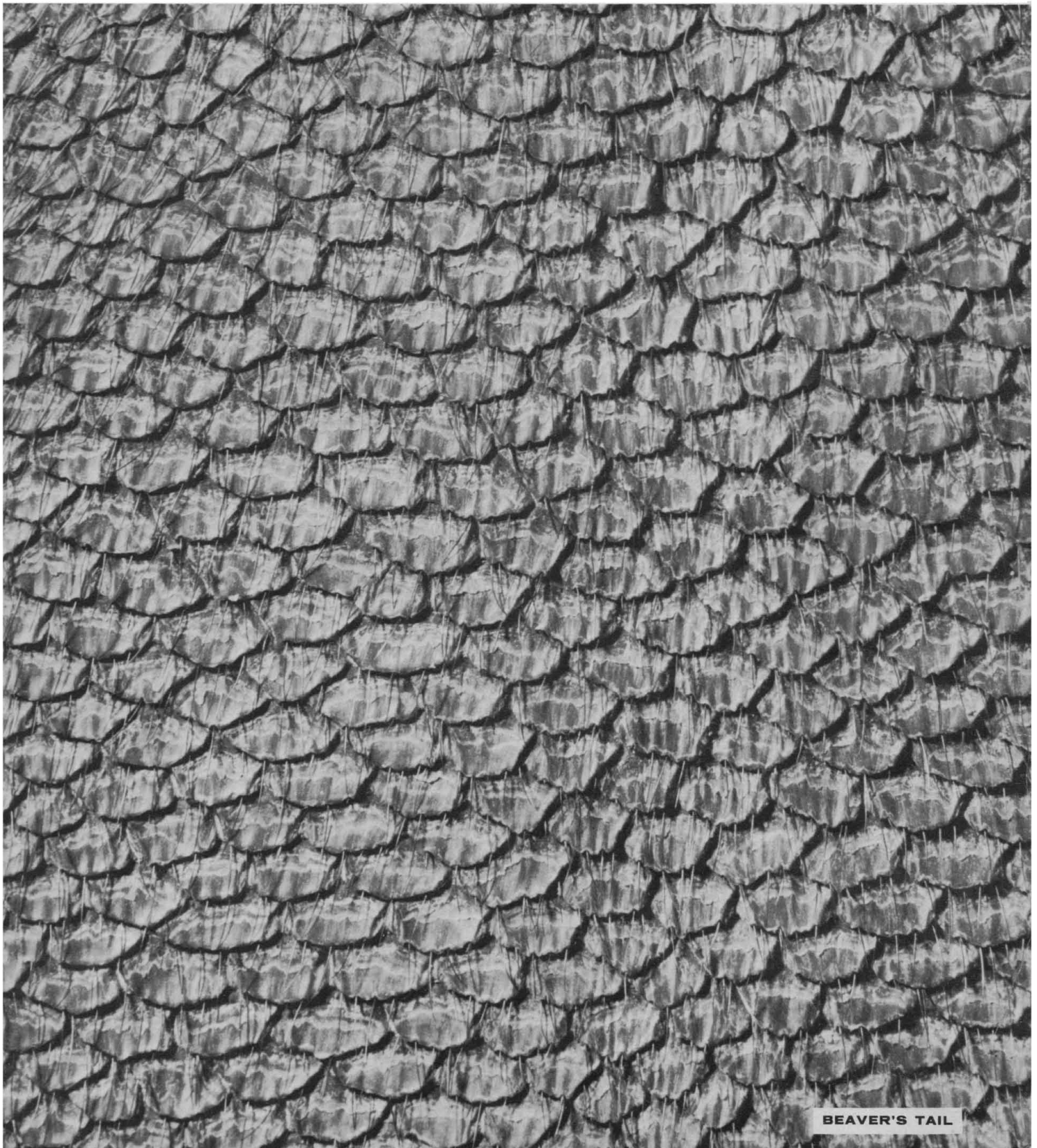


SCIENCE

20 September 1963

Vol. 141, No. 3586

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

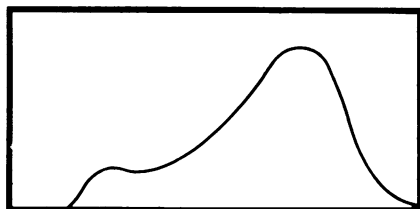


BEAVER'S TAIL

The Analytical Ultracentrifuge... a review of some exciting new measurements

The Analytical Ultracentrifuge has come a long way from its early days of simply photographing molecules as they sediment in high force fields. It now provides many of the highly sophisticated measurements needed in such rapidly advancing disciplines as biochemistry, biophysics, genetics and polymer chemistry. Three measurement areas are particularly active.

Interacting Systems The analysis of systems containing interacting components is the focus of considerable theoretical interest. An important contribution has been Gilbert's theory for reversibly interacting systems involving a single component. Systems of two components which react to form a complex also have been studied in detail. Bethune and



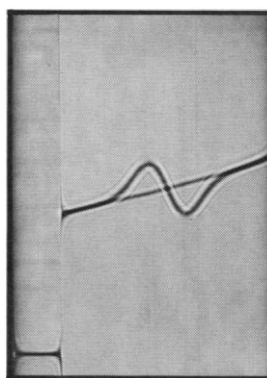
*Monomer-Trimer Equilibrium Forms
Two Boundaries*

Kegeles have applied a computer to analyze these systems as well as systems involving polymerization. Townend, Timasheff and co-workers have studied molecules which associate in aggregates as large as pentamers, and dissociate into sub-units. Others have examined isomer-

izing systems in which molecular interactions occur at speeds comparable to the time of separation of the molecular species. Both sedimentation and electrophoresis have provided important measurements in these studies.

Density Gradients Now established as a powerful and sensitive method to study nucleic acids, equilibrium sedimentation in a density gradient is rapidly finding other uses. Ifft and Vinograd have

*Schlieren
Pattern of
BMA at
Sedimentation
Equilibrium
in a Density
Gradient*

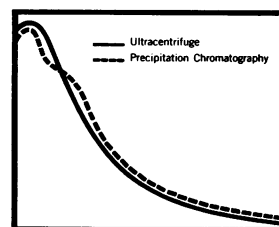


used density gradients to calculate molecular weights for solvated macromolecules, and have studied in detail the behavior of a protein of known molecular weight in a density gradient. Hu, Bock and Halvorson through use of stable isotopes have distinguished between newly synthesized and pre-existing proteins in a cell-free system. Wales has used density gradients of organic solvents to study extremely small quantities of various

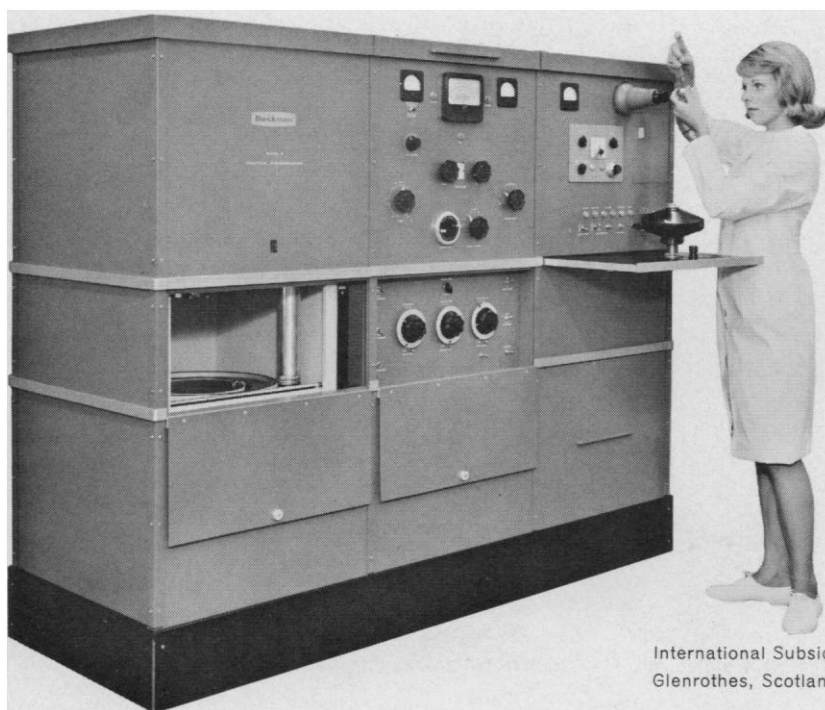
synthetic polymers, and Hermans has used density gradients to analyze for molecular weight distribution and density distribution of polymers. Both the analytical ultracentrifuge with ultraviolet and schlieren optics, and the preparative unit with swinging bucket rotors are widely used in density gradient centrifugation.

Synthetic Polymers The two density gradient studies noted above are only part of the recent surge of research using the ultracentrifuge to study synthetic polymers in organic solvents. Important papers have been published by investigators at the National Bureau of Standards,

*Comparison
of Data for
Molecular
Weight
Distribution
of
Polystyrene*



Esso, Shell Development, Dow, and Chemstrand. Their work covers linear polyethylene, polystyrene, Hevea rubber, and cis-1, 4-polyisoprene. A particularly significant example is the study by Wales and Rehfeld showing excellent results in measuring molecular weight distributions from sedimentation velocity data, and demonstrating clearly that their method did not require calibration with fractions of known molecular weight.



Such developments as these, together with up-to-date information on advances in the instrumentation itself, are reported regularly in our publication "Fractions" which is sent to owners of ultracentrifuges, electrophoresis-diffusion instruments, amino acid analyzers, and other Beckman biochemical instruments. If you would like a copy of "Fractions", we would be happy to send one to you. Please write Beckman Instruments, Inc., Spinco Division, Stanford Industrial Park, Palo Alto 5, Calif.

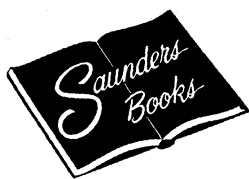
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By BARRY J. ANSON, Ph.D., (Med. Sc.), Robert Laughlin Rea Professor Emeritus, Department of Anatomy, Northwestern University Medical School; Research Professor, Department of Otolaryngology and Maxillofacial Surgery, College of Medicine, State University of Iowa. 632 pages, 8" x 10 3/4", 632 illustrations on over 600 plates (76 in color). \$18.00.
New (2nd) Edition—Published March, 1963.

New—Davenport's A Dissector's Manual of Human Anatomy

This practical new manual gives the student of anatomy specific instructions on how to accomplish regional dissection of the human body with a minimum of personal instructional assistance. *Special attention is devoted to the sites most difficult to dissect.* 151 exquisite drawings help the dissector anticipate the results of his work. Sufficient material is included to point out interstructural relationships and the significance of structure and function. The manual is organized to follow the major natural subdivisions of the body, with minor deviations inserted only where they favor regional dissection. Introductory material helps save laboratory time by covering such topics as: care of the cadaver, laboratory ethics, selection and use of instruments, terminology.

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20 September 1963

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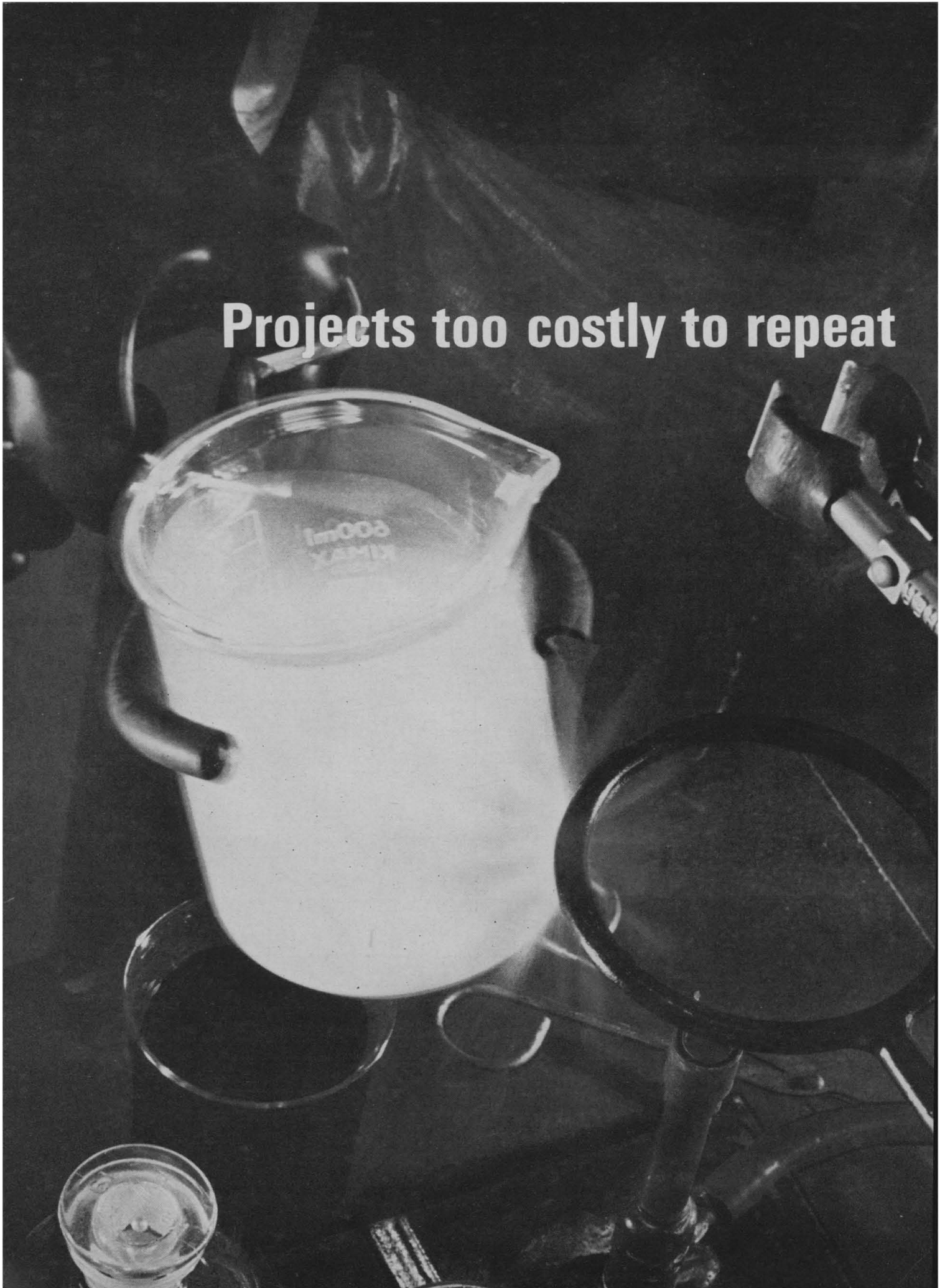
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COVER

The dorsal surface of a beaver's tail (*Castor canadensis*). Scales occur on the bodies of relatively few mammals. See review of *The Mammals*, page 1168. [Jack Dermid]

Projects too costly to repeat

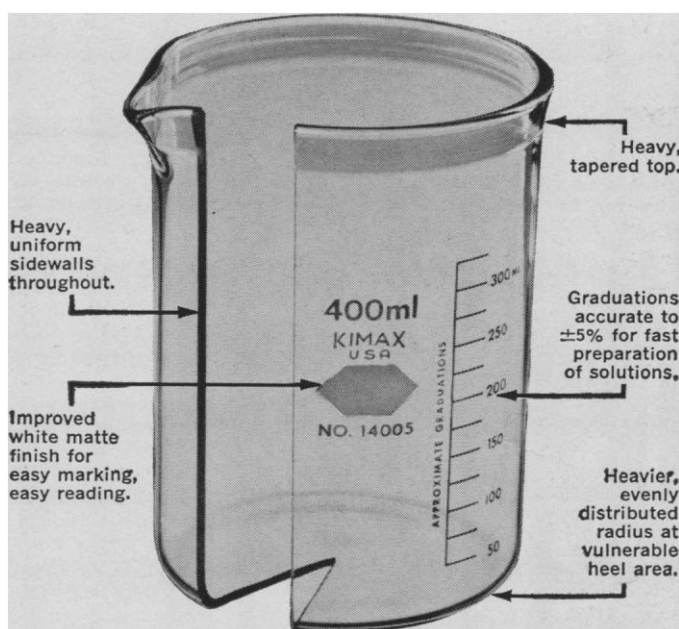


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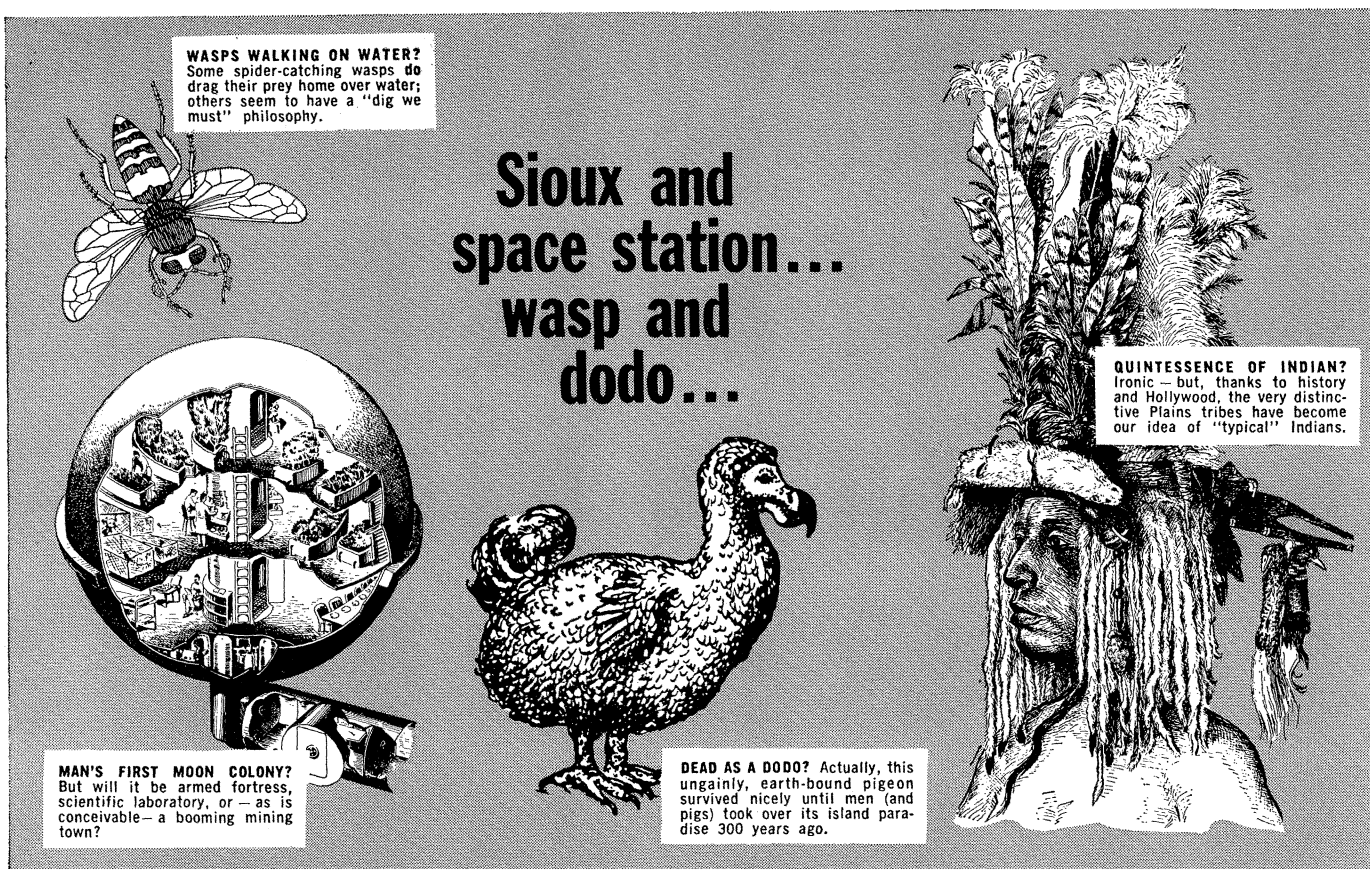
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Before you select any direct-writing recorder, you should investigate the following four basic performance requirements of most recording problems and compare to what degree available direct-writing recorders meet this requirement.

1. Signal Resolution

Signal resolution is the ability to obtain the maximum amount of useful information from the recorded trace. Very small signal variations can be missed due to insufficient pen excursion or from the signal becoming masked in a wide trace. AO specifications are based on a full 50 division pen excursion, since only then can maximum signal resolution be attained. This permits the trace to be "spread" over a wider area of the chart, thus making it much easier to see and interpret meaningful variations in the signal.

2. Frequency Response-Amplitude

For faithful reproduction of complex wave forms, even with low fundamental frequencies or repetition rates, a frequency response expressed at full 50 division pen excursion is vital. Frequency response expressed at small pen excursion or a substantial roll-off from an initial pen deflection is not a satisfactory representation of recording capabilities. The frequency response at full amplitude is the true gage of a recorder's ability to provide the greatest amount of information on complex incoming signals or transients.

The frequency response of the Series 250 Tracemaster Recorder is DC-110 cps $\pm 1\%$ at 50 divisions — *twice* that of any other unit. At a frequency response up to 200 cps the AO still provides an excursion of 12-14 divisions, where other recorder pens cease to deflect or barely deflect at such frequencies.

3. Rise Time

The ability of a recorder to record short duration transients with steep wave fronts — their presence, accurate amplitude without attenuation and exact complexion — depends upon its rise time capabilities over a full 50 divisions. The dynamic response of AO's Pen Motor backed up with fine electronics provides a rise time of 3.2 milliseconds (10% - 90%) at a *full 50 divisions*. Other recorders may specify equal rise time, but generally fail to mention that this is only at 5, 10 or 25 divisions of pen excursion. This superior rise time capability enables the Tracemaster Recorder to record transients far more faithfully.

4. Trace Uniformity and Definition

The trace must be uniform and of absolute minimum width in order to make clearly visible the smallest detail of information. The user must not confuse aesthetics with function; a relatively heavy "pretty" trace cannot provide as much signal information as a thin trace.

The AO Tracemaster Recorder uses the Direct-Carbon-Transfer technique to provide the finest line definition of any recorder and a degree of trace uniformity, under radically varying operating conditions, far superior to other writing techniques. The AO trace width is approximately 0.005 - 0.008 inches. This very fine, highly uniform trace is possible because it is independent of pen speed, paper speed or amplitude; line width is a direct function of stylus design, stylus pressure and carbon characteristics — all constant factors.

The Direct-Carbon-Transfer writing technique uses the principle of a very low mass rigid structure stylus operating against a Mylar base carbon film in direct contact with chart paper — all across a knife edge. The Mylar base serves as a natural lubricant between the stylus and knife edge, minimizing the friction loading effects and greatly extending stylus and knife edge life. It is the only writing system that can produce a good trace of (a) high frequency signals at full amplitude, and (b) wide excursion short duration transients as well as simple wave forms and DC inputs. It fully exploits the unique dynamic properties of the Tracemaster Pen Motor to provide a trace that can reveal the most minute variations in the input signal, thus providing the user with *more useful information*.

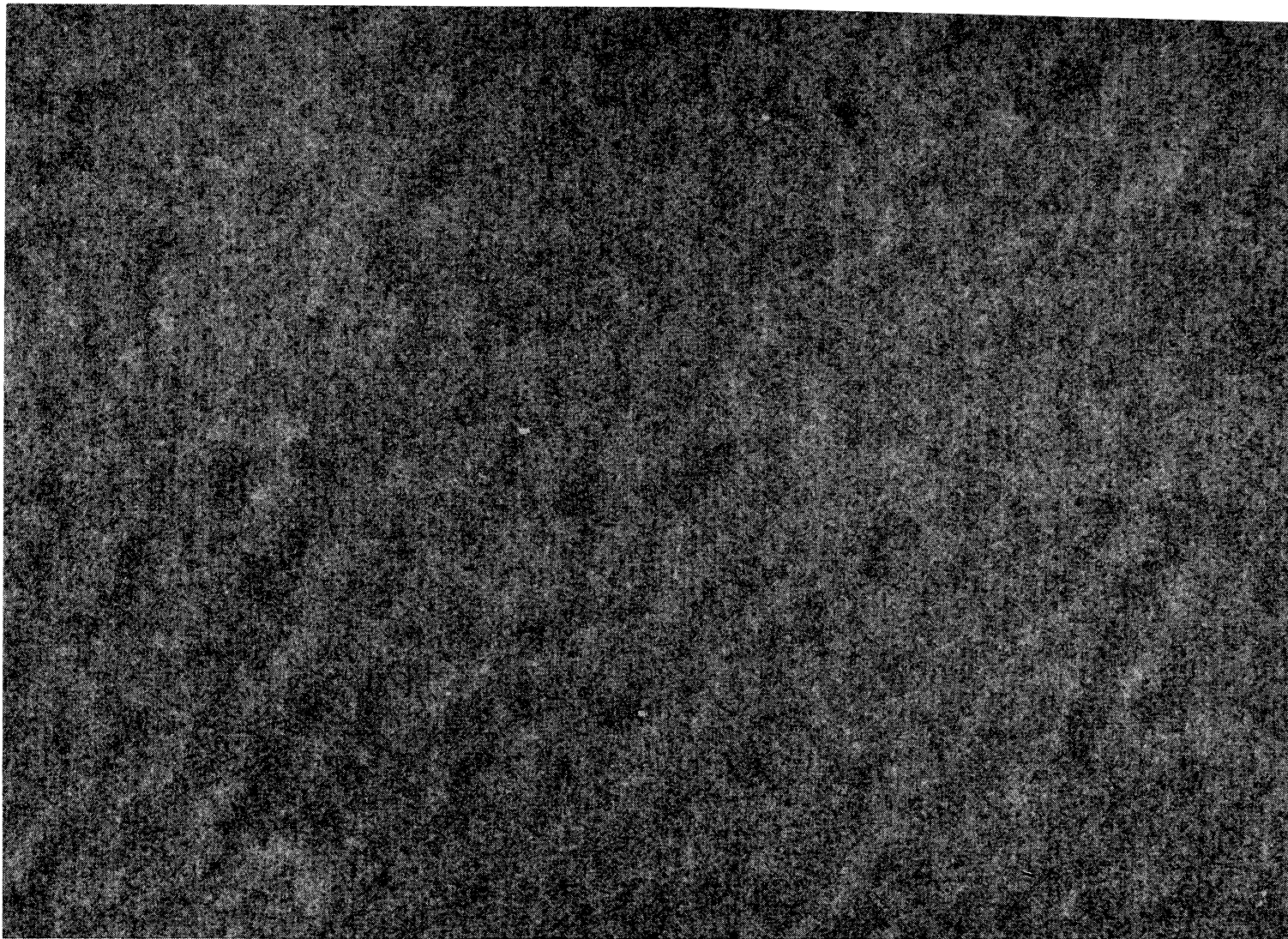
Thermal or heat writing systems cannot provide the trace uniformity or constancy of the AO DCT writing method. Any change in pen velocity or paper speed will cause (a) loss of signal, (b) burning of paper, or (c) wide variations in line width. While chart speed changes of such systems vary the amount of current to the styli, thermal lag still results in several seconds loss of trace or widening (or burning) of line. For pen speed changes, however, adequate adjustment of heat is impossible and sharp transients can be completely lost.

While pressurized ink writing alleviates some of the disadvantages of heat writing, its line width is substantially greater than AO DCT and it still does not have the capability of writing at the high frequency response-amplitude and rise time necessary for faithful reproduction of complex wave forms and transients. Pen clogging, ink splatter, run out and changes in flow characteristics under varying operating conditions may still cause loss of information. In addition pen breakage on transients can be critical.

Other Considerations

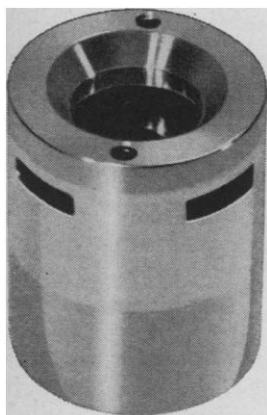
There are other things to look for when comparing direct-writing recorders — chart speed range, chart paper costs, operating convenience and flexibility. The AO Tracemaster 250 has the widest chart speed range — 0.1mm/sec to 500mm/sec — of any recorder. Chart paper costs range from 3.6¢ to 4.6¢ per foot, including carbon. This is similar to ink paper costs and *half* that of heat writing paper. Roll length and paper take-up is a full 1000 feet. The AO 250 Series includes an exclusive tilt front writing table for convenient observation of chart traces and easy notations. It also features a completely modular plug-in approach for all couplers, pre-amplifiers and driver amplifiers to provide maximum flexibility of selection and interchangeability.

These are the reasons why Tracemaster Recorders are the highest performing direct-writing recorders on the market. These are the reasons why AO has established new standards for quality and recording performance. These are the reasons *you* should specify Tracemaster! For complete information or a demonstration write: American Optical Co., Instrument Division, Industrial Electronics Dept., P. O. Box A, Buffalo 15, N. Y. Phone: 716-895-4000, TWX 716-858-1380.



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The background electron micrograph on this page shows the (111) orientation of single crystal gold. The spacing of the vertical lines is 2.35Å. It was taken by the tilted illumination method. The total magnification is 6,700,000.

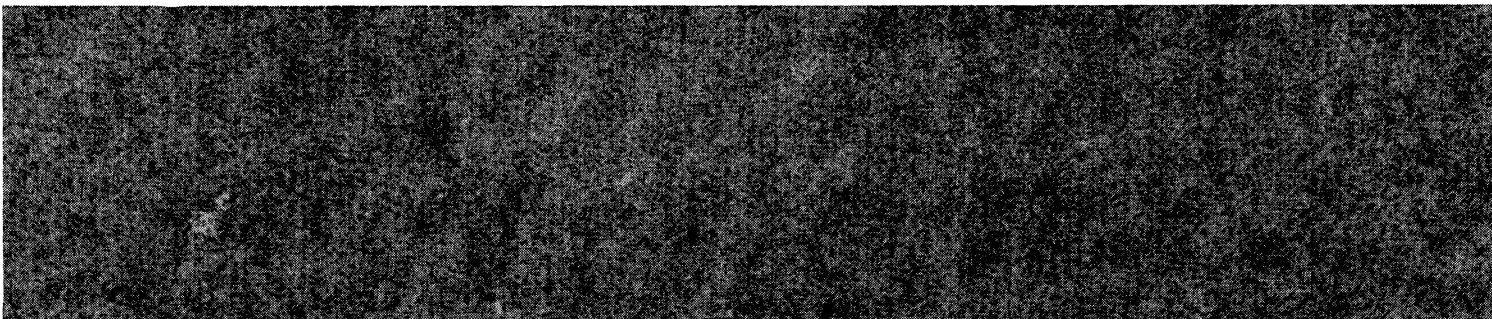
This extraordinary micrograph was obtained with a standard Model HU-11A by an expert electron microscopist under controlled conditions at the Hitachi Central Research Laboratory in Koku-

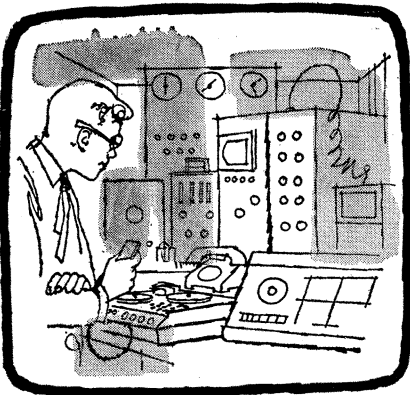
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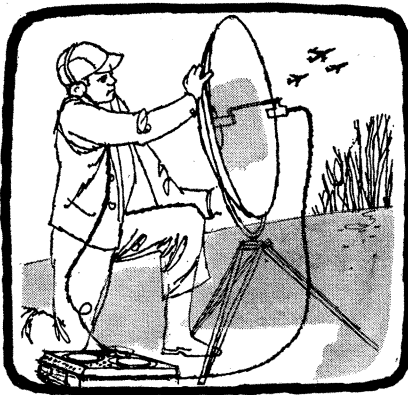
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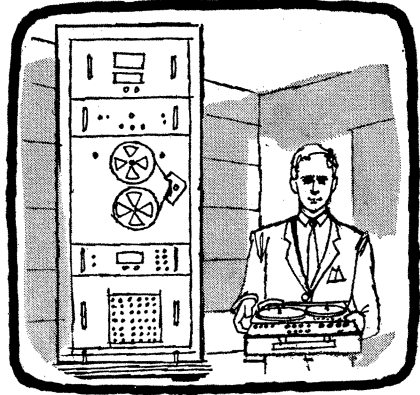




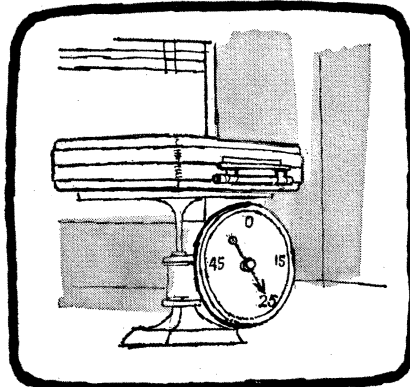
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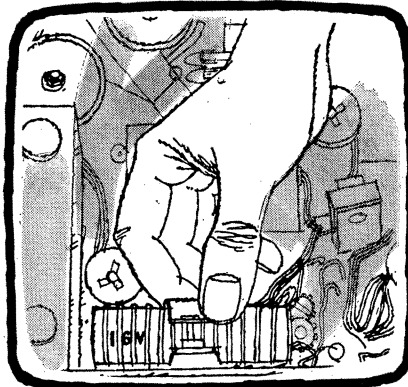
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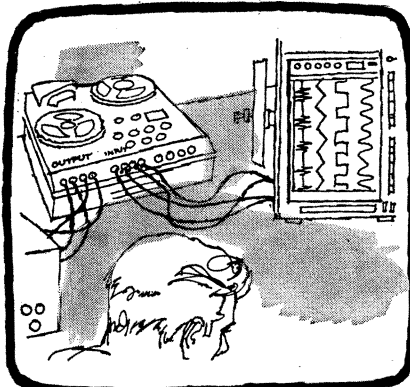
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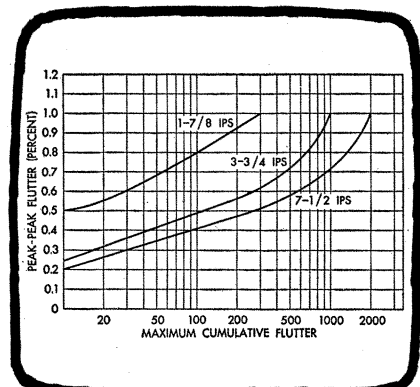
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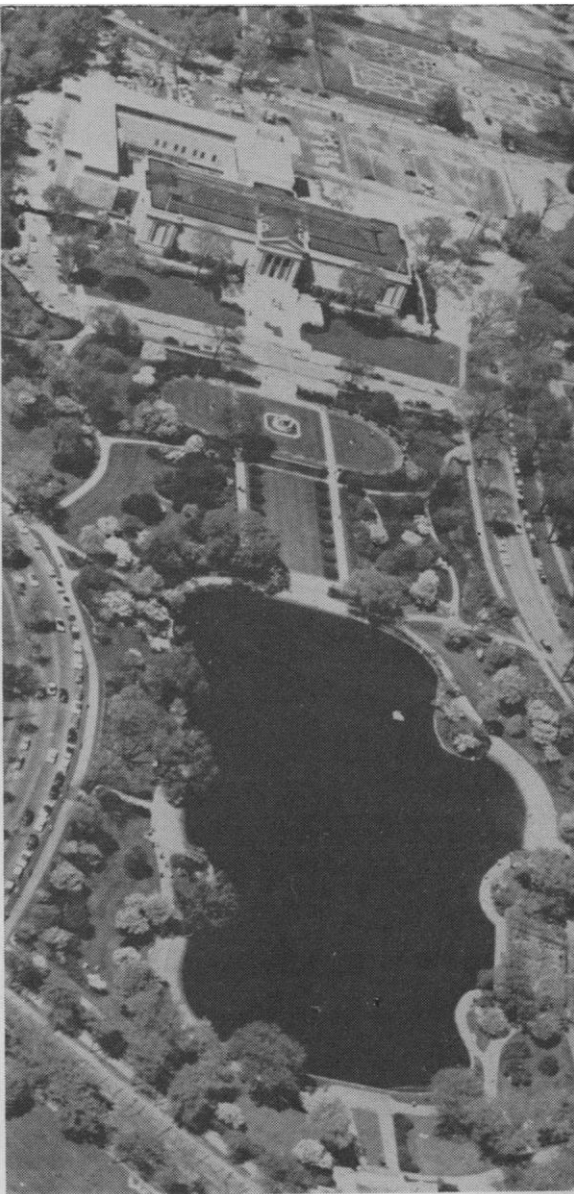
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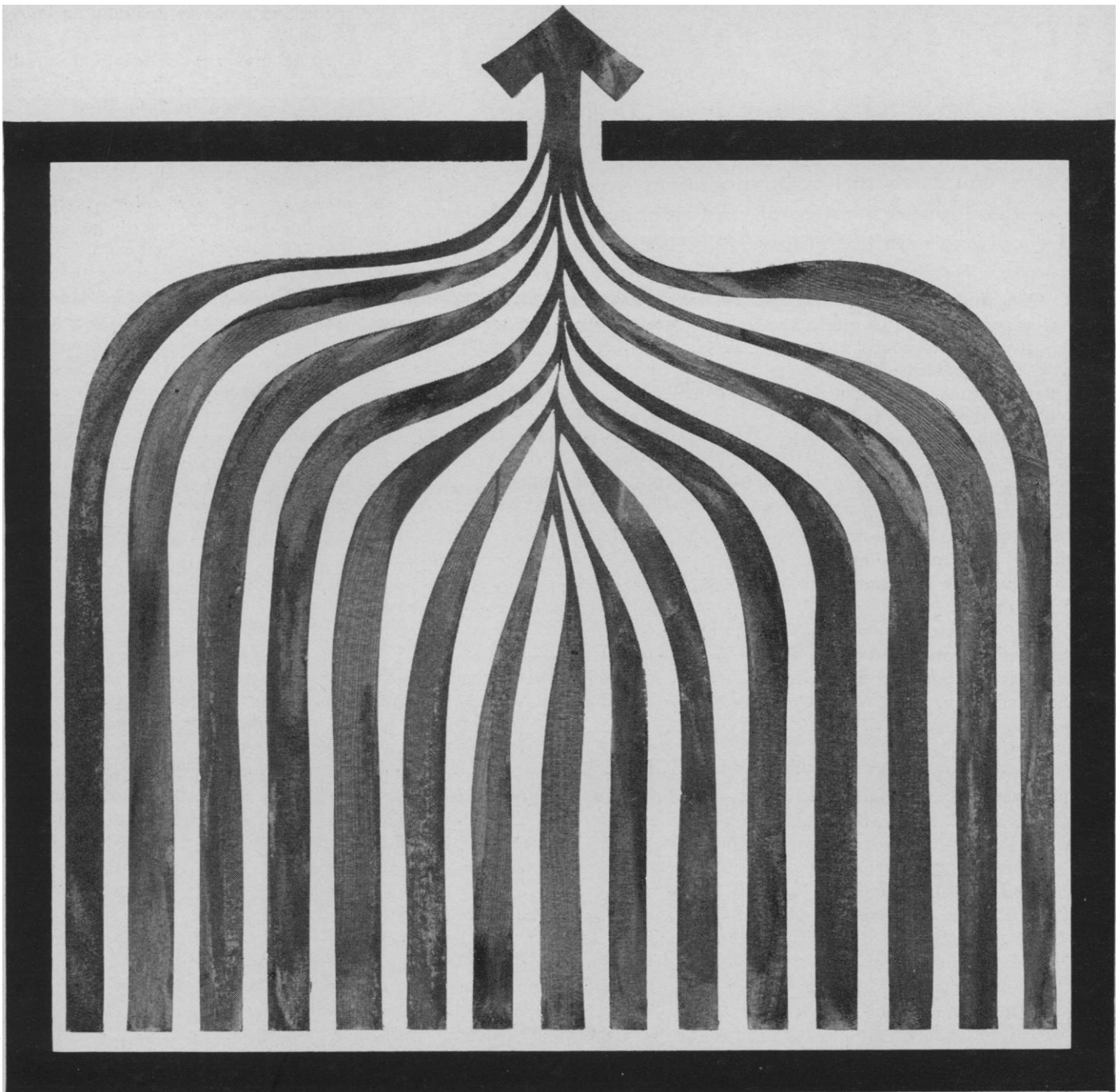
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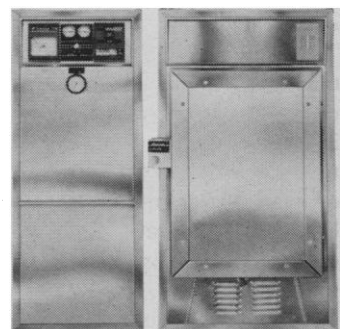
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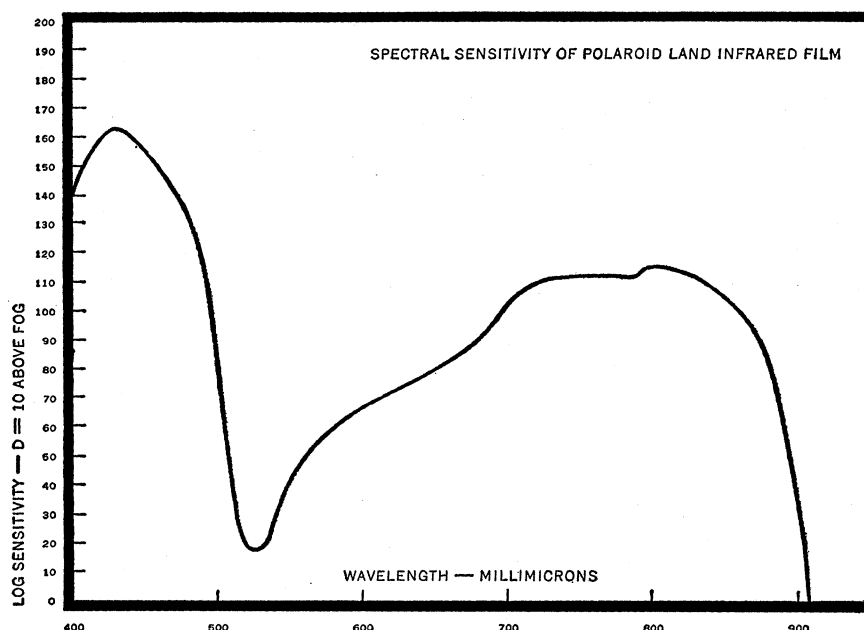


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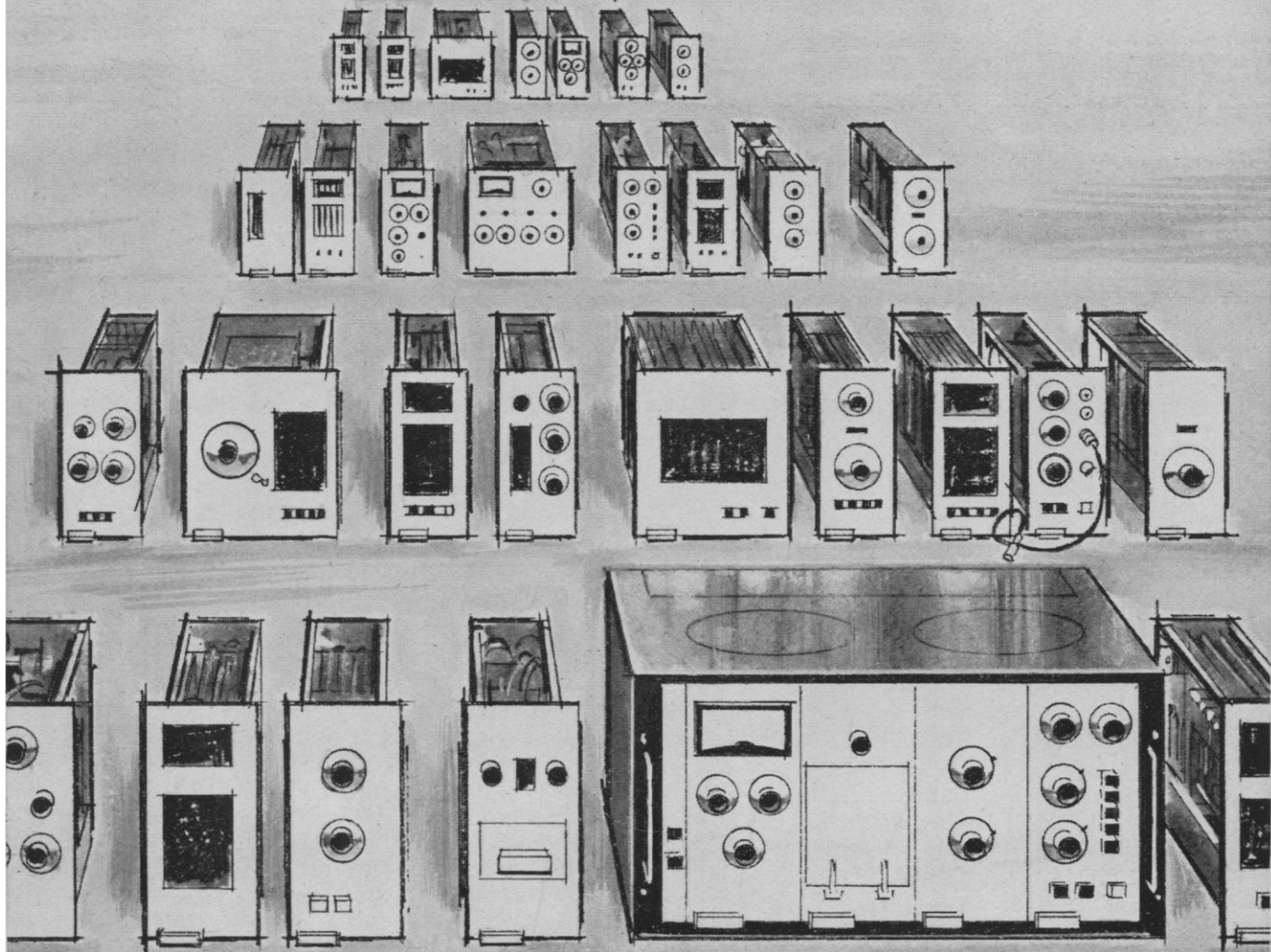
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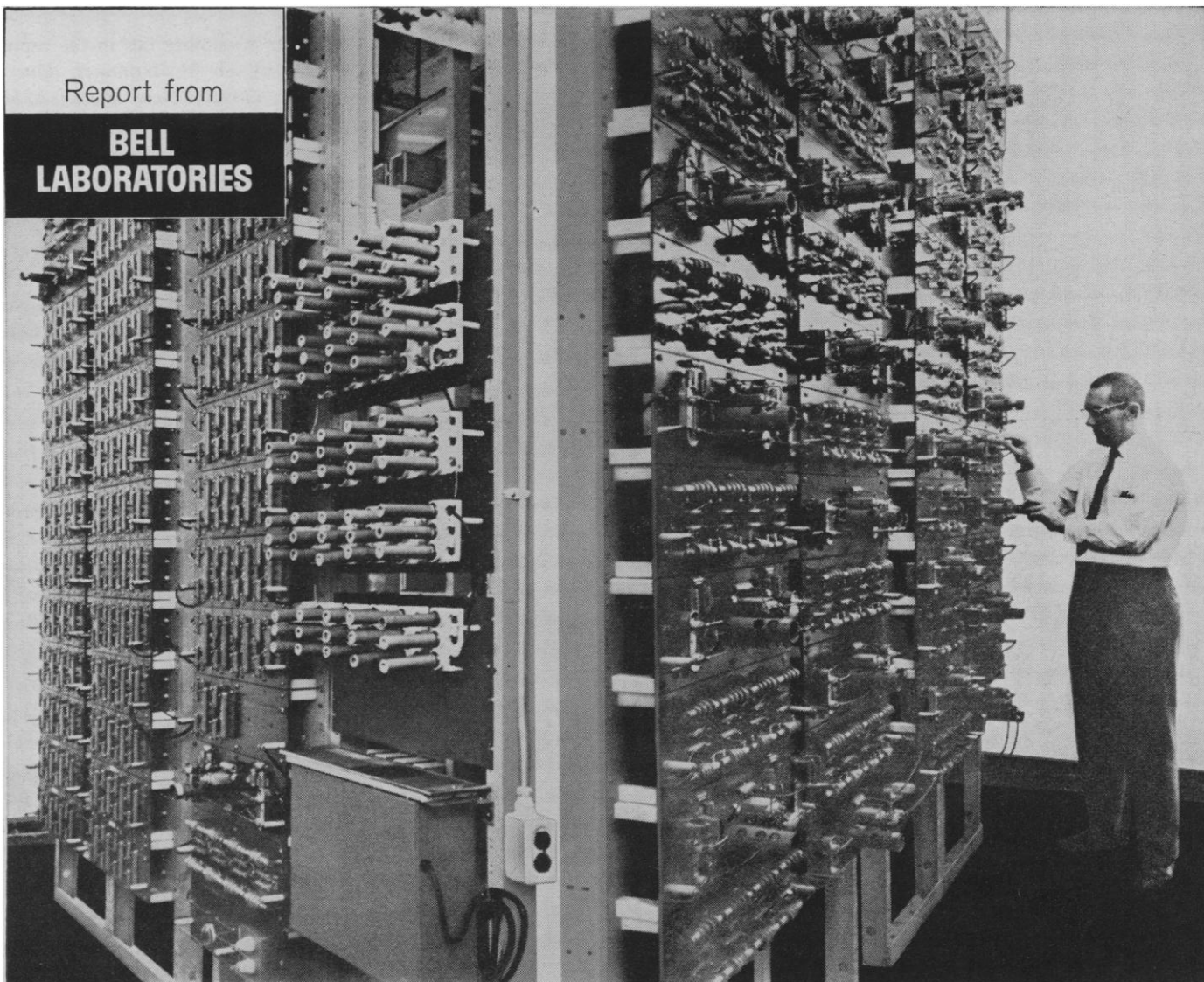
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In Memory of . . .

Each year we receive a few letters asking us to contribute to a memorial trust that is being established to honor an eminent scholar or teacher. Occasionally someone writes proposing to use his own estate for this purpose. These letters always pose a problem: the man's memory deserves honor, but there is real question whether there will be effective handling of a fund that almost certainly will be small. If the income is to be used locally—for example, to support a lectureship or a scholarship at a particular institution—and if the management is centralized, as in a faculty committee at that institution, there is reason to hope that the fund will be effectively utilized. But if these conditions are not met, the management may be pretty casual and the income may not be used very effectively, or the time required for thoughtful management may be unreasonably great for the amount of money involved.

Twenty-odd years ago a former president of the AAAS established a trust fund to support research in the field in which he was particularly interested. The fund is small and not widely known. Its grants have therefore been subject to the variable quality and size of the requests received each year. The trustees have been conscientious, and much of the income has been used to carry out the donor's wishes. But in some years the trustees have not found work of suitable merit and character to support. Instead of frittering the money away on work of poor quality, they have in those years added some of the income to capital. This action has led to a new difficulty: the Internal Revenue Service has charged the fund with unreasonable accumulation of income and is threatening to remove its tax-exempt status. This situation may serve as a warning to those who accept responsibility for the management of other small trusts.

This particular trust has partly solved its problem in a fashion that may be of interest to the sponsors or trustees of other small memorial funds: by transferring income to the Sigma Xi-RESA Research Fund. That fund is widely known and thoughtfully administered. Its small grants (\$100 to \$2000) provide all fields of science with a kind of support that is not likely to be supplied by grants from government agencies or large private foundations. Sigma Xi would welcome additional monies for its Research Fund, and it has in fact recently increased its own contributions because the amount of money available annually has been insufficient to meet all the meritorious requests. The officers of Sigma Xi are willing to take over responsibility for other funds, either by accepting the entire trust or by making grants from annual income. The cost of selecting appropriate grantees and other administrative costs would be borne by Sigma Xi, so all of the income from a transferred fund would be used for research grants.

We commend the idea to those who are proposing to establish new memorial trusts and to those who are finding it difficult to use in satisfactorily constructive ways the income from existing funds of this character. Surely the man whose memory is being honored would want the fund that bears his name to be used as constructively as possible. Sigma Xi offers a convenient and respected means of achieving this end.—D.W.

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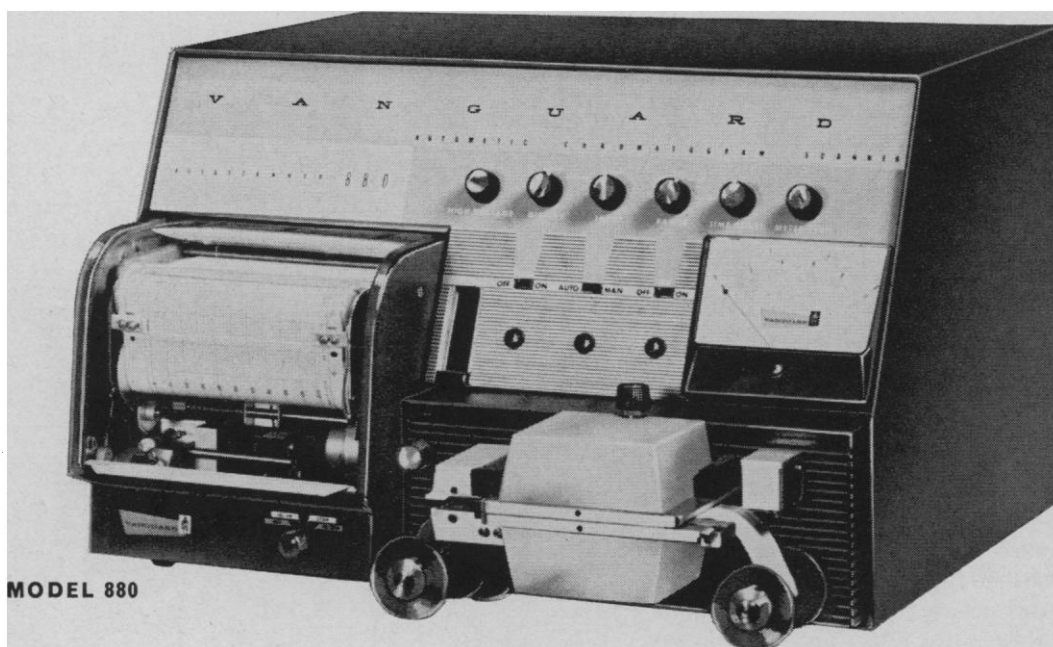
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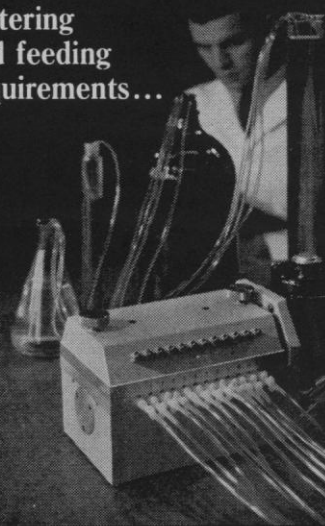
Ushakov described an interesting geographic study on populations of a frog collected over a range from north-western Russia to central Asia. The populations at the western and eastern ends of the cline are clearly different in thermostability of muscles, those in the central region are intermediate. It is argued that cellular adaptations are important for natural selection only in gametes and that integrative adaptations are dominant in adult animals.

There was general agreement that the tolerance limits of intact animals are narrower than for cells studied in vitro. Also concurred upon was the concept shown by one of Ushakov's experiments with leeches. He postulated that there may be meaningful capacity adaptation of cholinesterase in muscle with no change in thermal tolerance of the enzyme after acclimation to different temperatures. Ushakov generalized that acclimatory changes result from "integrative" effects in whole animals, and that thermoresistance is a "conservative" character, not adaptive for cells. Prosser suggested that perhaps similar tests made on nerve cells might give results close to those with whole animals.

Because the survival-temperature curves for heat death are very steep (Q_{10} approaches 4), it is suggested that heat death of muscle may be due to protein denaturation. A possible explanation of the apparent lack of resistance adaptation in muscle may be that protein primary structure is strictly determined by the genotype, hence there can be no qualitative effects on protein structure induced by the environment. The effects induced by environment which do occur in cells of animals may be in capacity adaptation and may result from quantitative changes in various enzymes, that is, by induction, repression, and inhibition of alternate pathways, or from changes in cofactors, lipids, and so forth. There seems to be no clear case of a direct acclimation effect on primary structure of any cellular protein, and this is to be expected if all protein synthesis is genetically determined. The possibility of effects on tertiary structure is less clear.

That cellular capacity adaptation can occur was indicated by Precht (Germany) in experiments in which the anterior and posterior portions of an eel were cooled or warmed sep-

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arately. Capacity adaptation in the sense of changes in oxygen consumption of muscle measured at intermediate temperatures occurred. Nervous acclimation was discussed by Prosser. In a report on hormonal factors in fish and earthworms Rao (India) noted a histological increase in height of cells secreting thyroid in Tilapia and inactivity of neurosecretory cells of a tropical earthworm when cold-acclimated. He also reported that body fluids from these cold-adapted animals stimulate oxygen consumption by isolated tissues of warm-adapted ones. The nature of such stimulating agents is unknown.

There were expectations that some vestige of Lysenkoism, in respect to cold adaptation, would be found, but Leningrad and Moscow groups seem to be going to extremes to prove that resistance adaptation in animals is genetic and that variation is fixed only by natural selection. When the question was raised in group discussions, a most emphatic denial of belief in Lysenko's theories was voiced. In fact, the Lysenkoists who are most active in the field of plant hardiness were not even included in the symposium. However, as recently as December 1962, a conference was held in Moscow on the problems of controlling heredity of farm crops.

It is apparent that in several fields Western biologists cannot neglect Soviet research. As an example, though reprints have been exchanged by the plant group for several years, a total of some three dozen new reprints and six books were presented to an American participant during the sessions. There is also an urgent need for more extensive translation of Russian articles.

The symposium was organized by the Institute of Cytology under the auspices of the Academy of Science of the U.S.S.R. with some support from UNESCO. Hospitality of the Soviet scientists to the foreign visitors was most generous and it was evident that there was a real thirst for information about the Western interpretation of research in the fields discussed. The general consensus was that more interchange between the U.S.S.R. and the United States is desirable.

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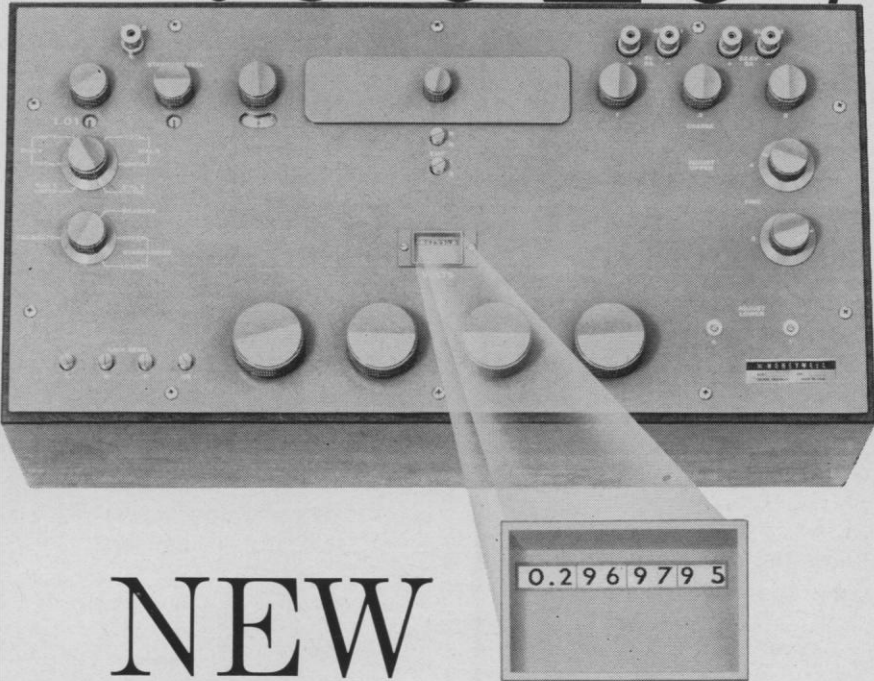
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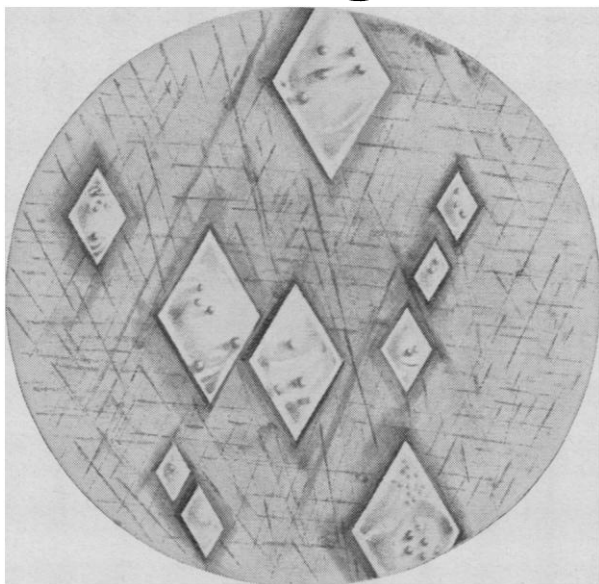
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Social Anthropology: Models, Political Systems, Religion, and Urbanization

The relevance of models for social anthropology, political systems and the distribution of power, modern approaches to the study of religion, and the social anthropology of complex urban societies were the chief new developments discussed at a joint Anglo-American meeting of the British Commonwealth Association of Social Anthropology held at Cambridge University, 24-30 June.

In the sessions devoted to models, Ward Goodenough (Pennsylvania) approached the concepts of status and role through the utilization of cognitive theory and Guttman scaling techniques; and David Schneider (Chicago) and I. M. Lewis (University College, London) presented a critical analysis of alliance and descent theory with reference to unilineal descent and prescriptive marriage. Remarks by the latter stimulated comments on the nature of the models used by anthropologists and their relevance to different field and research problems (Edmund Leach, Cambridge; M. N. Srinivas, Delhi; George Homans, Harvard). Marshall Sahlins (Michigan) offered new interpretations on the interrelations between the forms, material conditions, and social relations of exchange in primitive communities; he made a basic distinction between reciprocal exchange and centralized pooling of goods, and related different types of reciprocity to kinship, rank, and wealth differences.

Since the war, anthropologists have become increasingly interested in political systems and the distribution of power. A number of papers were presented by members of the School of Oriental and African Studies, London, on consensus in decision-making (F. G. Bailey), the comparative study of factions (R. Nicholas), and the significance of quasi-groups (Adrian Mayer). Concerned with the typology of African states, L. A. Fallers (Chicago), P. C. Lloyd (Ibadan), and A. Southall (Makerere) drew on the theoretical researches of American political scientists and their own field work to develop more adequate classifications for studies of political change.

The renewed interest in the scientific study of religion was noted by M. E. Spiro (University of Washing-

ton) when he argued that an adequate explanation for the persistence of religion requires both psychological and sociological variables and suggested some important areas for investigation. C. Geertz (Chicago), viewing religion as a cultural system, urged a wider conception of religion which would center on the meaning of the symbol systems. A number of papers were concerned more specifically with religion in various African societies, notably V. W. Turner (Manchester) on color symbolism among the Ndembu, R. E. Bradbury (University College, London) on ancestor worship among the Edo, and E. H. Winter (Virginia) on religion and society among the Iraqw. J. Loudon (Medical Research Council, South Wales) presented the results of a pilot study of religious order and mental disorder in a Welsh parish.

Various aspects of complex societies, such as urbanization in both newly developing nations and in Western society, were discussed. Eric Wolf (Michigan) pointed to the role of kinship, friendship, and patron-client relations in making the formal structures of complex societies operate more effectively; and B. Benedict (London School of Economics) analyzed the social characteristics of isolated communities. The theoretical orientations of urban studies in Africa were outlined by J. C. Mitchell (University College of Rhodesia and Nyasaland); and some preliminary hypotheses with regard to society and culture in urban Britain were presented by W. Watson and R. Frankenberg (Manchester).

The general discussions emphasized differences of approach with regard to the strategy and scale of research. Much to the surprise of many participants was the fact that there were no significant differences in American and British points of view, a situation that would not have been true even a decade ago.

Because the conference had been unusually successful, plans were made for future joint meetings; however, it was decided that they would be on a smaller scale, and with a more specific agenda. Participation of the American contingent, which included about 12 anthropologists, was made possible by a grant from the National Science Foundation, administered through the American Anthropological Association. The program was arranged by



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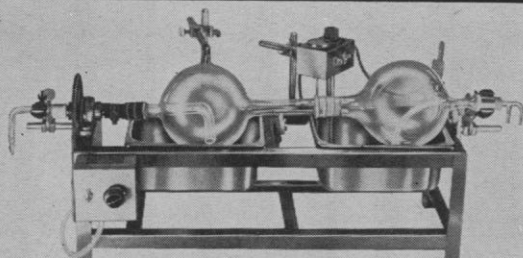
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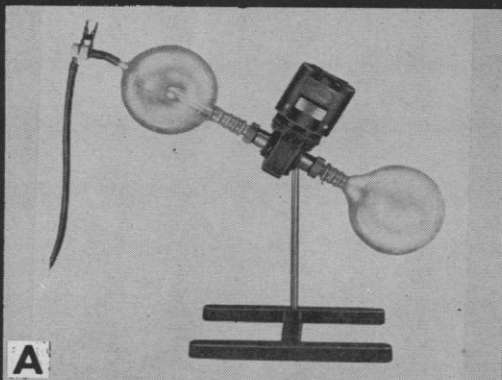
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Raymond Firth (London School of Economics) and Fred Eggan (Chicago) and was chaired by Max Gluckman (Manchester).

During the conference, participants attended the annual meeting of the Royal Anthropological Institute, and heard the presidential address of I. Schapera and the Huxley Memorial Lecture, delivered by E. E. Evans-Pritchard.

FRED EGGAN

*Department of Anthropology,
University of Chicago*

Forthcoming Events

October

1-3. **Physics and Nondestructive Testing**, symp., San Antonio, Tex. (W. J. McGonnagle, Southwest Research Inst., 8500 Culebra Rd., San Antonio 6)

1-3. **Space Electronics**, 8th annual symp., Miami Beach, Fla. (H. E. Weber, Martin Co., Orlando, Fla.)

1-4. **Animal Care Panel**, Los Angeles, Calif. (A.C.P., Box 1028, Joliet, Ill.)

1-4. **Aerospace Nuclear Safety**, 1st natl. topical meeting, Albuquerque, N.M. (A. J. Smith, Topical Meeting, Box 818, Kirkland Air Force Base, N.M.)

1-4. **Electronics Research and Development for Civil Aviation**, London, England. (Secretary, Inst. of Electrical Engineers, Savoy Pl., London W.C.2)

1-4. **American Council of Independent Laboratories**, Lincoln, Neb. (ACIL, 4302 East-West Highway, Washington, D.C.)

1-5. **Aviation and Cosmonautical Medicine**, 6th intern. congr., Rome, Italy. (Secretariat of the Congress, Centro di Studi e Ricerche di Medicina Aeronautica, Via P. Gobetti 2 a, Rome)

1-6. **Microbiology of Crude Oil**, intern. symp., Greifswald, Germany. (W. Schwartz, Institut für Mikrobiologie, Ludwig-Jahn-Str. 15, Greifswald)

3-4. **Physics of Optical Glass**, conf., Lathom, England. (Inst. of Physics and the Physical Soc., 47 Belgrave Sq., London S.W.1, England)

4-5. **Documentation**, intern. federation, Stockholm, Sweden. [Tekniska Litteratursällskapet (TLS) Rånhaamsvägen 12, Stockholm-Bromma 11]

4-5. **Muscular Dystrophy**, symp., Houston, Tex. (M. M. Guest, Dept. of Physiology, Univ. of Texas Medical Center, Galveston)

4-6. **American Acad. of Psychotherapists**, New York, N.Y. (H. Rockberger, 44 S. Munn Ave., East Orange, N.J.)

5. **Paleontological Research Inst.**, Ithaca, N.Y. (K. Caster, Geology Dept., Univ. of Cincinnati, Cincinnati, Ohio)

7-10. **Instruments and Research Equipment**, symp. and exhibit, 13th annual, Bethesda, Md. (J. B. Davis, National Institutes of Health, Bethesda 14)

7-11. **American Soc. of Civil Engineers**, annual, San Francisco, Calif. (ASCE, 345 E. 47 St., New York 17)

7-11. **Biological Effects of Neutron Irradiations**, intern. symp., Upton, N.Y.

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(C. W. Pelzer, Div. of Special Projects, U.S. Atomic Energy Commission, Washington 25)

7-12. **Communication**, 11th intern. congr., Genoa, Italy. (Civico Instituto Colombiano, Palazzo Tursi, Genoa)

8-10. **Analytical Chemistry** in Nuclear Technology, 7th conf., Gatlinburg, Tenn. (C. D. Susano, Oak Ridge Natl. Lab., P.O. Box X, Oak Ridge, Tenn.)

5-6. New England Intercollegiate **Geological Conf.**, Providence, R.I. (J. Rogers, Dept. of Geology, Yale Univ., Box 2161 Yale Station, New Haven, Conn.)

6-9. **Process Engineers**, annual, Hanover, Germany. (German Engineering Assoc., Rheingau Allee 25, Frankfurt-am-Main)

6-10. **Water Pollution Control Federation**, Seattle, Wash. (to be reconvened 13-16 Oct., Honolulu, Hawaii). (R. E. Furman, WPCF, 4435 Wisconsin Ave., NW, Washington, D.C.)

6-12. **Clinical Pathology**, 5th intern. congr., Mexico City, Mexico. (E. Cervera B., Asociacion Mexicana de Laboratorio Clinico, Durango 213, Mexico 7)

7. **Pediatric Radiology**, Montreal, P.Q., Canada. (R. G. Lester, Box 151, Medical College Station, Richmond, Va.)

8-10. Ciba Foundation Colloquium on **Endocrinology and Aetiology of Diabetes Mellitis** and Its Complications, London, England. (Ciba Foundation, 41 Portland Pl., London W.1)

8-10. **Science and Engineering**, 10th annual symp., U.S. Air Force Academy, Colo. (Maj. J. Shafer, RROND, U.S. Office of Aerospace Research, Washington, D.C.)

8-11. **Electromagnetic Relays**, intern. conf., Sendai, Japan. (C. F. Cameron, School of Electrical Engineering, Oklahoma State Univ., Stillwater)

8-11. American **Roentgen Ray Soc.**, Montreal, P.Q., Canada. (American College of Radiology, 20 N. Wacker Dr., Chicago 6, Ill.)

8-12. **Neurological Surgeons**, 13th congr., Denver, Colo. (J. R. Russell, 1815 North Capitol Ave., Indianapolis 2, Ind.)

9. American Acad. of **Arts and Sciences**, Brookline, Mass. (R. W. Burhoe, American Acad. of Arts and Sciences, 280 Newton St., Brookline Station, Boston, Mass.)

9-11. **Aerospace Electronics**, exposition and conf., Los Angeles, Calif. (E. Niles, Aerospace Electrical Soc., 3540 Wilshire Blvd., Los Angeles 5)

9-13. **Cytophotometry and Interference Microscopy**, symp., Giessen, Germany. (W. Sandritter, Pathologisches Institut, Justus Liebig Universität, Giessen)

10-11. **Bioassay and Analytical Chemistry**, 9th conf., San Diego, Calif. (G. Bucolo, General Atomic Div., General Dynamics Corp., P.O. Box 608, San Diego 12)

10-11. **Engineering** conf., Long Beach, Calif. (Natl. Soc. of Professional Engineers, 2029 K St. NW, Washington, D.C. 20006)

10-11. **Kidney**, 15th annual conf., New York, N.Y. (Natl. Kidney Disease Foundation, 342 Madison Ave., New York 17)

10-11. **Lipid Transport**, intern. symp., Nashville, Tenn. (H. C. Meng, Vanderbilt Univ. School of Medicine, Nashville)

10-13. American Soc. of **Clinical Hypnosis**, 6th, San Francisco, Calif. (W. T.

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13. American College of Dentists, Atlantic City, N.J. (O. W. Brandhorst, 4236 Lindell Blvd., St. Louis, Mo.)

13-17. Neurosurgery, 10th Latin American conf., Buenos Aires, Argentina. (R. Morea, Callao 1685, Buenos Aires)

13-18. Society of Motion Picture and Television Engineers, Boston, Mass. (H. J. Hall, Itek Corp., Lexington, Mass.)

13-18. Plastic Surgery, 3rd intern. congr., Washington, D.C. (Capt. Joseph Connelly, Bethesda Naval Hospital, Bethesda 14, Md.)

14-16. Geological Sciences, intern. union, Rome, Italy. (T. Sorgenfrei, Trane-gaardsvej 20, Hellerup, Denmark)

14-16. Systems and Procedures Assoc. of America, intern., Milwaukee, Wis. (R. L. Irwin, 7890 Brookside Dr., Cleveland 38, Ohio)

14-18. Audio Engineering Soc., 15th, New York, N.Y. (J. Harvey, Harvey Associates, 580 Fifth Ave., New York 36)

14-17. Association of Official Agricultural Chemists, Washington, D.C. (L. G. Ensminger, AOAC, Box 540, Benjamin Franklin Station, Washington 44)

14-18. American Rocket Soc., 18th annual, New York, N.Y. (ARS, 500 Fifth Ave., New York 36)

14-19. Anatomical Pathology, 4th Latin American congr., San Salvador, El Salvador. (F. K. Mostofi, Armed Forces Inst. of Pathology, Washington 25)

15. Oak Ridge Inst. of Nuclear Studies, Oak Ridge, Tenn. (W. G. Pollard, ORINS, Oak Ridge)

15-16. Reactor Operations, symp., American Nuclear Soc., Ottawa, Ont., Canada. (ANS, 244 E. Ogden Ave., Hinsdale, Ill.)

15-17. Progress in Metallography, seminar, Leoben, Austria. (Eisenhütte Österreich, Eisenhütteninstitut, Montanistische Hochschule, Leoben)

15-18. American Dietetic Assoc., 46th annual, Philadelphia, Pa. (ADA, 620 N. Michigan Ave., Chicago 11, Ill.)

16-18. Ballistic Missile and Space Technology, San Diego, Calif. (C. T. Morrow, Aerospace Corp., P.O. Box 95085, Los Angeles, Calif.)

16-18. Calorimetry, 19th conf., Bartlesville, Okla. (G. T. Armstrong, Natl. Bureau of Standards, Washington, D.C.)

16-18. Gaseous Electronics, 16th annual conf., Pittsburgh, Pa. (G. J. Schulz, Westinghouse Research and Development Center, Pittsburgh 35)

16-18. American Vacuum Soc., 10th natl. symp., Boston, Mass. (AVS, Box 1282, Boston 4)

17-18. Industrial Hydraulics, natl. conf., Chicago, Ill. (E. Hansen, Illinois Inst. of Technology, Chicago 16)

17-18. American Soc. of Tool and Manufacturing Engineers, Pittsburgh, Pa. (H. E. Conrad, 10700 Puritan Ave., Detroit, Mich.)

17-19. Society of Photographic Scientists and Engineers, Washington, D.C. (E. Ostroff, SPSE, Box 1609, Main Post Office, Washington, D.C.)

17-20. British Medical Assoc., annual clinical meeting, Stoke on Trent, England. (D. Gullick, BMA, Tavistock Sq., London W.C.2, England)

NEWS AND COMMENT

(Continued from page 1165)

areas: (i) the setting up of a coordinated weather satellite program; (ii) joint communications experiments with a passive reflector (an Echo satellite); (iii) joint contributions of satellite data to the World Magnetic Survey which will be conducted in 1965.

The August memorandum is regarded as significant by Washington observers because the Soviets followed through with dispatch and thoroughness in settling details and arrangements on equipment, communications links, exchanges of data, and so forth. There had been some who expected the Russians to drag their feet.

Another instance of Soviet-American scientific joint effort was announced earlier this month by the National Science Foundation, which said that the two nations will cooperate in Antarctica on a large-scale cosmic-ray investigation as part of the International Years of the Quiet Sun (IQSY) program. High steel antenna towers will be built at three United States bases and at a still undetermined number of Soviet bases. Other nations may cooperate in the project.

The U.S. and Russia are both signers of the Antarctic Treaty, which, in effect, makes the continent a demilitarized zone. The treaty includes a unique open inspection clause, and last week the United States announced it would exercise its option for the first time and send inspectors to the bases of six or seven countries, including the Soviet Union. The State Department said that the inspections were intended to establish a precedent. Between the lines it was not difficult to read a connection with the Senate debate on the test-ban treaty, where the possibilities of "cheating" have been given much attention. In a rather round-about way the inspections may be an attempt to lay groundwork for further moves in the field of arms control.

The U.N. Committee on the Peaceful Uses of Outer Space is worth watching for action on arms control and disarmament, if only because the members, particularly the smaller nations, are so apprehensive about the nonpeaceful uses of space. And it is not unlikely that, before too long, efforts will be made toward progress in arms control in space.

In general, however, it seems far too early to judge whether the current ice age of diplomacy is actually moderating.—JOHN WALSH