

SCIENCE

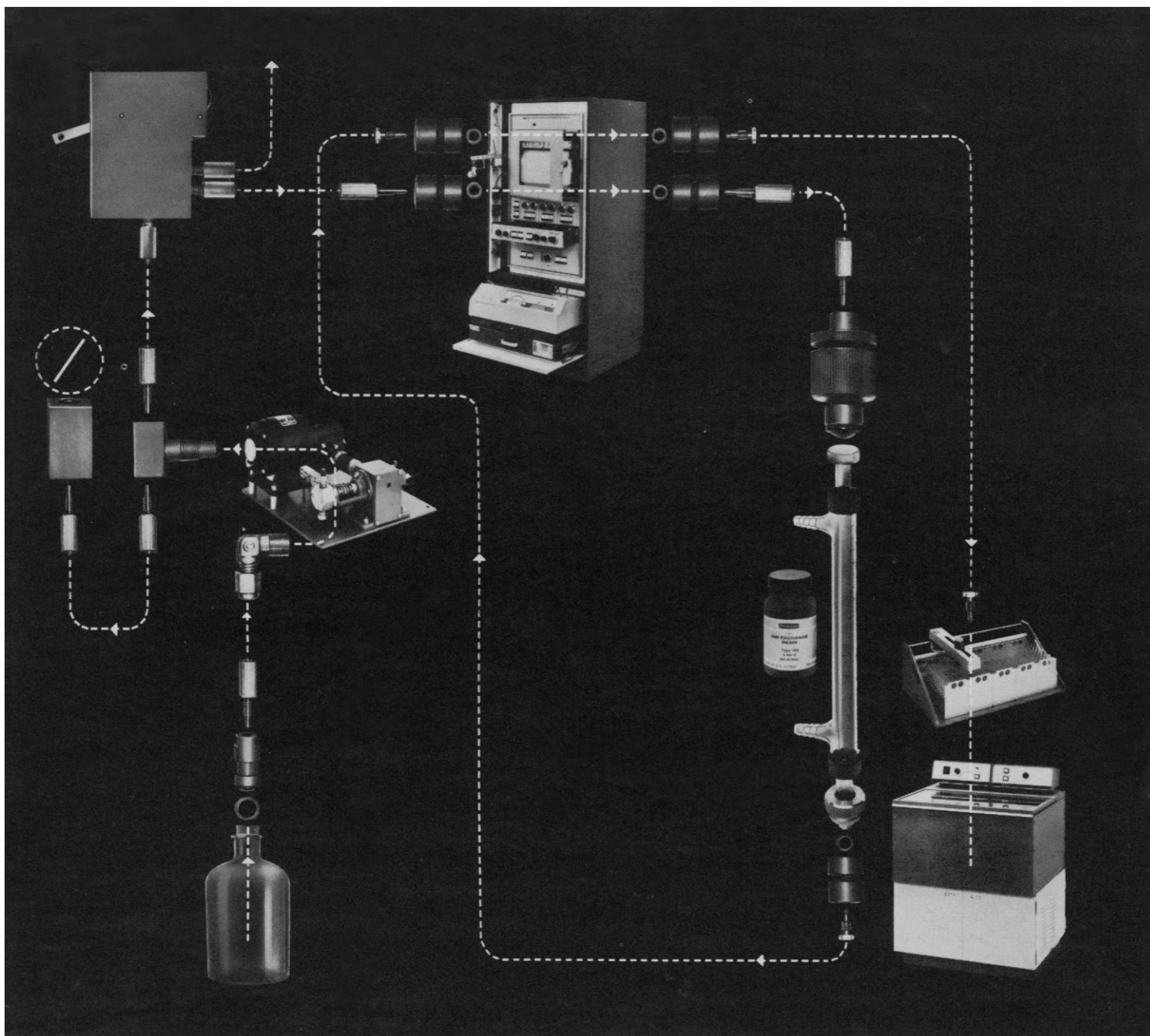
17 September 1965

Vol. 149, No. 3690

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



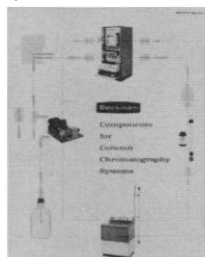
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Is ersatz ever better?

(Or: is it excessively presumptuous to claim—as we do herein—that our new reconstituted C¹⁴ protein hydrolysate is always all ways better for protein labeling than a natural C¹⁴ protein hydrolysate?)

The problem with using a natural yeast or algal C¹⁴ protein hydrolysate for protein labeling is that you *start* your work with numerous and varied unneeded unknowns since the natural hydrolysate is relatively crude and may contain as much as 30-40% of non-amino acid material. And who needs such gratuitous complications?

The uncertainty that comes from undefined and unwanted contaminants can now be avoided by using our new reconstituted C¹⁴ protein hydrolysate which consists of C¹⁴ amino acids (and C¹⁴ amino acids *only*.) This product is exclusive with us. At least for the nonce.

Our work gets started (as *yours* shouldn't) with the typically unpredictable C¹⁴ yeast hydrolysate. But its amino acids are then separated and purified and the extraneous materials eliminated. At this point we have the individual amino acids, each with a *minimum* radiochemical purity of 99%. Thirteen of these are then recombined so as to mimic closely their proportions in the natural hydrolysate.

Two things can now be said about this reconstituted protein hydrolysate: (1) it has a 100% biosynthetically-prepared L-amino acid composition, and (2) all of the amino acids are uniformly C¹⁴ labeled. Or, more simply: this mixture is free of any non-amino acid material, hot or cold, and all of the amino acids are hot.

If you reached this point assuming that the extra processing, the extra purity, the extra convenience to you, is going to cost you extra—forget it. It won't. Rather surprisingly, 100 μ c of this C¹⁴ reconstituted protein hydrolysate costs only \$35. 500 μ c is \$170. 1 mc runs \$320. And 2 mc a mere

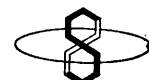
\$600. (For a pleasant surprise, compare these prices with what you now pay for the crude natural product.) Also, please note that you get a Product Analysis Report with every shipment with the specific activity of each of the component amino acids. The other specifications for this product look like this:

	sp. act. mc/mmole	μ c/mc of mix.		sp. act. mc/mmole	μ c/mc of mix.
L-Ala-C ¹⁴	> 70	80	L-Phe-C ¹⁴	> 168	80
L-Arg-C ¹⁴	> 130	50	L-Pro-C ¹⁴	> 110	50
L-Asp-C ¹⁴	> 110	125	L-Ser-C ¹⁴	> 85	80
L-Glu-C ¹⁴	> 165	125	L-Thr-C ¹⁴	> 100	80
L-Ileu-C ¹⁴	> 110	100	L-Tyr-C ¹⁴	> 150	80
L-Leu-C ¹⁴	> 130	50	L-Val-C ¹⁴	> 100	50
L-Lys-C ¹⁴	> 180	50			

mixture of purified L-amino acids is in 0.01 N HCl/ 100 μ c vials contain 100 μ c/ml / all other vials contain 1 mc/ml

One interesting final point: we also have a mixture that is comparable in essentially every respect to the reconstituted protein hydrolysate shown above but with only these four C¹⁴ essential amino acids: arginine, leucine, lysine, valine, and with total activity divided equally among these. This too is new. We call it our C¹⁴ L-Amino Acid Protein Labeling Mixture (catalog no. 3122-06). It, and the reconstituted protein hydrolysate (catalog no. 3122-08), are immediately available to you from stock. Write, or call us collect at 914-359-2700. Ask for Maryann.

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17 September 1965

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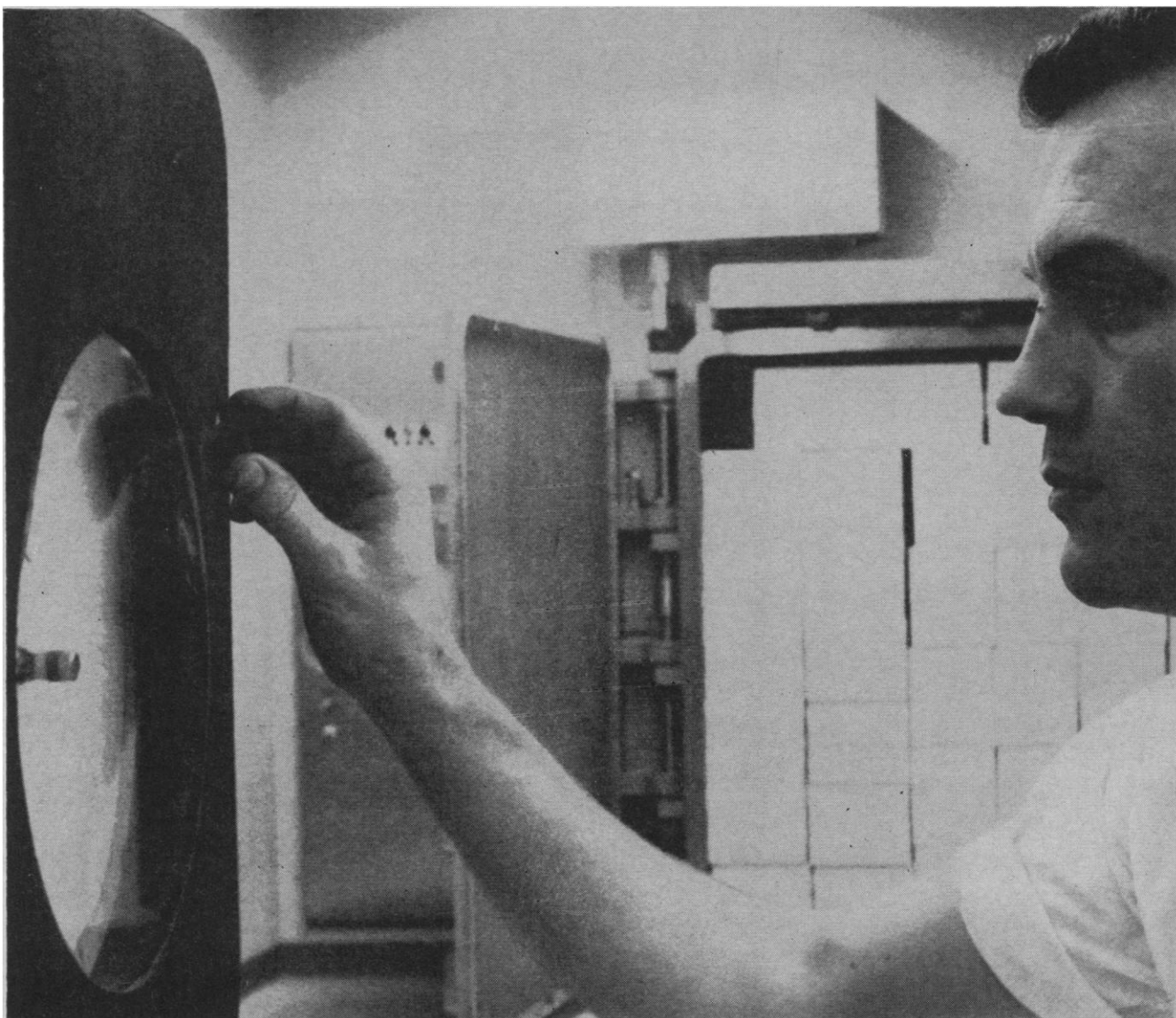
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COVER

Electron micrograph of surface replica of fossil bacteria found in Gunflint chert approximately 2000 million years old. The polished rock surface was etched with hydrofluoric acid to dissolve the inorganic matrix; then it was shadowed and replicated with a platinum-carbon film. These well-preserved bacilli are morphologically similar to certain extant iron bacteria. They are among the most ancient fossils now known (about $\times 24,000$). See page 1365. [Morton D. Maser, Harvard University]

What's the BIG IDEA in Industrial Sterilizers?



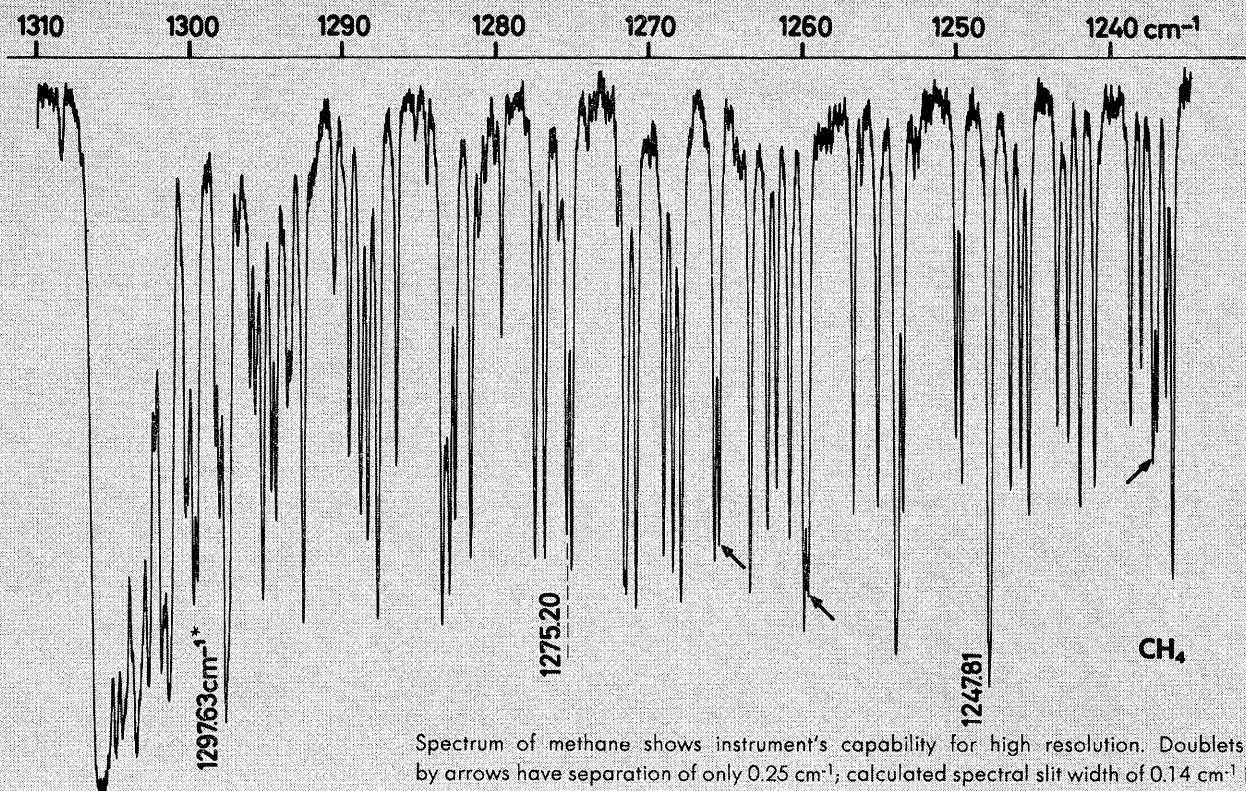
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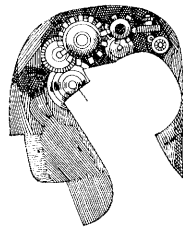
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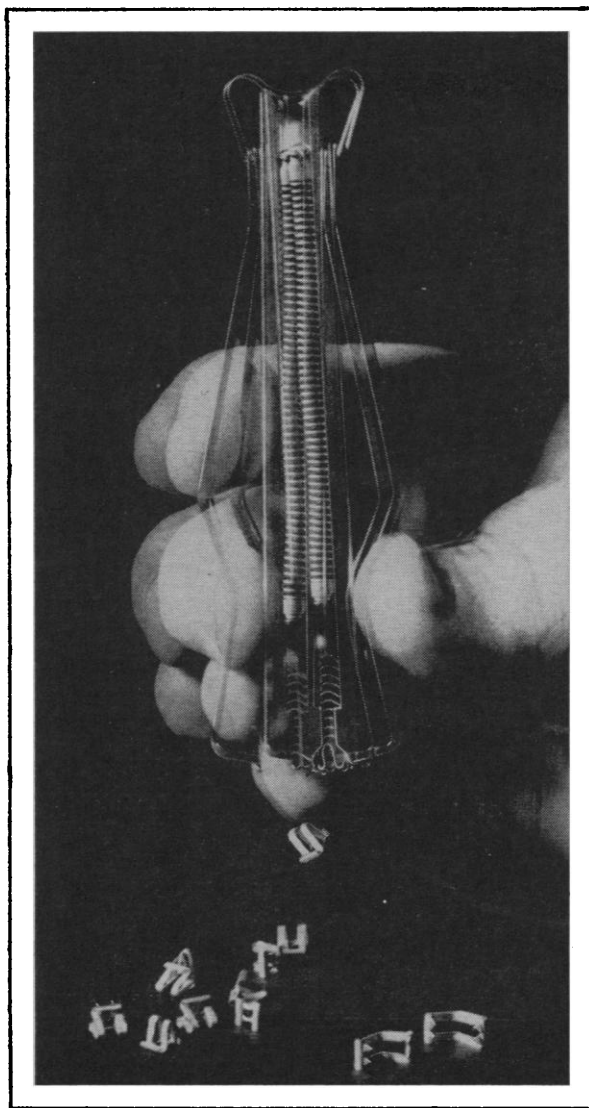


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D.Q.E., a simple concept that may help locate the boundary of the universe

Quanta from quasars must not be wasted. Quasars were first called quasi-stellar sources when the radio astronomers picked them up. Now, not many months later, the challenging problem is to tell them apart from the faintest stars on photographic plates. They are really intrinsically very different, being billions instead of millions of light years distant, as are the galaxies. Now astronomers are developing techniques for finding them among all the faint stars that are only thousands of light years away. In the excitement, any astronomer who uses big-telescope time for subjects other than quasars gets a slight feeling of impeding progress. Quasars are receding at nearly the speed of light. They must be out by the "shock wave" from the original big bang of creation. Space itself may have meaning only to this boundary and be a figment of the intellect beyond it.

Those who regard such matters as important have to argue quantum economics and telescope-time economics, which are related. In their world the big questions are: How long do I have to count quanta to pick up the difference between those from my quasar and those from radiative processes in the night sky, including scatter from the well lit motel on the other side of the mountain? How long can I count quanta without unjustly depriving my colleague of his quanta-counting time? The second question calls for administrative talent, the first for an understanding of D.Q.E., detective quantum efficiency.

This is a figure of merit that relates through simple algebra photographic graininess, contrast, speed, and the size of the star image rendered by the telescope. This same D.Q.E. is the square of the ratio of output signal/noise to input signal/noise—for any quantum detector, photographic or otherwise. To avoid inevitable loss of rigor in the present verbal environment, we'd rather not go into further detail here. Suffice it to say that 1) the viewpoint shows how an emulsion of lower sensitivity improves quasar-finding power if properly designed for the purpose; 2) that we have made such emulsions experimentally with gratifying results; 3) that pure scientists will not for long be the only ones using photographic products built by the D.Q.E. principle.

For a proper exposition of D.Q.E. send to Eastman Kodak Company, Special Applications, Rochester, N. Y. 14650 for a reprint from J.O.S.A. for August '65.

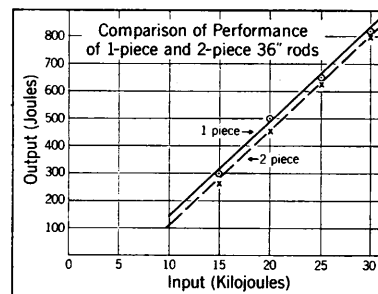
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PAT

Buy a bunch of perky graduate students a bottle of PAT and watch them have fun. PAT is an affectionate acronym for phenylazotriphenylmethane. There will be a lot of big talk about cage reactions, and whether geminate processes can ever really be enough to shut up the radical chemists, and where the hydrogen comes from to form all that benzene* from the free phenyl radicals that PAT spills into pure CCl₄, and how anybody could possibly call PAT a phenyl radical scavenger while talking about it out of the other side of their mouth as a grand source for phenyl radicals. Talk like that drifting down the corridors will be driving their future bosses to longer and longer lunch hours with coevals from the Classes of 1937-41.

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Suggestion

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*J.A.C.S. 86, 1150 (1964)

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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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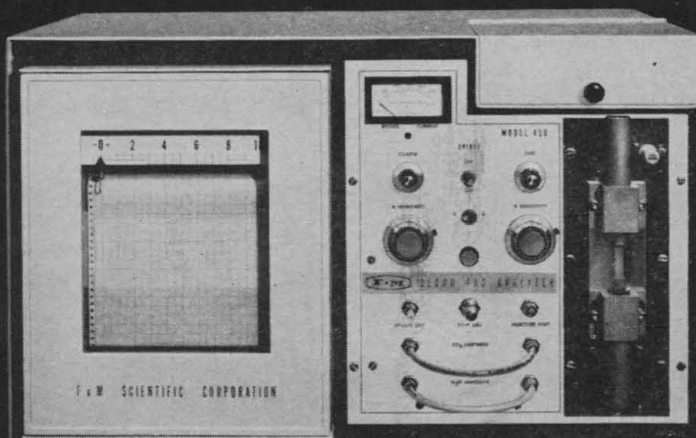
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The Model 450 is as accurate as the Van Slyke method. To prove this, we ran O_2 and CO_2 on a series of blood samples, by Van Slyke and by 450. We made duplicate determinations by Van Slyke, triplicate by 450. Observe, the two sets of results agree well within 2 percent relative (and the precision of the 450 values is better than that of the Van Slyke results).

Sample No.	Carbon Dioxide				Oxygen			
	Van Slyke		450 Analyzer		Van Slyke		450 Analyzer	
	Test Value (Vol.%)	Precision (%Rel.)	Test Value (Vol.%)	Precision (%Rel.)	Test Value (Vol.%)	Precision (%Rel.)	Test Value (Vol.%)	Precision (%Rel.)
1	40.73	1.1	41.00	0.75	17.85	2.2	17.35	1.50
2	52.65	1.0	55.00	.75	20.01	2.1	19.95	0.75
3	51.10	1.2	51.35	.75	17.55	2.1	17.35	.75
4	47.50	*	47.10	.75	13.10	*	13.13	.75
5	49.80	*	50.40	.75	18.00	*	17.61	.80
6	53.55	*	53.35	.79	13.16	*	12.54	.80
7	48.15	*	45.50	.75	21.58	*	20.85	.75

*Single determination

Proof Two: Reproducibility

This is where our design changes in the new 450 really paid off, resulting in a reproducibility much better than the accepted $\pm 2\%$ of the Van Slyke method. To prove this, we made sextuplet O_2 and CO_2 determinations on the same blood sample; results are shown in the table at right.

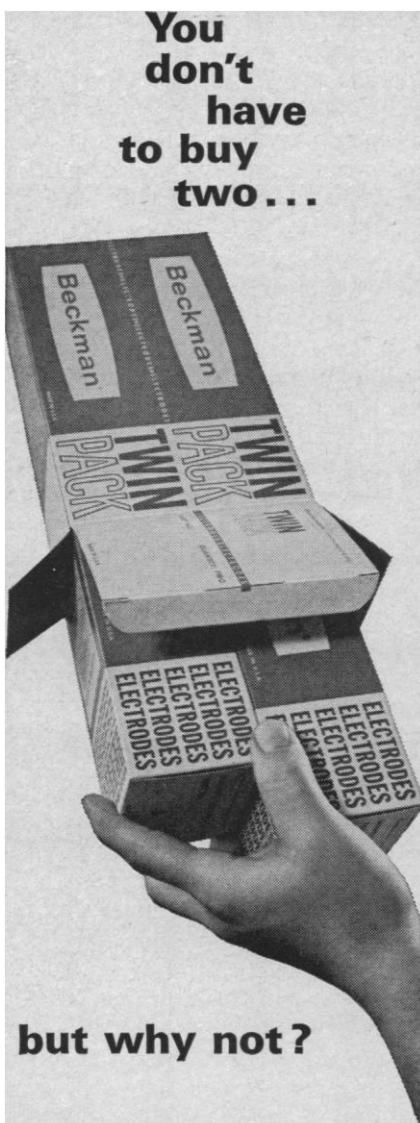
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Run No.	Carbon Dioxide		Oxygen	
	Peak Height (cm)	Test Value (Vol.%)	Peak Height (cm)	Test Value (Vol.%)
1	90.0	45.00	50.0	25.00
2	88.5	44.25	50.5	25.25
3	89.0	44.15	50.5	25.25
4	88.5	44.25	50.5	25.25
5	88.0	44.0	50.0	25.00
6	88.0	44.00	50.5	25.25
Average (X)	88.7	44.11	50.3	25.17
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NOTE: Range, difference between the high and low value, is an estimate of the reproducibility of the data.



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and unhindered development. This approach has yielded disappointingly few demonstrable gains. Readiness measurements do not even correlate significantly with reading achievement. On the other hand, recent advances in the teaching of mathematics have been impressive, largely because the mathematicians and educators concerned have looked not only at the child but at the discipline to be learned, sought new ways of structuring it, and revised the methods and materials. For good instruction, instead of simply waiting for "new processes" to be "acquired with maturation," one must indeed program the teacher. That the program must be geared to the child's potentialities goes without saying. Piaget's work has played a significant role in the "new math," but so has rational analysis of a problem with resulting programs of experiment and instruction (1).

Elkind's letter implies that I think of the child as a miniature adult and am unconcerned with developmental psychology. This is not the case, for my own current research is concerned with perceptual development—in fact, with development of strategies in perceptual processing. But in studying development of a particular skill, I think it is essential to analyze that skill so as to discover the optimum strategy at its final attainment—in this case, what kind of perceptual processing characterizes the skilled reader. The sequencing of training procedures, I believe, must lead to this strategy as a final goal. That some components of the skill must precede others, both developmentally and in training, was the major point of my article. For example, Elkind points out that tactile discrimination of letters is positively correlated with reading skill among young children but negatively related to reading skill later. This makes good sense in terms of my analysis, for letter discrimination is a prerequisite to decoding, and tactile and visual discrimination of letters shows cross-modal transfer (2). But later, the child should have proceeded to the processing of larger units, and perceptual skills different from single-letter discrimination would correlate with success. Factor analysis of the learning of the Morse code at different stages of mastery shows a factor shift of exactly this sort (3). There is no evidence that this shift is due to development of new learning processes. It seems rather that acquisition of superior performance of the task demands it.

I do not believe, as it is now fashionable to profess in some circles, that anyone can learn anything at any time if the program is right. But if we are going to *teach*, we had better be concerned not only with maturation, but also with the structure of the subject we are teaching, the units that have utility for it, and the optimum strategies for it.

ELEANOR J. GIBSON
*Graduate Psychological Laboratories,
Cornell University, Ithaca, New York*

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3. E. A. Fleishman, B. Fruchter, *J. Appl. Psychol.* 44, 97 (1960).

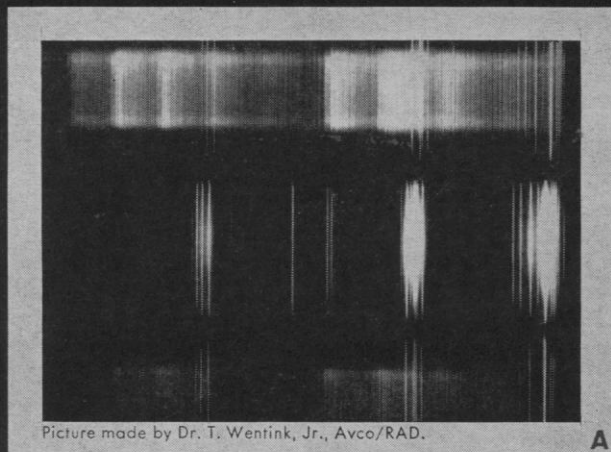
Half-Life of Radiocarbon

An international conference on carbon-14 and tritium dating was held at Washington State University, 7-11 June 1965. This was in effect the sixth international conference on radiocarbon dating and the first one in which discussions of tritium were included. As in the past, the question of which value for the half-life of radiocarbon should be used in reporting radiocarbon dates was debated at some length. Upon conclusion of the discussion, an *ad hoc* committee drew up the following statement, which was unanimously approved by vote of the conference:

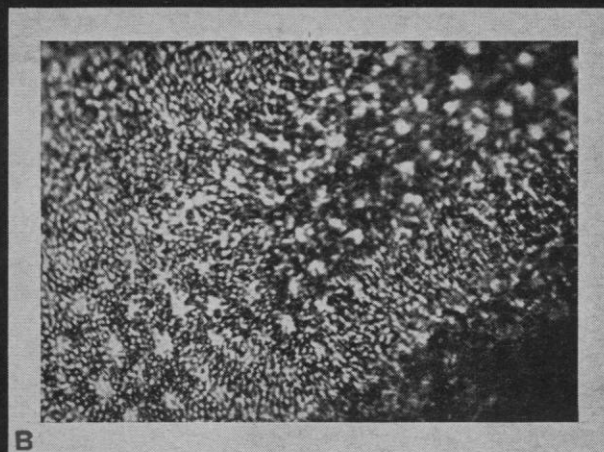
The sixth radiocarbon conference meeting at Pullman, Washington, on June 11, 1965, under the general title "International Carbon-14 and Tritium Conference" reconsidered in some detail the question concerning the half-life that would be most useful in expressing radiocarbon dates. The consensus of opinion favored the retention of the previously used half-life of 5568 years [*Nature* 195, 984 (1962)]. The reasons for this decision were based in the main on the desire to avoid the confusion which would arise should the many thousands of published dates require revision. It was also recognized that there are discrepancies between the radiocarbon chronology and other chronologies which would not be corrected by a change in the half-life.

It was recognized that the value 5730 remains the best available half-life for the decay of radiocarbon. Those who wish to do so may continue to convert the published dates by multiplying by the factor 1.03.

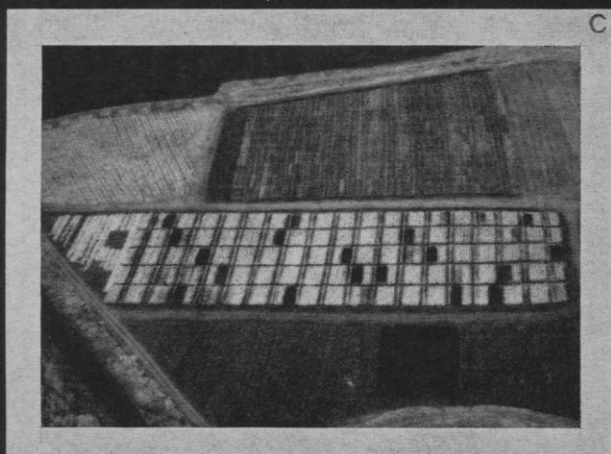
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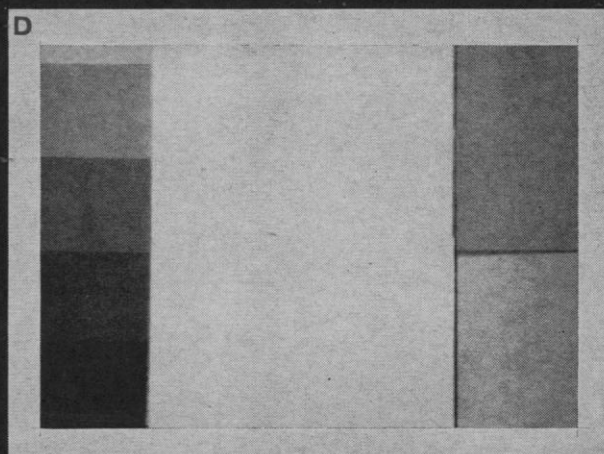
A



B



C



D

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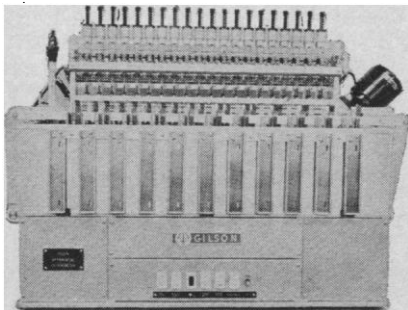
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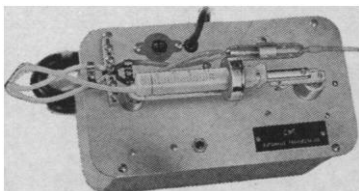
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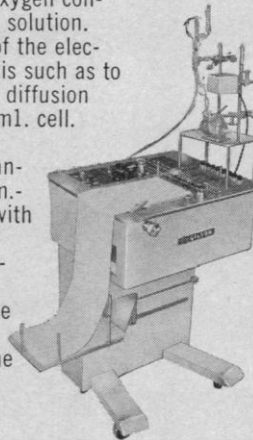
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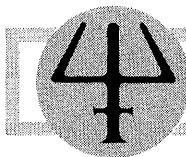
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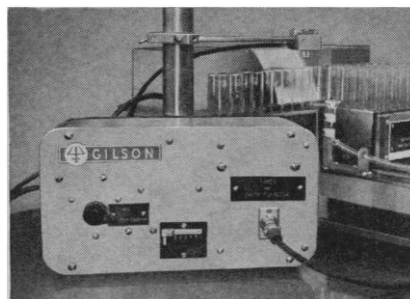
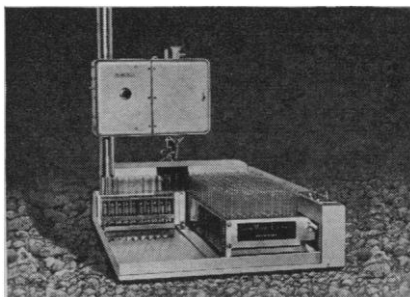
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Television Coverage of the Gemini Program

The television coverage of the manned space flights in June (GT4) and August (GT5) put one aspect of science and technology in the same league as political conventions and the World Series. The vast audiences commanded by such an effort make it important, since the time the public spends in viewing these programs represents, for many, a substantial portion of the hours it devotes to any sort of scientific or technical subject—on television or otherwise.

What did the American public see on TV about the scientific and technical aspects of the Gemini program, and what can it expect in the future?

Analysis of some 50 hours of coverage of the two flights shows that the visual reporting of GT5 was significantly better than the reporting of previous missions—a much-needed advance over the breathless chronicling of launch and splashdown, the saccharine family interviews, and the "illustrated radio" talks by technical specialists.

NBC showed the greatest change; its reporting of GT5 was outstanding in breadth of subject matter, accuracy, and visual quality. ABC, which had the best coverage of GT4, thanks to science editor Jules Bergman, maintained its breadth and accuracy but did not substantially increase its visual backup for GT5. CBS did an accurate though limited job for GT5; its coverage was of much better quality than its reporting of previous flights.

For the GT5 mission there was more emphasis everywhere on scientific and technical aspects, such as the orbital mechanics of rendezvous, visual acuity experiments, and effects of weightlessness. Visual presentation replaced many of the previous verbal descriptions—for example, the animated representation of retrofire and reentry, and a studio demonstration explaining specific impulse.

Perhaps the most significant single change was a new confidence on the part of many of the on-camera reporters. The GT4 reporting was plagued with errors, faulty interpretations, difficulty in ad-libbing, and, in one case, outright embarrassment over inability to define so simple a word as *azimuth*. One reporter commented, "It all gets so confusing," as he tried to explain how many sunrises and sunsets the astronauts would see in the course of their flight.

The GT5 programs showed many more reporters facing the cameras confidently, commenting accurately and in much greater detail. Obviously, much more attention had been given to preparation and backup.

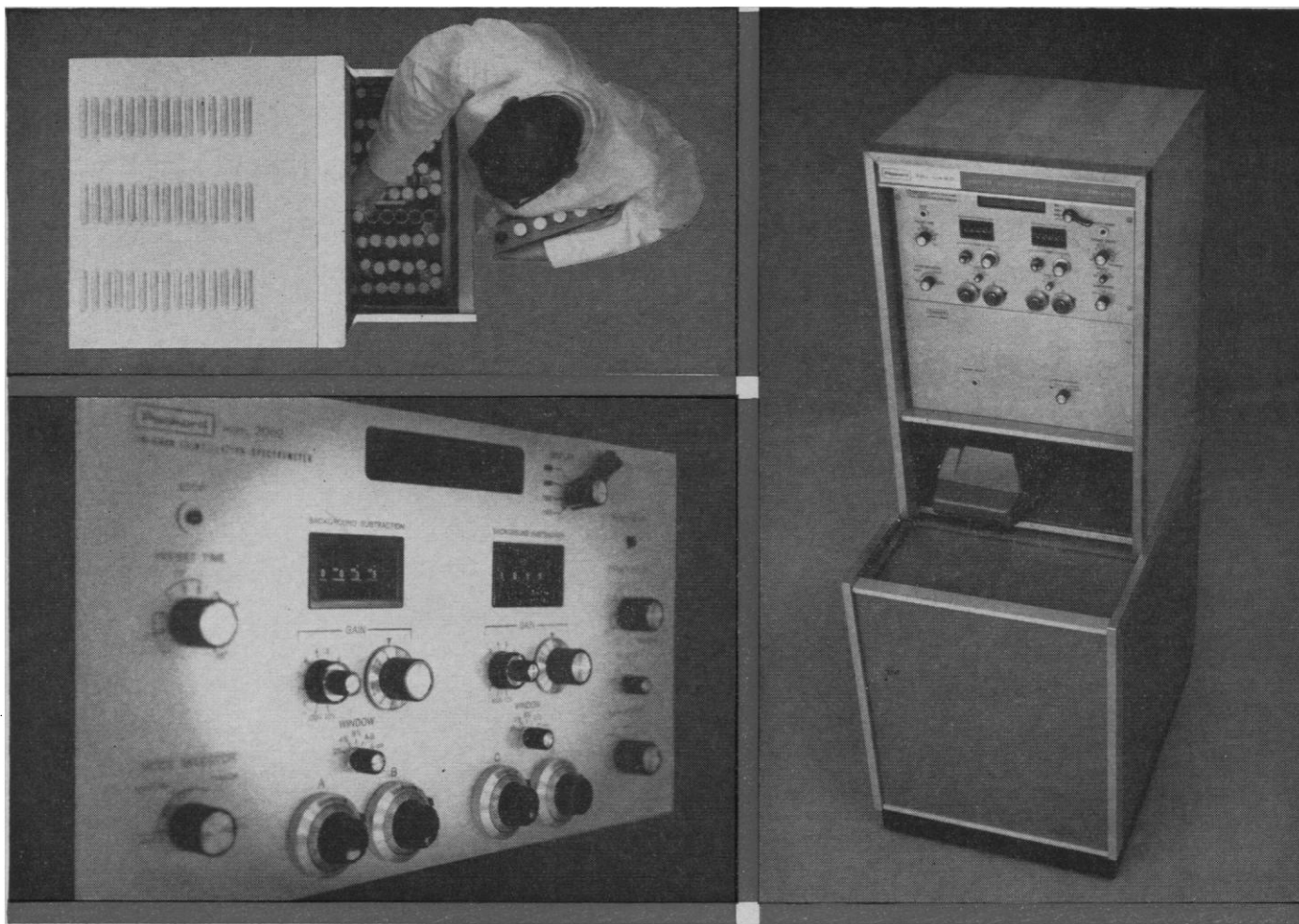
The television achievements for the GT5 mission rate compliments and also raise important questions. With an increasingly sophisticated audience, more frequent flights, and flights of greater duration, what will be the nature of TV coverage in the future? We will certainly see more "pool coverage"—the common use of "pickups" on launch, landing, and press conferences. But television is a competitive enterprise. How will the networks compete?

Perhaps a new day is at hand, for competition will more and more be in terms of the knowledge and skill of the reporters, and of the quality of the production teams.

It is inevitable that unexpected problems (like that of the fuel cell in GT5) will arise in the future. The network with the know-how to explain and illustrate the situation immediately, without extensive research or outside help, will take the lead in ratings.

Interpretive coverage will be another area of competition. For, except for the possibility of emergencies, launch and landing are becoming almost routine. Scientific experiments and technical innovations will make the headlines for tomorrow's flights, and the subjects of tomorrow's TV programs.

In short, the networks which excel in their scientific homework will excel in the marketplace—and deservedly so.—E. G. SHERBURNE, JR., *American Association for the Advancement of Science*



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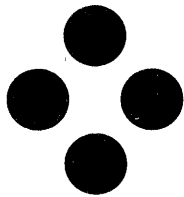
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conf., Cleveland, Ohio. (A. F. Leatherman, Battelle Memorial Inst., 505 King Ave., Columbus, Ohio 43201)

28-30. German Soc. for **Documentation**, 17th annual, Constance, Germany. (The Society, Schubertstr. 1, Frankfurt am Main, Germany)

28-30. Physics and **Nondestructive Testing**, symp., Dayton, Ohio. (D. W. J. McGonnagle, IIT Research Inst., 10 W. 35 St., Chicago, Ill. 60616)

28-30. Industrial and Commercial **Power Systems**, conf., Buffalo, N.Y. (J. A. Hart, Allison Div., General Motors Corp., Box 894, Indianapolis 6, Ind.)

28-1. **Experimental Mechanics**, 2nd intern. congr., Washington, D.C. (J. L. Jones, Soc. for Experimental Stress Analysis, 21 Bridge Sq., Westport, Conn. 06880)

28-1. Society for **Experimental Stress Analysis**, Washington, D.C. (B. E. Rossi, 21 Bridge Sq., Westport, Conn.)

28-1. **Inhaled Particles and Vapors**, Cambridge, England. (J. S. McLintock, Medical Service, Natl. Coal Board, Hobart House, Grosvenor Pl., London S.W.1)

28-1. **Medical Electronics**, European symp., Brighton, England. (J. Pearce, 4 Mill St., London W.1)

28-2. **Hyperpure Materials** in Science and Technology, Inst. for Applied Physics of Hyperpure Materials, Dresden, Germany. (The Institute, Dresden A 20, Winterbergstr. 28, East Germany)

29-1. German Soc. for **Aviation and Space Medicine**, intern. congr., Munich, Germany. (H. von Diringshofen, German Soc. for Aviation and Space Medicine, Silcherstr. 6, Munich 13)

29-1. **Analytical Chemistry**, symp., Graz, Austria. (Prof. Gutmann, Austrian Assoc. for Microchemistry and Analytical Chemistry, Eschenbachgasse 9, Vienna 1)

29-1. European **Atomic Forum**, 2nd congr., Frankfurt am Main, Germany. (European Atomic Energy Forum, 26, rue de Clichy, Paris 9)

29-1. American **Vacuum Soc.**, 12th annual symp., New York, N.Y. (R. L. Jepsen, Varian Associates, 611 Hansen Way, Palo Alto, Calif.)

October

1-3. French-Language Assoc. of **Scientific Psychology**, 10th study sessions, Marseilles, France. (P. Fraisse, The Association, Inst. de Psychologie, 28, rue Serpente, Paris 6°)

1-11. International **Scientific Film Assoc.**, 19th annual congr., Bucharest, Rumania. (ISFA, 38, avenue des Termes, Paris 17°, France)

2. Association of **Clinical Biochemists**, annual, London, England. (D. W. Moss, Postgraduate Medical School, Ducane Rd., London, W.12)

3-5. **Refractory Metals**, 4th symp., French Lick, Ind. (J. Maltz, Materials Research Div., NASA, 600 Independence Ave., SW, Washington, D.C. 20546)

3-7. American **Phytopathological Soc.**, Miami Beach, Fla. (J. R. Shay, Dept. of Botany and Plant Pathology, Purdue Univ., Lafayette, Ind.)

3-8. **Clinical Pathology**, 6th intern. congr., Rome, Italy. (B. L. Della Vida, Via de'Penitenzieri 13, Rome)

3-9. **Water Desalination**, 1st intern.

symp., Washington, D.C. (Atomic Industrial Forum, 850 Third Ave., New York 10022)

4-5. **Enzyme Regulation**, 4th intern. symp., Indiana Univ., Indianapolis. (G. Weber, Indiana Univ. School of Medicine, Indianapolis 46207)

4-5. **Physical Metallurgy of Refractory Metals**, conf., American Inst. of Mining, Metallurgical, and Petroleum Engineers, French Lick, Ind. (AIME, 345 E. 47 St., New York 10017)

4-6. **Electronics**, Canadian conf., Toronto, Ont. (W. M. Lower, 1819 Yonge St., Toronto)

4-6. **Industrial Organic Analysis**, Analytical Chemistry Div., Chemical Inst. of Canada, Sarnia, Ont. (R. M. Small, Research Dept., Polymer Corp, Sarnia)

4-6. International **Scientific Radio Union/Inst. of Electrical and Electronics Engineers**, fall meeting, Dartmouth College, Hanover, N.H. (IEEE, Box A, Lenox Hill Station, New York, N.Y.)

4-7. **Instrument-Automation Conf.**, Los Angeles, Calif. (E. M. Grabbe, Instrument Soc. of America, 530 William Penn Pl., Pittsburgh, Pa. 15219)

4-7. **Otorhinolaryngology**, 62nd French congr., Paris, France. (H. Guillon, 6, avenue Mac-Mahon, Paris 16°)

4-7. **Research Equipment**, exhibit and instrument symp., 15th annual, Bethesda, Md. (J. B. Davis, Natl. Institutes of Health, Bethesda, Md. 20014)

4-7. International Committee for **Social Sciences Documentation**, annual plenary assembly, Budapest, Hungary. (J. Meyriat, 27, rue St. Guillaume, Paris 7)

4-8. **Aeronautic and Space Engineering**, Soc. of Automotive Engineers, Los Angeles, Calif. (C. C. King, SAE Western Branch, 999 North Sepulveda Blvd., El Segundo, Calif. 90245)

4-8. Ciba Foundation **Clinical Research** Guest Conf., London, England. (Ciba, 41 Portland Pl., London W.1)

4-10. **Physicists**, conf., Frankfurt am Main, Germany. (G. Schubert, Inst. für Theoretische Physik, Universität, Mainz, Germany)

4-13. International Council for the **Exploration of the Sea**, 53rd annual meeting, Rome, Italy. (The Council, Charlottenlund Slot, Charlottenlund, Denmark)

4-13. **Commonwealth Medical Conf.**, Edinburgh, Scotland. (Mrs. J. Hotchkiss, Ministry of Overseas Development, Stag Place, London, S.W.1, England)

5-7. Industrial and Commercial **Power Systems**, conf., Buffalo, N.Y. (T. O. Zittel, Bethlehem Steel Co., 3555 Lake Shore Rd., Buffalo 14219)

5-8. International Committee of **Weights and Measures**, session, Sèvres, France. (Intern. Bureau of Weights and Measures, Pavillon de Breteuil, Sèvres, Sein-et-Oise, France)

5-9. **Infectious Pathology**, 4th intern. congr., Freiburg im Breisgau, Germany. (G. Mossner, Hugertstr. 55, Freiburg im Breisgau)

5-9. **Tuberculosis**, 18th intern. conf., Munich, Germany. (Intern. Union Against Tuberculosis, 15, rue Pomereu, Paris 16°, France)

6-8. **Dynamics of Fluids and Plasmas**, symp., Univ. of Maryland, College Park. (S. I. Pai, Inst. for Fluid Dynamics and

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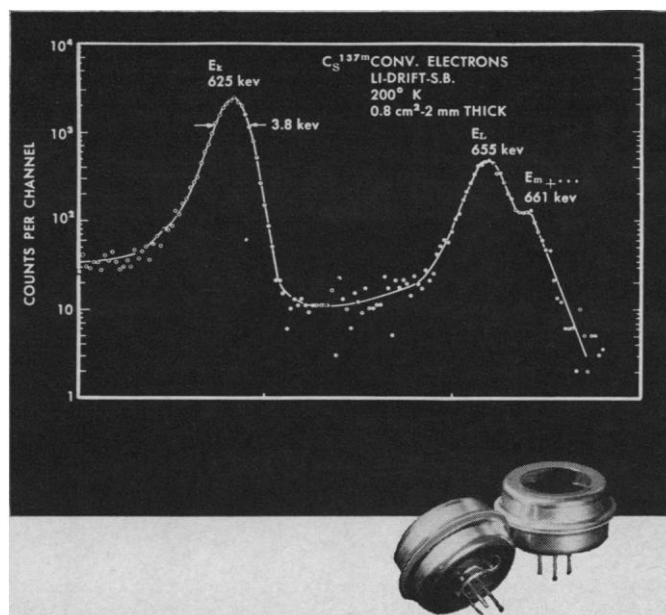
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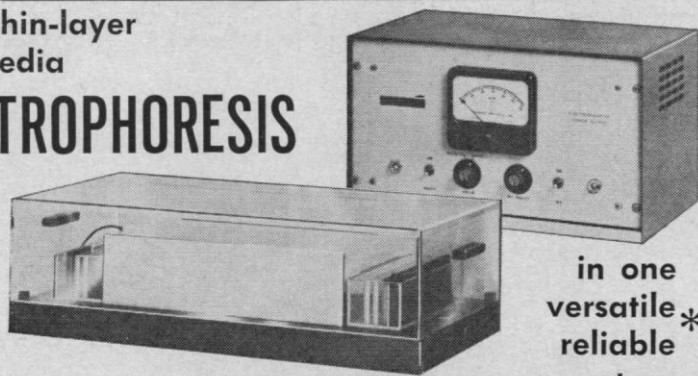
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Applied Mathematics, Univ. of Maryland, College Park 20742)

6-8. **Optical Soc. of America**, annual meeting, Philadelphia, Pa. (M. E. Wurga, OSA, 1155 16th St., NW, Washington, D.C. 20036)

6-8. **Royal Inst. of Public Health and Hygiene**, annual conf., Weymouth, England. (Secretary, RIPHH, 28 Portland Place, London, W.1, England)

6-10. **Wood and Organisms**, intern. symp., Berlin, Germany. (German Soc. for Wood Research, Danneckerstr. 37, Stuttgart S, Germany)

7-9. **Seismological Soc. of America**, eastern sec. 37th annual, Lamont Geological Observatory, Palisades, N.Y. (J. Dorman, Lamont Geological Observatory, Palisades 10964)

8-9. **Atlantic Coastal Plain Geological Assoc.**, field trip, South Carolina. (D. J. Colquhoun, Dept. of Geology, Univ. of South Carolina, Columbia)

8-9. **Association of Midwestern College Biology Teachers**, 9th annual conf., Northern Illinois Univ., DeKalb)

8-9. **Indiana Acad. of Science**, fall meeting, Notre Dame. (C. F. Dineen, St. Mary's College, Notre Dame)

9. **Paleontological Research Inst.**, Ithaca, N.Y. (K. V. W. Palmer, Paleontological Research Inst., 109 Dearborn Pl., Ithaca)

9-10. **Gastroenterology**, French conf., Paris, France. (R. Biguie, 79, Boulevard Malesherbes, Paris 8°)

9-13. **American Soc. of Clinical Hypnosis**, Chicago, Ill. (F. D. Nowlin, ASCH, 800 Washington Ave., SE, Minneapolis, Minn. 55414)

9-17. **Electrical, Electronics, and Mechanical Engineering**, first Pan American congr., Mexico, D.F. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 10021)

10-14. **Water Pollution Control Fed.**, 38th annual, Atlantic City, N.J. (R. E. Fuhrman, 4435 Wisconsin Ave., NW, Washington, D.C. 20016)

10-15. **International Federation for Documentation**, congr., Washington, D.C. (Secretariat, FID, 9650 Wisconsin Ave., Washington 20014)

10-15. **Electrochemical Soc.**, meeting, Buffalo, N.Y. (Executive Secretary, ES, 30 E. 42 St., New York 10017)

10-15. **Endocrinology**, 6th Pan American conf., Mexico, D.F. (G. Gual, Inst. Nacional de la Nutrición, Dr. Jimenez No. 261, Mexico 7)

10-16. **American Documentation Inst.**, Washington, D.C. (J. E. Bryan, 2000 P St., NW, Washington, D.C. 20036)

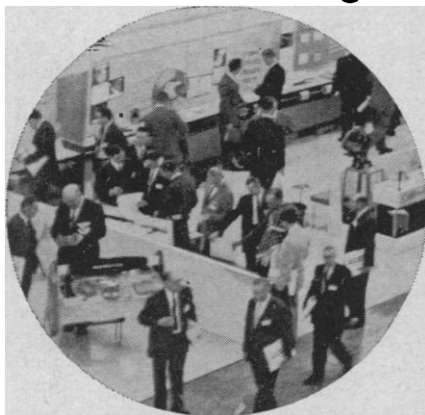
10-17. **Bronchoesophagology**, 1st Latin American congr., Rio de Janeiro, Brazil. (F. Aprigliano, Rua Alcindo Guanabara, 24, Sob-Loja 206, Rio de Janeiro)

10-17. **Otorhinolaryngology**, 14th Brazilian congr., Rio de Janeiro, Brazil. (W. Benevides, Rua Alcindo Guanabara, 24, Sob-Loja 206, Rio de Janeiro)

10-17. **Plastic Surgery**, 10th Latin American congr., Buenos Aires, Argentina. (J. Norberto Spera, Riglos 624, Buenos Aires)

11-13. **Color Centers in Alkali Halides**, symp., Univ. of Illinois, Urbana. (D. W. Compton, Dept. of Physics, Univ. of Illinois, Urbana)

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11-13. Communications, 11th natl. symp., Utica, N.Y. (G. E. Brunette, Communications Div. (EMCT) Rome Air Development Center, Griffiss AFB, New York 13442)

11-13. Metabolic Roles of Lipids, symp., Cincinnati, Ohio. (C. H. Hauber, American Oil Chemists' Soc., 35 East Wacker Dr., Chicago 1, Ill.)

11-13. Manned Spaceflight, 4th meeting, St. Louis, Mo. (J. F. Yardley, McDonnell Aircraft Corp., P.O. Box 516, St. Louis)

11-13. National Acad. of Sciences, fall meeting, Univ. of Washington, Seattle. (H. Neurath, Dept. of Biochemistry, Univ. of Washington, Seattle 98105)

11-13. American Record Management Assoc., 10th annual conf., Minneapolis, Minn. (L. Loveless, Office Services, Honeywell, Inc., 2701 Fourth Ave., S, Minneapolis 55408)

11-14. Association of Official Agricultural Chemists, 79th annual, Washington, D.C. (L. G. Ensminger, AOAC, Box 540, Benjamin Franklin Station, Washington 20044)

11-14. American Oil Chemists' Soc., fall meeting, Cincinnati, Ohio. (AOCS, 35 E. Wacker Dr., Chicago, Ill. 60600)

11-15. Fall Metallurgy Days, Paris, France. (Soc. Française de Metallurgie, 25 rue de Clichy, Paris 9°)

11-16. Stomatology, 19th French Congr., Paris. (R. Cayron, 99, rue de Courcelles, Paris 17°)

11-23. International Organization for Standardization, Milan, Italy. (Soc. of Motion Picture and Television Engineers, 9 E. 41 St., New York 10017)

12-13. Cardio-Renal Consequences of Sustained Hypertension, seminar, Philadelphia, Pa. (Miss S. Rosen, Symposium Office, Hahnemann Medical College and Hospital, 230 N. Broad St., Philadelphia 19102)

12-14. Analytical Chemistry in Nuclear Technology, 9th conf., Gatlinburg, Tenn. (C. D. Susano, Oak Ridge Natl. Laboratory, P.O. Box X, Oak Ridge, Tenn. 37831)

12-16. Communications, 13th intern. Congr., Genoa, Italy. (Inst. for Intern. Communications, Viale Brigate Partigiane, 18, Genoa)

13. Medical Physics, seminar, New York, N.Y. (American Inst. of Physics, 335 E. 45 St., New York 10017)

13. Animal Nutrition Research Council, 26th annual, Washington, D.C. (J. C. Fritz, 12314 Madeley Lane, Bowie, Md. 20715)

13-15. Detonation, 4th symp., White Oak, Silver Spring, Md. (S. J. Jacobs, U.S. Naval Ordnance Laboratory, White Oak, Silver Spring 20910)

13-15. American Assoc. of Petroleum Geologists, mid-continent regional meeting, Tulsa, Okla. (E. W. Ellsworth, AAPG, Box 979, Tulsa 74101)

13-16. Tau Beta Pi Assoc., Inc., Univ. of Maryland, College Park. (R. H. Nagel, 508 Dougherty Engineering Bldg., Univ. of Tennessee, Knoxville)

13-17. Soil Biology, first Latin American colloquium, Bahia Blanca, Argentina. (Organizing Committee, Inst. de Edafologia e Hidrologia, Alem 925, Bahia Blanca, Argentina)



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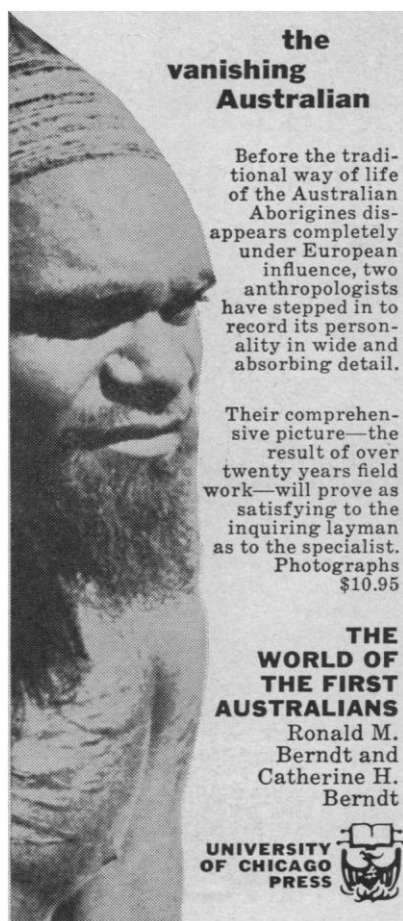
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13-19. **Instrumentation and Automation**, 3rd intern. congr., Düsseldorf, Germany. (Nordwestdeutsche Ausstellungs- und Messe-Gesellschaft, Ehrenhof 4, 4000 Düsseldorf 10)

14. **Association of Vitamin Chemists**, Chicago, Ill. (D. Olson, Dawe's Laboratories, 4800 S. Richmond St., Chicago)

14-15. **International Federation of Surgical Colleges**, 8th annual, Philadelphia, Pa.; 17, Atlantic City, N.J. (K. Cassels, Royal College of Surgeons, Lincoln's Inn Fields, London W.C.2, England)

14-16. **British Orthopaedic Assoc.**, fall meeting, London, England. (Joint Secretariat, 47 Lincoln's Inn Fields, London, W.C.2)

15. **Southern California Acad. of Science**, Los Angeles. (C. Rozaire, Los Angeles County Museum, 900 Exposition Blvd., Los Angeles 90007)

15-16. **Contributions of Cytogenetics to the Determination of Phylogenies**, 12th symp., Missouri Botanical Garden, St. Louis. (H. C. Cutler, Missouri Botanical Garden, St. Louis 63110)

15-16. **National Soc. of Professional Engineers**, 3rd annual conf., Oklahoma City, Okla. (NSPE, 2029 K St., NW, Washington 20006)

15-17. **American Heart Assoc.**, Scientific sessions, Bal Harbour, Fla. (AHA, 44 E. 23 St., New York 10010)

16-17. **Infectious Diseases Soc. of America**, Washington, D.C. (E. H. Kass, IDS, Boston City Hospital, Boston, Mass. 02118)

17-21. **Antimicrobial Agents and Chemotherapy**, 5th interscience conf./4th intern. congr. of chemotherapy, Washington, D.C. (R. W. Sarber, American Soc. for Microbiology, 115 Huron View Blvd., Ann Arbor, Mich.)

17-21. **Metallurgical Soc. of American Inst. of Mining, Metallurgical, and Petroleum Engineers**, Detroit, Mich. (American Inst. of Mechanical Engineers, 345 E. 47 St., New York 10017)

18. **Industrial Pharmacy sect.**, American Pharmaceutical Assoc., 4th annual mid-west regional meeting, Chicago, Ill. (C. Schroeter, Abbott Laboratories, North Chicago, Ill.)

18-19. **American Inst. of Aeronautics and Astronautics/Canadian Aeronautics and Space Inst.**, Toronto, Ont., Canada. (D. L. Raymond, 1290 Sixth Ave., New York 10019)

18-19. **Systems Science**, conf., Case Inst. of Technology, Cleveland, Ohio. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 10021)

18-20. **Dynamic Stability of Structures**, intern. conf., Evanston, Ill. (G. Herrmann, Technological Inst., Northwestern Univ., Evanston 60201)

18-20. **Electromagnetic Radiation in Agriculture**, intern. conf., Roanoke, Va. (D. P. Brown, Niagara Mohawk Power Corp., 300 Erie Blvd. W., Syracuse, N.Y. 13202)

18-20. **American Soc. of Lubrication Engineers**, San Francisco, Calif. (D. B. Sanberg, 5 North Wabash Ave., Chicago, Ill.)

18-20. **Canadian Inst. of Mining and Metallurgy**, annual western meeting, Winnipeg, Canada. (CIMM, 906 Drummond

Bldg., 1117 St. Catherine St. W., Montreal 2, P.Q., Canada)

18-20. **Nuclear Science**, 12th symp., San Francisco, Calif. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 10021)

18-20. **Applied Spectroscopy**, 12th symp., Ottawa, Ont., Canada. (R. V. Baker, Aluminum Co. of Canada, Arvida, P.Q., Canada)

18-21. **Advances in Gas Chromatography**, 3rd intern. symp., Houston, Tex. (A. Zlatkis, Dept. of Chemistry, Univ. of Houston, Houston)

18-21. **Management Information and Data Transfer Systems**, American Univ., Washington, D.C. (R. I. Cole, Center for Technology and Administration, American Univ., 2000 G St., NW, Washington, D.C.)

18-22. **American Soc. of Civil Engineers**, Kansas City, Mo. (W. H. Wisely, ASCE, 345 E. 47 St., New York 10017)

18-22. **Society for Nondestructive Testing**, 25th natl. conv., Detroit, Mich. (N. H. Cale, Anaconda American Brass Co., Research and Technical Center, P.O. Box 747, Waterbury, Conn.)

18-22. **American Public Health Assoc.**, 93rd annual, Chicago, Ill. (APHA, 1790 Broadway, New York, N.Y.)

18-22. **Radioisotope Instruments in Industry and Geophysics**, Warsaw, Poland. (J. H. Kane, Div. of Special Projects, U.S. Atomic Energy Commission, Washington, D.C.)

18-22. **American Soc. for Metals**, natl. congr., Detroit, Mich. (A. R. Putnam, ASM, Metals Park, Ohio)

18-22. **Application of Radioisotopes in Gastroenterology**, symp., Lausanne, Switzerland. (A. Vannotti, Clinique Médicale Universitaire, Hôpital Cantonal, Lausanne)

18-22. **American College of Surgeons**, annual clinical congr., Atlantic City, N.J. (American College of Surgeons, 55 East Erie St., Chicago, Ill. 60611)

19-20. **International Rhinologic Soc.**, 1st congr., Kyoto, Japan. (H. A. E. van Dishoeck, Academisch Ziekenhuis, Leiden, Netherlands)

19-21. **Association of Analytical Chemists**, 13th conf., Detroit, Mich. (G. Schenk, Dept. of Chemistry, Wayne State Univ., Detroit 48202)

19-21. **Cloud Physics and Severe Storms**, conf., American Meteorological Soc., Reno, Nev. (K. C. Spengler, 45 Beacon St., Boston 8, Mass.)

19-21. **Radio Astronomical and Satellite Studies of the Atmosphere**, 2nd symp., Boston, Mass. (G. A. Cushman, Wentworth Inst., 550 Huntington Ave., Boston)

19-22. **Economics of Automatic Data Processing**, symp., Rome, Italy. (Intern. Computation Center, Viale della Civiltà del Lavoro, 23, P.O.B. 10053, Rome)

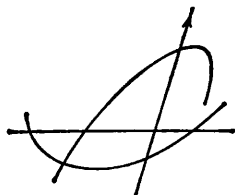
20-21. **Airborne Infection**, 2nd intern. symp., Johns Hopkins School of Medicine, Baltimore, Md. (E. K. Wolfe, Fort Detrick, Frederick, Md. 21701)

20-21. **International Soc. of Audiology**, 2nd congr., Kyoto, Japan. (M. Goto, Dept. of Otolaryngology, Kyoto Univ., Shogoin, Sakyo-ku, Kyoto)

20-22. **Circuit and System Theory**, Allerton Conf., Univ. of Illinois, Monticello. (M. E. Van Valkenburg, Dept. of Electrical Engineering, Univ. of Illinois, Urbana 61803)

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20-22. **Design of Experiments**, 11th conf., Hoboken, N.J. (F. G. Dressel, Army Research Office-Durham, Box CM, Duke Station, Durham, N.C. 27706)

20-22. **Parenteral Drug Assoc.**, annual conv., New York, N.Y. (PDA, Western Saving Fund Bldg., Broad and Chestnut St., Philadelphia, Pa. 19107)

21. **New Mexico Acad. of Science**, Albuquerque. (K. S. Bergstresser, 739 42nd St., Los Alamos, N.M.)

21-22. **Copolymer conf.**, Ludwigshafen, Germany. (Deutsche Bunsen-Gesellschaft für Physikalische Chemie, Varrentrappstr. 40-42, 6 Frankfurt am Main, Germany)

21-22. **Electrochemical Current Sources**, symp., Frankfurt am Main, Germany. (Gesellschaft Deutscher Chemiker, Postfach 9075, 6 Frankfurt am Main)

21-23. **Microminiaturization in Automatic Control**, symp., Munich, Germany. (G. Müller, Siemens & Halske AG, Wernerwerk für Messtechnik, Postfach 834, Karlsruhe, Germany)

21-23. **Society of Photographic Scientists and Engineers**, symp., Washington, D.C. (W. S. Dempsey, Houston Fearless Corp., 1413 K St., NW, Washington 20005)

22-23. **Data Processing in Public Libraries**, conf., Drexel Inst. of Technology, Philadelphia, Pa. (M. D. Warrington, Graduate School of Library Science, Drexel Inst. of Technology, Philadelphia 19104)

23-28. **American Acad. of Pediatrics**, annual, Chicago, Ill. (R. G. Frazier, AAP, 1801 Hinman Ave., Evanston, Ill. 60204)

24-27. **Society of American Foresters**, annual, Detroit, Mich. (Society of American Foresters, 1010 16th St., NW, Washington 20036)

24-29. **Stable Isotopes**, 4th symp., Leipzig, East Germany. (Inst. für Stabile Isotope, Deutsche Akademie der Wissenschaften, Permoserstr. 15, 705 Leipzig)

24-30. **American College of Gastroenterology**, Bal Harbour, Fla. (D. Weiss, 33 W. 60 St., New York 10023)

25-27. **Chemical Engineering**, 15th conf., Quebec, Que., Canada. (Chemical Inst. of Canada, 48 Rideau St., Ottawa 2, Ont.)

25-27. **Functional Organization of the Compound Eye**, symp., Karolinska Inst., Stockholm, Sweden. (W. E. Savely, Air Force Office of Scientific Research, Washington, D.C. 20333)

25-27. **Electrical Insulation**, Natl. Acad. of Sciences-Nat. Research Council conf., Buck Hill Falls, Pa. (D. W. Thornhill, NAS, 2101 Constitution Ave., NW, Washington, D.C.)

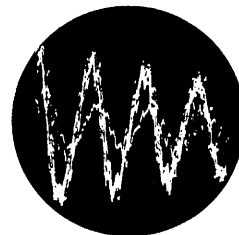
25-27. **Electronics**, natl. conf., Chicago, Ill. (R. G. Brown, Dept. of Electrical Engineering, Iowa State Univ., Ames 50010)

25-27. **Nuclear and Engineering Ceramics**, conf., Harwell, England. (G. H. Stewart, British Ceramic Soc., Shelton House, Shelton, Stoke-on-Trent, England)

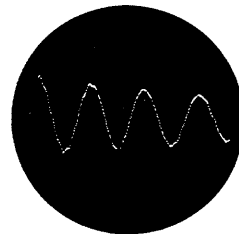
25-27. **Society of Rheology**, Case Inst. of Technology, Cleveland, Ohio. (J. C. Miller, Union Carbide Plastics Co., Bound Brook, N.J.)

25-29. **Hypotensive Polypeptides**, intern. symp., Florence, Italy. (E. G. Erdős, Dept. of Pharmacology, Univ. of Oklahoma Medical Center, Oklahoma City 73104)

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