SCIENCE

17 September 1965

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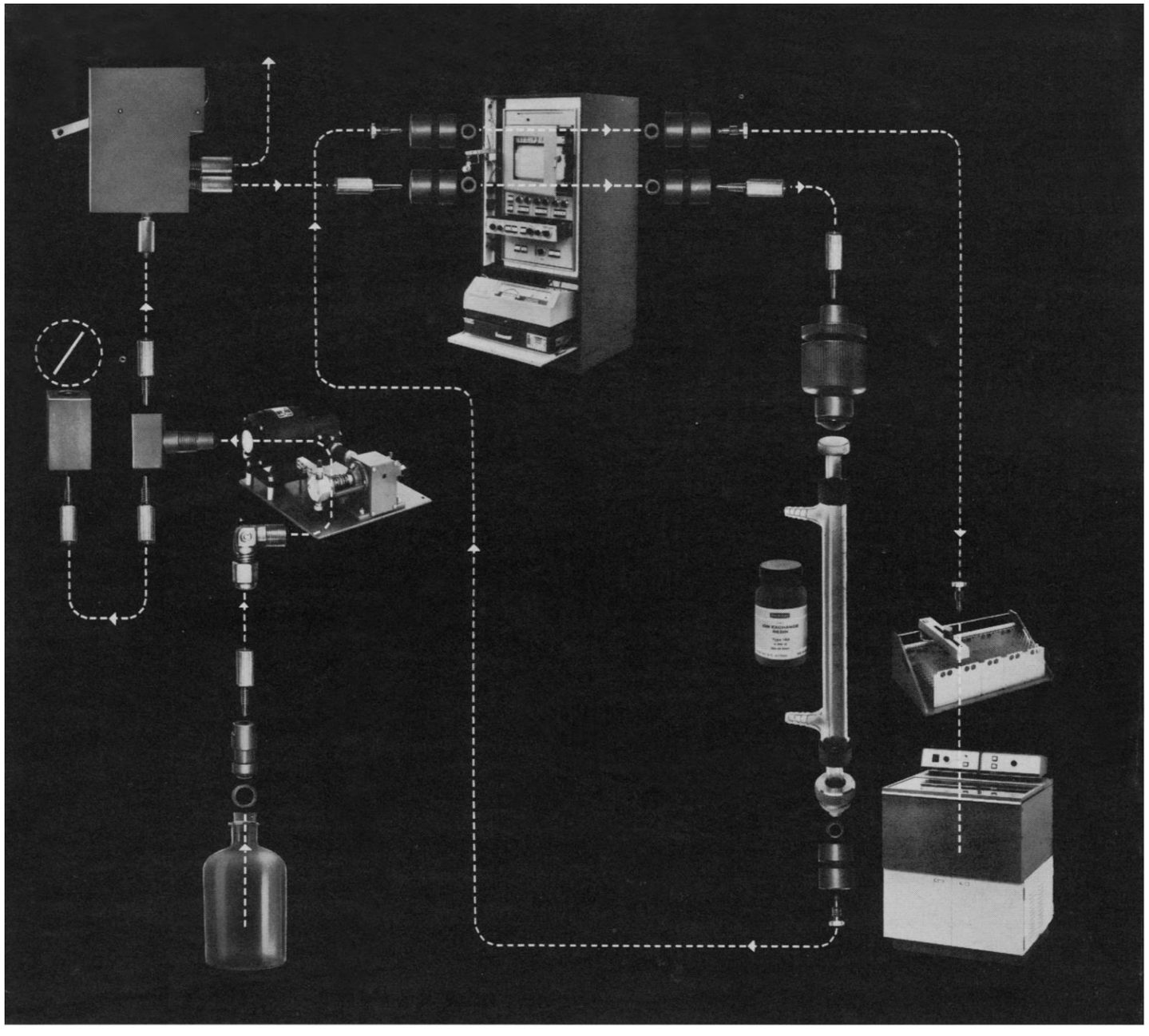
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

PRECAMBRIAN BACTERIA



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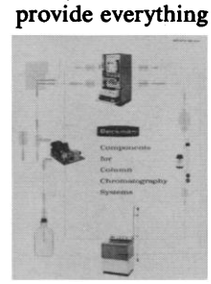

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Is ersatz ever better?

(Or: is it excessively presumptuous to claim—as we do herein—that our new reconstituted C^{14} protein hydrolysate is always all ways better for protein labeling than a natural C^{14} protein hydrolysate?)

The problem with using a natural yeast or algal C^{14} 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 C^{14} protein hydrolysate which consists of C^{14} amino acids (and C^{14} 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 C^{14} 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 C^{14} 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 μc of this C^{14} reconstituted protein hydrolysate costs only $35. 500 μc 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	μc/mc of mix.		sp. act. mc/mmole	μc/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 μc vials contain 100 μc/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 C^{14} essential amino acids: arginine, leucine, lysine, valine, and with total activity divided equally among these. This too is new. We call it our C^{14} 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.

Schwarz BioResearch, Inc.
ORANGEBURG, NEW YORK 10962

17 September 1965
Vol. 149, No. 3690

SCIENCE

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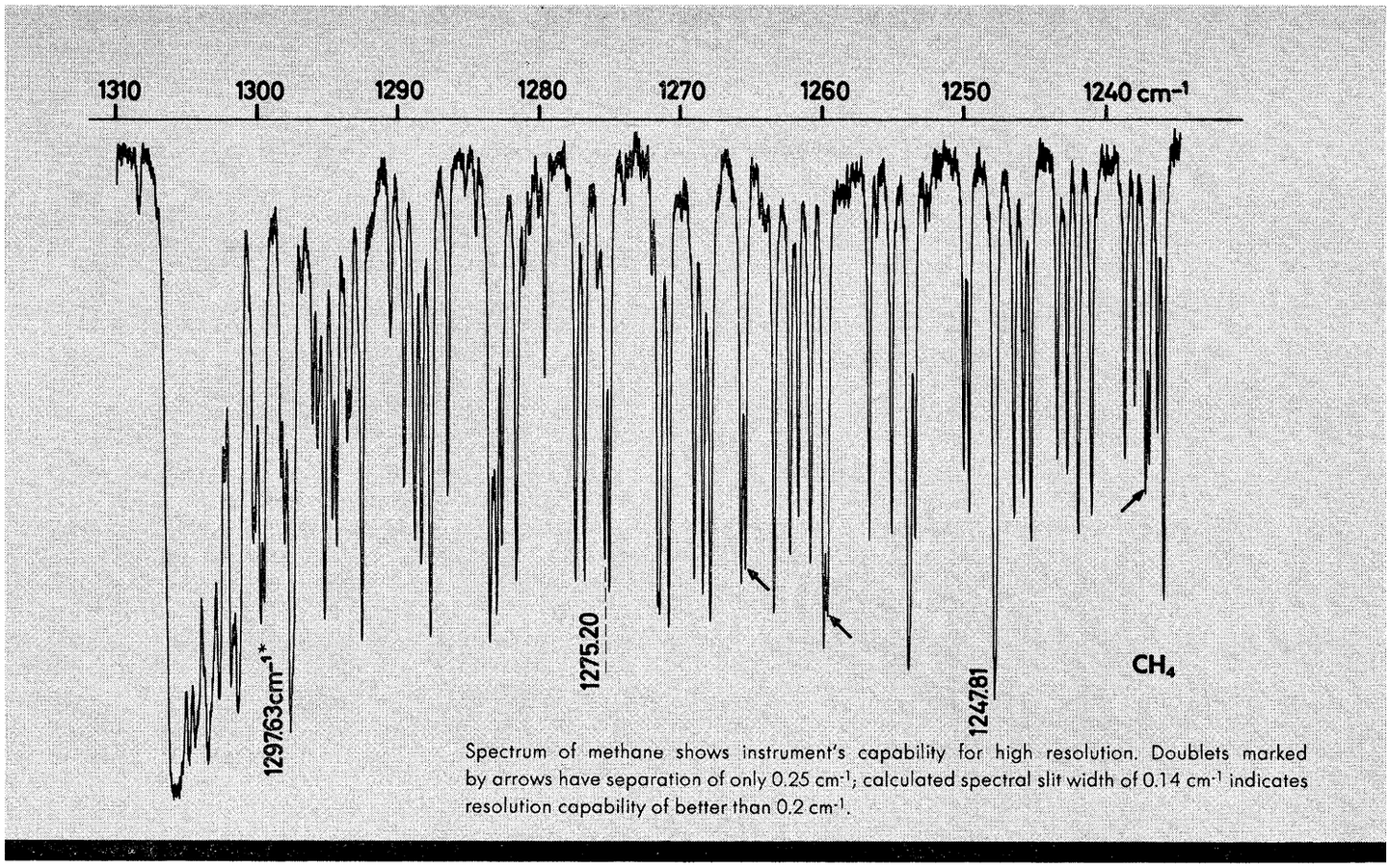
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

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 × 24,000). See page 1365. [Morton D. Maser, Harvard University]



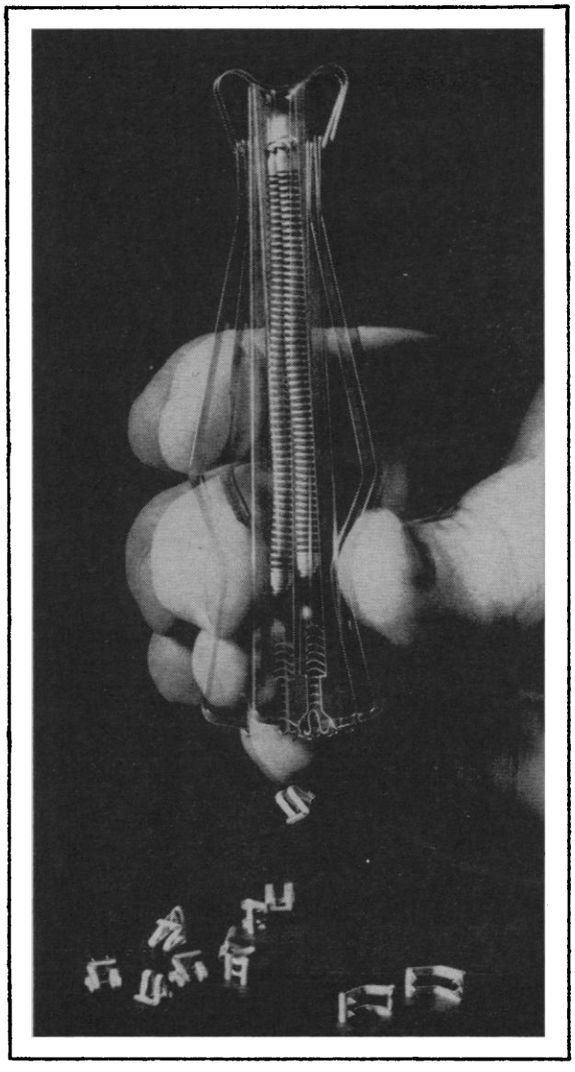
Spectrum of methane shows instrument's capability for high resolution. Doublets marked by arrows have separation of only 0.25 cm^{-1}; calculated spectral slit width of 0.14 cm^{-1} indicates resolution capability of better than 0.2 cm^{-1}.

RANGE: 5000 TO 200 CM^{-1} RESOLUTION: TO 0.16 CM^{-1} INSTRUMENT: THE NEW MODEL 225 INFRARED SPECTROPHOTOMETER

Perkin-Elmer's new Model 225, scanning from 5000 to 200 cm^{-1} (2 to 50 microns) gives you range combined with resolution unmatched by any other commercial infrared spectrophotometer. In pure research, this powerful new instrument permits difficult quantitative analyses of mixed samples, and investigation of molecular structures, with highest precision. In routine spectroscopy, it quickly earns its way: you can use its exceptionally high energy to scan spectra at high speed with consistently good resolution.

Another advantage of the Model 225's extra performance is that you can trade the extremely high resolving power for better-than-usual results when energy is severely limited. This means that weak and recessive information is brought out so that it can be used easily, in spite of the limited signal. An accessory recorder enhances this capability, by providing ordinate and abscissa scale expansions up to 50 X.

The Model 225, designed and built by Bodensee/Perkin-Elmer & Co. GmbH, offers all the advantages of a prism-grating monochromator operating in the first and second order, backed up by Perkin-Elmer's noted filter system and other advancements in modern electronic and optical technology. For more information, including additional sample spectra, write Instrument Division, Perkin-Elmer Corporation, 723 Main Avenue, Norwalk, Conn.



me people still use time-consuming methods of skin closure
I think nothing of it. We don't think much of it either.

That's why we developed the **9mm. Autoclip®* Method**—to make quick work of what is otherwise a slow, tedious procedure. It's the modern method of skin closure—fast, convenient, secure. 9mm. Autoclips can be used even on the smallest laboratory animals.

This new, improved method features an Autoclip Applier, 9mm. stainless steel Autoclips and an Autoclip Remover. This combination is designed to offer distinct advantages:

The Autoclip Applier automatically spring feeds the clips to the incision area as fast as skin edges can be approximated. You simply insert the rack of 20 Autoclips and it's ready for instant use. The Applier may be sterilized with the Autoclips in place.

The stainless steel Autoclips are actually double clips with four gripping points which provide maximum holding power. The advantages over sutures are many...fewer Autoclips are required for secure closure, there is less trauma and scarring, more rapid healing, and the chance of infection is reduced.

The Autoclip Remover provides painless, easy removal of clips. The remover only touches the clip itself, avoiding the danger of contamination that results from removal of sutures where there is direct contact with the wound.

The 9mm. Autoclip Applier, Remover and 100 Autoclips are available in a convenient kit at a suggested price of $43.75.

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Kodak reports on:

quanta conservation . . . an intermediate policy in lasers . . . a source of phenyl radicals . . . how to get on a mailing list of infrared technologists

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.

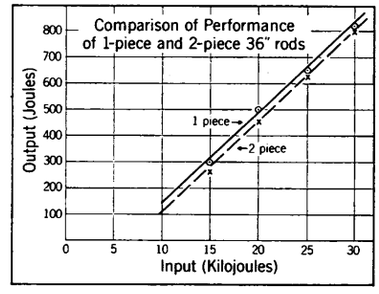
For a proper exposition of D.Q.E. send to Eastman Kodak Company, Special Applications, Rochester, N. Y. 14650 for a reprint from J.O.S.A. *for August '65.*

Long, long rods for the profession

All too easy it is to believe we know all the folks out there in laserland and their gals all know our phone number. That backward-looking viewpoint neglects the still unknown heroes who will save the skins of the generous makers of laser-development budgets.

These heroes are probably no amateurs. They have probably been devoting full time to keeping abreast. Now that they are ready to grab the lead instead of just staying abreast, they need rods from a supplier in an intermediate position. That's just what we are here — a supplier. We follow an intermediate policy between working directly in established projects only and offering raw glass only. We have a highly respectable background in high-precision optics. We make our own glass by our own methods. We welcome inquiries for neodymium-doped silicate glass rods around two inches thick and a yard or more long, with Brewster-angle or other kinds of ends. We welcome challenges to hold the loss coefficient under 0.1 % per cm and to raise the damage threshold to 600 joules/cm² of cross-section.

If there is anybody in the audience who has been wondering how much is lost by hitching two rods together with Brewster faces overlapped, as compared with an uninterrupted rod of equal length, let him note some input-output studies on one of our 36-inchers before (*solid*) and after (*dashed*) we busted it unintentionally and unhappily.



That phone number is (716) - 325 - 2000, Ext. 5166. It connects to Special Products Sales, Eastman Kodak Company, Rochester, N. Y. 14650. Mail to this address from residential return addresses is handled gingerly. At a recent science fair where a young blade kept firing, learnedly, a pocket-size laser rod that some kind-hearted physicist had bestowed on him for the advancement of his education, we walked over and told him to stop right then and there. We advised his proud mama and papa to get him to an ophthalmologist. What an ophthalmologist can do for damaged retinas we don't know.

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 CCl_4, 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.

We prefer to make things tougher for ourselves by hiding PAT under the official name *1',1',1'-Triphenylbenzeneazomethane* but hoping it will be remembered as EASTMAN 9599. We furnish it as the bright yellow crystalline solid $\phi N = NC\phi_3$. In solution (the choice of solvent being a pretty expansible topic) it comes apart into many kinds of brightly active fragments that either diffuse away to interesting adventures or else cling together in a busily interacting microcosm unentered by solvent molecules. It is called a cage by the smarties. Yet how can industry hope for a future without grabbing the smartest smarties it can lay hands on?

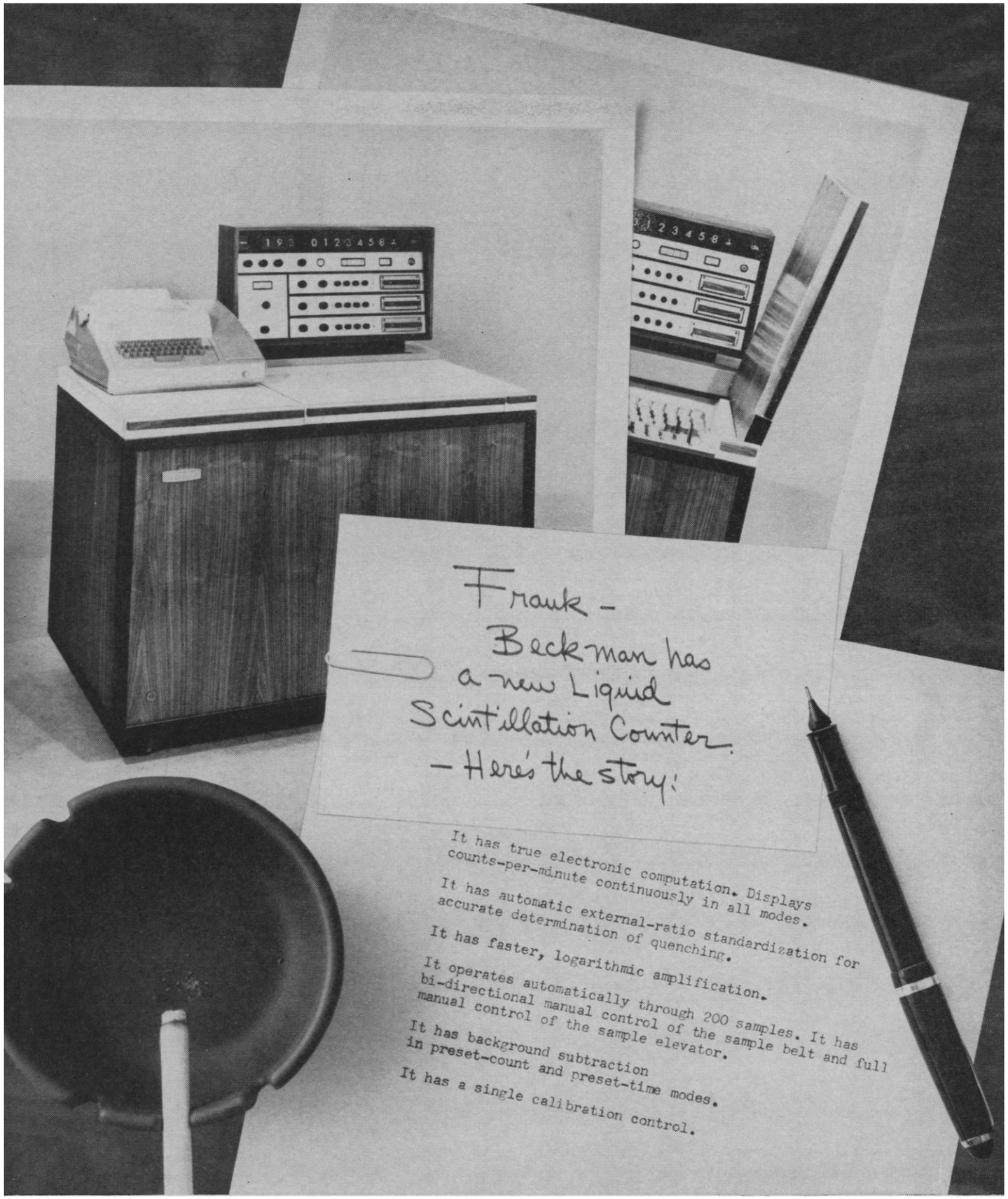
In addition to remembering PAT as EASTMAN *9599, it is even more desirable to remember that all the* EASTMAN *Organic Chemicals come from Distillation Products Industries, Rochester, N. Y. 14603 (Division of Eastman Kodak Company).*

Suggestion

If you are doing anything in infrared technology beyond operating a heat lamp or a spectrometer, please inform K. T. Lassiter, Publications Service, Eastman Kodak Company, Rochester, N. Y. 14650 so that you can be cued in from time to time when we have news for you.

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

This is another advertisement where Eastman Kodak Company probes at random for mutual interests and occasionally a little revenue from those whose work has something to do with science



All of these features make this the most advanced Liquid Scintillation Counter.
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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 on Antarctica: Continent of International Science by Laurence M. Gould; the Joint Address of Sigma Xi and Phi Beta Kappa by J. Bronowski; the George Sarton Memorial Lecture by Stillman Drake on "The Accademia dei Lincei"; and the National Geographic Society Illustrated Lecture.

AAAS Committees: Special Program of the AAAS Committee on Council Affairs on Civil Defense: Speakers: Eugene Wigner, Wolfgang Panofsky, Owen Chamberlin, Fred Payne, Barry Commoner, Bentley Glass, and Anatol Rapoport, moderator, and Henry Eyring, chairman; Committee on Desert and Arid Zones Research.

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 when the meeting opens. Use the coupon below.

AAAS
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(Check 1a or 1b) 1a. ☐—Enclosed is $5.00 Advance Registration Fee. This brings me the **General Program** and a **Convention Badge.**

1b. ☐—Enclosed is $3.00 for the **General Program.** (If I attend the meeting, the Badge, which I need to obtain the privileges of the meeting, will cost me $2.00 more.)

2. FULL NAME (Dr., Miss, etc.) .....
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6. CONVENTION ADDRESS .....
(May be added later, after arrival)

Please mail this coupon and your check or money order for the total amount to the AAAS in Washington, D.C. (address as shown)

MEETING • 26-31 DECEMBER

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.

Rates per Day

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	
Golden Bear (44) (and others)	7.00-8.00	8.00-10.00	10.00-12.00	18.00

RESIDENCE HALLS

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

---

AAAS Housing Bureau
P.O. Box 210
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.)

.....

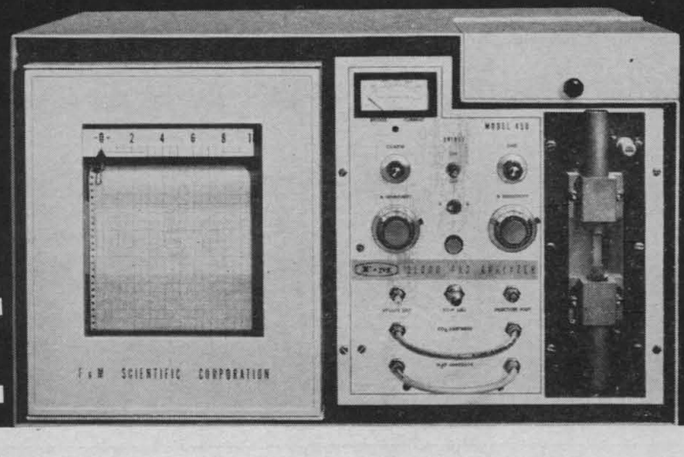
DATES: ARRIVAL ..... A.M. .....P.M. ..... DEPARTURE .....
(These must be indicated—add approximate hour, A.M. or P.M.)

NAME .....
(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.

OUR BLOOD GAS ANALYZERS AREN'T WHAT THEY USED TO BE



THEY'RE BETTER

Since we introduced it back in 1963, our designers have quietly made some important changes in the Model 450 Blood Gas Analyzer. Recently our applications chemists verified these changes in a series of practical clinical tests that prove we spent our time and money wisely.

Proof One: Accuracy

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.

Why not call your F & M Technical Representative for a full discussion of these new proofs of performance, write us for Bulletin 4500. F & M Scientific Corporation, Route 41 & Starr Road, Avondale, Pennsylvania 19311; phone (215) 268-2281. In Europe: F & M Scientific Europa N.V., Basisweg, (Sloterdijk) Amsterdam, The Netherlands.

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
Range (R)	2.0	0.25	0.5	0.25

NOTE: Range, difference between the high and low value, is an estimate of the reproducibility of the data.

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In the final analysis, it's **F&M**

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

References

1. R. M. Gagné, in "Mathematical learning," *Monograph Soc. Res. Child Develop. No. 99*, L. N. Morrisett and J. Vinsonhaler, Eds. (1965), pp. 42–49.
2. A. D. Pick, H. L. Pick, Jr., M. L. Thomas, *J. Exp. Child Psychol.*, in press.
3. E. A. Fleishman, B. Fruchter, *J. Appl. Psychol.* **44**, 97 (1960).

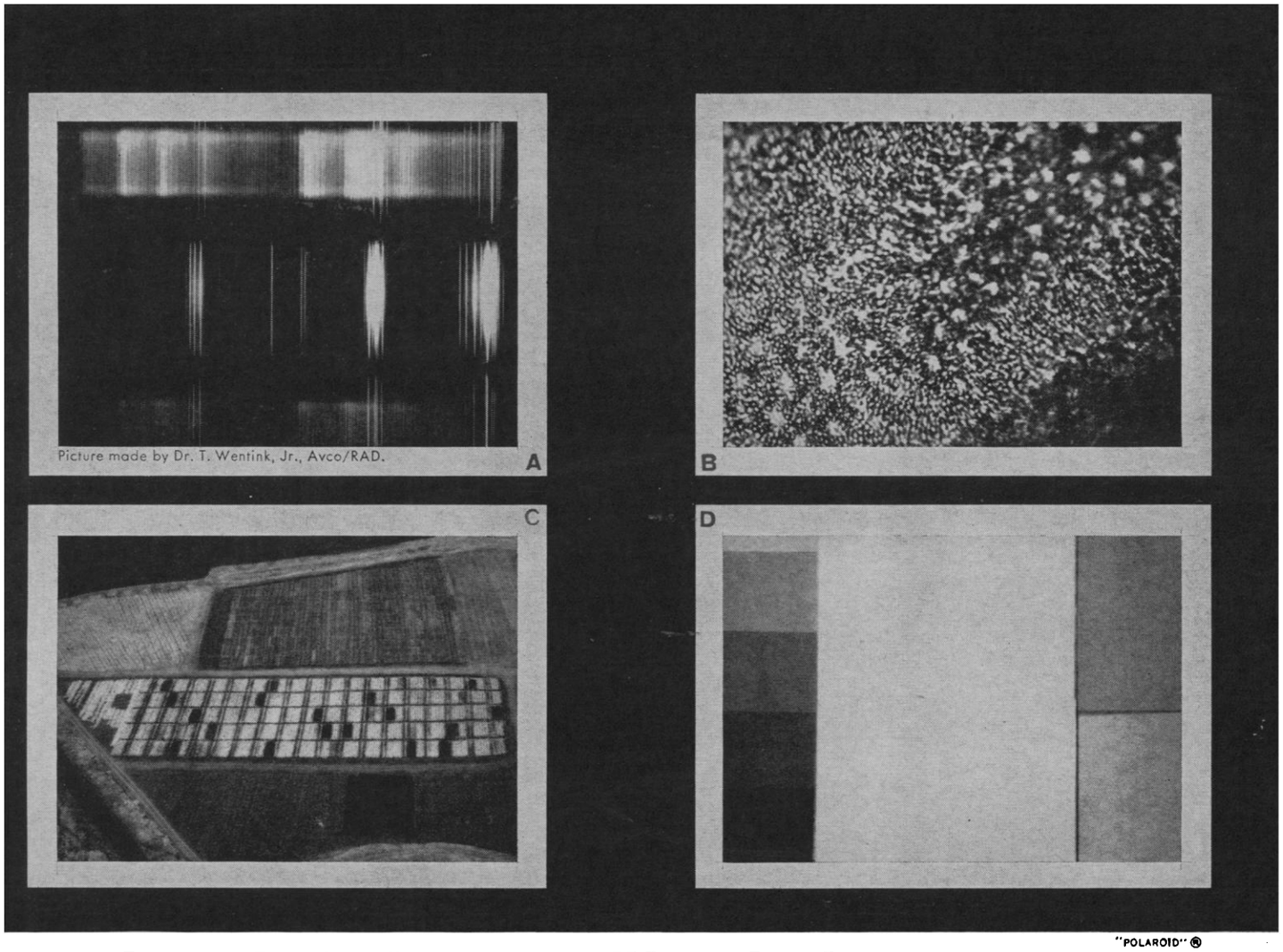
Half-Life of Radiocarbon

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.

FREDERICK JOHNSON
Box 71, Phillips Academy, Andover, Massachusetts 01810



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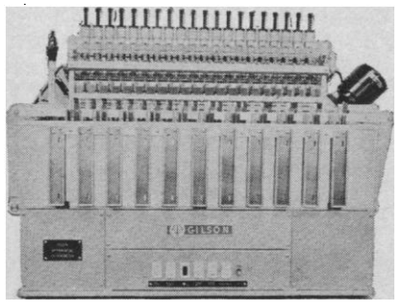

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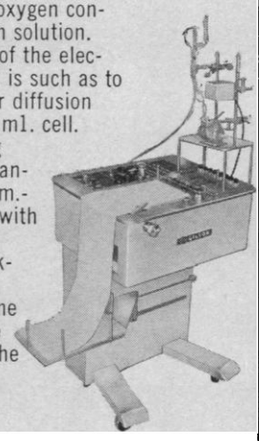

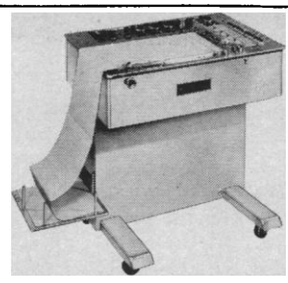

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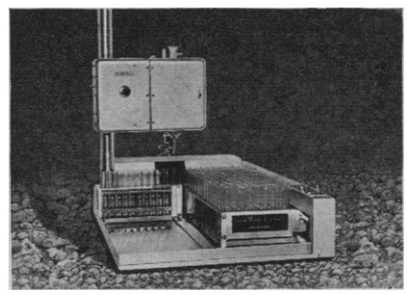

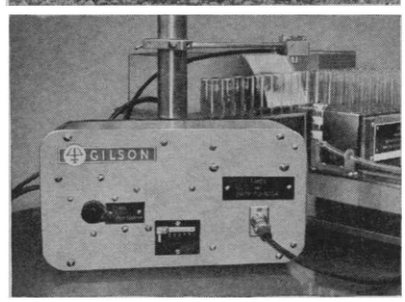

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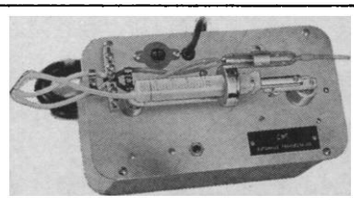

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17 September 1965, Volume 149, Number 3690

SCIENCE

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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.

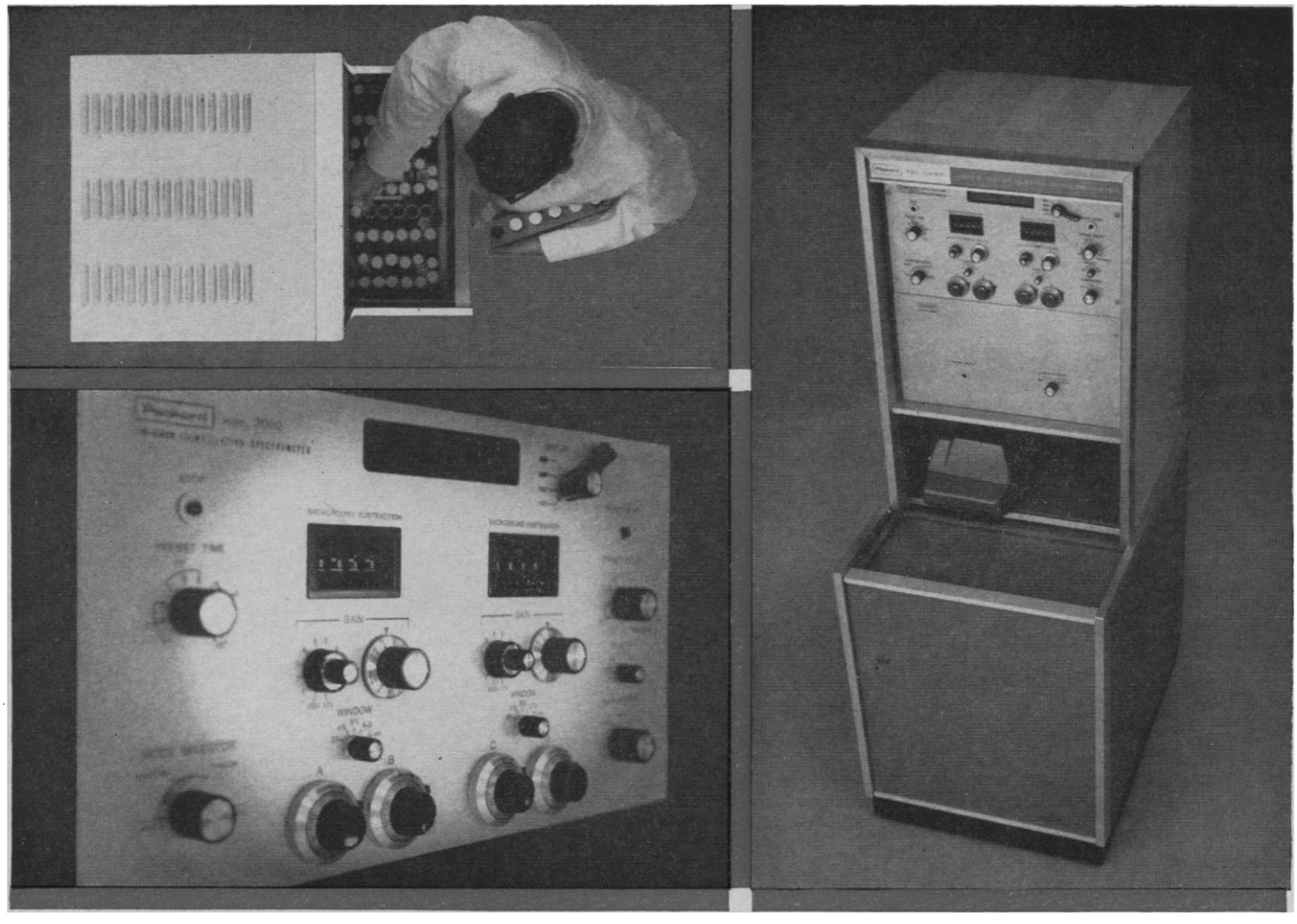
The television achievements for the GT5 mission rate compliments and also raise important questions. With an increasingly sophisticated audience, more frequent flights, and flights of greater duration, what will be the nature of TV coverage in the future? We will certainly see more "pool coverage"—the 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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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, Hugerterstr. 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

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

6–8. **Optical** Soc. of America, annual meeting, Philadelphia, Pa. (M. E. Warga, 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 8e)

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)

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 9e)

11–16. **Stomatology**, 19th French congr., Paris. (R. Cayron, 99, rue de Courcelles, Paris 17e)

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)

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 midwest 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 Civilia 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)

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. Erdös, Dept. of Pharmacology, Univ. of Oklahoma Medical Center, Oklahoma City 73104)