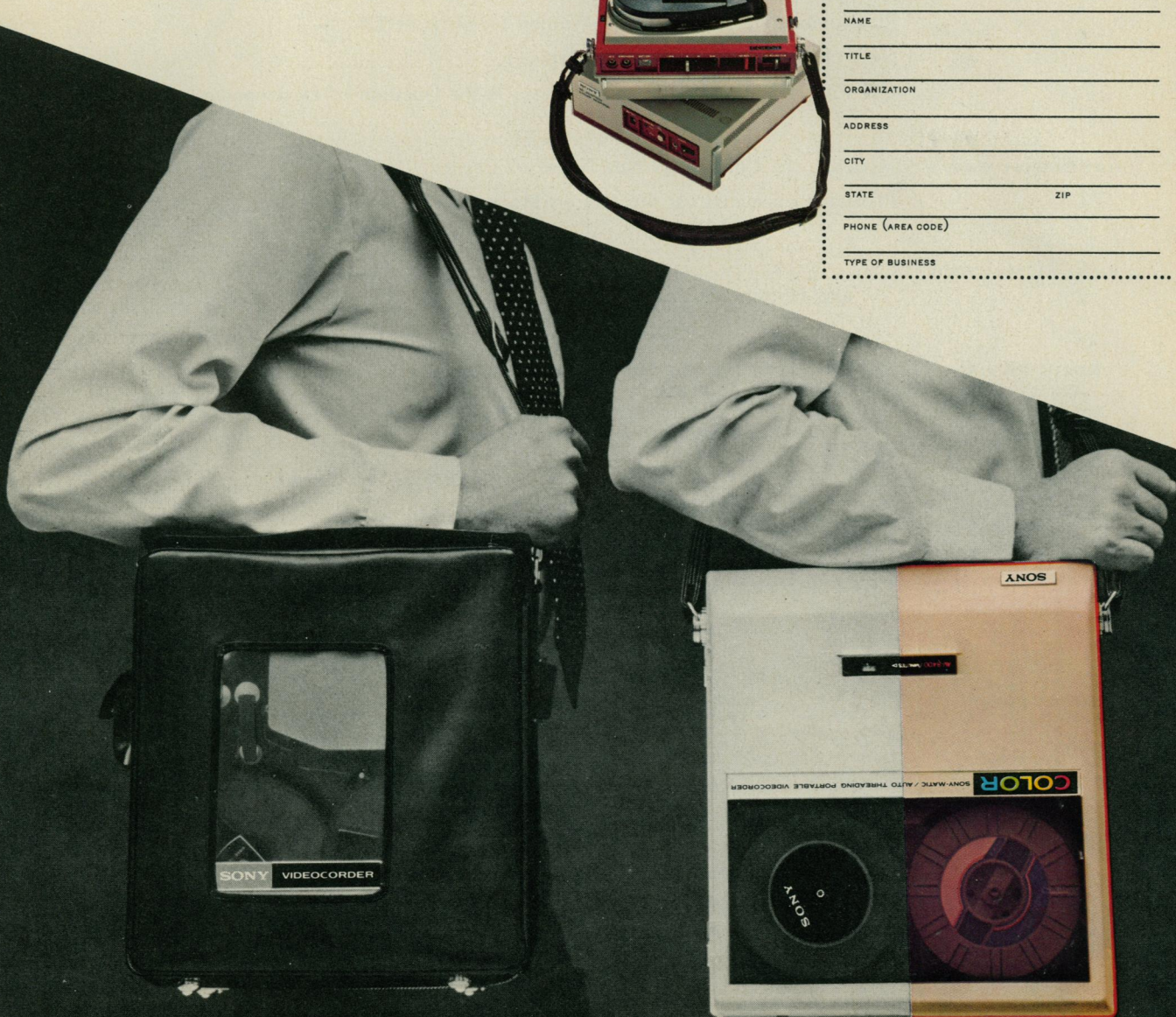


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Contemporary Chinese artist showing foreign soldiers pillaging during the Opium War. Members of different cultures may perceive diverse racial differentiae, which may or may not have objective bases. See page 1115 and Figs. 1 and 2. [F. Mineta, *History of the War of 1840-1842* (in Japanese translated from the Chinese)]

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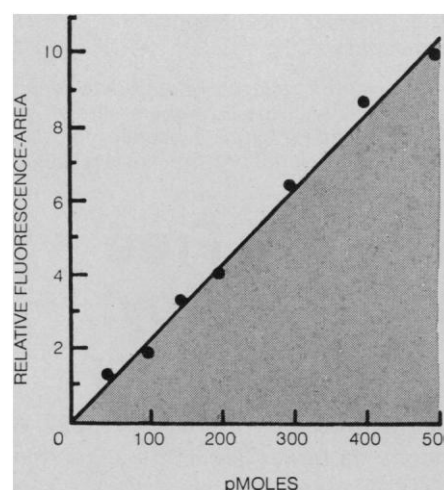
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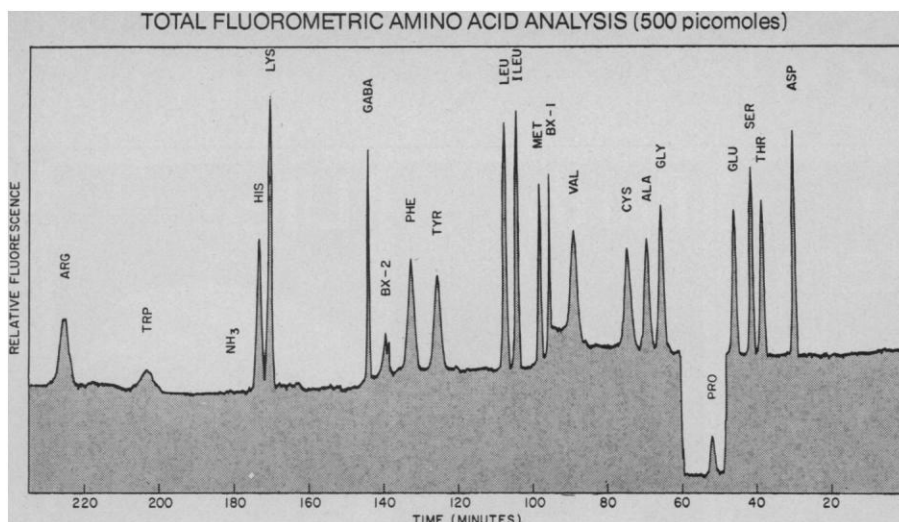
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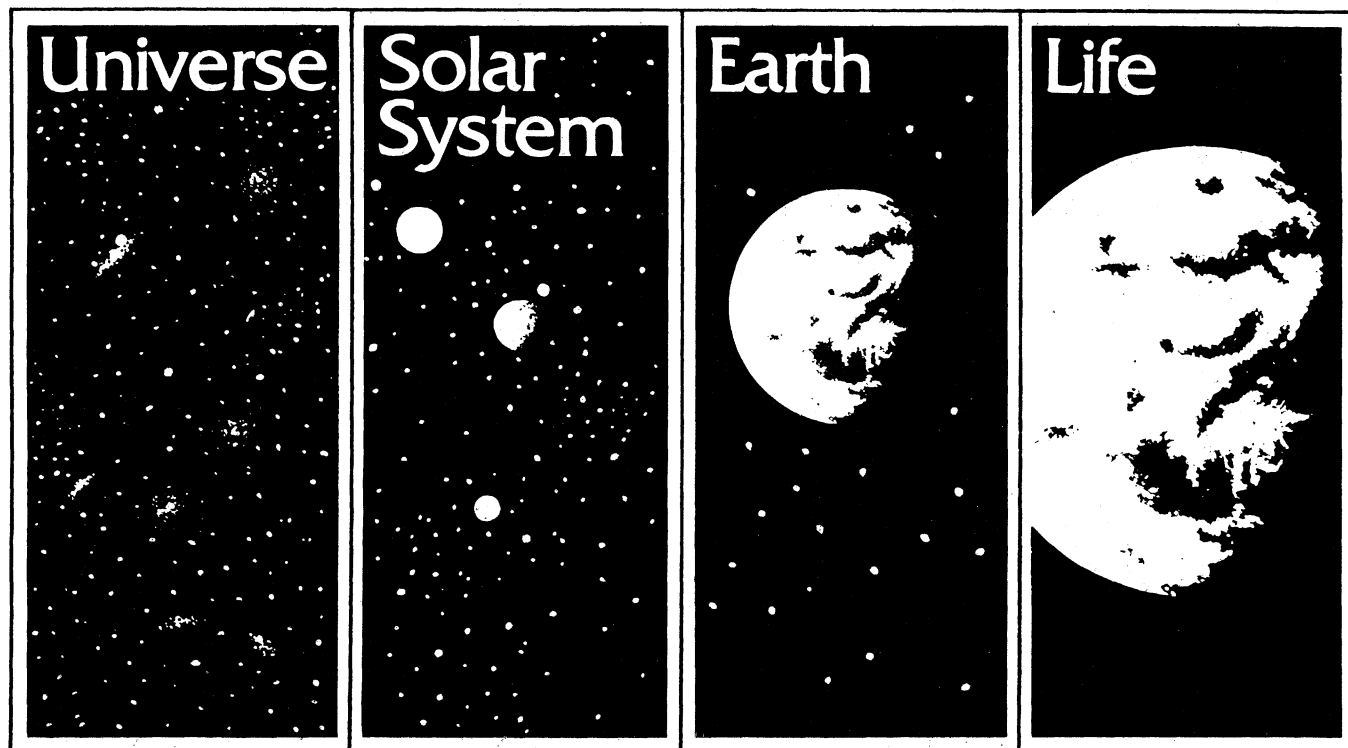
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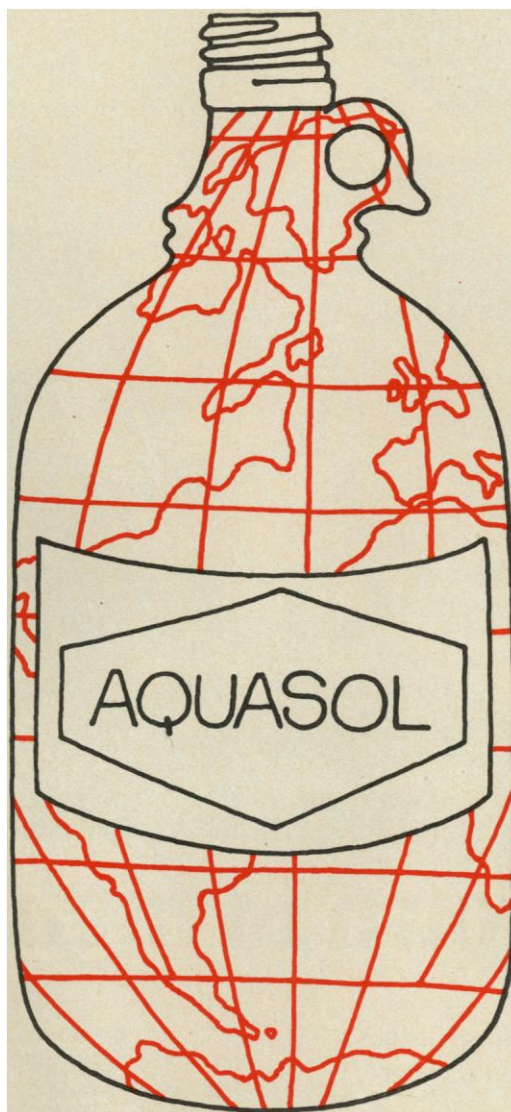
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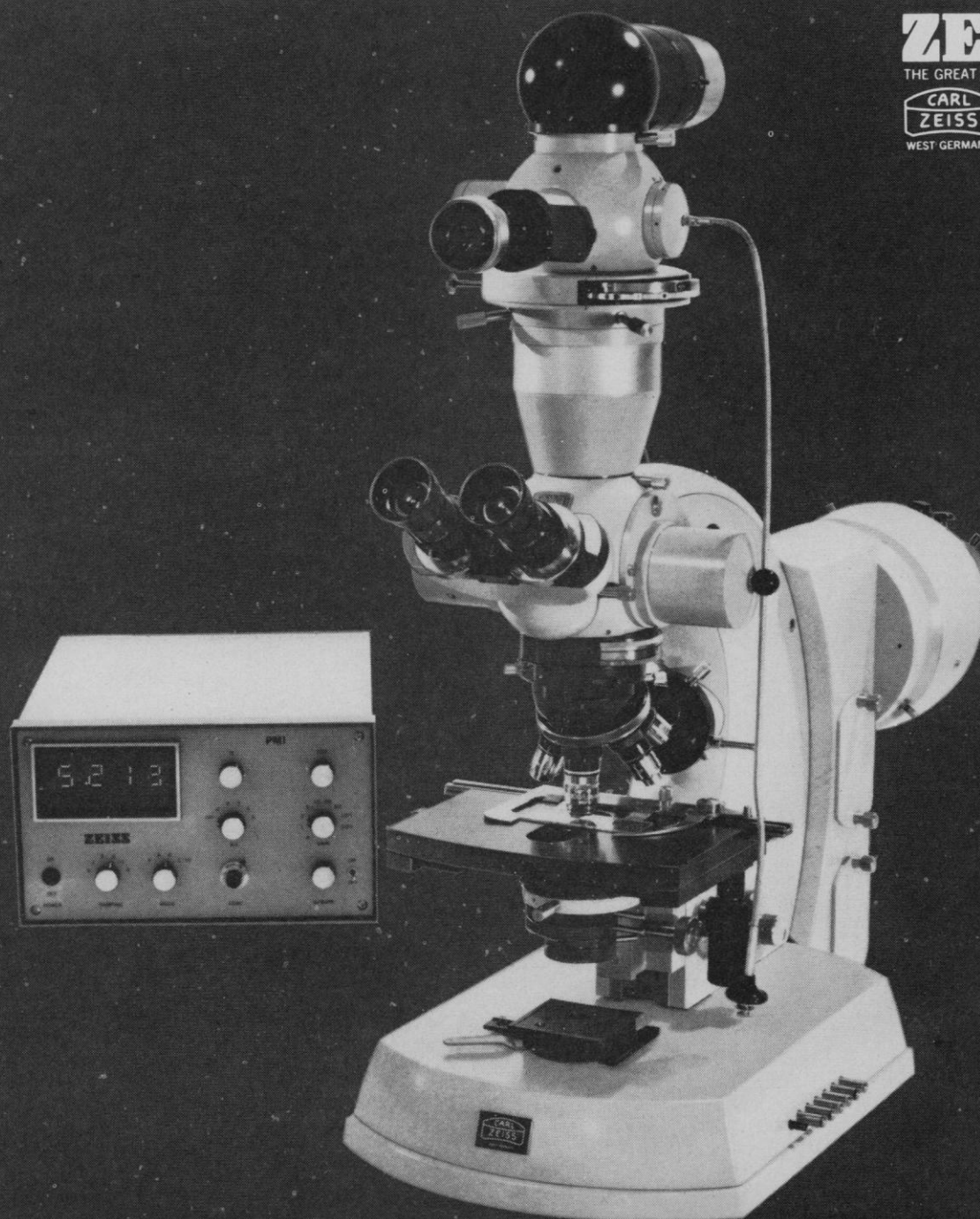
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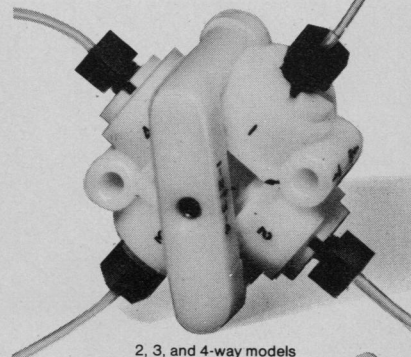
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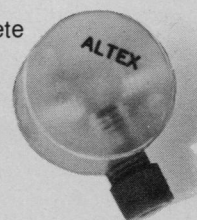
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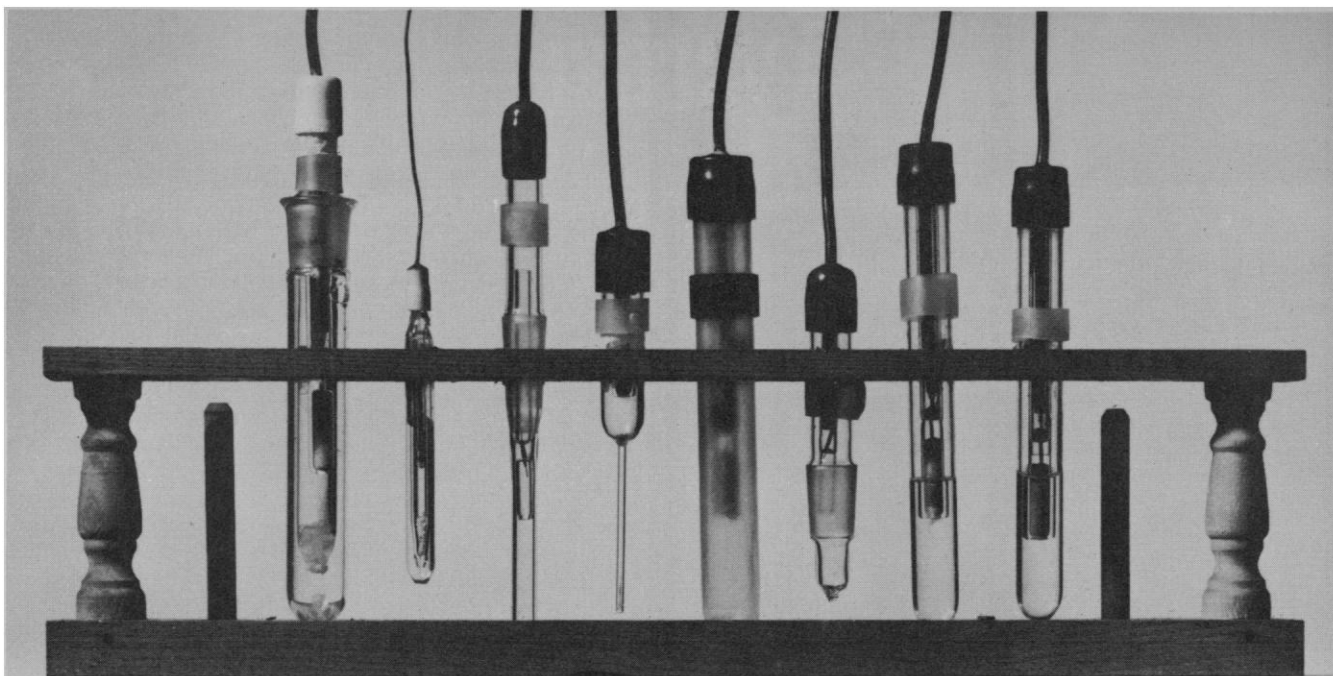
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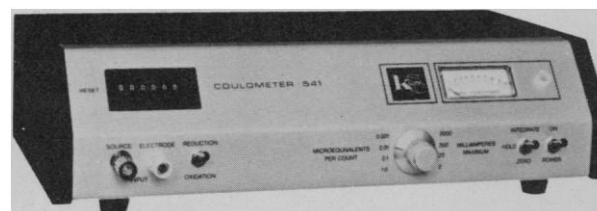
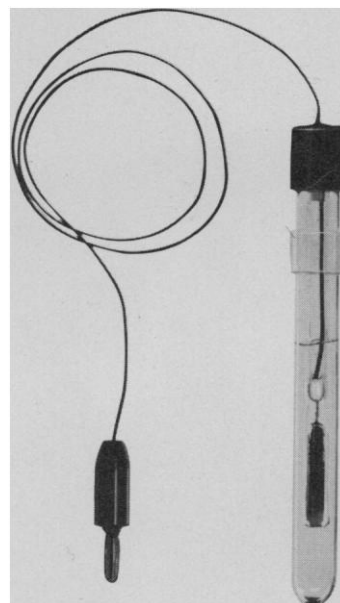
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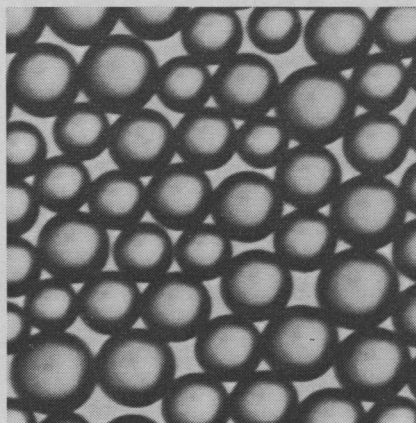
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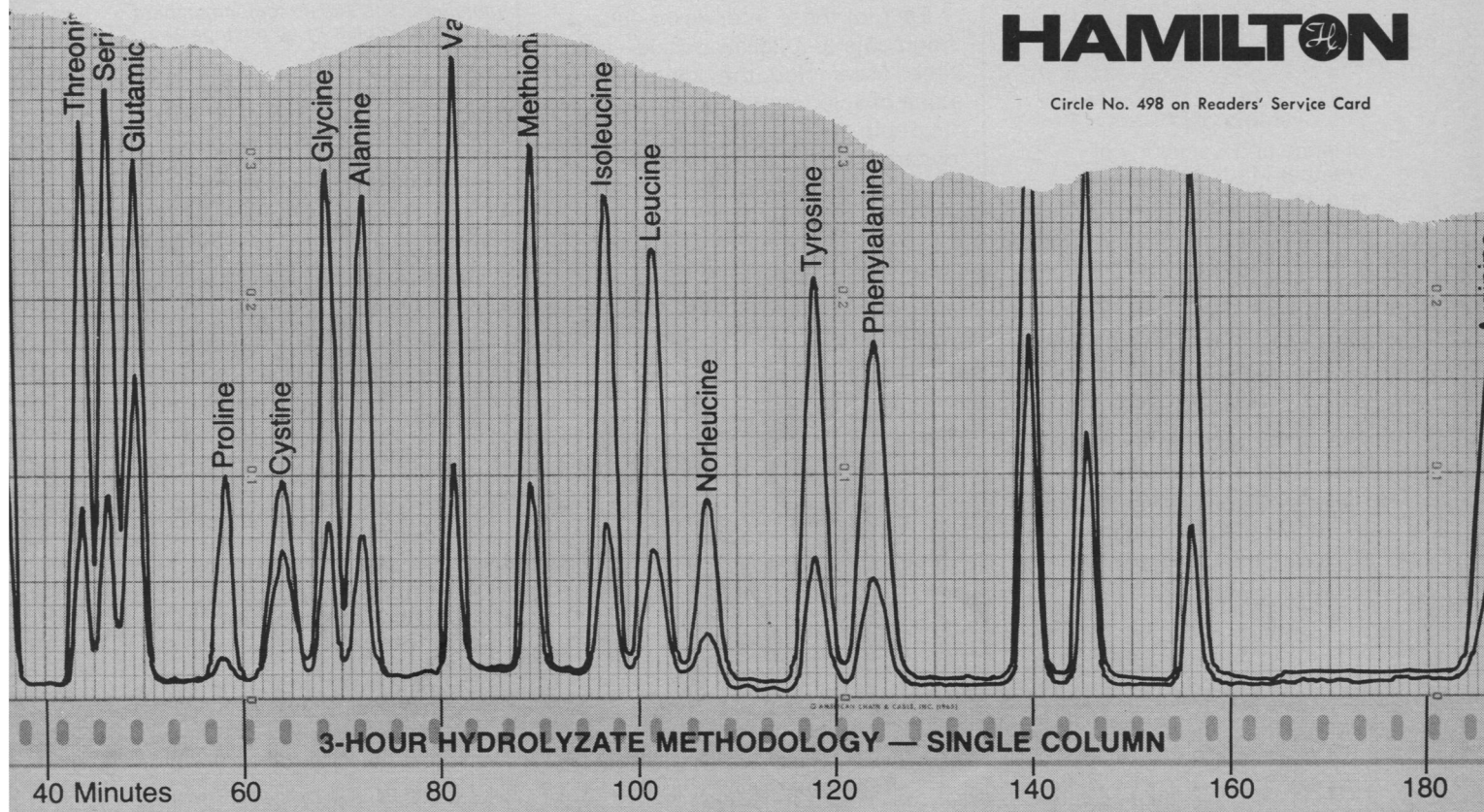
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What appeared to be a good idea in Count von Zeppelin's day is still not economically feasible.

TED P. BOND

Department of Physiology,
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Galveston 77550

Reference

1. E. K. Gann, *Flying*, May 1974, p. 51.

The Creative Process

Although there are different perceptions of creativity, few are so pessimistic as those reported by Thomas H. Maugh II (Research News, 21 June, p. 1273). I would like to respond to several points.

It is possible "to create conditions that nurture preexisting creativity." Teachers at all levels are daily encouraging inquiry, challenging students to expand their intellectual horizons, and reducing the psychological barriers to both creativity and learning (1).

The ability to generate ideas can be altered. Brainstorming, attribute listing, and other divergent and convergent thinking techniques can be taught so that the individual produces more ideas (2). Further, I have seen hundreds of my own students increase their facility in idea production as a result of instruction, teacher expectancies, and their own growth in self-confidence. On the other hand, while it is possible to teach the principles of critical thinking,

it is more difficult to convince people to practice self-criticism. This requires a state of emotional comfort with oneself that can evolve but cannot be taught.

The observation by Krebs that one must know which questions to ask is important. It implies, however, both the psychological freedom to ask questions and some information on which to base them. Differences in ability and experience affect both factors.

In summary, creative ability lies on a continuum. It can be nourished in an atmosphere of psychological freedom or squelched by rigidity. It exists in many realms other than science and the arts and may be apparent in the youthful student as well as the famed adult.

LITA LINZER SCHWARTZ

Department of Educational Psychology,
Pennsylvania State University,
Ogontz Campus, Abington 19001

References and Notes

1. J. F. Feldhauser, D. J. Treffinger, S. J. Bahlke, *J. Creat. Behav.* 4, 85 (1970); R. A. Goodale, *ibid.*, p. 91; T. Christie, *ibid.*, p. 13; E. P. Torrence, *ibid.* 6, 114 (1972).
2. Doubters are referred to G. A. Davis, *Psychology of Problem Solving: Theory and Practice* (Basic Books, New York, 1973) for a summary of these techniques.

In his report on the conference to dissect the creative process in science and medicine, Maugh notes the participants' conclusions that "the ability to generate ideas is the innate part of creativity that probably cannot be altered," and that "creative science" cannot be taught in universities.

These comments are similar to those of the sculptor Lee Mach in the credo for her *Collected Works* (1). To the question "How does one assess the myriad influences that finally congeal to create a piece of sculpture, a painting, a song . . . is art really educable?" she answers, "Many artists, even those that teach, think not. Many creative achievements have been made by men and women with little if any formal education . . . formal education may tend to smother by the weight of precedent the intuition and initiative of the gifted one. . . . Artists no less than doctors, scientists, and educators need the conceptual foundation upon which to build their special expressive skills . . . education can help or hinder the abilities but cannot produce them."

SAM MACHLIS

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References

1. L. Mach, *Collected Works of Lee Mach* (Matu, Larchmont, N.Y., 1973).

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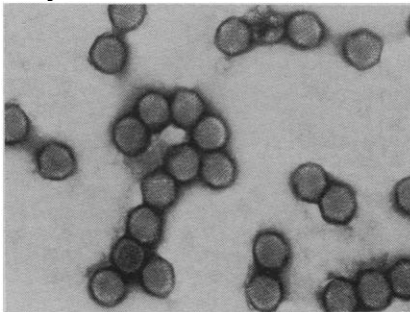
ing a 0.3 ml fraction typically took one hour with greater than 90% recovery.

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World Population: World Responsibility

The United Nations Population Conference, which concluded on 31 August in Bucharest, passed by acclamation a World Plan of Action that dramatized the growing global concern for the planet's plight.

For a decade, a babble of voices (the denunciation of Malthus, the Catholic-Protestant theological cross fire over contraception and abortion, the socialist countries' insistence that socioeconomic justice, aided by technology, could remove all need for family planning and make a limited Earth unlimitedly fruitful) obscured the real issues.

The successful agreement on the new action plan understood how far we have come since the United Nations was founded, and, astoundingly, extended sovereignty to all nations regardless of size or strength.

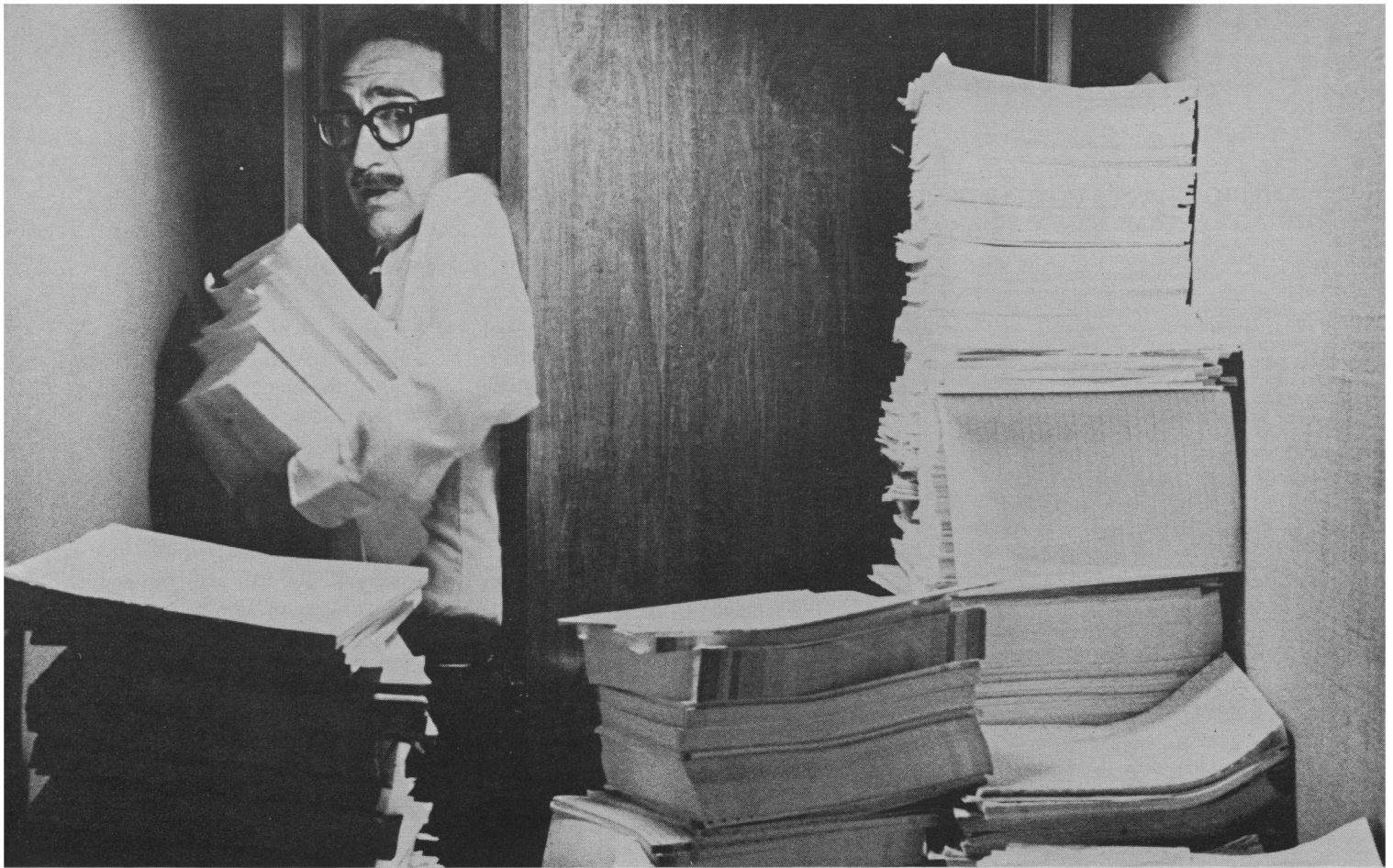
Then only scattered prophets of doom and a few percipient demographers realized that the world's population was doubling every 25 years and would inevitably outrun its resources. We didn't even have a passable world census.

Now we know that world population has reached over 3 billion and cannot be halted far short of 6 billion by the year 2000. There was talk then of a World Food Bank; this came to nothing as the United States, Canada, and Australia exercised a benevolently phrased monopoly of surplus grain, paralleled at present by the monopoly of the oil-producing states. Then world planners were bemused by ideas of unlimited growth which, in time, would correct economic injustices within affluent societies and between nations. The very idea of universal nationhood was fresh, promising. The affluent expected to remove the economic discrepancies of the newly recognized two-thirds of the world, cheaply, and as part of their own growth. The socialist countries used accusations of genocide to foment discontent.

At Bucharest it was affirmed that continuing, unrestricted worldwide population growth can negate any socioeconomic gains and fatally imperil the environment. The Conference recognized that constructive changes in the consumption patterns of affluent countries are vitally necessary to cope with the limited resources of the planet; that mere access to contraceptives and safe abortion will not reduce growth among those without hope of an improved life, although they are essential in realizing such hopes.

The earlier extreme views—that social and economic justice alone can somehow offset population increase and that the mere provision of contraception can sufficiently reduce population—were defeated. A new view emerges: to the sovereign right of states to determine domestic policies is now added responsibility for the quality of international life; to the human right of individuals and couples to decide on the number and spacing of their children, there is now the responsibility for the well-being of future children and the community. Those governments, for which excessive population growth is detrimental to their national purpose, are given a target date of 1985 to provide information and methods for implementing these goals.

The specter of the possible death by famine of as many as 30 million people in the next few years stood before us all. The Conference approved the negotiated plan by voice vote, followed by formal expressions of dissent. The contrast between the some 30 percent of the budget that the United States puts into military expenditures—which may destroy the planet—and the expenditures on population activities—never exceeding more than 0.1 percent—is arresting.—MARGARET MEAD



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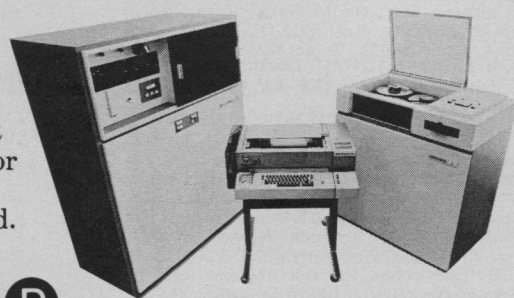
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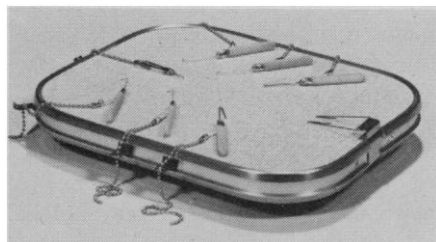
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Twelve-Year Index to Adverse Drug Reactions reports adverse reactions, interactions, and related therapeutic hazards. It costs \$17.50 per copy. ClinAlert. Circle No. 958 on Readers' Service Card.

Life Sciences describes products and services in a newsletter format. ICN Pharmaceuticals, Life Sciences Group. Circle No. 959 on Readers' Service Card.

Option J Peak Read is a two-page bulletin on a means to measure peak values of events without an oscilloscope. This is done with an assembly that is integrated with the V/E-13 voltmeter or the V/E-20A digital indicator. Vishay Instruments. Circle No. 960 on Readers' Service Card.

Model 1135 Test System for Mechanical Properties is featured in a six-page brochure. Instron Corporation. Circle No. 961 on Readers' Service Card.

Thermometric Titrations is the subject of "Application Notes," volume 9, number 2. Sources of error, design, and experimental technique are covered. McKee-Pedersen Instruments. Circle No. 962 on Readers' Service Card.

Bete's Health Survey is published semimonthly. News of ideas and events likely to influence health care and delivery of same are culled from scientific journals and the popular press. Annual subscriptions cost \$66. Channing L. Bete Company. Circle No. 963 on Readers' Service Card.

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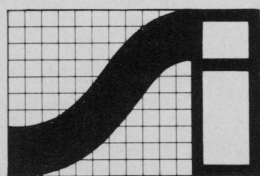
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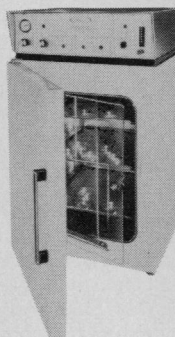
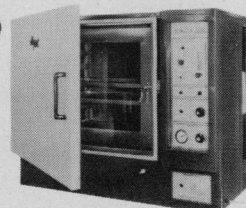
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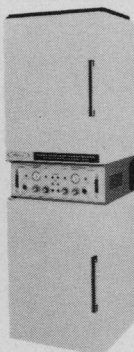
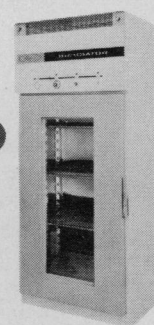
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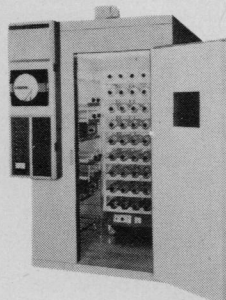
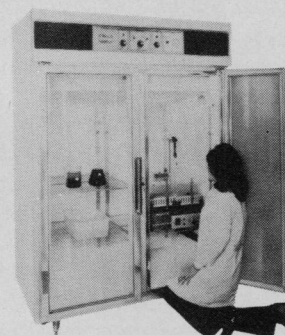
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of Engineering. Lexington (Heath), Lexington, Mass., 1974. xvi, 84 pp., illus. \$8.50.

Journey onto Land. Coleman J. Goin and Olive B. Goin. Illustrated by Margaret Matthew Colbert. Macmillan, New York, 1974. xii, 114 pp. Paper, \$2.95.

Laboratory Instructions in Microbiology. Dean A. Anderson. Mosby, St. Louis, ed. 2, 1974. x, 206 pp., illus. Paper, \$5.50.

Laser Applications. Vol. 2. Monte Ross, Ed. Academic Press, New York, 1974. xii, 360 pp., illus. \$24.

Liberal Arts Physics. Invariance and Change. John M. Bailey. Freeman, San Francisco, 1974. xvi, 496 pp., illus. \$12.95.

Linear Multiobjective Programming. M. Zeleny. Springer-Verlag, New York, 1974. x, 220 pp., illus. Paper, \$7.70. Lecture Notes in Economics and Mathematical Systems, vol. 95.

Living with Your Eye Operation. Theodore Berland and Richard Aloysius Peritt. Illustrated by June Hill Pedigo. St. Martin, New York, 1974. vi, 134 pp. \$5.95.

Man. Richard J. Harrison and William Montagna. Appleton-Century-Crofts (Prentice-Hall), New York, ed. 2, 1973. xxvi, 458 pp., illus. Paper, \$5.25.

Man Shapes the Earth. A Topical Geography. Harm J. De Blij. Hamilton (Wiley), Santa Barbara, Calif., 1974. xiv, 482 pp., illus. \$11.95.

Marine Zoogeography. John C. Briggs. McGraw-Hill, New York, 1974. xiv, 476 pp., illus. \$25. McGraw-Hill Series in Population Biology.

Master Builders of the Animal World. David Hancocks. Harper and Row, New York, 1974. 144 pp., illus. + plates. \$8.95.

Mechanisms of Cell-Mediated Immunity. Robert T. McCluskey and Stanley Cohen, Eds. Wiley, New York, 1974. xii, 418 pp., illus. \$22.50.

Microbial Metabolism. H. W. Doelle, Ed. Dowden, Hutchinson, and Ross, Stroudsburg, Pa., 1974. xiv, 424 pp., illus. \$25. Benchmark Papers in Microbiology.

Molecular Virology. C. Arthur Knight. McGraw-Hill, New York, 1974. xiv, 236 pp., illus. Paper, \$5.95.

Molecules and Life. An Introduction to Molecular Biology. Mikhail V. Vol'kenshtein. Translated from the Russian edition (Moscow, 1965) by Serge N. Timasheff. Plenum, New York, 1974. xiv, 514 pp., illus. Paper, \$7.95. Reprint of the 1970 edition.

New Concepts in Air Pollution Research. Interdisciplinary Contributions by an International Group of 20 Young Scientists. Jan-Olaf Willums, Ed. Halsted (Wiley), New York, 1974. 184 pp., illus. Paper, \$11.95.

Nutrition and Fetal Development. Papers from a symposium New York, Nov. 1972. Myron Winick, Ed. Wiley-Interscience, New York, 1974. xii, 188 pp., illus. \$14.50. Current Concepts in Nutrition, vol. 2.

Obsolescence and Professional Career Development. H. G. Kaufman. Amacom (American Management Assoc.), New York, 1974. xiv, 194 pp., illus. \$11.95.

Ostracoda-Myodocopa. Part 3B, Halocypriformes-Halocypridae Conchoecinae. Erik M. Poulsen. The Carlsberg Foundation, Charlottenlund, Denmark, 1973 (distributor, Høst, Copenhagen). 224 pp., illus. Paper, DKr. 95. Dana-Report No. 84.

Of Love and Lust. On the Psychoanalysis of Romantic and Sexual Emotions. Theodor Reik. Aronson, New York, 1974. xxii, 624 pp. \$12.50. Reprint of the 1949 edition.

Our World in Space. Robert McCall and Isaac Asimov. New York Graphic Society, Greenwich, Conn., 1974. 176 pp., illus. \$19.95.

Phenothiazines and Structurally Related Drugs. Proceedings of a symposium, National Institute of Mental Health, June 1973. Irene S. Forrest, C. Jelleff Carr, and Earl Usdin, Eds. Raven, New York, 1974. xxii, 818 pp., illus. \$35. Advances in Biochemical Psychopharmacology Series, vol. 9.

Photon Correlation and Light Beating Spectroscopy. Proceedings of a symposium, Capri, Italy, July 1973. H. Z. Cummins and E. R. Pike, Eds. Plenum, New York, 1974. viii, 584 pp., illus. \$37.50. NATO Advanced Study Institutes Series, vol. 3.

The Physical Chemistry of Aqueous Systems. Proceedings of a symposium, Pittsburgh, June 1972. Robert L. Kay, Ed. Plenum, New York, 1973. x, 258 pp., illus. \$19.50. Reprinted from the *Journal of Solution Chemistry*, vol. 2, Nos. 2/3 (1973).

Physical Diagnosis in Medicine. A. E. Davis and T. D. Bolin. Pergamon, New York, 1974. viii, 122 pp., illus. Paper, \$5.75. Reprint of the 1973 edition.

Physical Science. Readings on the Environment. Jerry D. Wilson and Stephen D. Baker, Eds. Heath, Lexington, Mass., 1974. x, 374 pp., illus. Paper, \$6.95.

Physiological Chemistry of Carbohydrates in Mammals. Walton W. Shreeve. Saunders, Philadelphia, 1974. xiv, 330 pp., illus. \$11.

Plants, Animals and Man. Proceedings of a meeting, Hot Springs, Ark., Sept. 1973. Soil Conservation Society of America, Ankeny, Iowa, 1974. 272 pp., illus. Paper, \$5.

Plant Science. An Introduction to World Crops. Jules Janick, Robert W. Schery, Frank W. Woods, and Vernon W. Ruttan. Freeman, San Francisco, ed. 2, 1974. viii, 740 pp., illus. \$14.50. A Series of Books in Agricultural Science.

The Poisons Around Us. Toxic Metals in Food, Air, and Water. Henry A. Schroeder. Indiana University Press, Bloomington, 1974. xiv, 144 pp. \$6.95.

Political Science, Government, and Public Policy Series. 1973 Annual Supplement. Joan Schmitz Bergholt, Ed. IFI/Plenum, New York, 1974. Three volumes. Vol. 1, xxxiv + pp. 1-832. Vol. 2, xi + pp. 833-1690. Vol. 3, xi + pp. 1691-2514. \$250.

Politics, Medicine, and Social Science. David Mechanic. Wiley-Interscience, New York, 1974. xii, 306 pp. \$12.95.

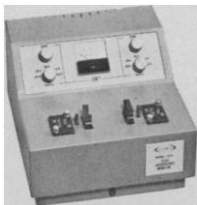
Pollution Lab. Melvin Berger. John Day (Intext), New York, 1974. 126 pp., illus. \$5.95. Scientists at Work.

Positive Peer Culture. Harry H. Vorrath and Larry K. Brendtro. Aldine, Chicago, 1974. xiv, 158 pp., illus. \$7.50.



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Les Proies des Rapaces. Petits Mammifères et Leur Environnement. Jean Chaline, Hugues Baudvin, Dominique Jamot, and Marie-Charlotte Saint Girons. Doin, Paris, 1974. 142 pp., illus. Paper, 45 F.

Protides of the Biological Fluids. Proceedings of a colloquium, Brugge, Belgium, 1973. H. Peeters, Ed. Pergamon, New York, 1974. xvi, 678 pp., illus. \$51. Proteins and Related Subjects, vol. 21.

Psychiatric Diagnosis. Robert A. Woodruff, Jr., Donald W. Goodwin, and Samuel B. Guze. Oxford University Press, New York, 1974. xii, 222 pp. Cloth, \$7.95; paper, \$4.95.

Quantum Physics. Stephen Gasiorowicz. Wiley, New York, 1974. xiv, 514 pp., illus. \$16.95.

A Random Walk in Science. An Anthology Compiled by R. L. Weber. E. Mendoza, Ed. Institute of Physics, London, and Crane, Russak, New York, 1973. xviii, 206 pp., illus., + plates. \$12.50.

Regulation of Transcription and Translation in Eukaryotes. Proceedings of a symposium, Mosbach, Germany, Apr. 1973. E. K. F. Bautz, P. Karlson, and H. Kersten, Eds. Springer-Verlag, New York, 1973. viii, 350 pp., illus. \$26.20.

Research Experiences in Plant Physiology. A Laboratory Manual. Thomas C. Moore. Springer-Verlag, New York, 1974. xii, 462 pp., illus. Paper, \$9.50.

Safety in the Chemical Laboratory. Vol. 3. Norman V. Steere, Ed. American Chemical Society, Easton, Pa., 1974. viii, 160 pp., illus. Paper, \$5.50. Reprinted from *Journal of Chemical Education*.

Science in Summer and Fall. Georg and Lisbeth Zappler. Doubleday, New York, 1974. xii, 178 pp., illus. \$5.95.

The Science of Astronomy. John R. Woods, Ed. Harper and Row, New York, 1974. xiv, 466 pp., illus. Paper, \$8.50.

Scripts for Hands on Biology. An Audio-tutorial Approach. John M. White and Robert D. Barnes. Hamilton (Wiley), Santa Barbara, Calif., 1974. Variously pagged, for looseleaf binder, \$5.95.

Sets and Transfinite Numbers. Martin M. Zuckerman. Macmillan, New York, 1974. xviii, 424 pp., illus. \$11.95.

Shock Waves and Man. I. I. Glass. University of Toronto Institute for Aerospace Studies, Toronto, 1974. xii, 170 pp., illus. \$8.50.

A Short Textbook of Clinical Chemistry. D. N. Baron, Lippincott, Philadelphia, 1973. viii, 248 pp., illus. \$6.75. Third edition of *Essentials of Chemical Pathology*.

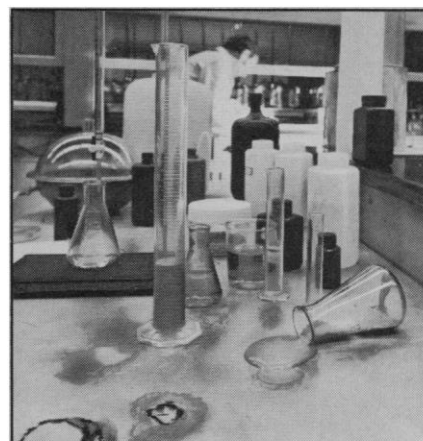
Sight and Mind. An Introduction to Visual Perception. Lloyd Kaufman. Oxford University Press, New York, 1974. xvi, 580 pp., illus. \$14.95.

Small-Group Instruction. Theory and Practice. Joseph A. Olmstead. HumRRO, Alexandria, Va., 1974. viii, 130 pp. Paper, \$3.95.

The Social Primates. Paul E. Simonds. Harper and Row, New York, 1974. xiv, 258 pp., illus. Paper, \$7.95. Animal Behavior Series.

The Strategy of Life. Clifford Grobstein. Freeman, San Francisco, ed. 2, 1974. xii, 174 pp., illus. Cloth, \$4.95; paper, \$2.95.

Subatomic Physics. Hans Frauenfelder



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and Ernest M. Henley. Prentice-Hall, Englewood Cliffs, N.J., 1974. xviii, 554 pp., illus. \$16.50. Prentice-Hall Physics Series.

Surface and Colloid Science. Vol. 7. Electrokinetic Phenomena. S. S. Dukhin and B. V. Derjaguin. Translated from the Russian by A. Mistetsky and M. Zimmerman. Wiley-Interscience, New York, 1974. xiv, 356 pp., illus. \$24.75.

Symposia of the Fourth International Congress of Primatology, Portland, Oregon, August 1972. William Montagna, Ed. Karger, Basel, 1973. 4 vols., illus. Vol. 1, Precultural Primate Behavior. xvi, 258 pp. \$42. Vol. 2, Primate Reproductive Behavior. x, 126 pp. \$21.25. Vol. 3, Craniofacial Biology of Primates. x, 274 pp. \$42. Vol. 4, Nonhuman Primates and Hu-

man Diseases. xii, 150 pp. \$24.75. The set, \$129.50.

System Identification. Methods and Applications. Harriet H. Kagiwada. Addison-Wesley, Reading, Mass., 1974. xxii, 294 pp., illus. Cloth, \$16; paper, \$8.50. Applied Mathematics and Computation Series, No. 4.

The Teaching of Medical Ethics. Proceedings of a conference, New York, June 1972. Robert M. Veatch, Willard Gaylin, and Councilman Morgan, Eds. A Hastings Center Publication, Hastings-on-Hudson, N.Y., 1973. xxii, 176 pp. Paper.

Technology of Controlled Thermonuclear Fusion Experiments and the Engineering Aspects of Fusion Reactors. Proceedings of a symposium, Austin, Texas,

Nov. 1972. E. Linn Draper, Jr., Ed. United States Energy Commission, Oak Ridge, Tenn., 1974 (available as CONF 721111 from National Technical Information Services, Springfield, Va.). xii, 1040 pp., illus. Paper, \$16.60. AEC Symposium Series, No. 31.

Temperature Regulation. S. A. Richards. Wykeham Publications, London, and Springer-Verlag, New York, 1973. xii, 212 pp., illus. Paper, \$6. The Wykeham Science Series, vol. 27.

The Therapeutic Classroom. Monica Holmes, Douglas Holmes, and Judith Field. Aronson, New York, 1974. xii, 204 pp. \$10.

Thinking Machines. A Layman's Introduction to Logic, Boolean Algebra, and Computers. Irving Adler. Illustrated by Ruth and Peggy Adler. John Day (Intext), New York, ed. 2, 1974. 222 pp., \$6.95.

Tires and Other Things. Some Heroes of Automotive Evolution. W. E. Butterworth. Doubleday, New York, 1974. x, 180 pp., illus. \$4.95.

Topological Methods in Walrasian Economics. E. Dierker. Springer-Verlag, New York, 1974. iv, 130 pp., illus. Paper, \$6.20. Lecture Notes in Economics and Mathematical Systems, vol. 92.

Toxic Constituents of Animal Foodstuffs. Irvin E. Liener, Ed. Academic Press, New York, 1974. x, 222 pp., illus. \$14.50. Food Science and Technology series.

Two New Sciences. Including Centers of Gravity and Force of Percussion. Galileo Galilei. Translated from the Latin edition (Leydden, 1638) by Stillman Drake. University of Wisconsin Press, Madison, 1974. xl, 324 pp., illus. Cloth, \$12.50; paper, \$4.50.

The Universal Traveler. A Soft-Systems Guide to Creativity, Problem-Solving, and the Process of Design. Don Koberg and Jim Bagnall. Kaufmann, Los Altos, Calif., ed. 2, 1974. 128 pp., illus. Paper, \$3.95.

Variational Methods Applied to Problems of Diffusion and Reaction. William Strieder and Rutherford Aris. Springer-Verlag, New York, 1973. x, 110 pp., illus. \$13.90. Springer Tracts in Natural Philosophy, vol. 24.

Vertebrate Structures and Functions. Readings from *Scientific American*. With introductions by Norman K. Wessells. Freeman, San Francisco, 1974. viii, 440 pp., illus. Cloth, \$12; paper, \$6.95.

Water. A Primer. Luna B. Leopold. Freeman, San Francisco, 1974. xviii, 172 pp., illus. Cloth, \$4.95; paper, \$2.95. A Series of Books in Geology.

What Chemists Do. A Laboratory Manual. Joseph Nordmann. Illustrated by the author. Harper and Row, New York, 1974. xiv, 290 pp. Paper, \$5.95.

What Is Chemistry? A Chemical View of Nature. Joseph Nordmann. Harper and Row, New York, 1974. xiv, 706 pp., illus. \$12.95.

The Work of W.H.O. 1973. Annual Report of the Director-General of the World Health Assembly and to the United Nations. World Health Organization, Geneva, Switzerland, 1974 (distributor, Q Publications, Albany, N.Y.). xii, 324 pp. Paper, Sw. fr. 12. Official Records of the World Health Organization, No. 213.

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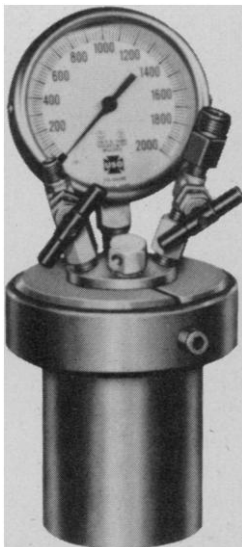
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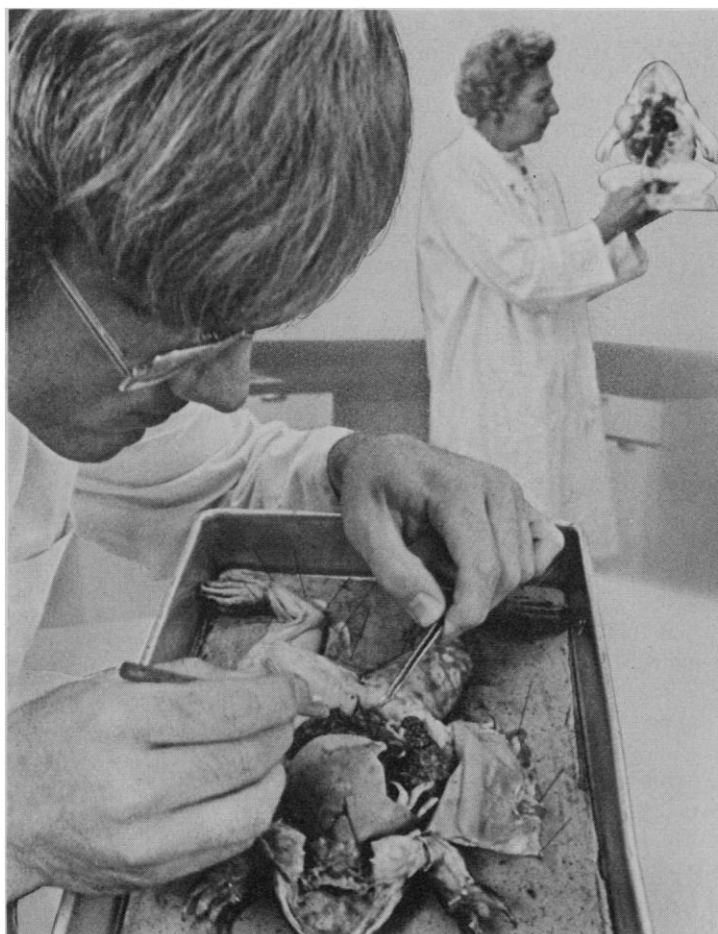
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NEWS AND COMMENT

(Continued from page 1144)

have welcomed the promise of more action than was contained in the Plan of Action, but the U.S. delegation seems to have been relieved that the final form of the plan was close to a "fall-back" formula worked out by the UN secretariat.

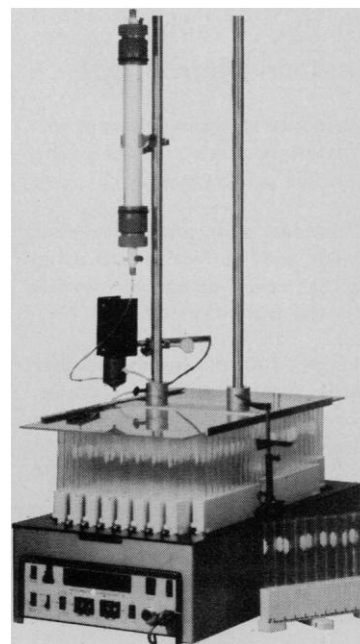
A conference like the one at Bucharest should probably not be judged by the floor debate and the final report it produces, as the press often tends to do. But it is difficult to know how far to credit more sanguine estimates from conference participants who sometimes incline to professional Pollyannaism.

UN conferences undoubtedly have consciousness-raising value. Preparations include a round of regional seminars and the writing and circulation of new technical papers, some of high quality. Contacts made among people from inside and outside government in the process have long-term effects which are hard to assess. There is also an outpouring of information and, what in some cases is more important, attention is directed to gaps in information as, for example, the lack of reliable census figures for some countries.

World conferences are now organized with plenary sessions—at which rhetoric is vented—balanced by smaller meetings of experts where interactions are often useful. In addition, starting with Stockholm, the interested but uncredentialed have had access to an unofficial parallel meeting which at Bucharest was called the "Tribune." These sessions are uneven in quality and are viewed by some as providing the UN organizers with a safety valve, but some of them, interestingly enough, draw delegates away from the main conference.

One of the more striking and potentially significant developments at Bucharest was the injection of women's rights into the debate and, rather prominently, into the Plan of Action. Highly capable women have been active in the family planning movement for many years. What was noticeable at Bucharest, however, was the new willingness of women from Third World countries to take firm, independent lines which were often opposed to the attitudes expressed by men in their delegations. In the Plan of Action, full involvement of women in development efforts as well as population programs was urged. Translating words into action back home will not be easy, but some observers feel that pessimists on population have been underestimating the power of women.

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