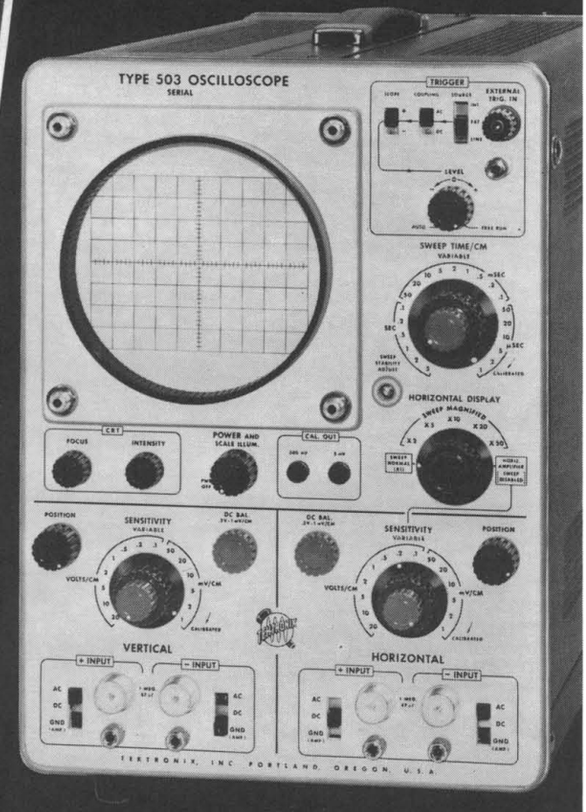
SCIENCE 11 November 1966
Vol. 154, No. 3750
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

MALLARD DUCK

general-purpose oscilloscope for dc-to-450 kHz applications



Type 503—Size is 14¾" high x 10" wide x 21⅝" deep and weight is approximately 29 pounds.

TYPE 503

Color-coordinated controls and functional panel layout aid you in setup and application, make the oscilloscope easy to operate, even for non-technical personnel.

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Differential Input: at all sensitivities

Sensitivity: 1 mV/cm to 20 V/cm

Common-Mode Rejection Ratio: 100:1,1 mV/cm to 0.2 V/cm, dc-to-50 kHz maximum signal 4V pp.

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Sweep Range: 1 μsec/cm to 5 sec/cm

Sweep Magnifier: 2X, 5X, 10X, 20X, and 50X

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Type 503 Oscilloscope	$640
Rack-Mount Model Type RM503 Oscilloscope .	$655

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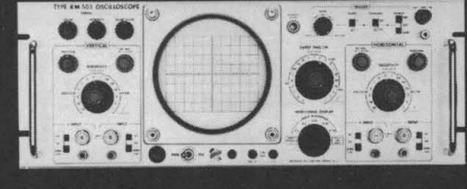

Type RM503 — only 7 inches high and weight is approximately 27 pounds.

for more information— or a demonstration— call your Tektronix field engineer

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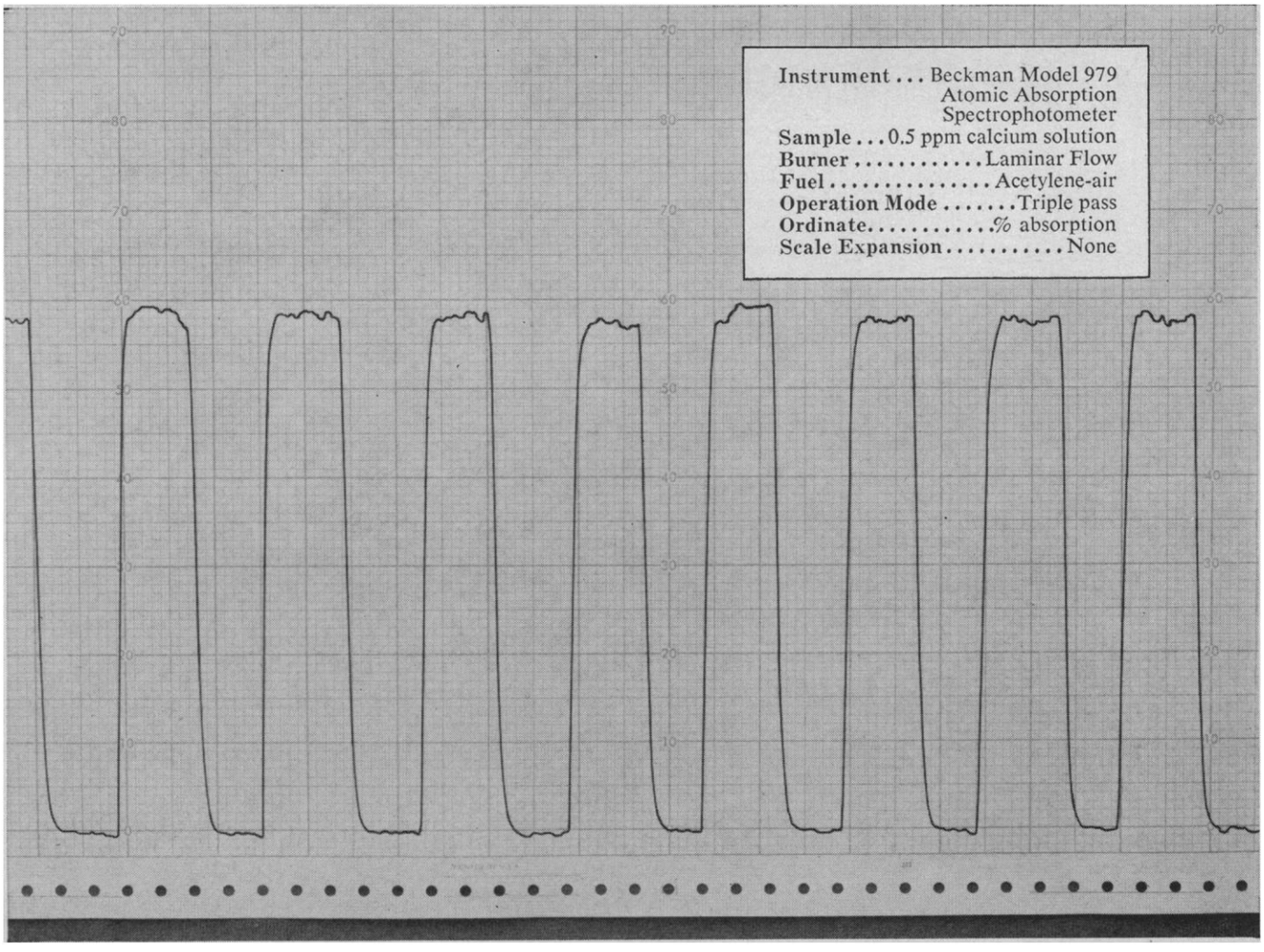

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SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

The mallard duck represents one of the many endangered bird species. In 1964 the breeding population was depressed due to overharvest. The aid of university zoologists and conservationists is sought to preserve such species. See page 723. [George Koshollek, Jr., Milwaukee, Wisconsin]

WASHINGTON, D. C. • 133rd AAAS

Order Your General Program

It provides complete, detailed information about all the sessions and symposia scheduled, the Annual Exposition of Science and Industry, and the Science Theatre.

Program Highlights

Moving Frontiers of Science: Lynn White on The Historical Roots of Our Ecologic Crisis; Th. Dobzhansky on the Changing Man; Thomas F. Malone on Weather Modification; D. S. Greenberg on Problems of Securing Constructive Legislation.

Washington Academy of Sciences Invited Address: P. M. S. Blackett, Nobel laureate in physics, president of the Royal Society, "The Ever-Widening Gap."

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Special Sessions: AAAS Presidential Address by Henry Eyring, "Untangling Biological Reactions"; Joint Address of Sigma Xi and Phi Beta Kappa by Walter Orr Roberts, "Science, a Wellspring of Our Discontent"; George Sarton Memorial Lecture by George Wald, "Color Vision: Model and Reality"; and National Geographic Society Illustrated Lecture by Ralph Gray, "International 89."

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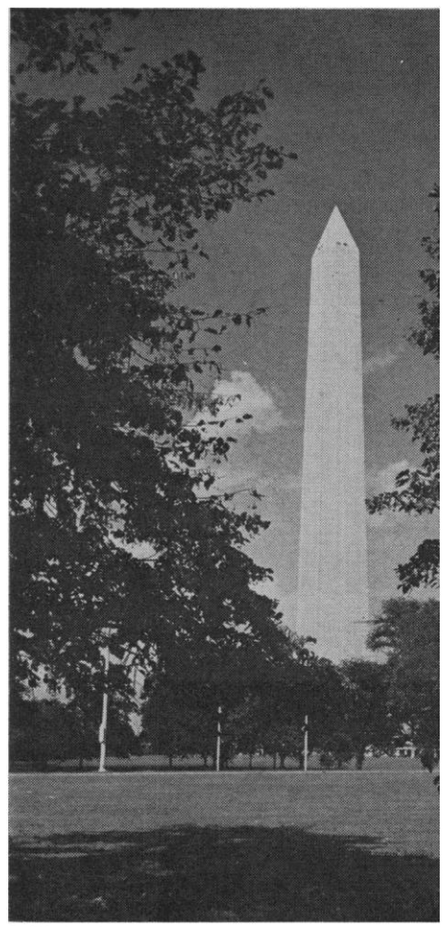

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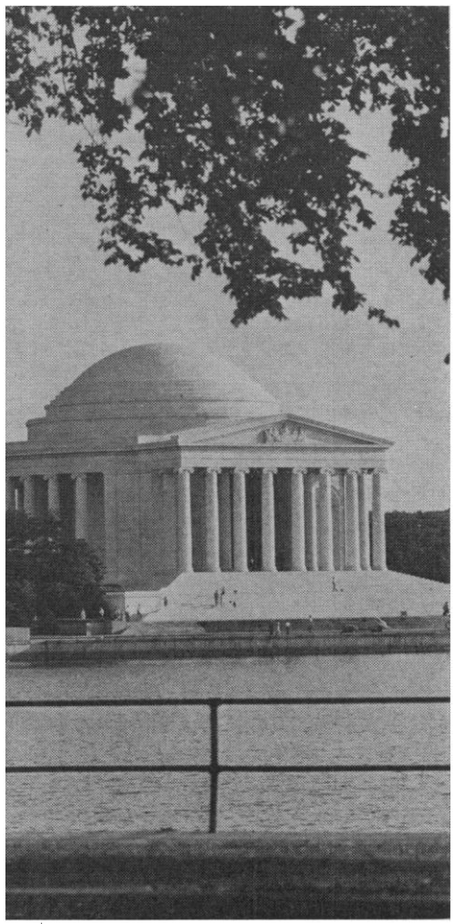

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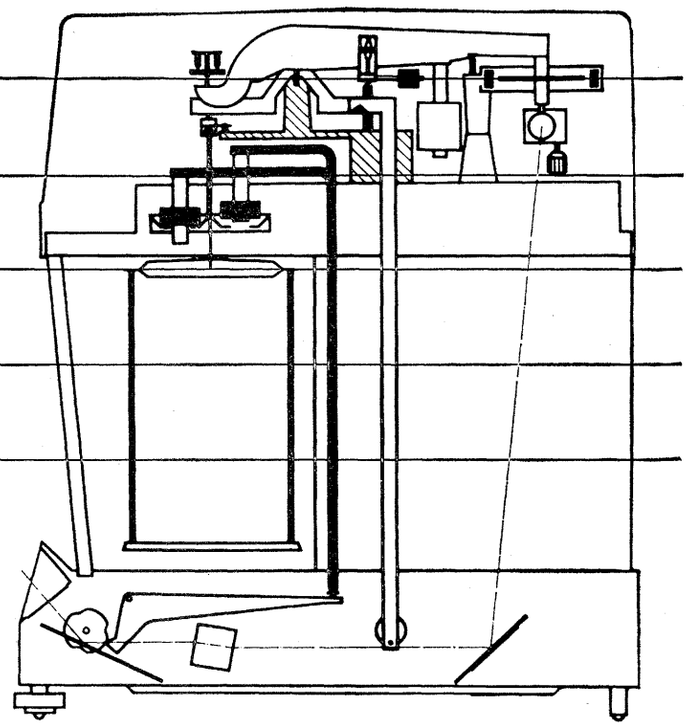
Mail this coupon now to the AAAS Housing Bureau. Rooms will be assigned and confirmed in order of receipt of reservation.

In 10 minutes Matheson Scientific can show you which Balance is best



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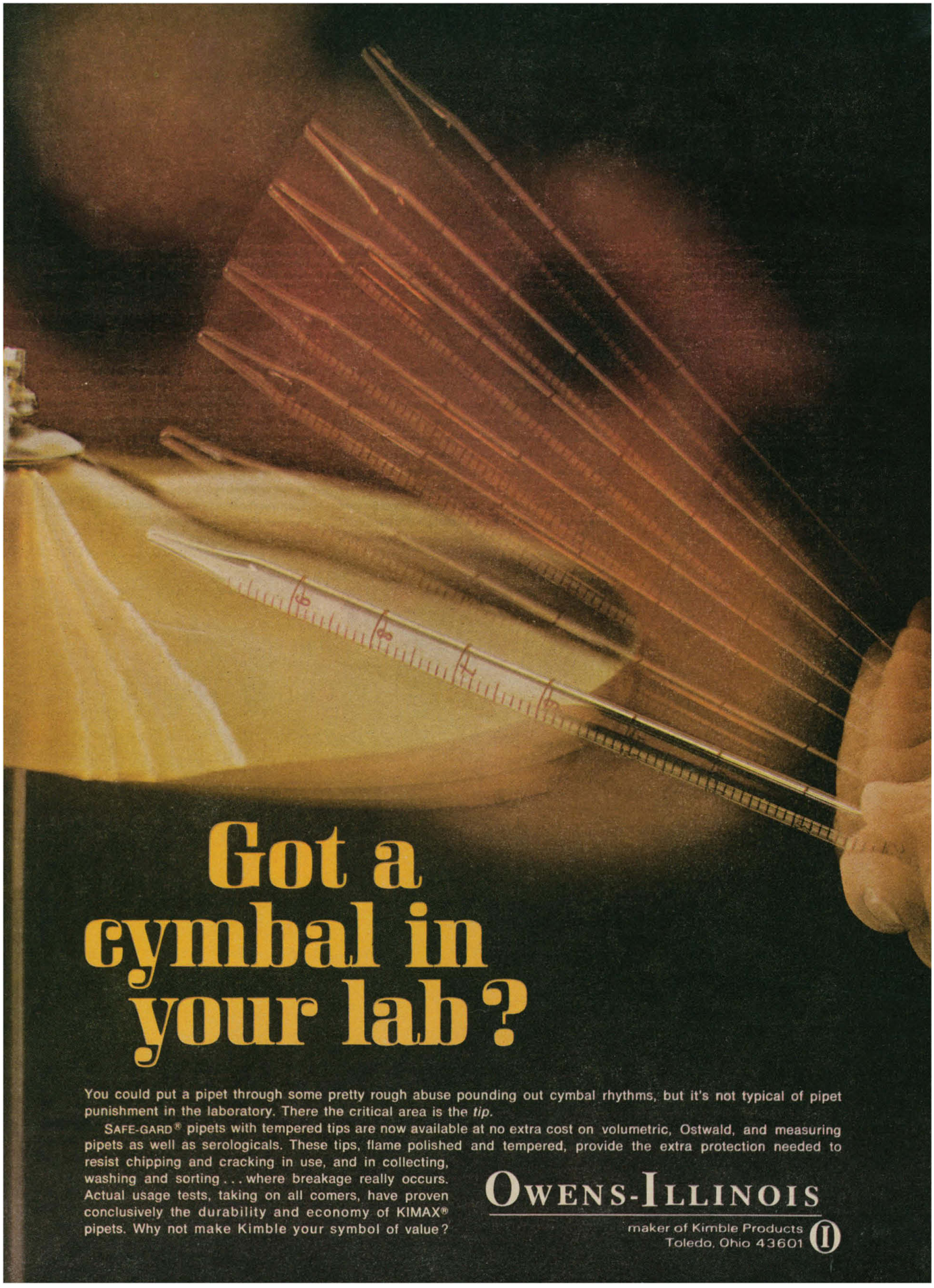

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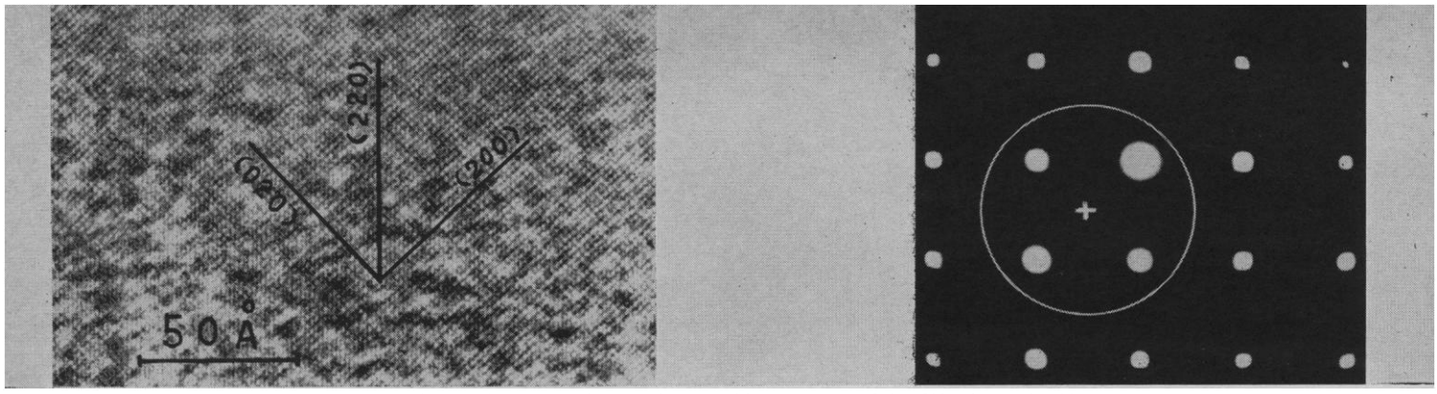

Electron micrograph and diffraction pattern taken on the HU-11C showing the crossed lattice images of the (200) planes of gold. The (020) and (200) planes = 2.04 Angstroms. The (220) plane = 1.44 Angstroms. All important factors such as contamination, stage drift, astigmatism and aberrations must be negligible to achieve this ultra-high resolution. The HU-11C was operated at an accelerating voltage of 100 KV and an electron optical magnification of 270,000 X. The illumination was tilted until the three reflections showed nearly equal intensity in the diffraction pattern; then the micrograph was taken.

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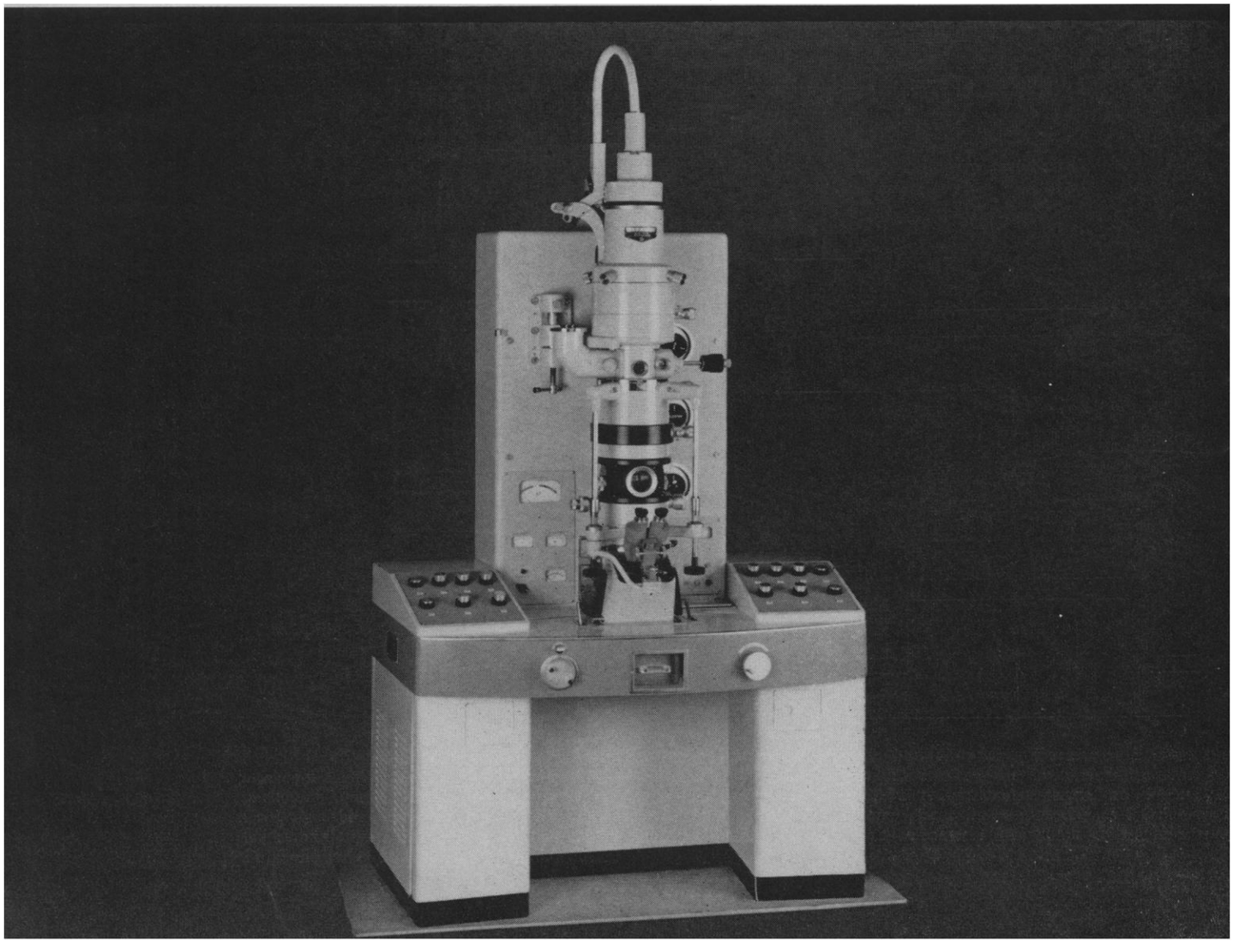

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So don't figure and don't fuss.

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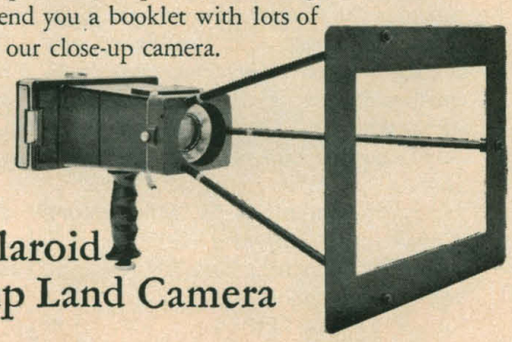

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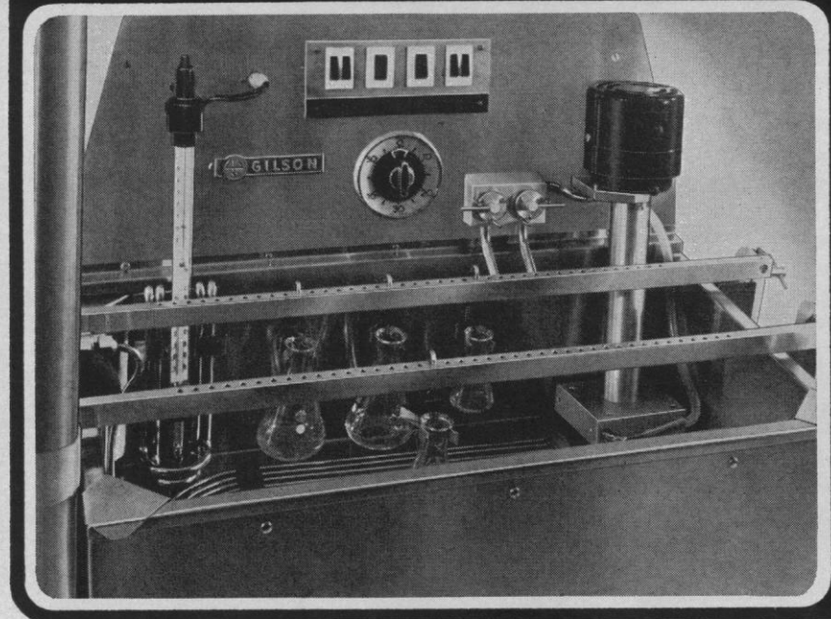

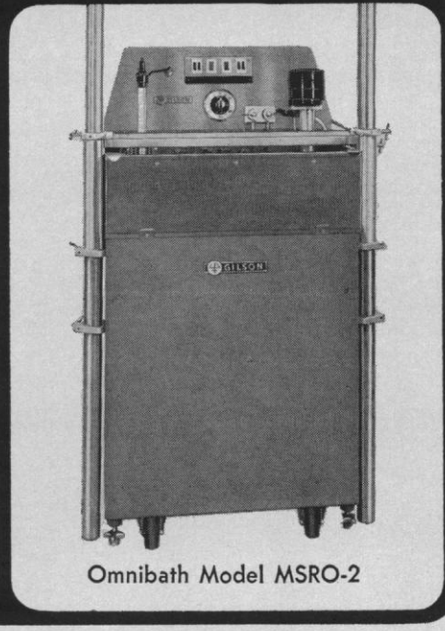

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11 November 1966, Volume 154, Number 3750 **SCIENCE**

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Information Exchange Groups

Since 3 February 1961 the National Institutes of Health have operated, on an experimental basis, a facility for rapid dissemination of unevaluated preprints. The experiment began modestly with one Information Exchange Group (IEG), consisting of 32 members, working in the field of electron transfer and oxidative phosphorylation. New participants were added through nomination by existing members or by application. Membership was open internationally to those actively engaged in the research area served by the group. Participants sent manuscripts to NIH, where they were copied and forwarded to members. No charge was made for the service. The IEG memoranda were intended to be informal instruments for discussion, even polemics, but most of them have been scientific papers.

During the first year the average number of members was 56, and ten preprints were circulated. The enterprise expanded rapidly. During 1964 and 1965 six more IEG's were added. By 1 October 1966 total membership had increased to 3625. The number of preprints rose to 151 per month. During 1966, NIH estimates, more than 1.5 million copies of preprints will be sent out.

Potential for further growth in IEG membership is large. E. C. Albritton of NIH has proposed that "all scientists around the world [except for scientists in countries with which the U.S. has no diplomatic relations] capable of independent research in any IEG's research area be permitted to join." Continuation of current trends for another 2 years would result in a membership in all the established IEG's of as many as 14,000, with a distribution of perhaps 30 million copies of preprints. Given unlimited financial support, there would be additional room for growth. Albritton estimates that 200 IEG's might be formed. Ultimate annual costs for an expanded service might be in the range of $10 to $100 million.

It is unlikely that NIH will conduct this experiment. Partly this is because of tight budgets. Partly it will be a response to increasing criticism of the IEG experiment (*Science*, 12 August and 21 October).

In their early stages the IEG's were a useful medium for transfer of information. They provided active workers a timely and concentrated view of developments in their field. However, with inflation of membership (which NIH could not feasibly prevent), the quality of the average communication has suffered.

A principal argument for the IEG is its comparative speed of publication. Yet, at times, backlogs at the NIH printshop have resulted in delays of up to 2 months. On some occasions reports have appeared in *Science* before they have been distributed as IEG preprints. IEG sponsors speak of time savings of 6 to 9 months over conventional journals. This is an exaggeration. In several journals the time required for publication of a first-class manuscript is less than 2 months more than the average processing time at NIH. Longer delays in journal publication arise partly because the average manuscript submitted is of doubtful scientific value or is poorly written. In an era of information explosion, who needs government-subsidized shoddy merchandise?

The median interval between receipt and publication of short manuscripts can and should be less than 4 months. The explosive growth of the IEG's is in part a mass protest against the inefficiency of many publications. The growth also reflects a desire on the part of some scientists to avoid a discipline essential to the integrity of science.

—PHILIP H. ABELSON

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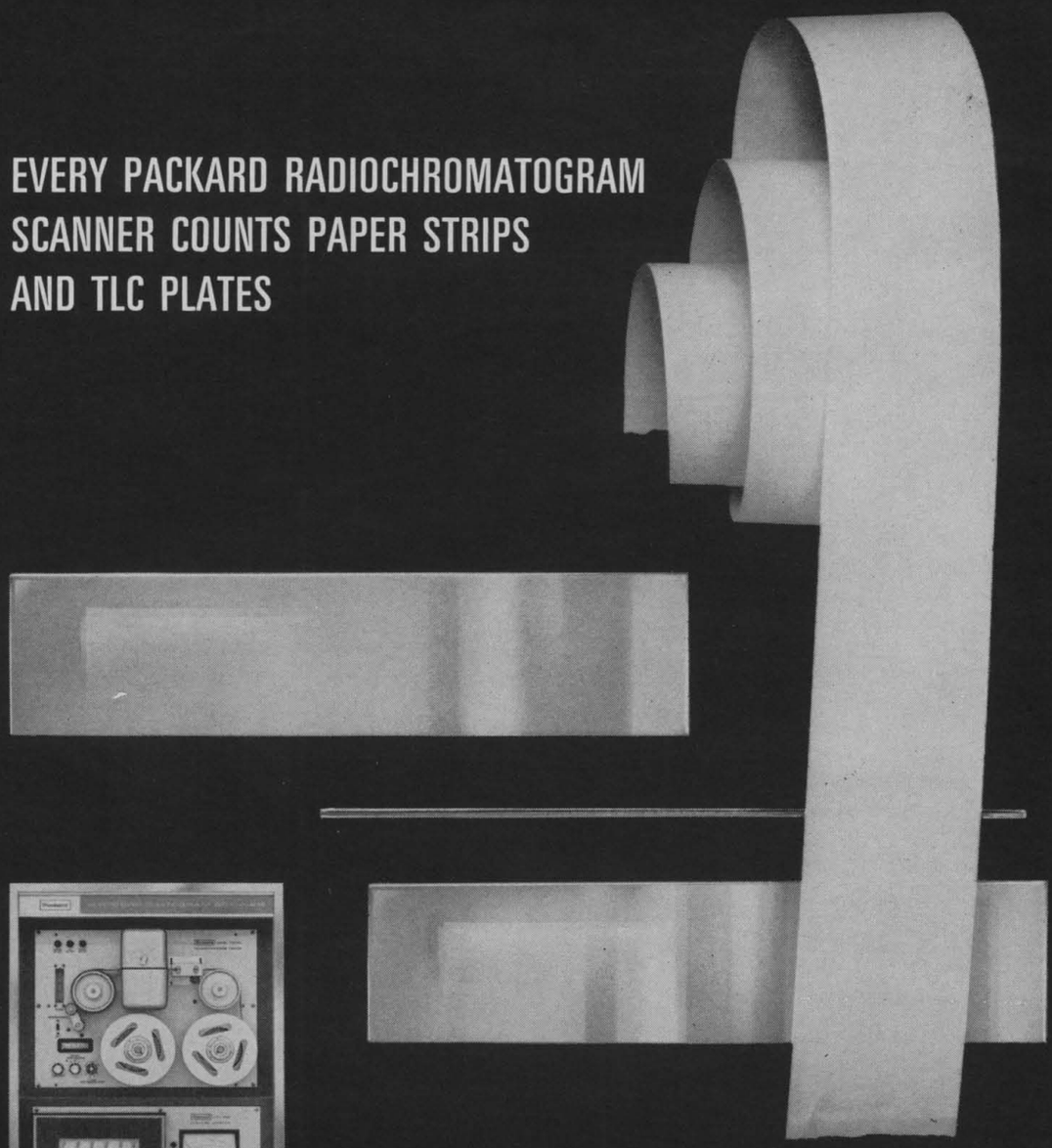

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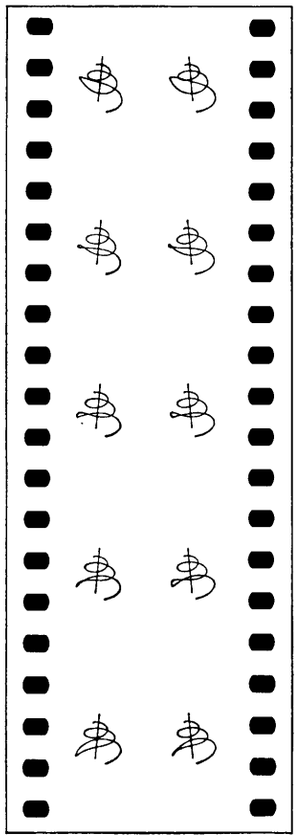
Report from

BELL LABORATORIES

A 3-D Glimpse of the Hearing Process



THE MOVIE shows the basilar membrane as a "stereo pair" of spiral lines. The sequential frames shown here represent the motion of the membrane responding to the sound "oo" in the word "too" as pronounced by R. C. Lummis, one of the scientists responsible for the film.

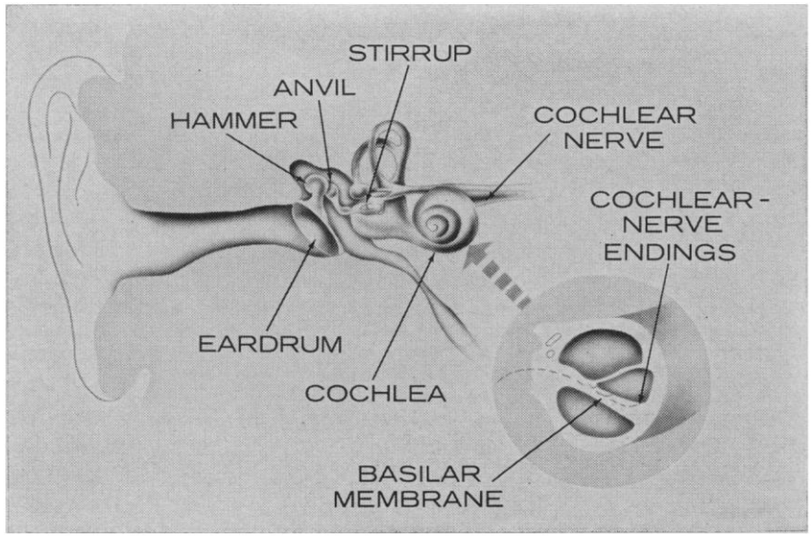
To view this illustration in 3-D, place a sheet of paper on edge between one stereo pair. Position your head so each eye sees only one image. The pictures should then seem to converge and appear three-dimensional.

For screen projection, polarized light and polarized eyeglasses are used to obtain a 3-D image.

THE BASILAR MEMBRANE is a lengthwise partition in the spiral, fluid-filled cochlea (figure). Sound, from the eardrum by way of the hammer, anvil, and stirrup, produces vibrations in this membrane. The end nearest the stirrup resonates at the highest audible tones (approximately 20,000 Hz); the end near the apex of the spiral resonates at the lowest (approximately 20 Hz).

The cochlear nerve terminates near the membrane and, by sensing the vibration at each point, converts the mechanical motion into nerve impulses which the brain perceives as a sound.

Because of its filtering and analytical functions the basilar membrane is a center of interest in hearing research. Since it is embedded in the skull, direct study is extremely difficult.



At Bell Telephone Laboratories, basic research in voice communications does not end with telephone equipment. For instance, three scientists here have made a stereoscopic motion picture showing how the ear's principal transducer—the basilar membrane—moves in response to sound.

A number of steps were involved: First, equations describing the membrane's response were converted to digital form, suitable for machine computation. Next, a program was devised so a computer could determine the precise motion of each point on the membrane as a function of any complex sound input. Finally, the resulting data were processed with another program which introduced the parallax effects inherent in binocular vision.

The output was a series of pairs of stereoscopic images. The computer drew these on the face of a cathode-ray tube where they were automatically photographed to form the frames of the movie.

In this film, the membrane's movements (actually microscopic) are greatly enlarged and slowed down for detailed examinations. Thus we have developed a promising tool for the study of hearing. For example, movies made in this way could help us evaluate theories of the basilar membrane's role in converting sound to nerve impulses. (Several complex mathematical relationships have been proposed; now we may see them in simulated action and measure their properties.)

The scientists who made this film are Robert C. Lummis, A. Michael Noll, and Man Mohan Sondhi. The membrane-response equations from which they began were originated by James L. Flanagan, also of Bell Laboratories. His work was based on anatomical measurements made by Nobel laureate Georg von Békésy of the University of Hawaii.

Bell Telephone Laboratories
Research and Development Unit of the Bell System

ISI

Eases Scientists' Information Problems Provides Convenient Orderly Access to Literature

On the fifth floor of a modern office building, a stone's throw from Philadelphia's Independence Hall, some 125 associates of the Institute for Scientific Information are busy providing services and turning out publications specifically designed to help scientists cope with their literature and information problems. In addition to providing these services, now used by more than 80,000 scientists, ISI devotes a large percentage of its budget to research and development of new techniques for handling scientific information.

ISI's pioneering research has nurtured one of the most promising new concepts for information retrieval developed during the past 50 years – the concept of *citation indexing*.

The *Science Citation Index*, a comprehensive, multi-disciplinary Index to science, is based on this concept, and is published quarterly and annually by ISI. The *Science Citation Index* enables librarians, administrators and scientists to retrieve both scientific and technological information in a manner heretofore not thought possible. Although the *SCI* system has been in current operation for only two years, it is gaining wide acceptance by academic, industrial and government researchers.

For 1965 alone, approximately 300,000 source items were indexed to generate the *SCI* for that calendar year. This involved the processing of some 3,000,000 cited references originally written by approximately one-third of a million authors.

The basic concept of citation indexing is based on the observation that when one article cites another article there must be a subject relationship between the two articles. Each bibliographic citation as, e.g., 'A.R. JONES, Fed. Proc. *33*, 1493 (1959)', is an unambiguous descriptor or symbol which designates the subject matter discussed in some aspect of the citing work. For this reason, citation indexing provides the scientist a unique and efficient method for conducting, in a minimum of time, highly specific searches, since each cited reference becomes an entry point in the Index.

The *Science Citation Index* enables one to trace the literature forward in time; that is, to go from an earlier cited article to a later citing article. This contrasts with conventional systems in which one usually locates a current article and builds up a bibliography by tracing backward in time through the footnotes cited in the article at hand. *SCI* indexing is based on the author's rather than the indexer's estimate of the subject content of an article. For this reason, the *SCI* has been said to be particularly responsive to the user's, rather than the indexer's viewpoint. For the time being *Science Citation Indexes* are available only for the years 1961, 1964 and 1965. The 1966 Index is, of course, now in production. ISI plans to publish Indexes for 1962 and 1963 as soon as practical.

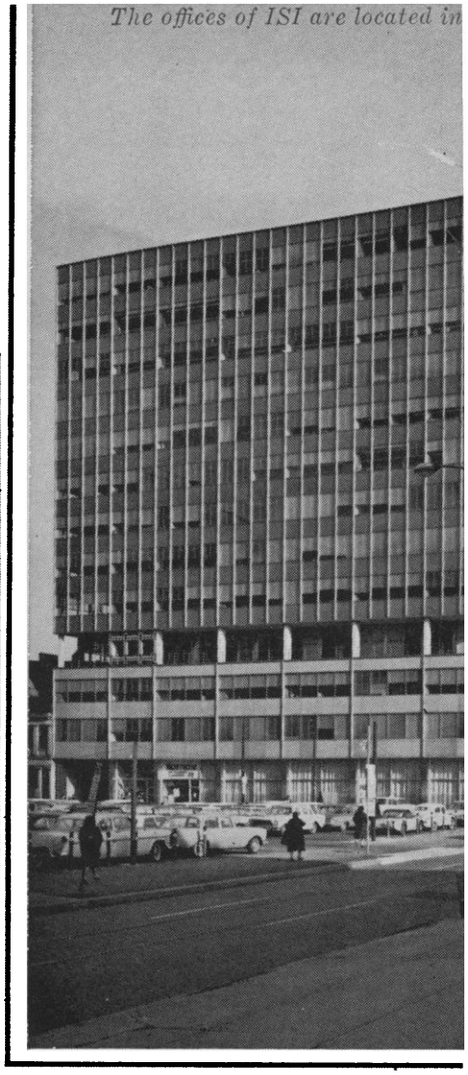
During the past eight years, ISI has initiated such services as *Current Contents of Chemical, Pharmaco-Medical and Life Sciences* and *Current Contents of Space, Electronic and Physical Sciences*, which are estimated to be read by over 60,000 scientists each week. In addition, ISI introduced the *Index Chemicus* in 1960, a unique abstracting-indexing service that pinpoints and reports graphically on approximately 120,000 newly synthesized chemicals each year. The *Index Chemicus* is estimated to be read regularly by 10,000 synthetic chemists, pharmacologists and others throughout the world – at least 50% outside the United States.

In 1965, ISI introduced the *Automatic Subject Citation Alert*. *ASCA* is, in part, based on the citation indexing principle and is the first large scale computer-based service commercially available for selective dissemination of information to individual scientists and/or groups that covers all major disciplines.

One of the major precepts of ISI's philosophy is that the various fields of science and technology are, in fact, interdisciplinary and should not be categorized into arbitrary a priori classifications. Many of the world's literature abstracting organizations continue to operate on an a priori basis, but ISI believes that it is not proper to try to rigidly define the perimeters of fast-changing areas of research. Highly interdisciplinary fields such as molecular biology, oceanography, behavioral science, etc., require that information be extracted simultaneously from the literature of all disciplines.

ISI is attempting to *broaden* the *base* of coverage of all its services while at the same time making it easier for the individual scientist to *narrow* down and extract that *facet* of multi-disciplinary information of specific interest and value to him.

It has been estimated from various sources that some 50,000 scientific and technical journals are being published in more than 65 languages. Estimates from ISI indicate that less than 1,000 journals account for over 90% of the significant scientific reports – approximately 250,000 articles per year – of which a considerable portion is duplication in various forms. This means that, contrary to popular belief, a relatively small number of journals account for a high percentage of the significant articles published. ISI's present journal coverage already exceeds 1,500 journals.


The offices of ISI are located in

While the processing of several hundred thousand items each year is no trivial problem, ISI's studies have led to both manual and computer systems that enable the scientist to overcome the sense of helplessness that is conveyed by unqualified allusions to 50,000 journals – many of which ceased publication long ago, or publish a trivial number of significant papers. While there has been a steady growth of the literature, ISI believes the so-called "information explosion" can indeed be controlled. Contrary to the general cliché that "there is too much scientific information", ISI would assert that "there is often little or no information available about a specific problem". This "needle in the haystack problem" is faced almost daily by every scientist. In many such cases, conventional literature searching techniques may not be practical. However, such techniques as the *Science Citation Index* and *ASCA* enable the searcher to find out quickly if there is – or is not – information available on a specific point. By reducing the time required to do comprehensive but specific searches, ISI hopes to increase the use of the literature as an effective research instrument.

Information science as practiced by conventional libraries and information centers has not usually been thought to be an important or exciting part of research and development by scientists. However, with the increased opportunities for productive exploitation of the scientific literature, this situation is now changing. Computer technology has also had great impact on the field, making large scale information handling systems practical. More than half of ISI's total

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working force consists of information scientists, librarians and data processing technicians. An IBM 360 and an IBM 7044 system are used to process approximately 100,000 new punch cards per week. The cards are then converted to magnetic tape. Using special programs developed at ISI, these tapes are scanned automatically for scientists all over the world.

ISI's all-consuming goal is to organize the world's total output of significant scientific and technical literature into an integrated file and provide convenient current and retrospective access to the file by individual scientists. By the end of 1966, ISI will have processed approximately ten million reference records. The goal of total retrospective coverage for the literature of the twentieth century should be completed in gradual stages over the next decade. This enormous file will be of inestimable value both for current laboratory research and also for new types of historical studies.

While the file building is going on, ISI's research program, headed by Dr. Irving H. Sher, who received his doctorate in biochemistry from Johns Hopkins University, is experimenting with new techniques on the commercial services already being provided by ISI. He is working hand in hand with A.W. Elias, ISI's Director of Publications and Services. The fruits of this research already have started to pay off in the new ISI *Searching Service* in which it is possible to obtain a retrospective search of the literature on a specific topic using ISI's data bank. Searches are performed daily at low cost–often by telephone or cable request.

Even at the present time, ISI is supplying copies of its magnetic tapes to various organizations for their internal use. These tapes are used in many ways including citation and word-searching approaches to subject matter retrieval. A new approach which simplifies the complexities of existing word-profile schemes is now in its final stages of testing and debugging. This additional approach will augment the *ASCA* citation profiles and enable scientists to construct word profiles to search literature for concepts that do not lend themselves as readily to the citation approach. The combined approaches through words, authors, organizations, citations and journals will provide a depth of indexing to satisfy very exacting requirements at low cost.

Studies on the sociological implications of science and scientific literature are an important part of ISI's R & D program. A recent report for the US Government on *The Use of Citation Data in Writing the History of Science* [9] is looked upon by many in the field as having unique application to pinpointing areas for future scientific research, identifying the research fronts of science, and evaluating published work by providing convenient access to criticisms by peers.

Supporting all of ISI's retrieval and dissemination activities is an original system of storing scientific journals. ISI learned from the outset that it must back up any bibliographic listing in *Current Contents*, *Index Chemicus*, etc., with convenient access to the papers listed. It is generally expected that the scientist will use local library facilities for this purpose. In addition, reprints are frequently requested directly from authors by using the computer-produced address directories which ISI publishes. Nevertheless, there is frequently the need for the scientist to obtain quickly a paper that is not received at his institution. For this reason, ISI operates the *Original Article Tear Sheet* service. In the *OATS* service, tear sheets are literally torn from extra copies of journals received by ISI. Although many requests are received at ISI, only a small number of requests are for any given article. This enables the Institute to satisfy most needs from a maximum of five or six copies of each issue.

ISI takes great pride in the good relations it has maintained with hundreds of publishers throughout the world who cooperate to minimize the many inherent time lags in publication and recognize that the growth of interdisciplinary science requires that individuals have access to many journals they do not ordinarily scan directly. The growth in popularity of ISI's services has been paralleled by a comparable increase in journal circulation throughout the world.

The key to effective retrieval of information is to convert the process of information discovery to that of information recovery. By effectively disseminating information in the first place, as through *Current Contents*, *Index Chemicus*, and *ASCA*, the memory of the individual scientist can be better exploited to recover that information when it is needed again. On the other hand, since the individual scientist can only be exposed to a fraction of the world's information in his lifetime, he also needs what has been described as "systematic serendipity" – an organized process of information discovery of that which he did not know existed. Finally, he must be able to quickly and efficiently determine if it is valid to conclude that *no* information is available and he can proceed in the laboratory with a reasonable degree of assurance that unwitting duplication of efforts will be avoided.

The *SCI* and *ASCA* serve these two latter functions. The above objectives of information science indicate the important creative and service roles the entire information processing profession can play in future research and development activity throughout the world.

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For details on specific ISI services, write Dept. 29-16.

photolysis processes, the stronger bond is frequently broken instead of the weaker ones.

The fifth session began with a talk by J. Baxendale (United Kingdom) who outlined the development of the idea of the solvated electron. S. Gordon (Argonne) continued with a description of his optical studies of transients formed in the pulsed radiolysis of aqueous solutions of phthalate ions. He obtained a second-order rate constant for the reaction of a hydrated electron with *p*-phthalate ion to form the transient. J. Simons (Birmingham), in discussing the formation of color centers by trapping electrons on polyhaloalkanes in rigid organic glasses, concluded that this light-induced process does not necessarily require the addition of an efficient electron donor. J. Bennett described his work with B. Mile and A. Thomas (all of Shell Research, Chester, England); they obtained optical and ESR spectra of solvated electrons produced by the deposition of potassium atoms on ice and solid alcohols in a rotating cryostat. They postulated mechanisms for the transformations which occur when these samples are warmed. D. Smith (Chalk River, Canada) described the results of ESR studies with a "dual" cavity (TE_{104}) which permits measurements of ESR difference spectra and thus microwave saturation properties of the solvated electron. A. Maclachlan (DuPont, Wilmington) discussed his use of pulse radiolysis to form peroxy radicals, which are then studied by transient spectroscopy during their interaction with inhibitors. Short contributions were also made by M. Haissinsky (Institute du Radium, Paris) and by M. Donodetti.

The sixth and last session of the symposium was concerned with diradicals, triplet, and unstable singlet molecules. There was some brisk discussion, moderated by the chairman, J. van der Waals (Royal Dutch Shell, Amsterdam). P. S. Skell (Pennsylvania State University) reviewed the chemical criteria for distinguishing singlet and triplet methylene molecules; he applied these criteria to a variety of novel reactions involving carbon atoms and C_3 molecules. R. Wolfgang (Yale University) also described some reactions of free carbon atoms produced in the form of C^{11} by the nuclear-recoil technique. With hydrocarbons two major mechanisms were established: (i) insertion into the C-H bond

and (ii) addition to a double bond. A. M. Trozzolo, E. Wasserman, and W. A. Yager (Bell Laboratories) had applied electron spin resonance to the study of the structure and isomerism of ground-state triplet methylenes. Geometric isomerism was detected in the naphthylmethylenes. Studies of methylenes by electron absorption spectroscopy were presented also. J. W. Johns (National Research Council, Ottawa) observed the methylenes HFC and HCCl, obtained in the flash photolysis of dibromofluoromethane and dibromochloromethane. G. L. Closs (Universtiy of Chicago) had studied the electron absorption spectrum of diphenylmethylene oriented in single crystals of diphenylethylene. By an elegant combination with ESR results, it was possible to obtain the polarized spectrum. Narrow-line vibrational structure also was observed. Evidence for the formation of carbenes in the reaction of hydrogen atoms with polyhalomethanes was given by J. M. Tedder (St. Andrews). A vibrationally excited polyhalomethane was postulated as an intermediate that undergoes unimolecular decomposition to yield the dihalocarbene and hydrogen halide.

Other contributions to the discussion included descriptions of studies of bisnitroxides, thermochromic molecules, reactions of carbon suboxide, sulfur monoxide, and production of triplet states by pulse radiolysis.

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Forthcoming Events

December

1–2. **UNESCO**, 75th executive board session, Paris, France. (Pl. de Fontenoy, Paris 7)

1–3. **Medicine and Sociology**, intern. symp., East Berlin, Germany. (K. Winter, Hygiene-Institut Humboldt-Universität, Otto-Grotewohl-str. 1, 108 Berlin, East Germany)

1–8. **Heads of National Research Insts.**, mtg., Bangkok, Thailand. (U.N. Economic Commission for Asia and the Far East, Sala Santitham, Rajadamnern Ave., Bangkok)

2. American **Industrial Hygiene** Assoc., mtg., Metropolitan New York, New Jersey, Delaware sections, Sterling Forest, N.Y. (O. M. Banks, Shell Chemical Co., 110 W. 51 St., New York 10020)

2–3. Perspectives in **Leukemia**, symp., New Orleans, La. (W. Dameshek, Leukemia Society, 211 E. 43 St., New York 10017)

2–3. **Nuclear Power Stations Operation**, conf., Bern, Switzerland. (Swiss Assoc. for Atomic Energy, P.O. Box 2613, 3001 Bern)

3–4. **Space Flight**, conf., Bremen, Germany. (Secretariat, Hermann Oberth Soc., Fritz-Beindorff-allee 9, 3000 Hanover, West Germany)

3–8. American Acad. of **Dermatology and Syphilology**, 25th annual mtg., Miami Beach, Fla. (The Academy, 636 Church St., Evanston, Ill.)

3–11. **Aviation and Aerospace**, intern. exposition, New York, N.Y. (F. S. Doman, Aviation and Aerospace Exposition, Inc., 500 Fifth Ave., New York 10036)

4–7. American Inst. of **Chemical Engineers**, 59th annual mtg., Detroit, Mich. (E. B. Chriswell, California Research Corp., Room 807, 200 Bush St., San Francisco, Calif.)

4–8. American Inst. of **Chemical Engineers**, 59th annual mtg., Detroit, Mich. (R. E. Greenhaigh, Dow Corning Corp., Midland, Mich.)

5–7. **Antennas and Propagation**, intern. symp., Palo Alto, Calif. (R. L. Deadabrand, Radio Physics Laboratory, Stanford Research Inst., Menlo Park, Calif.)

7. **American Institute of the City of New York**, mtg., New York. (Mrs. G. E. Peterson, American Institute of the City of New York, 2 E. 63 St., New York 10021)

5–7. Theory and Application of **Gas**

Chromatography in Industry and Medicine, Hahnemann Medical College, Philadelphia, Pa. (H. S. Kroman, Dept. of Medicine, Medical College and Hospital, 230 N. Broad St., Philadelphia 19102)

5–8. **Magnesium in Biophysiopathology and Therapeutics**, intern. congr., Buenos Aires, Argentina. (A. Vidal Freyre, Ayacucho 1427, Buenos Aires)

5–8. **Polarized Targets and Ion Sources,** intern. conf., Saclay, France. (A. Abragam, Direction de la Physique, Centre d'Etudes Nucleaires de Saclay, B.P. 2, Gif-sur-Yvette, Seine-et-Oise, France)

5–9. **Operating Metallurgy**, 2nd conf. and exposition, Philadelphia, Pa. (C. L. Hopkins, American Inst. of Mining, Metallurgical, and Petroleum Engineers, 345 E. 47 St., New York 10017)

6–7. **Unconventional Inertial Sensors**, symp., Washington, D.C. (J. W. Lindberg, AIR 53321G, Naval Air Systems Command, Washington, D.C. 20360)

7–9. **International Scientific Radio Union**, fall mtg., Palo Alto, Calif. (R. A. Helliwell, Radioscience Laboratory, Stanford Univ., Stanford, Calif. 94305)

8–11. **Rodents**, Indian symp., Calcutta. (D. W. Parrack, Johns Hopkins Univ. Center for Medical Research and Training, All-India Inst. of Hygiene and Public Health, 110 Chittaranjan Ave., Calcutta 12)

9–10. **Contractile Process**, symp., New York Heart Assoc., New York. (The Association, 10 Columbus Circle, New York 10019)

9–11. American Acad. of **Psychoanalysis**, mtg., New York, N.Y. (M. Carroll, The Academy, 125 E. 65 St., New York 10021)

12–14. **Air Pollution**, natl. conf., Washington, D.C. (A. C. Stern, Div. of Air Pollution, U.S. Public Health Service, Washington, D.C. 20201)

12-14. **Renal Failure,** 17th symp., Hahnemann Medical College, Philadelphia, Pa. (A. N. Brest, Section of Vascular Diseases and Renology, Hahnemann Medical College and Hospital, 230 N. Broad St., Philadelphia 19102)

12–17. **History of Oceanography**, intern. congr., Monte Carlo. (R. Novella, Villa Girasole, 16, boulevard de Suisse, Monaco)

12–19. **Heads of National Standards Institutes,** mtg., Bangkok, Thailand. (U.N., Economic Commission for Asia and the Far East, Sala Santitham, Rajadamnern Ave., Bangkok)

14–16. Fundamentals of **Gas-Surface Interactions,** symp., San Diego, Calif. (H. Saltsburgh, General Dynamics/General Atomic, P.O. Box 608, San Diego 92112)

14–16. **Fluid Logic and Amplification,** 2nd intern. conf., Cranfield, England. (H. Stephens, British Hydromechanics Research Assoc., South Rd., Harlow, Essex, England)

15–16. International **Brain Research** Organization, central council and executive committee, mtg., Paris, France. (UNESCO, Pl. de Fontenoy, Paris 7)

16–18. American **Psychoanalytic** Assoc., fall mtg., New York, N. Y. (American Psychoanalytic Assoc., 1 E. 57 St., New York 10022)