SCIENCE

20 August 1965
Vol. 149, No. 3686

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

CHONDRULE IN CHAINPUR METEORITE

New...and just the ticket for amino acid analysis

6	0	2	6	9
5	0	5	3	9
4	0	6	2	5
3	0	9	0	7
2	0	3	8	0
1	0	3	6	0
0	0	3	5	5
9	1	3	3	6
8	2	1	0	8
7	0	8	6	9
6	0	2	4	8
5	0	1	5	9
4	4	5	8	7
3	0	6	7	3
2	1	2	2	4
1	1	8	3	6
0	0	7	5	5
9	0	8	7	2

The new Beckman Digital Integrator makes the most tedious part of amino acid analysis the easiest—does away with dot-counting and peak height measurements. An accessory to the Model 120 Amino Acid Analyzer, the Integrator prints out on a ticket the relative concentration of each amino acid in the sample, while the Model 120 recorder simultaneously produces the usual chromatogram. When you consider that calculations for a protein hydrolyzate ordinarily take about an hour following completion of the run, the advantages of instantaneous, automatic integration are obvious.

The Model 125 Digital Integrator comes complete, ready to connect to any Model 120 Analyzer—there's nothing else to buy. The Integrator features solid-state circuitry, a built-in baseline corrector, timer unit for automatic shifts between 570 and 440 mμ inputs, is fully warranted and backed by Beckman nationwide service.

For more information on the Digital Integrator—from the Company that knows amino acid analysis best—write for Data File 125-5.

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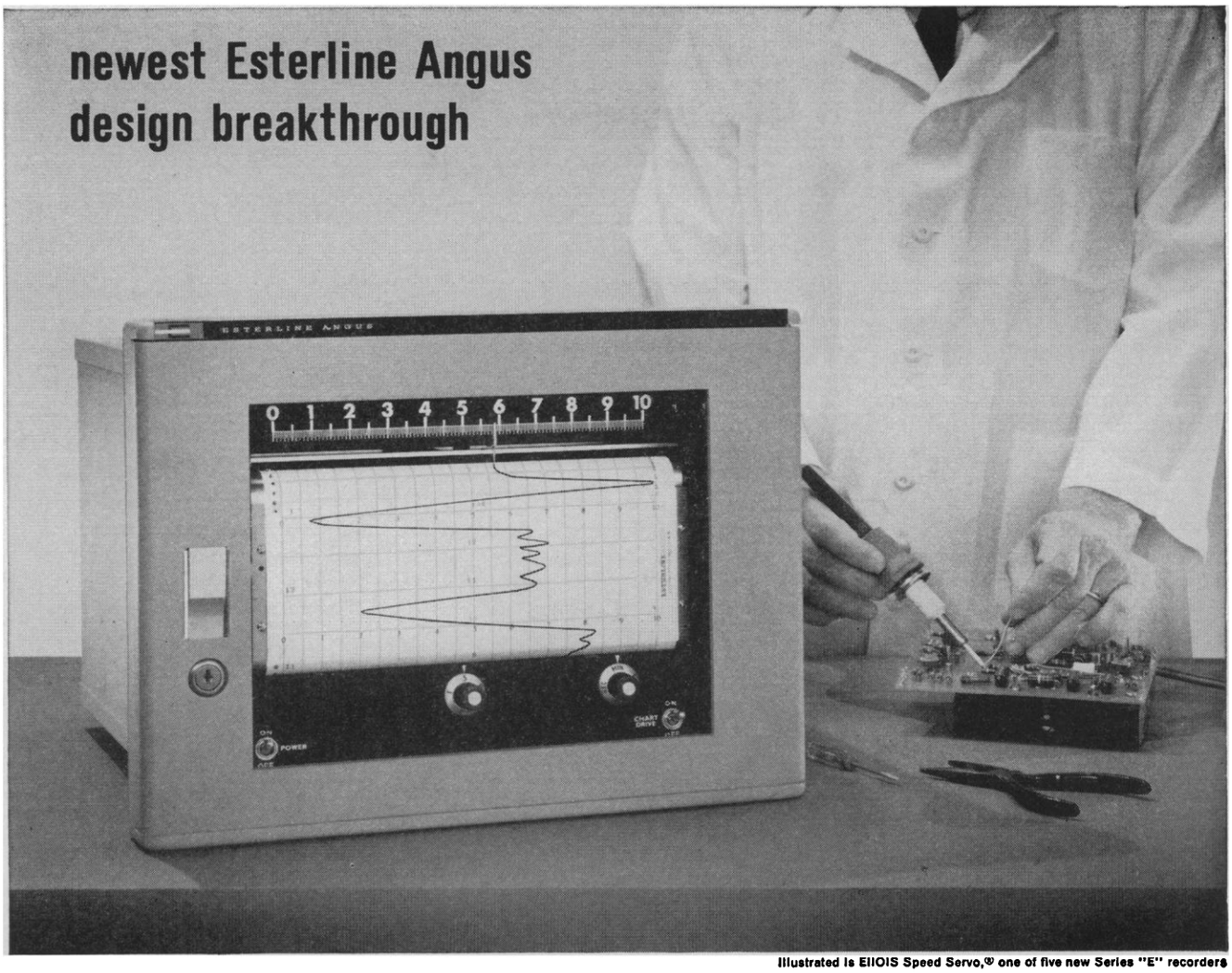
newest Esterline Angus design breakthrough



Illustrated is ElIOIS Speed Servo,® one of five new Series "E" recorders

1/5 second response over 10″ span + inertial ink pump = the only wide chart Speed Servo®

Never before has a servo recorder offered the versatility, dependability and reliability of the Wide Chart Esterline Angus Speed Servo.® It delivers:

☐ 1/5 second response over the full 10″ span. ☐ spans as low as 1 MV. ☐ a servo mechanism with only one moving part . . . no drive cords to break or gears to wear. ☐ new inertial ink pump (patent applied for) provides skip-free writing at any pen speed. ☐ optional adjustable zero—adjustable span . . . zero displacement to ± 100 MV . . . spans from 1 to 100 MV. ☐ solid state amplifier. ☐ source impedance of 50,000 ohms. ☐ conductive plastic feedback potentiometer lasts thousands of hours longer than any wire wound potentiometer.

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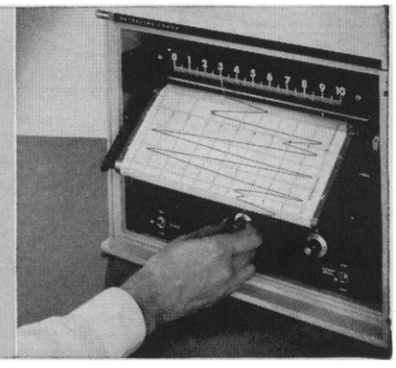

Open door shows automatic chart drive controls . . . dial any one of 15 speeds instantly . . . from ½″ per hour to 8″ per second without gear change, motor change or screw driver adjustments . . . sloped writing surface and chart tear off bar are featured.

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20 August 1965
Vol. 149, No. 3686

SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

An arrested stage in the crystallization of a chondrule in the Chainpur chondrite. Skeletal pyroxene crystallites are set in a clear, isotropic, silica-rich glass. The large white grain is an olivine crystal below and separate from the pyroxene crystals which are wholly surrounded by glass. This chondrule evidently formed by quenching of a liquid silicate droplet from high temperatures. The dark line, produced by a beam of the electron microprobe while traversing across this area, is 40 microns long. See page 856.

Tritiated thymidine and its relatives

(Have you heard the good news about our tritiated thymidine? And have you met its whole family?)

First, two pieces of good news about tritiated thymidine itself. Our prices are down. Quite substantially. Examples: 25 mc dropped from $600 to $400 (and *no one* has a lower one) and 5 mc will now run you $100 instead of $150 (and again, *no one* has a lower one.) Etcetera.

The second newsworthy fact re our tritiated thymidine: we have the *widest* range of specific activities available anywhere, from the lowest (0.36c/ mmole), to the highest (> 10c/ mmole), with three other levels in between.

Incidentally, new batches of tritiated thymidine fail to work their way into our inventory unless they have a minimum radiochemical purity of 99%. (What happens with the passage of time? Read on, we get to that provocative question somewhere below.) Now to tritiated thymidine's interesting relatives.

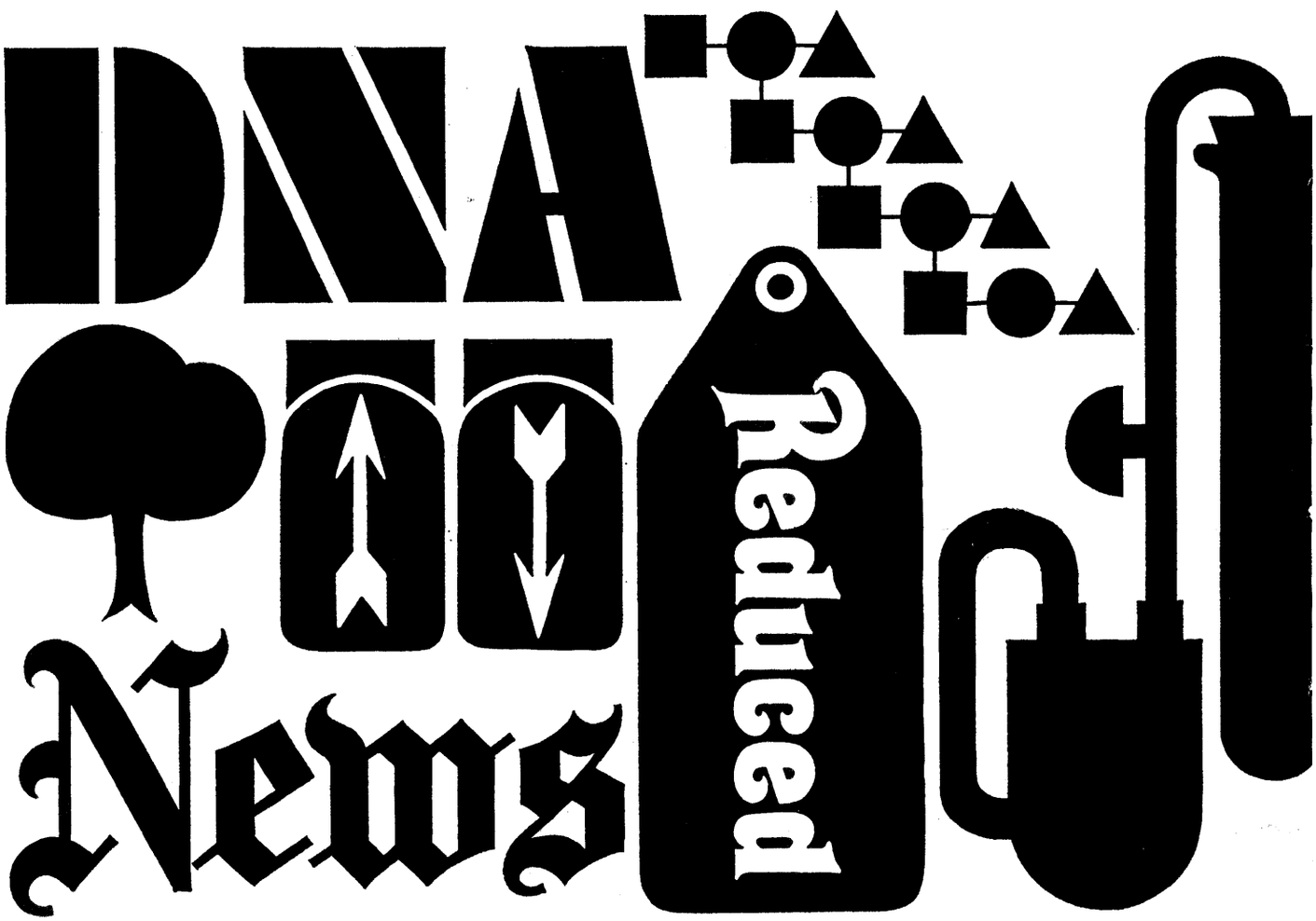
As a most convenient mechanism for introducing radioactivity into cell DNA, tritiated thymidine obviously gets a great deal of attention. As a result, we tend to forget to tell you about the related compounds that we have (not just in our catalogs—in our *stock*) that you might wish to know about.

THYMIDINES (not tritiated) —We have two. Thymidine-2-C^{14} with these specific activities: 6-10mc/ mmole and 25mc/ mmole (new!). Also, a chromatographically homogeneous unlabeled thymidine.

THYMIDINE NUCLEOTIDES—A uniquely wide selection here. The thymidine 5′-phosphates-2-C^{14} are now in stock as the mono, di and triphosphates, while the tritiated thymidine 5′-phosphates are available in the mono and triphosphate form. The unlabeled thymidine 5′-monophosphate is yours as the monocalcium or disodium salt.

THYMIDINE'S PYRIMIDINE BASE—Thymine-H^3, as with everything else in this recitation, is also in stock and immediately available.

TRITIATED THYMIDINE LITERATURE—We have assembled a packet of most useful information on tritiated thymidine. It contains: detailed, helpfully illustrated procedures for tritium autoradiography developed at Brookhaven (unpublished and not generally available elsewhere); specification sheets covering tritiated and unlabeled thymidine; and



general information on tritiated thymidine including a rather extensive bibliography. Also: necessary precautions in the handling of tritiated thymidine. If you're not one of the 6000 people who have already requested this package —or even if you are—we'll be happy to mail it to you too.

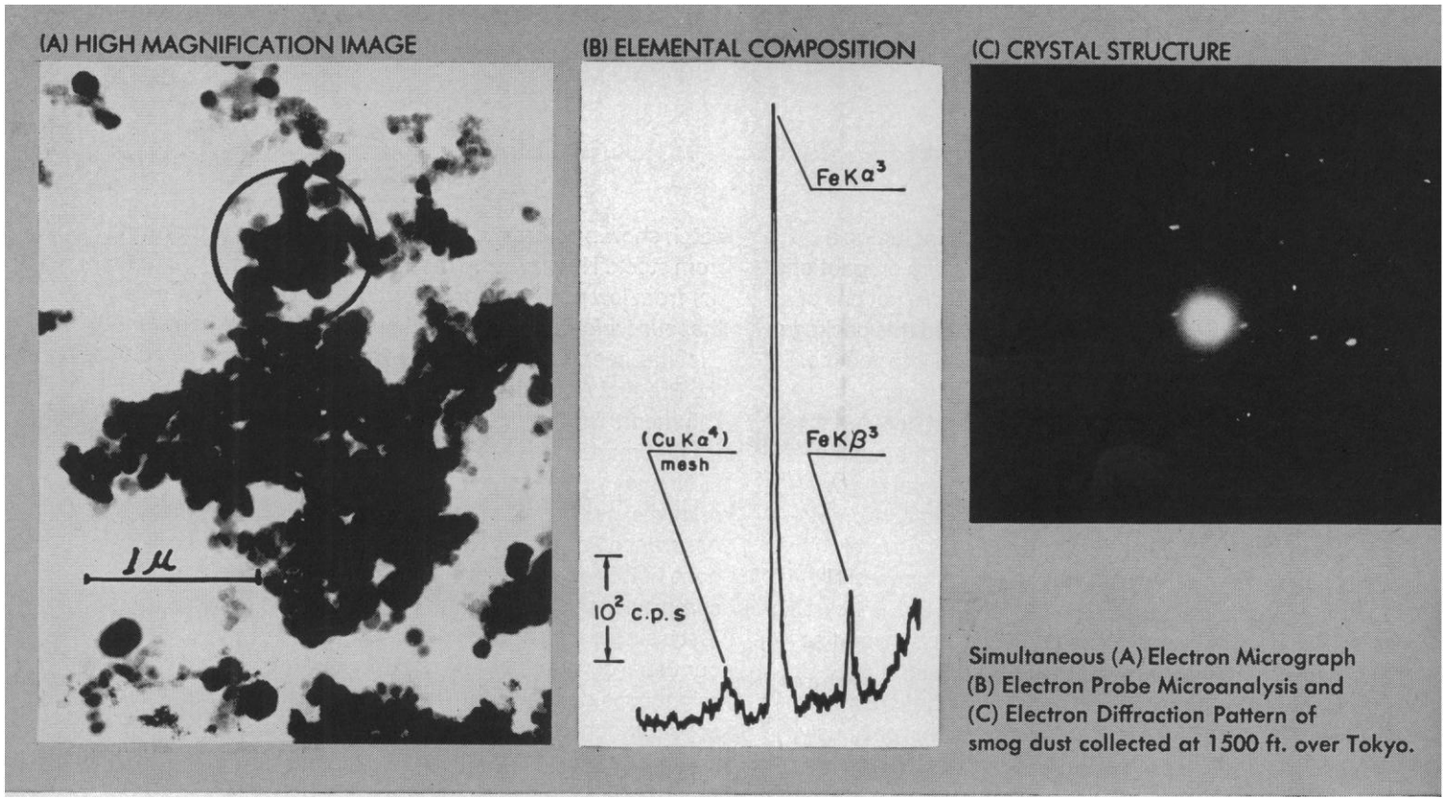
SCHWARZ QUALITY ASSURANCE PROGRAM—Every shipment from us is accompanied by a most detailed Product Analysis Report which gives you all the quality control data pertaining specifically to the material you receive. And we include a most revealing radiochromatogram with 0.5% sensitivity. This precise evidence of quality enables you to use all your time doing research. You literally *can* leave the quality control to us.

You will recall that new batches of tritiated thymidine are placed in inventory only if they have a minimum radiochemical purity of 99%. Now, then, what *does* happen with the passage of time? Sometimes, obviously, it goes down. So, we re-assay every batch of tritiated thymidine in our stock—as well as every batch of every other radiochemical in the house—every ten weeks. Any batch showing a breakdown in excess of 3% is withdrawn from stock. No maybes. This procedure protects you (and us) from low purity material. But the fact of the matter is that our *typical* radiochemical purity is 99%. (Whenever a lot has been re-assayed, these data too are included on the Product Analysis Report that you receive with your shipment. The ambiguity as to product quality, or history for that matter, has been eliminated.)

Now we've told you about our tritiated thymidine, its relatives, our literature, and the Schwarz Quality Assurance Program. A lot of information—of necessity none of it in depth. We are trying to indicate the comprehensiveness of our product line and services in just a single area and to suggest to you that this typifies our usual coverage. Perhaps the implication is that you might consider checking the Schwarz catalog *first* for any of your biochemical or radiochemical needs.

For a catalog, for detailed information on any of the products or points made above, or for placing an order: write, or call us collect at 914-359-2700. Ask for Maryann.

Schwarz BioResearch, Inc.
Orangeburg, New York 10962



Simultaneous (A) Electron Micrograph (B) Electron Probe Microanalysis and (C) Electron Diffraction Pattern of smog dust collected at 1500 ft. over Tokyo.

No. 4 in a Series

See the Model HXA-1 at the EMSA Meeting, August 25-28, Statler-Hilton, N.Y.

ADVANCES IN ELECTRON MICROSCOPY

Electron microscopists have long realized that quantitative knowledge of the elemental composition of observed microstructures would add a major new dimension to electron micrograph interpretation. This can be especially valuable in thin foil work, in the study of precipitates and impurities, aerosols and dusts, and in tissue sections.

In an electron microscope, characteristic x-rays are emitted as the specimen is penetrated by the high energy electron beam. To measure this x-radiation with high precision and resolution while maintaining the other basic functions of the electron microscope—high resolution image formation and electron diffraction—is a design problem which has eluded many workers. Hitachi research scientists have now solved this problem by designing the Model HXA-1 electron probe microanalyzer attachment, a compact high performance x-ray spectrometer built into the specimen chamber of Hitachi HU-11 series electron microscopes. Vacuum-locked specimen exchange is maintained.

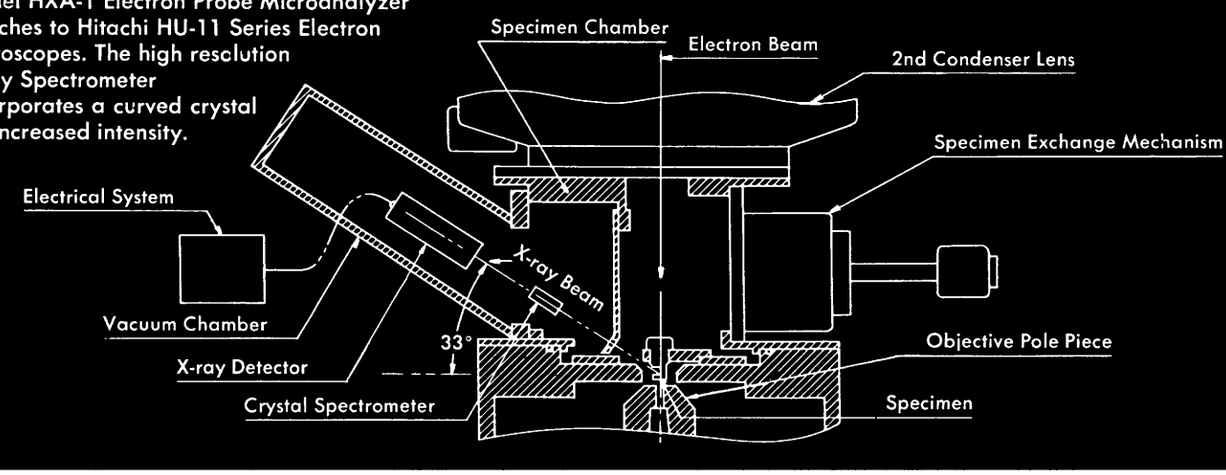
For high sensitivity, the HXA-1 is provided with a large 33° x-ray takeoff angle, curved mica analyzing crystal, and proportional counter. It can automatically scan x-ray wavelengths from 1-10Å and thus record spectra of the elements from magnesium to uranium with excellent resolution. The illuminated area on the specimen can be as small as two microns in diameter. The electron transmission image on the fluorescent screen is used to find areas of interest with direct magnifications from 400X to 100,000X and a resolution of better than 20Å.

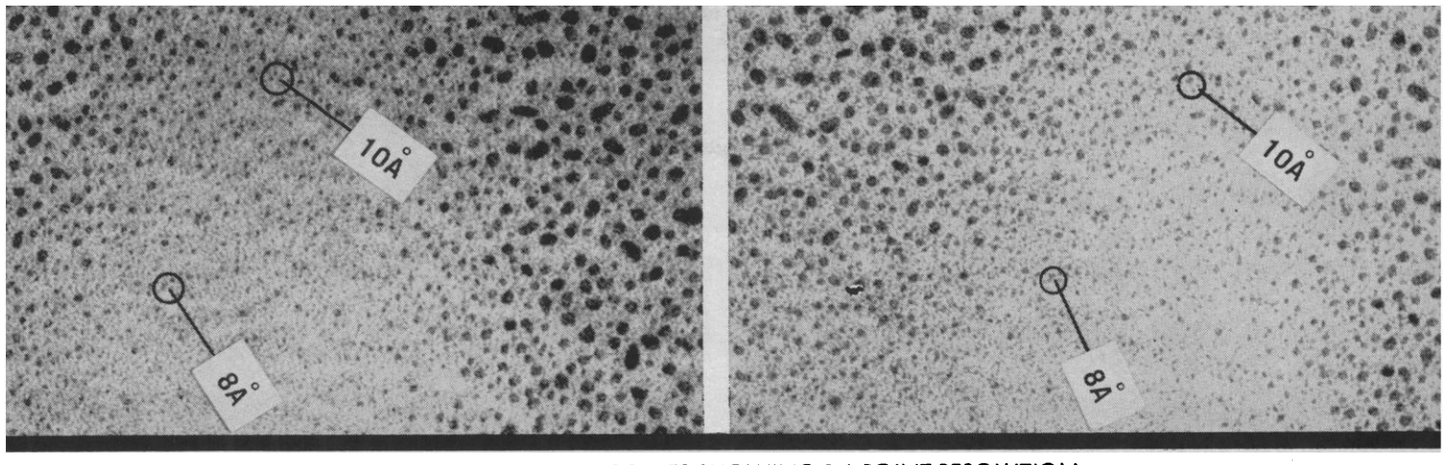
The remarkable capability of the new system is illustrated above. Smog dust was collected by an airplane at 1500 ft. over an industrial area and analyzed on a Hitachi HU-11B Electron Microscope equipped with the HXA-1. The dust was examined at high magnification, and x-ray microanalyses determined elemental composition and electron diffraction patterns indicated the crystal structure of selected particles.

For more information on the new Model HXA-1 write the Distributor Products Department, Perkin-Elmer Corporation, 723 Main Avenue, Norwalk. Conn.

PERKIN-ELMER

Model HXA-1 Electron Probe Microanalyzer attaches to Hitachi HU-11 Series Electron Microscopes. The high resolution X-ray Spectrometer incorporates a curved crystal for increased intensity.





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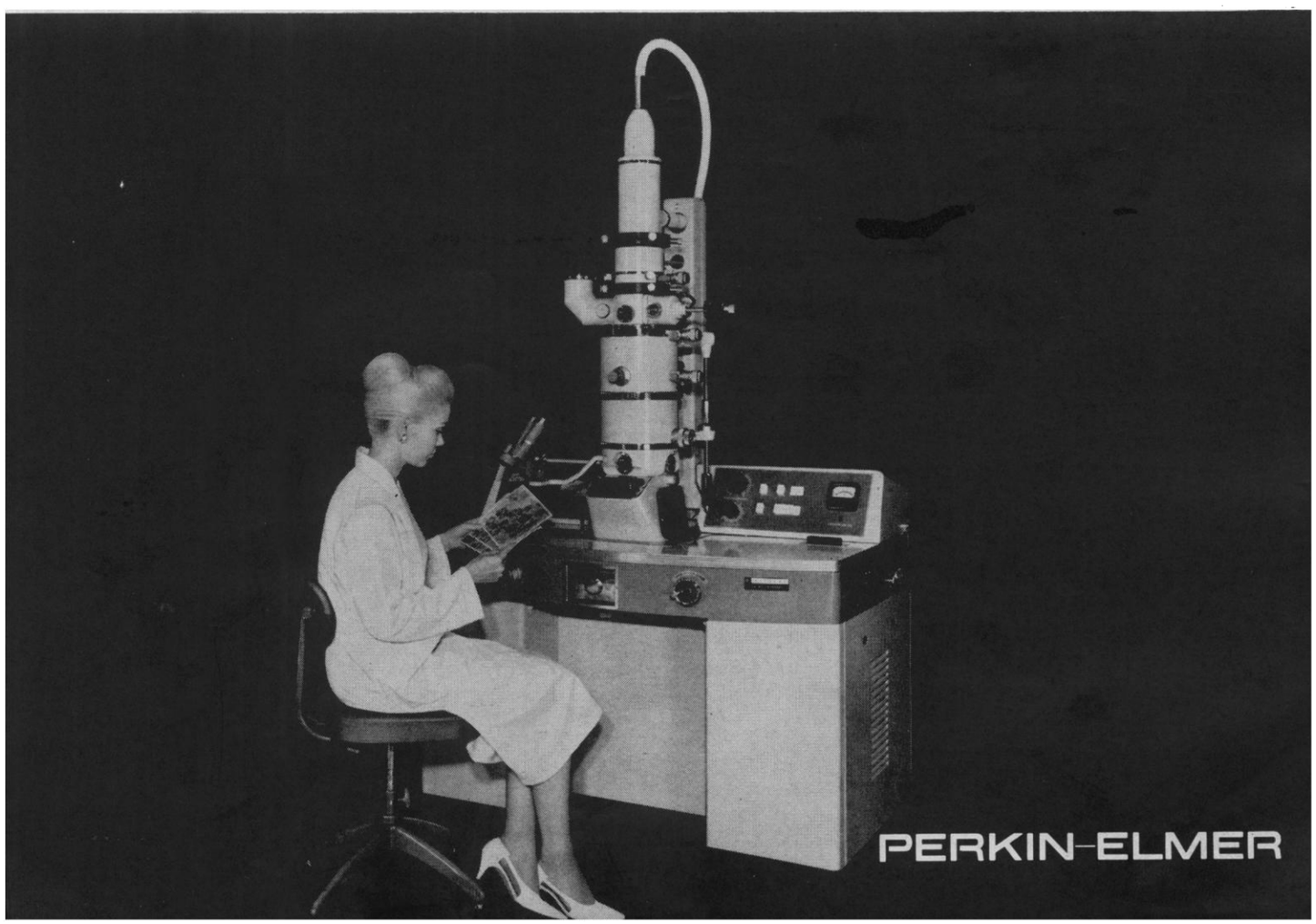
Here are some of the important features of the HS-7S: High resolution: 8 Å guaranteed. Direct magnification 1000X to more than 80,000X, permitting final magnification to 1,000,000X. Binocular viewer (7X). Simple, fast and reliable operation. Click stop positioning of interchangeable condenser and objective apertures (four apertures each). Push button vacuum system including vacuum locked specimen and camera chambers. Takes 18 lantern slides (3¼"x4") per magazine load with additional 18 in prepump chamber. Double condenser lens for improved contrast (four micron spot diameter). Stigmator for objective lens. Step focusing. Built-in anticontamination device for specimen chamber. Built-in exposure meter. Full range of accessories available including the new TV image intensifier system. Compact: 49x32 inches floor space. Price $24,000 duty free. For further information contact Perkin-Elmer Corporation, Distributor Products, Department 723, Main Avenue, Norwalk, Conn.

(Prices subject to change without notice.)



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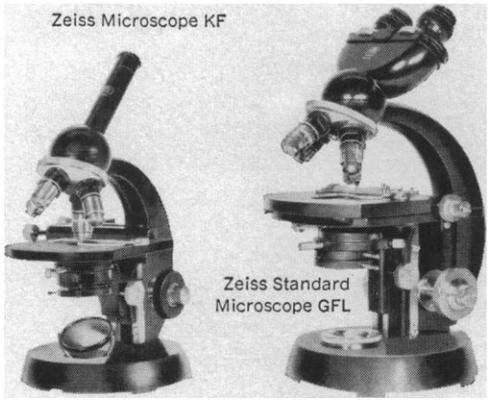
What's in a Name?

The beginning of modern microscopy, if the name is ZEISS. A good microscope was largely a matter of luck until, near the end of the 19th century, an extraordinary man was invited to the workshop of a German microscope-maker named Carl Zeiss. The man was Professor Ernst Abbe, a



brilliant astronomer-physicist who later became Zeiss' partner. Fascinated by the microscope's unrealized potential, Abbe worked four years to formulate the geometrical optics of modern precision microscopes—only to discover that there was no glass with which to make them.

In collaboration with Dr. Otto Schott, a glass chemist, Abbe helped develop glass that could be manufactured with *predictable* refractive properties— the first true optical glass.

Thus, modern microscopy began. With ZEISS.

ZEISS microscopes were used by Pasteur, Koch, Ehrlich; by most of the great names in modern science.

Today, ZEISS instruments remain indispensable tools in the research and industrial laboratories of the world.

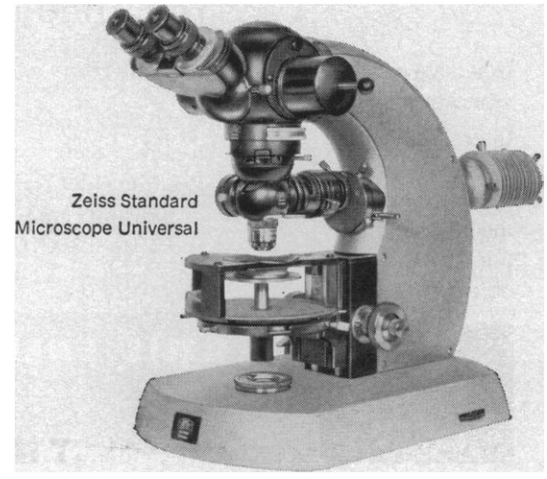
What's in a name? A flow of new ideas that has created the widest range of microscope designs available, if the name is ZEISS. Abbe believed that all ZEISS designs should serve a single cause: the advancement of science.

That guiding tenet, always an integral part of ZEISS philosophy, has resulted in

contributions which have become generic to microscopy. *Abbe condenser, Köhler illumination, Apochromats,* all began with ZEISS.

And new developments continue.

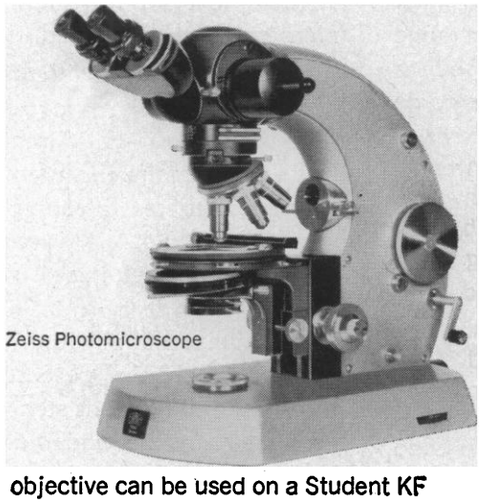
For instance, there is the *Ultraphot II* with its bellows-type 4x5" automatic camera . . . the *Photomicroscope* with a



built-in automatic 35mm micrography system . . . the *Fluorescence Microscope* which makes it possible to continuously vary mercury/tungsten light ratio . . . and many more.

The continuing search for new instrument capabilities has resulted in the widest range of microscopes available, all of them based on the six standard stands illustrated on these two pages.

What's in a name? The ultimate in interchangeability, if the name is ZEISS. All of the ZEISS light microscopes incorporate another tenet of ZEISS design: interchangeability. Because the mechanical tube length of ZEISS microscopes is standardized at 160mm for *both* transmitted and reflected light, objectives, condensers, eyepieces, monocular tubes, binocular tubes, and most stages can be exchanged at will among any of the six basic microscope stands. Thus, the most sophisticated



Zeiss Photomicroscope

objective can be used on a Student KF stand as well as on an Ultraphot.

Interchangeability for unmatched versatility is a ZEISS hallmark.

What's in a name? Objectives of unsurpassed quality, if the name is ZEISS. For three-quarters of a century, ZEISS objectives have set the world's standards

ZEISS

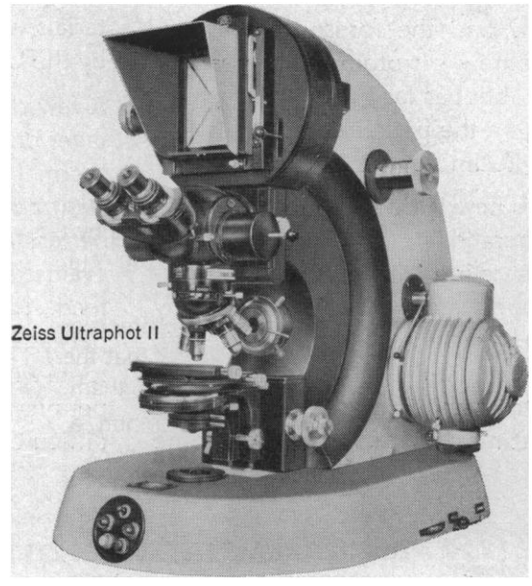
for quality across the entire visible spectrum—and beyond. To study the invisible, ZEISS has developed the exclusive Ultrafluars for ultraviolet studies. Ranging from 10/.20 to 100/1.25, their higher numerical apertures produce sharp and brilliant images in the wavelength range of 230-700mμ.

Today, only ZEISS offers a complete range of Planapochromats—from 4x to 100x, for bright-field, dark-field and phase-contrast work.

All told, there are 132 ZEISS precision objectives that range from 1/.04 up to 100/1.32.

Through ZEISS quality objectives, science explores the farthest reaches of the microcosm.

What's in a name? The great name in optics. The great name in microscopy. If the name is ZEISS. Carl Zeiss, Inc., 444 Fifth Avenue, New York, N. Y. 10018. In Canada: 14 Overlea Blvd., Toronto.



Zeiss Ultraphot II

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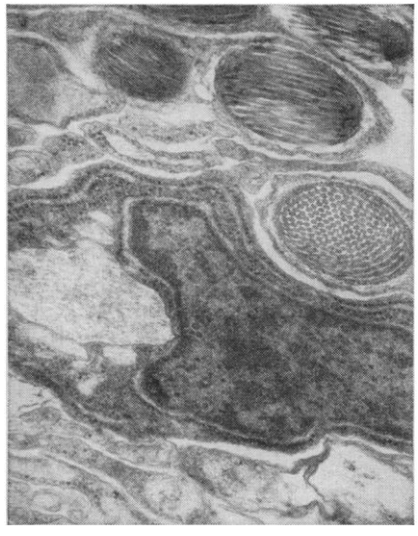
Kodak advertises:

a strong desire to contribute to electron micrography . . .
a complexing agent for hydrocarbons . . . visible intelligence

Competence in customers



Delbert E. Philpott took this beautiful electron micrograph on a KODAK Projector Slide Plate, Contrast. It shows the ultimate source of the sticky secretion on the tube feet of starfish that gives them a grip powerful enough to open oysters. The sieve-like object is a cross-section of one of the secretory packets that Dr. Philpott discovered. Two more secretory packets are seen in longitudinal section above it. The large object beneath the packets is the cell nucleus.

How much easier life would be for biology students without the long tale spilled out on KODAK Projector Slide Plates by electron microscopes over the past quarter century! Used to be KODAK Lantern Slide Plates. No difference. (Only the name was updated. The old name was redolent of coal oil.) In addition to "Contrast," they also come as "Medium." Very little difference in electron-exposure behavior. ("Not so," argue some customers. We don't argue back. The customer is always right.)

What, then, has happened to the spirit of progress in materials for electron micrography? This is a very difficult question on which we have been working for a long time. About all we have to show for this work is an article entitled "Some Things Every Electron Microscopist Ought to Know." It's free from Publications Service, Eastman Kodak Company, Rochester, N. Y. 14650. It chats a little theory (very, very lightly) about electron image structure. Dr. Philpott had never read it before making the electron micrograph that revealed the starfish's secretory secret. Neither did any of the people who uncovered all the other organelles for the biology students.

Operations in the π-clouds

The U.S. Air Force has been kind enough to develop a new electron acceptor and kind enough to tell the world about it, including us, who have promptly made and marketed it as EASTMAN 9724, *9-(Dicyanomethylene)-2, 4, 7-trinitrofluorene*. This is a fine thing for an air force to do.

EASTMAN 9724 makes π-complexes with hydrocarbons, π-complexes notably less inclined to dissociate on crystallization than the π-complexes of *2,4,7-Trinitro-9-fluorenone* (EASTMAN 7135). Less potent a π-acid than the mighty *Tetracyanoethylene* (EASTMAN 7883), the nitrilated trinitrofluorene is stronger than its parent, which owes its fame to a Ph.D. candidate who, a decade ago, acquired a large number of our benzene derivatives and watched them under the microscope to see which would and which wouldn't form brightly colored addition compounds with the trinitrofluorenone from a fusion mixture. Hoping at the outset for a touchstone to tell the mononuclears from the polynuclears, he wound up instead with a set of selection rules that his successors in interest have succinctly summarized in the π-bonding concept. Now all aromatics have been fitted out by the theoreticians with halos composed of the pooled left-over electrons. Unless electron-loving substituents have drained off the π-cloud or the halo has been otherwise bent somehow, a new variety of stable complexes will be formed with the trinitrofluorenone structure. Except that if the Air Force is right and you do it with EASTMAN 9724 instead, the complexes will be *more* stable. The absorption maxima of the charge-transfer bands—whence comes the bright color—occur at longer wavelengths that do not confuse with the absorption bands of the aromatic hydrocarbon donors. Want a list of the maxima as seen in *Dichloromethane* (EASTMAN S342 is the Spectro Grade)? They're beautifully spaced.

This EASTMAN *Organic Chemicals business is handled by Distillation Products Industries, Rochester, N. Y. 14603 (Division of Eastman Kodak Company).*

Uncertainty searching

Costlier means of storing and retrieving technical and business information can be found than our RECORDAK MIRACODE equipment. Nevertheless, it sells. U. S. taxpayers may even be pleased to learn that prominent among the buyers have been government agencies, civil and military, with budgets where you would think they could scarcely afford to engage in procurement that contributes so weakly toward the task of spending.

As a result of this acceptance accorded the MIRACODE System since its introduction in 1963, development has progressed. You put intelligence in visible form on microfilm,* encode it, and then at some future time, when you push buttons telling what you want, it finds it, zip-zip, and even offers you paper copies. The progress made permits us to drop the assumption that you will know what you want. Maybe you will only know what you *don't* want. Maybe you will be specifying your interests by boundary conditions. Maybe, being a child of the age, you handle the conjunctions "and" and "or" creatively. Maybe encoding economies are practiced. Furthermore, in all likelihood the guys who just possibly might have written that key paper you seek and/or the smart young lady who encoded it for microfilm were thinking in a context different from yours. Therefore we can arrange for the sequence of descriptors not to matter.

Get in touch with Charles E. Harris, Jr., Recordak Corporation (Subsidiary of Eastman Kodak Co.), 770 Broadway, New York, N. Y. 10003. Charlie Harris talks smaller dollar numbers than do those who think you believe in a machine where you will press a button and get a yes-or-no answer. Recordak, being the microfilm pioneer, is strongly coupled to the eyes. The eye is the external part of the central nervous system. The magnificence of man's central nervous system sets him apart from the beasts.

*The intelligence might have come out of a computer, unseen except from the microfilm.

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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

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AAAS Distinguished Lecture: Genetics and Cultural Change by George W. Beadle, president, University of Chicago.

Interdisciplinary Symposia: Ground-level Climatology; Proteins and Nucleic Acids; Materials Science in Medicine, Dentistry, and Pharmacy; Behavior, Brain, and Biochemistry; Mathematical Bases in Economic Planning.

Special Sessions: AAAS Presidential Address by Laurence M. Gould; the Joint Address of Sigma Xi and Phi Beta Kappa by J. Bronowski; the George Sarton Memorial Lecture; and the National Geographic Society Illustrated Lecture.

AAAS Committees: Special Program of the AAAS Committee on Council Affairs on Civil Defense; Committee on Desert and Arid Zones Research symposium on Evolving Water Law: Conflict between Federal and State Governments; Commission on Science Education.

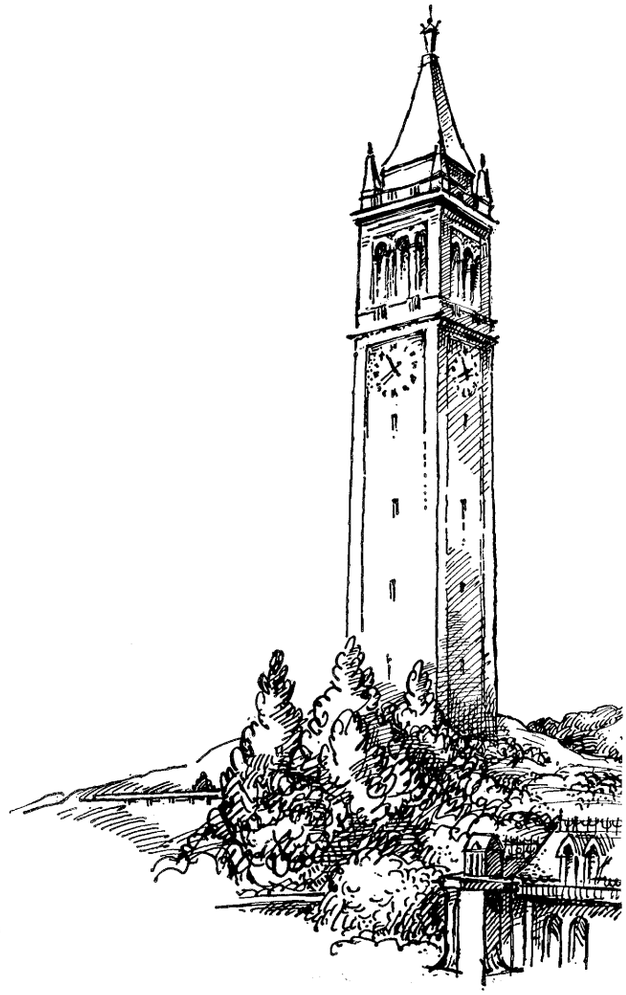
Lawrence Hall of Science: Director Harvey E. White will lecture twice on this splendid Center of Science Education, 27 and 29 December.

Sections and Societies: The 20 AAAS Sections and some 92 participating societies are scheduling specialized symposia and papers.

AAAS Science Theatre: The latest foreign and domestic films.

Exhibits: The Annual Exposition of Science and Industry is on the lower level of the ASUC Student Center, AAAS Headquarters.

Advance Registration: By registering in advance, you avoid delay at the Registration Center on arrival; you receive the **General Program** in time to plan your days at the meeting; and your name is posted in the Visible Directory of Registrants when the meeting opens. Use the coupon below.



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Make Your Reservations

Make sure you have the sleeping accommodations you prefer. Since this is a campus meeting—and the ASUC Student Center is AAAS headquarters—society headquarters will be mainly in university buildings.

Hotel and Motel Information. A deposit of $5 is required by all hotels and motels. Deposits are credited toward the final bill, and are refunded if cancellation is received not later than 10 days before the date of your reservation. Make checks payable to the AAAS Housing Bureau.

Residence Hall Information. Accommodations are available for one or two persons per room, for couples, and for children 14 years or older. Hours for room registration at the Hall are 8:00 a.m.–10:30 p.m. daily. The full amount for room, with or without meals, is collected in advance. There is a special charge for overnight 30 December (no meals December 31): $6.00 single occupancy, $5.00 per person double. Parking is 50¢ per 24-hour day. The general deadline for residence hall reservations is 10 December.

For more details on all of the above facilities and services, see the 23 July issue of Science, page 454.

The hotel, motel, and residence hall sleeping accommodations are for your convenience in making your room reservation in Berkeley. **Please use the coupon below and send it and any necessary deposit directly to the AAAS Housing Bureau in Berkeley.** Give a definite date and estimated hour of arrival, and also your probable date of departure. The Housing Bureau will make the assignment and promptly send you a confirmation.

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HOTELS	Single	Double	Twin	Suite	Parking
Claremont (300)	$11.00	$15.00	$15.00		Free
Durant (200)	8.50*		12.00*	$18.00-22.00	50¢, $1.00
Shattuck (250)	8.50	11.00	14.00	25.00-35.00	Public
* A few single rooms at $5.50, twins at $7.50.					
MOTELS					
Berkeley House (112)	9.50	13.50	13.50	25.00-28.00	
Berkeley Plaza (52)	7.00	8.50	9.50	15.00	
Berkeley Travelodge (46)	8.00	10.00	11.00		
California Motel (42)	6.50	7.00	8.00		
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Single occupancy—$7.50 without meals; $8.50 with breakfast and lunch
Two in a room—$6.50 each without meals; $7.50 each with breakfast and lunch

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AAAS Housing Bureau
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Berkeley, California 94701

Date of Application ..... Deposit of $..... enclosed

Please reserve the following accommodations for the 132nd Meeting of the AAAS in Berkeley, 26-31 December 1965

First Choice of Hotel, Motel, or Residence Hall ..... **Second Choice** .....

Type of room: Single ☐ Double bed ☐ Double, twin beds ☐ Suite ☐ Rate: Desired ..... Maximum rate.....

Number in party ..... Sharing this room will be: .....
(List name and address of each person, including yourself. Attach list if space is insufficient.)

.....

DATES: ARRIVAL ..... A.M. .....P.M. ..... DEPARTURE .....
(These must be indicated—add approximate hour, A.M. or P.M.)

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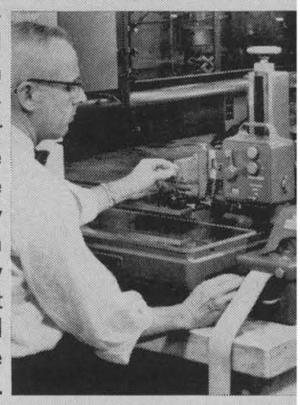
(Individual requesting reservation) (Please print or type)

ADDRESS .....
(Street) (City) (State) (ZIP Code)

Mail this coupon now to the AAAS Housing Bureau. Enclose hotel or motel room deposit if needed. Make checks payable to AAAS Housing Bureau. All rooms will be assigned and confirmed in order of receipt of reservation.

PLOTTING THE UNMEASURABLE

In a tantalum thin film circuit where the film is 400 atom layers thick, a variation in thickness of as little as four atom layers can cause a significant difference in resistance. Since Western Electric is using an increasing number of thin film circuits in the sophisticated communications equipment we are now making for the Bell System, we needed a rapid but reliable method of measuring variations of that order. ☐ Originally Bell Telephone Laboratories engineers worked out a method of using a stylus measuring device to give measurements with a precision of about 15 atom layers. But this was not close enough. So Western Electric engineers went further. ☐ Using the statistical technique known as multiple regression analysis, they developed a computer program that enabled them to derive contour plots of the surface of the film which gave them results almost five times as accurate as their original measurements. This ability to analyze processes far more closely than straightforward measurement would allow is becoming an increasingly important part of Western Electric's job in helping the Bell telephone companies give America the most convenient communications on earth.



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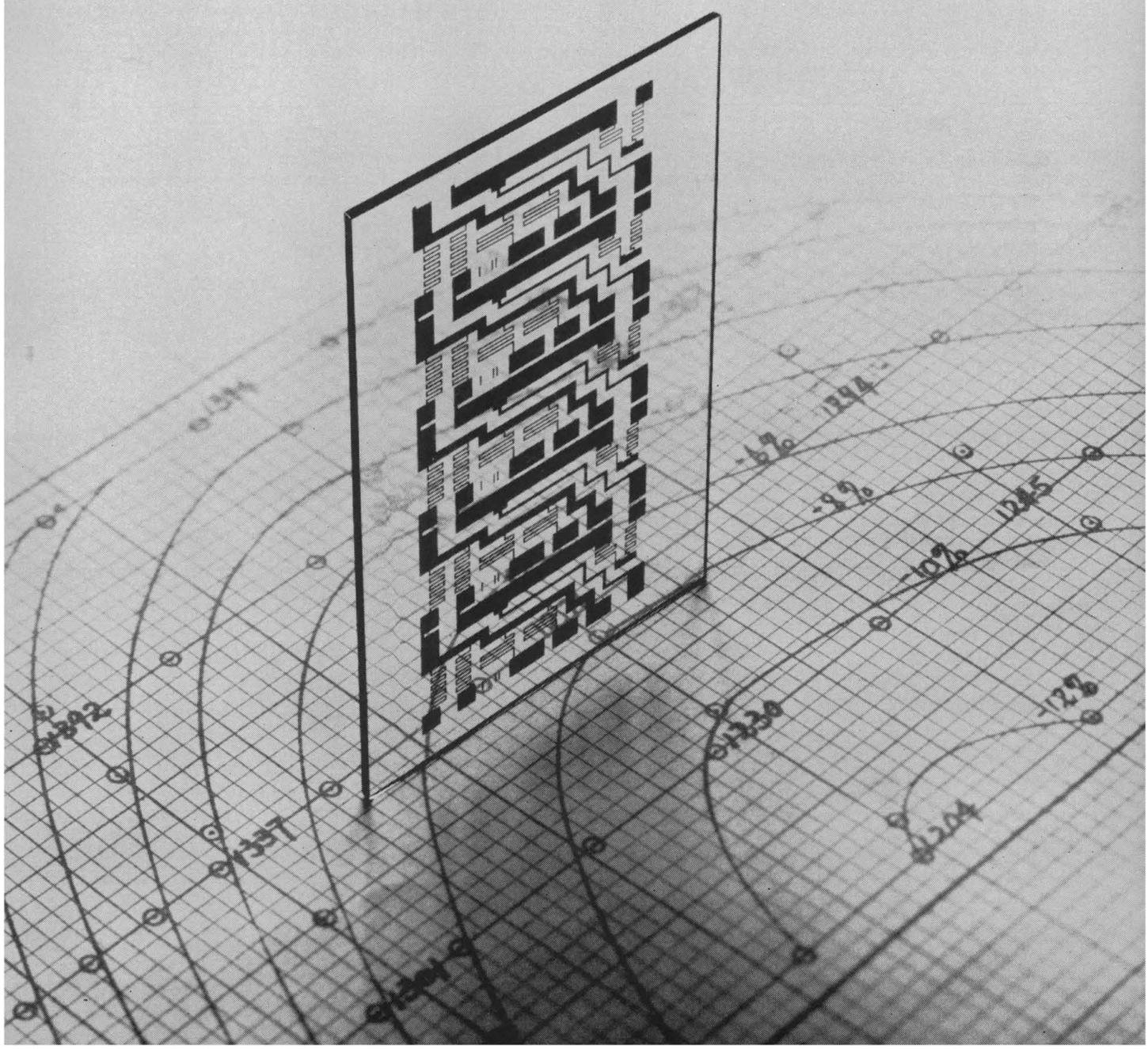

therefore important, even essential, that the public bring unremitting and strong counterpressure to bear. Let us hope the present bill will be aborted, but that pressure for a maximum flow of information will continue undiminished. Parenthetically, I understand that the bill currently undergoing committee hearings, apparently identical with Larrabee's citation, H.R. 5583, is numbered H.R. 5012.

Larrabee is apparently concerned primarily with the impact of the proposed bill on the scientific and technologic community. This is natural, given the special audience for your journal. However, in considering questions like this one, is it not a little parochial to claim, even by implication, a special dispensation for the scientist and technologist? Granted there are some aspects of the general problem which are special to science and technology (Larrabee mentions a "right to publish"); these special aspects can be soundly dealt with only in the general context of access to federal records.

There is a voluminous literature on access to records. May I recommend a paper that provides some historical perspective: "'Public records'—who knows what they are?" by Oliver W. Holmes [*Am. Archivist* **23**, 3 (1960)].

C. E. DEWING
1320 McCay Lane, McLean, Virginia

Grassland Fires

The recent report regarding grassland vegetation by Wells (9 Apr., p. 246) and the letter by Ehrenfried (28 May, p. 1173) stress the role of man as a cause of fires in the Great Plains region. As a range conservationist with several years of experience in western North and South Dakota, I have had the effectiveness of lightning in starting prairie fires amply demonstrated to me. On many occasions, during the late summer months, lightning started numerous fires over a wide area where I was responsible for fire control, and control measures were necessary to suppress them. On such occasions one could vividly picture the potential of such fires in a time when no fire control agencies existed. In that era such fire-retarding factors or conditions as roads, railways, plowed fields, residential areas, strip mines, and overgrazed rangelands would also have been absent. That man contributed (and continues to contribute) to the incidence of fires on the Great Plains cannot be denied, but the role of lightning should not be overlooked or slighted.

CARL-ERIC GRANFELT
Box 338, Whiteriver, Arizona

Aristogenics

In the 18 June issue of *Science* (p. 1579), two books were reviewed under the heading "Modifying man: Muller's eugenics and Lederberg's euphenics." Readers who find these books enjoyable or important may be interested to learn of a project which at present is being actively discussed in England and which in many ways may be expected to fit the English milieu particularly well. Briefly, it is proposed to have a bill laid before Parliament which would grant certain eugenical privileges to the aristocracy, of blood and mind. The peerage, including life peers, would under this scheme be allowed polygamous marriages, while knights would be asked to provide semen to a Bank of Superior Genotypes. Gradations of privilege may, under the proposal, be laid down in historical terms for peers, but for knights according to classifications such as the five classes of the Order of the British Empire. Women (married women, for the time being) will presumably be urged to use the Bank by drawing freely on the account of their choice.

Like any human undertaking, the plan in question cannot be expected to appeal to everyone, perhaps not even to all eugenicists. Some no doubt will complain that not all peers or knights are sufficiently superior for the proposed honors. But that argument was conclusively squelched in a recent letter to the *New Statesman* which, referring to the bemedaled Beatles, said: "You see fit to condemn publicly the award of an MBE to four boys who have given more pleasure to more people of all races than, perhaps, anyone ever before." That attitude has become widespread and will presumably give much support to the eugenic scheme, notably among women. Skeptics may wish to turn to an article "Eugenics and utopia" in the spring issue of *Daedalus*.

WALTER LANDAUER
University College, London, England

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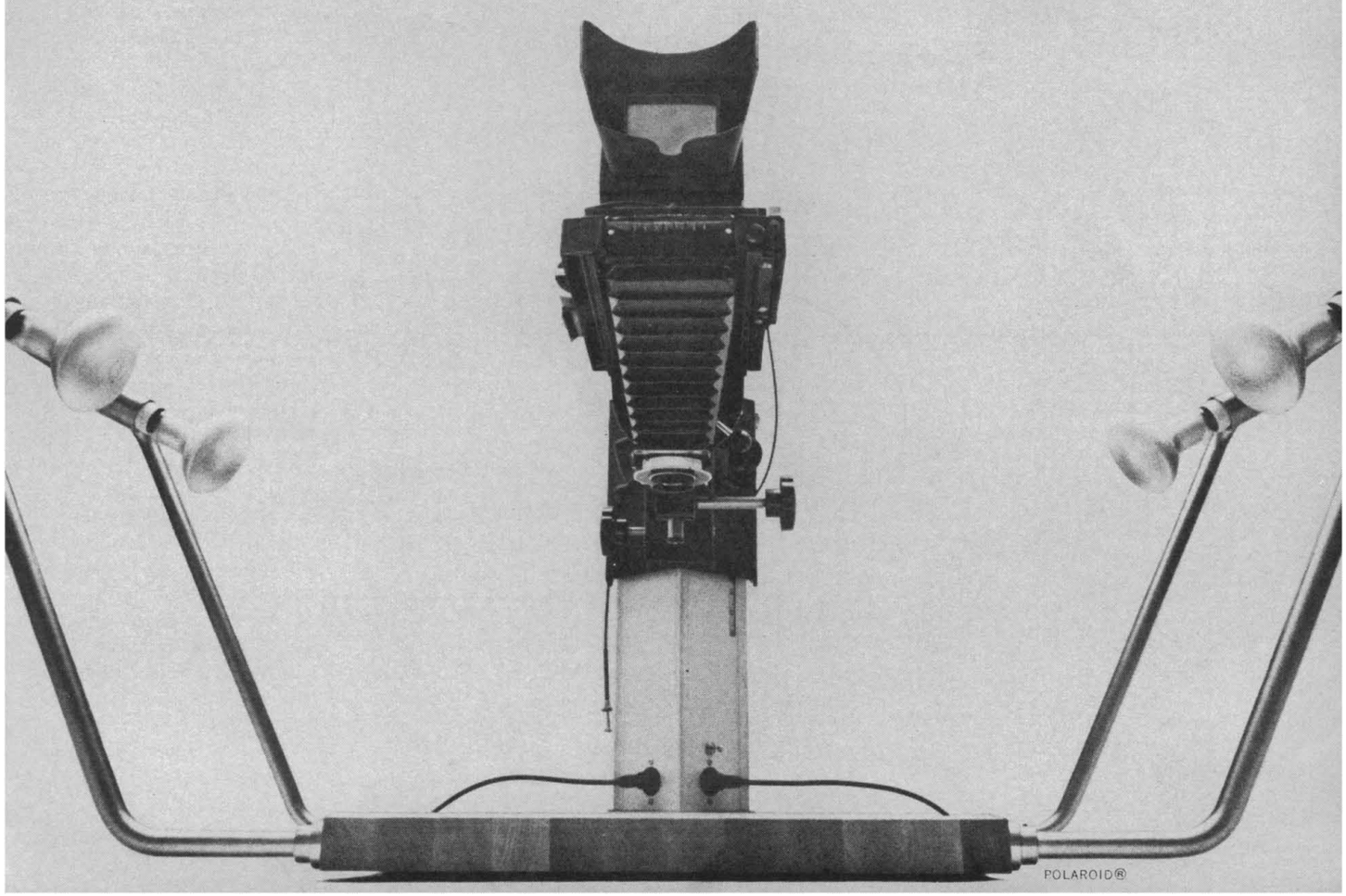

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Save the World

The time has arrived for an extensive systems analysis of the problems of saving planet Earth as a pleasant, productive home for mankind, for now, with a rush, there has come widespread recognition of the deadly seriousness of many of the issues involved.

The fundamental problem is people. Whatever we do to increase food supplies, conserve water, improve land management, or curb pollution merely postpones for a few years the day of catastrophe unless we stop increasing the number of hungry mouths. National and international governmental agencies have *population* high on their agendas. Pope Paul has asked his special advisory commission to speed its report to him, and that report may become public in the next few weeks. Much, very much, is to be done, but this problem is recognized as urgent.

Others are gaining in recognition and urgency. Governor Brown of California has engaged four aerospace companies to study the problems of smog, sewage, transportation, and agricultural and industrial wastes in that teeming state. UNESCO's Hydrological Decade started this year. Other signs, all of recent days, concern a variety of elements of the problem. On 11 August the President met with eastern governors, mayors, and congressmen to consider the water emergency in their states. On 5 August the Western Interstate Water Conference was warned that five of the seven great drainage areas of the western states will, within the next 15 years, be developed as far as they can be. On 6 August India extended to all cities of over a million its policy of restricting the allowance of wheat or rice for adults to 12 ounces a day. A group of congressmen spent several hours viewing the horrors of the Hudson River, its oil slicks, dead fish, detergent bubbles, beer cans, and other garbage. Congressional hoppers are full of bills dealing with national parks, wilderness areas, and conservation measures. A Gallup poll showed 77 percent of a national sample as favoring government action on water problems. Morris Neiburger of the University of California, Los Angeles, warned that if the rest of the world gets to using automobiles as freely as the United States does, smog will kill us all within a century. High-rise mausoleums have been proposed. All of these actions, conferences, and alarms are accompanied by a spate of newspaper and magazine articles that warn the public of the consequences of inaction.

If it be assumed—as it must be—that we will succeed in stemming population growth and preventing nuclear catastrophe, our expected success on these problems makes it time for an analysis on a global scale of the whole set of environmental problems, a systems study of mankind in relation to his planet. Finding the right sponsor for such a study will be an initial difficulty, but perhaps one of the United Nations agencies or a foundation with a world view will come forward. Other difficulties will be created by political divisions, apathy, and the claims of other problems. Controversial decisions will be necessary on whether to move water, move people, change their style of life, or change the distribution of agriculture and industry. Many of the remedial actions will be partial and piecemeal. But a systems analysis of man and his environment would bring increased public and governmental understanding of the scope and importance of positive action and would provide guidance on priorities, costs, time scales, interrelationships, and alternatives that will have to be debated before integrated programs of action can be started.

—DAEL WOLFLE

16th mtg., Budapest, Hungary. (S. Lengyel, ELTE Fizikai-Kemial es Radiologiai Tanszek, Puskin u. 11–13, Budapest 8)

5–10. **Electromyography**, intern. mtg., Vienna. (K. Pateisky, Universitats Nervenklinik, 14 Lazarettgasse, Vienna 9)

5–10. **Neurology**, 8th intern. congr., Vienna, Austria. (Congress Office, Vienna Academy of Medicine, Alserstr. 4, Vienna 9)

5–10. Ecology of **Soil Bacteria**, symp., Liverpool, England. (N. A. Burges, Univ. of Liverpool, Hartley Botanical Laboratories, Liverpool)

5–12. **Electroencephalography and Clinical Neurophysiology**, 6th intern. congr., Vienna, Austria. (M. A. B. Brazier, Brain Research Inst., Univ. of California Medical Center, Los Angeles 24)

5–14. **Fertility and Sterility**, 5th intern. congr., Madrid, Spain. (J. Ascenzo Aabello, Parque Meliton Porras, 161, Miraflores, Lima, Peru)

6–9. **Organosilicon Chemistry**, intern. symp., Prague, Czechoslovakia. (Inst. of Chemical Process Fundamentals, Prague-Suchodol 2)

6–9. **Thermal Analysis**, first intern. conf., Aberdeen, Scotland. (C. B. Murphy, Bldg. 5, General Electric Co., 1 River Rd., Schenectady, N.Y.)

6–10. **Embryology**, 7th intern. conf., Edinburgh, Scotland. (A. S. G. Curtis, Dept. of Zoology, University College London, Gower St., London W.C.1, England)

6–10. **Plasma Physics and Controlled Nuclear Fusion Research**, 2nd conf., Abingdon, England. (H. H. Storhaug, Div. of Scientific and Technical Information, Intern. Atomic Energy Agency, Kärntner Ring 11, Vienna 1, Austria)

6–10. European Organization for **Quality Control**, 9th conf., Rotterdam, Netherlands. (Secretariat, Weena 700, Rotterdam 3)

6–10. International Union of Directors of **Zoological Gardens**, annual, Berlin, Germany. (E. M. Lang, Zoologischer Garten, Basel, Switzerland)

6–11. **Electromagnetic Distance Measurement**, symp., London, England. (R. C. A. Edge, Field Survey, Ordnance Survey, Leatherhead Rd., Chessington, Surrey)

6–11. **Electromagnetic Wave Theory**, Intern. Scientific Radio Union, symp., Delft, Netherlands. (R. Timman, Technological Univ., Julianalaan 132, Delft)

6–11. **Polarization Phenomena of Nucleons**, 2nd intern. conf., Karlsruhe, Germany. (H. Schopper, Institut für Experimentelle Kernphysik, Kernforschungszentrum Karlsruhe, Postfach 947, 75 Karlsruhe)

6–11. Basic Problems in **Thin Film Physics**, intern. symp., Clausthal-Göttingen, Germany. (R. Nossek, Physikalisches Institut, Technische Hochschule, Clausthal)

6–12. International Soc. for Research on **Nutrition and Vital Substances**, Salzburg, Austria. (H. A. Schweigart, The Society, Bemeroderstr., 61, Hanover-Kirchrode, Germany)

6–12. **Photosynthesis**, Western European conf., Zeist, Netherlands. (J. C. Goedheer, Physica Inst., State Univ., Bijlhouwerstraat 6, Utrecht, Netherlands)

6–17. **Cosmic Rays**, 9th intern. conf., London, England. (C. J. Hatton, Physics Dept., Leeds Univ., Leeds 2, England)

6–17. **Equatorial Aeronomy**, 2nd intern. symp., Brazilian Space Commission, São José dos Campos, Brazil. (F. de Mendonca, Comissão Nacional de Atividades Espaciaia, São José dos Campos)

6–17. **Laboratory Animal Husbandry**, symp., Dublin, Ireland. (M. L. Conalty, Medical Research Council Laboratories, Trinity College, Dublin 2)

7–9. **Electronic Materials**, conf., San Francisco, Calif. (American Inst. of Mining, Metallurgical, and Petroleum Engineers, 345 E. 47 St., New York 17)

7–9. Internal **Friction** in Solids, conf., Manchester, England. (G. M. Leak, Dept. of Metallurgy, Univ. of Manchester, Manchester 13)

7–9. **Minerals**, Soc. of Mining Engineers, fall mtg., Phoenix, Ariz. (American Inst. of Mining, Metallurgical and Petroleum Engineers, 345 E. 47 St., New York 17)

7–9. Biology of **Parasites of Veterinary Importance**, World Assoc. for the Advancement of Veterinary Parasitology, 2nd intern. conf., Univ. of Pennsylvania, Philadelphia. (S. M. Gaafar, Dept. of Veterinary Microbiology, Pathology, and Public Health, Purdue Univ., Lafayette, Ind.)

7–10. **Virus and Vector on Perennial Hosts**, intern. conf., Davis, Calif. (B. Hewitt, Dept. of Plant Pathology, Univ. of California, Davis 95616)

7–14. **Acoustics**, 5th intern. congr., Liége, Belgium. (J. Frenkiel, 33 rue St.-Gilles, Liége)

8–10. **Automation** in Analytical Chemistry, intern. symp., New York, N.Y. (E. C. Whitehead, Technicon, Research Park, Chauncey, N.Y.)

8–10. **Biochemistry of Copper**, intern. symp., Harriman, N.Y. (J. Peisach, Dept. of Pharmacology, Albert Einstein College of Medicine, Yeshiva Univ., New York 61)

8–10. **Genetics** Soc. of America, Colorado State Univ., Fort Collins. (R. P. Wagner, Univ. of Texas, Austin)

8–10. **Magnet Technology**, intern. symp., Stanford Univ., Stanford, Calif. (R. H. Moulton, Jr., Stanford Linear Accelerator Center, P.O. Box 4349, Stanford Univ., Stanford)

8–10. International Organization for **Medical Physics**, first intern. conf., Harrogate, England. (Secretary, United Kingdom Natl. Committee for Medical Physics, 45/47 Little Britain, London E.C.1)

8–10. **Radiation Effects**, mtg., Asheville, N.C. (American Inst. of Mining, Metallurgical, and Petroleum Engineers, 345 E. 47 St., New York 17)

8–10. **X-Ray Optics and Microanalysis**, 4th intern. conf., Orsay, France. (Mr. Deschamps, Dept. of Physics, Institute de Recherches de la Siderurgie Française, St.-Germain-en-Laye, France)

8–11. **Biological Systems** at the Molecular Level, Naples, Italy. (R. C. Williams, Virus Laboratory, Univ. of California, Berkeley 94720)

8–11. **Biometric** Soc., eastern North America region, Philadelphia, Pa. (E. L. LeClerg, 6804 40th Ave., University Park, Hyattsville, Md.)

8–11. Prevention of **Dental Caries**, symp., Prague, Czechoslovakia. (J. Kostlan, Vinohradska 48, Prague 2)

8–11. American **Political Science** Assoc., Washington, D.C. (E. M. Kirkpatrick, 1726 Massachusetts Ave., NW, Washington)

8–11. American **Statistical** Assoc., Phila-