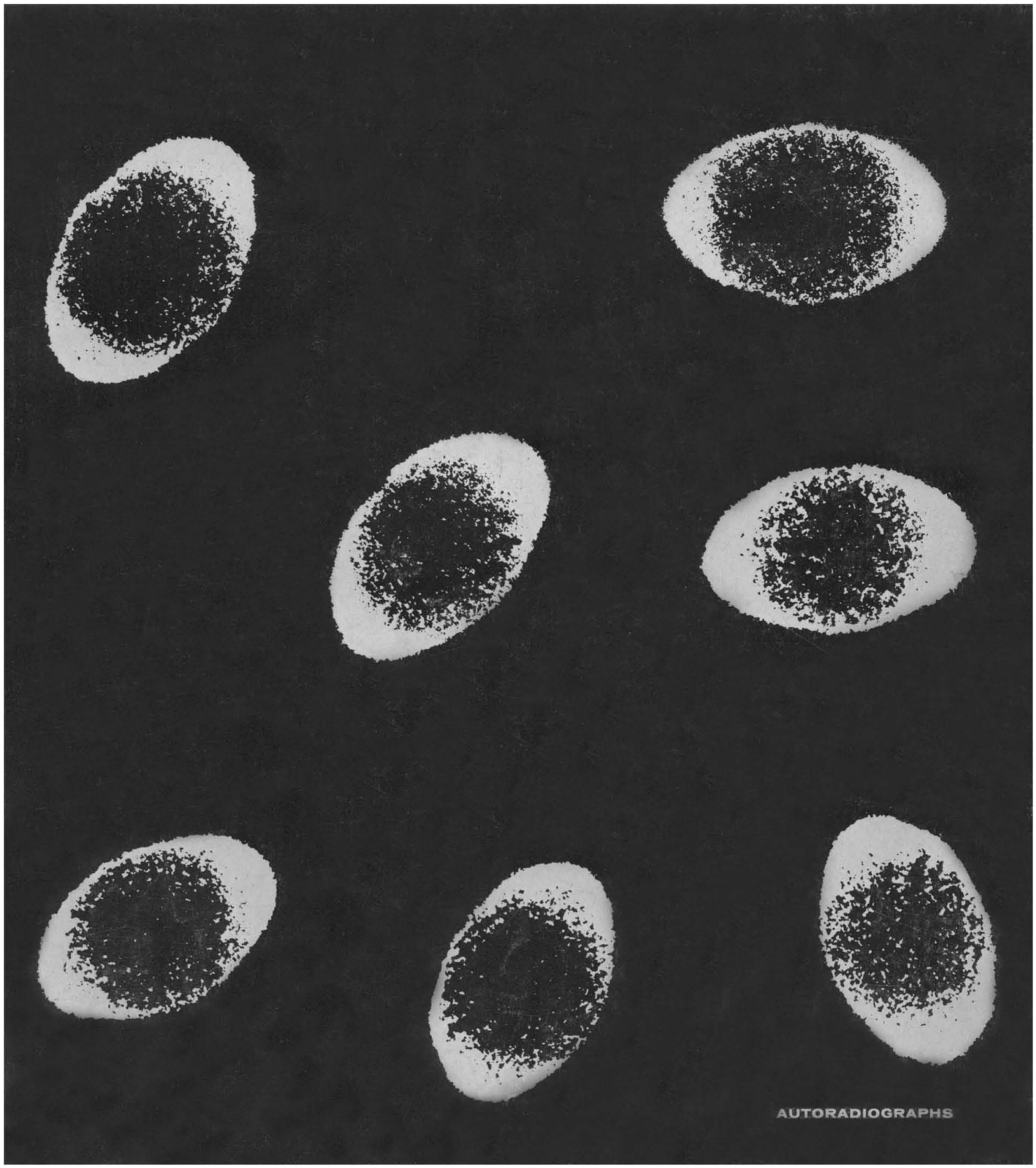
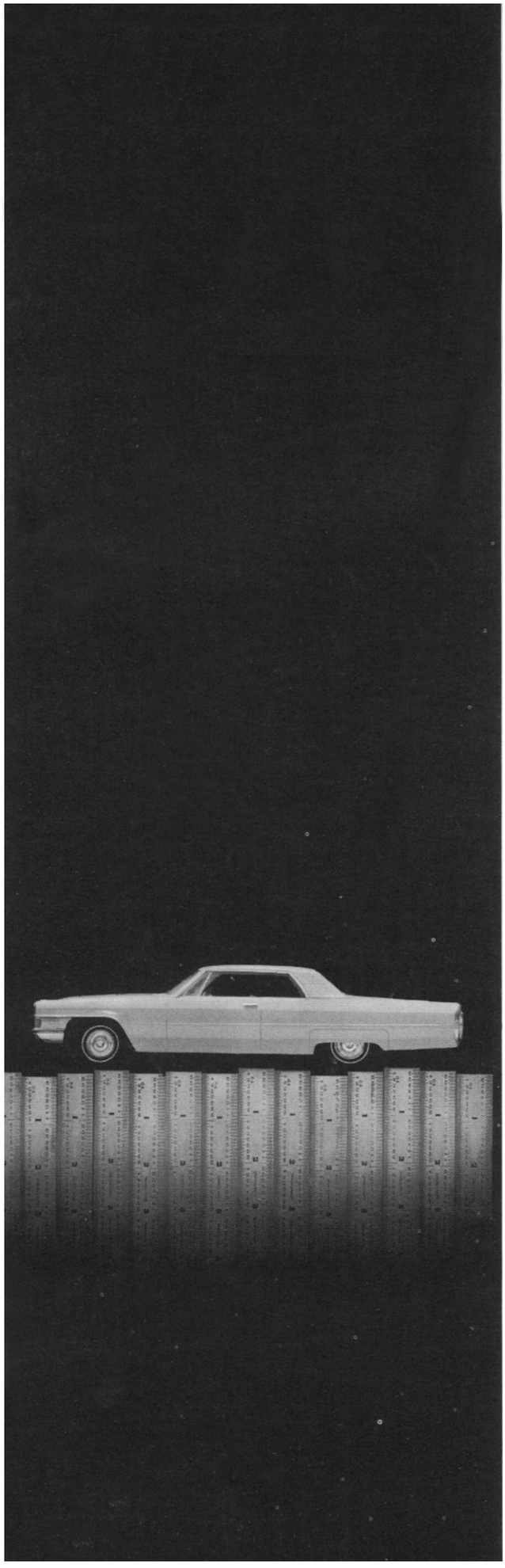
SCIENCE

1 October 1965
Vol. 150, No. 3692

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE





One of a series briefly describing GM's research in depth

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Did you travel a rough road this morning? How rough? Specifically.

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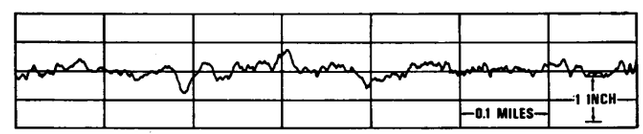
In addition to aiding state highway departments, the Profilometer has also helped airport authorities quickly determine runway surface conditions and is being used to measure profiles of railroad rails. It can show irregularities having wavelengths up to 1,000 feet.

Research travels many roads . . . sometimes building the tools to gather information, analyze it, and suggest its uses. It all helps General Motors to find a better way.

General Motors Research Laboratories

Warren, Michigan



GM Research oscillograph trace of concrete highway profile.

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SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

COVER

Autoradiographs reveal the pattern of protein synthesis in sections of 12-day-old chick lenses labeled with C^{14}-leucine. Labeling with precursors of proteins and polynucleotides aids in elucidating molecular events in the lens during differentiation. (Autoradiograph negative; the average length of the long axis of the lens is 1.6 millimeters.) See page 71. [R. Reeder and E. Bell, Massachusetts Institute of Technology]

nigh prohibitive. Moreover, deciphering illegible signatures adds to the agony. In order to alleviate some of the inconvenience and to add a touch of courtesy, I propose the following format:

Dear_____

I would very much appreciate a copy of your article entitled_____

_____

_____

which appeared in _____

_____

Thank you for this courtesy.
Yours sincerely,

Cut and use stub for address

Department of Biochemistry
University of Atlantis
Shangrila, Alaska, USA

The requester is expected to print his name legibly on the return address stub in addition to signing his name above the stub. The stub can be cut off and pasted on an envelope containing a reprint. The stub should be kept small for ease in cutting and pasting; the postal card is therefore printed vertically. For the sake of stamp collectors, the stub should be at the opposite end from the stamp.

This idea is not new. D. Hammer of the Max-Planck-Institut für Immunbiologie (and probably others also) has been using a similar but more elaborate card, from which the stub can be readily detached along perforations. I advocate a wider use of his thoughtful format.

ARTHUR A. HIRATA
Biochemical Research Department,
Abbott Laboratories,
North Chicago, Illinois

Windshield-Washing Hazard?

I have recently returned from a vacation in western United States during which I traveled several thousand miles by car. Two or three times each day, depending upon how frequently I stopped at gas stations, my windshield was carefully washed of the hundreds or thousands of splattered remains of the-Lord-knows-how-many different insect species. In most cases the attendant had some sort of container of water into which he plunged a cloth or one of those rough-surfaced bug-removal sponges, sometimes immersing his arm to the elbow in the dirty, debris-laden water. . . . Having viewed this procedure for the past several summers, I have begun to wonder whether some of those splattered winged creatures have carried viruses, bacteria, or other microorganisms which are, or could be, pathogenic to man. One might argue that the high speeds of the car, and sunlight beating on the windshield, would inactivate any virus, etc., that happened to arrive there via its unfortunate vector. But a pathogen might well be resistant to such desiccation and heat, and moreover one might drive into a station immediately after obliterating its vector so that these physical effects would not have had time to come into play. Moreover, continual use of the same water, car after car, could easily lead to some sort of concentration of agents.

I submit that if any such danger does exist, it exists on a very large scale. How many millions of bug-encrusted windshields are washed daily, especially in the summer vacation months? Think of what must be scores of thousands of people washing windshields, hundreds (thousands?) of times daily—people who, I suggest, have many lesions on their hands and arms as a result of their activities around machinery. Are these people exposing themselves to infectious diseases through their occupation? . . . Do we know enough to dismiss this concern out of hand?

JOHN I. PAYNE
Department of Bacteriology,
University of Alberta, Edmonton

Narrow Escape

Having almost succumbed to the siren song of mathematics, I appreciate Donald R. Weidman's letter, "Emotional perils of mathematics" (3 Sept., p. 1048). I wonder how many of the people who now proselytize for mathematics in search of the next Gauss give thought to those they catch but do not need?

E. R. RANG
Research Department,
Honeywell, Inc., St. Paul, Minnesota

CHARGED PARTICLES

Extending the capabilities of research equipment

Results from Tandem Research Program

The Tandem Research Group has made notable progress in the past year. Significant experimental results from the program are:

1. 250 mA high-brightness positive ion beam from an expanded-plasma source operating at 38 kv.

2. 270 μA analyzed beam of H_1^+ ions out of the Research Tandem with 320 μA H^- injection and water-vapor stripping.

3. 2.0 μA analyzed dc beam of He^- ions. The previous maximum current routinely available has been 0.1 μA with the EN source.

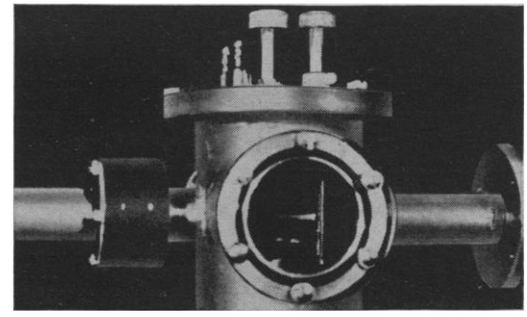
Doubly Charged Helium Ions

Components are now available for converting 3, 4 and 5 MeV machines to produce He^{++} ions at higher energies. Specifications: 30 μA at 5.0 MeV; 10 μA at 7.0 MeV; 5 μA at 10.3 MeV. More than double this current performance has been demonstrated but with some loss in stability and reliability. Multiple-charge states (2, 3 and 4) of neon, oxygen and nitrogen have also been produced with the new kit installed in a 3 MeV Van de Graaff. Beam energies from 5.04 MeV to 9.8 MeV and beam currents from 0.1 to 10 μA were observed. For details on the new HE^{++} kit and experimental results, write for Technical Note #13.

Optical Spectroscopy of Excited Atomic States

When an energetic beam of ions is passed through a thin foil, the charge state of the ion may change, either up or down. The emitted particles may be left in states of electronic excitation from which visible light is subsequently emitted during de-excitation. The emitted light spectrum is characteristic of the excited ion. When particle beams of approximately 0.4 μA or more are used, the light is sufficiently intense for spectroscopic analysis.

The refinement and application of this technique promises to be of major importance in the theory of atomic structure, in measuring hot plasma temperatures, and in acting for the means of energy loss in fast fission fragments in an absorber. Perhaps most importantly, it will help determine the relative abundance of the elements in the sun and other stars, which is the basis for theory of stellar evolution, the origin of the chemical elements, the age of astronomical objects and the nature of the stellar energy. For further details, ask for Technical Note #10.

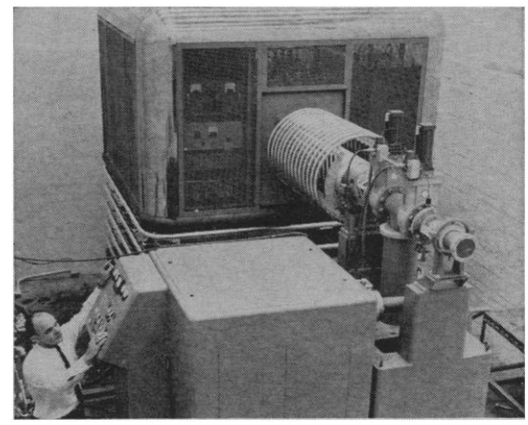


A nitrogen beam, 0.8 μA at 2 MeV, passes from right to left through a carbon foil approximately 9 $\mu g/cm^2$ thick.

Intense Ion Beams at 500 kv

The ICT-500 keV positive ion accelerator now being built by High Voltage Engineering operates at energies from 100 to 500 keV dc and pulsed. In performance tests, the machine has produced analyzed ion beam currents from 4 mA at 100 keV to 10 mA from 300 to 500 keV. 10 mA dc positive ion beam currents of H^1, H^2, and D^1 have been produced at a target located 6 feet from the end of the acceleration tube. Beam diameter is 15 millimeters maximum for all particles over the entire energy range. Previous experience with a similar machine of 300 keV maximum energy showed 15 mA of d_2^+ and a 3 centimeter beam diameter. The ICT-500 positive ion accelerator is designed for dc and pulsed operation in the nanosecond and microsecond range with a minimum pulse length of 2 nsec. at a repetition rate of 2.5 Mc/s. Pulse content is 1 mA protons and 0.7 mA deutrons.

The particle source utilized with the ICT-500 positive ion accelerator is an expanded plasma type which has produced 70 mA total beam at 500 kv.



The high-brightness, intense ion beam produced by the ICT-500 accelerator is eminently suited for laboratory production of 14 MeV neutrons for cross-section measurements, dosimetry studies, weapons-effect simulation and special low-density target experiments.

For detailed information, write to Technical Sales, High Voltage Engineering Corp., Burlington, Mass. or HVE (Europa) N. V. Amersfoort, The Netherlands. Subsidiaries: Electronized Chemicals Corporation, Ion Physics Corporation. ARCO Division, Walnut Creek, California.

HIGH VOLTAGE ENGINEERING

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New Centers of Excellence

Anxiety over distribution of federal funds is widespread. A major crystallizing influence has been interest in the choice of a site for the new high-energy accelerator (*Science*, 13 Aug., p. 730). The Atomic Energy Commission received a total of 126 proposals from 46 states. Many of the proposals were well-prepared, lengthy documents, signed by presidents of universities. In almost every instance, sponsors included important political figures as well as congressional representatives. In its approach to the AEC one West Coast city was represented by 35 emissaries, including the mayor, who led the delegation and made the presentation.

In the course of preparing their proposals the various groups had to ask themselves searching questions concerning the quality of their local universities. They became highly aware of the importance of research and development in shaping civilization. They were reminded of the present distribution of federal expenditures for research, half of which go to twenty institutions. Appetite for government support has been thoroughly whetted throughout the nation. The accelerator can be awarded to only one group. Obviously, consolation prizes must be available for the remainder.

President Johnson has responded to this new reality in a memorandum entitled "Strengthening Academic Capability for Science Throughout the Country" (see *Science*, 24 Sept., p. 1483). The document calls for important changes in the distribution of federal research funds. The President states: "Research supported to further agency missions should be administered not only with a view to producing specific results, but also with a view to strengthening academic institutions and increasing the number of institutions capable of performing research of high quality." The President makes it clear that the institutions to be strengthened are other than the present leading twenty. "[F]unds are still concentrated in too few institutions in too few areas of the country. We want to find excellence and build it up wherever it is found so that creative centers of excellence may grow in every part of the nation."

This is a worthy objective. Can it be accomplished? What will it cost in money and human values? What is the time scale? Immediate substantial beneficial effects from the new policies are not likely to be felt widely. Partly this is because delays are inevitable in broad implementation of new policies. Moreover, many institutions will be unable to exploit the new opportunities effectively. Too few administrators understand what must be done to foster scientific creativity. They believe that excellence can be bought. A current fallacy is that "brains go where the money is." In fact, brains go where brains are. Brains go where there is a challenge. Brains go where brains are valued for intellectual as well as practical achievements.

Most of the leading twenty institutions have been great for a long time. They will continue to be excellent for they know how to obtain and maintain quality. They have the asset of traditions of superiority that tend to be self-sustaining. If federal support is curtailed, individuals at the great universities will suffer. Some may be forced to go elsewhere. Whether the new policies result in more good than harm will depend in part on how skillfully the policies are implemented to conserve existing strength. The results will also depend on the wisdom of administrators at the new centers and on the intellectual environment and traditions that they create. The work of achieving enduring excellence is the labor not of a year but of a generation.—PHILIP H. ABELSON

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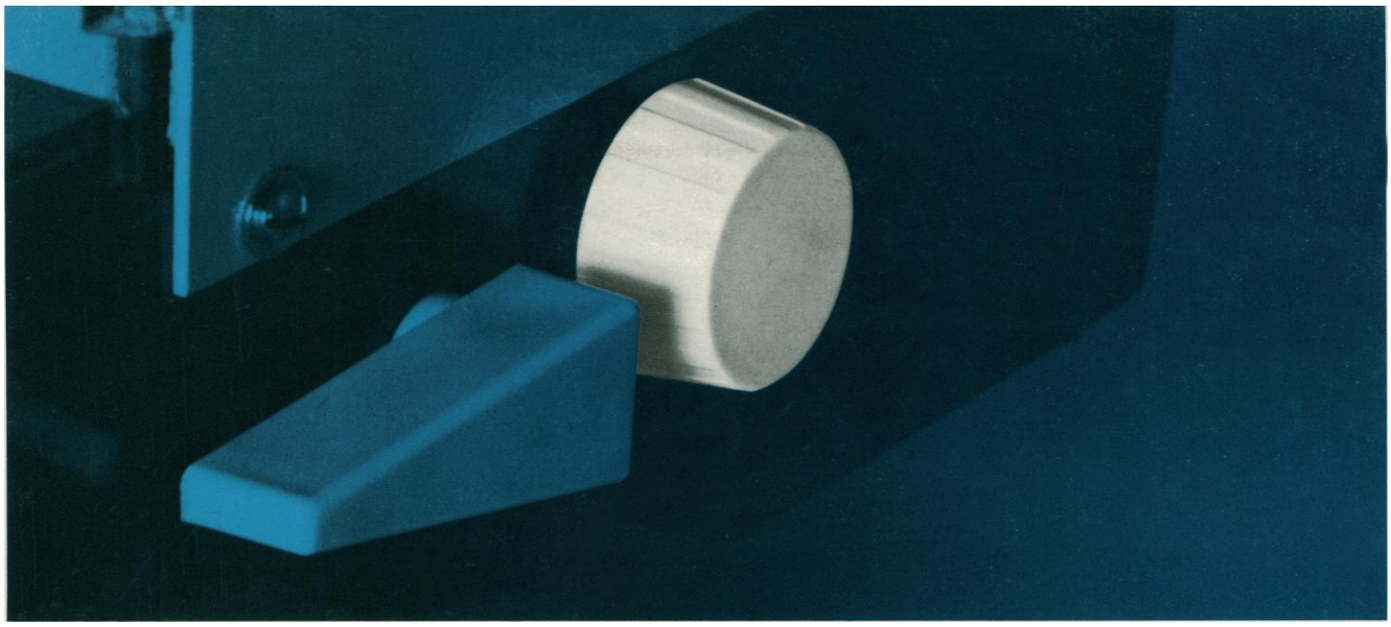

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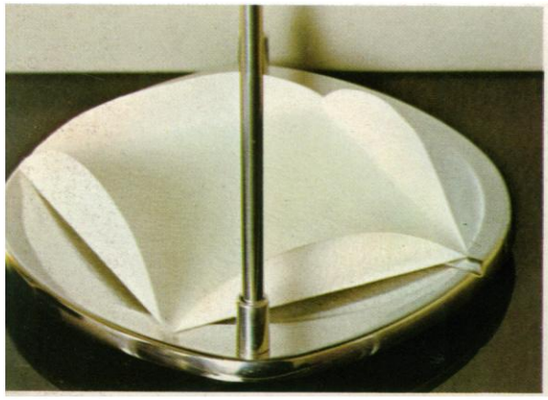
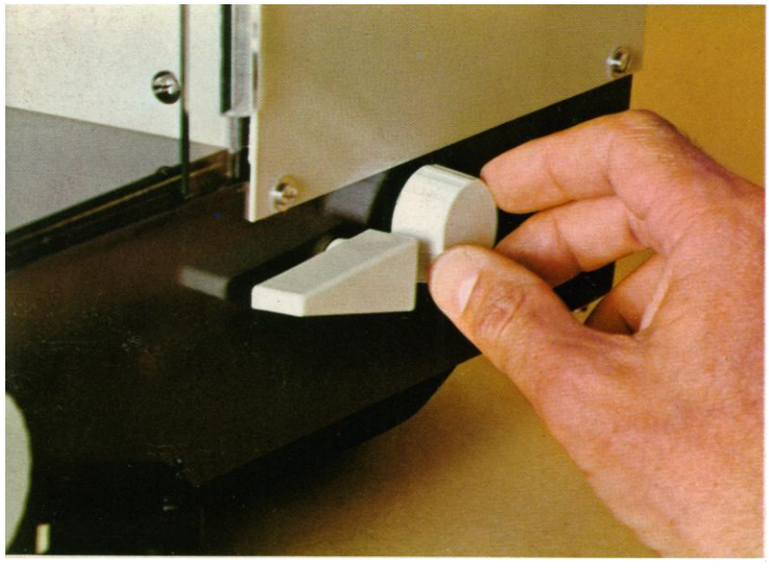
before mechanical taring – the weight of the filter paper cup on the pan would normally be 0.5887 grams after setting the micrometer.





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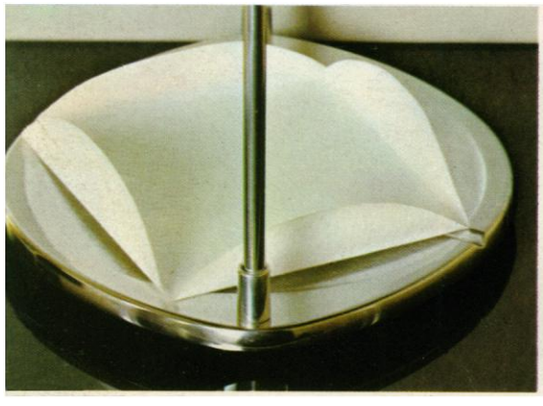
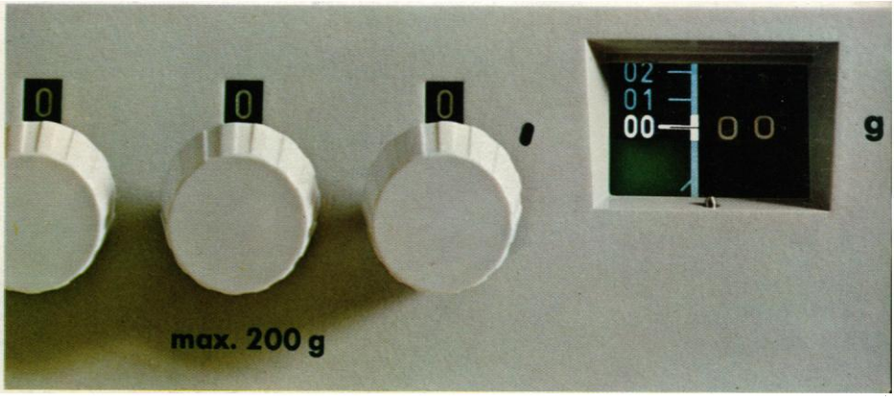
the mechanical tare – instead of weighing the cup, use the TARAMATIC control knob to bring the optical scale back to zero.





after mechanical taring – with filter paper cup on the pan, all systems now read zero.

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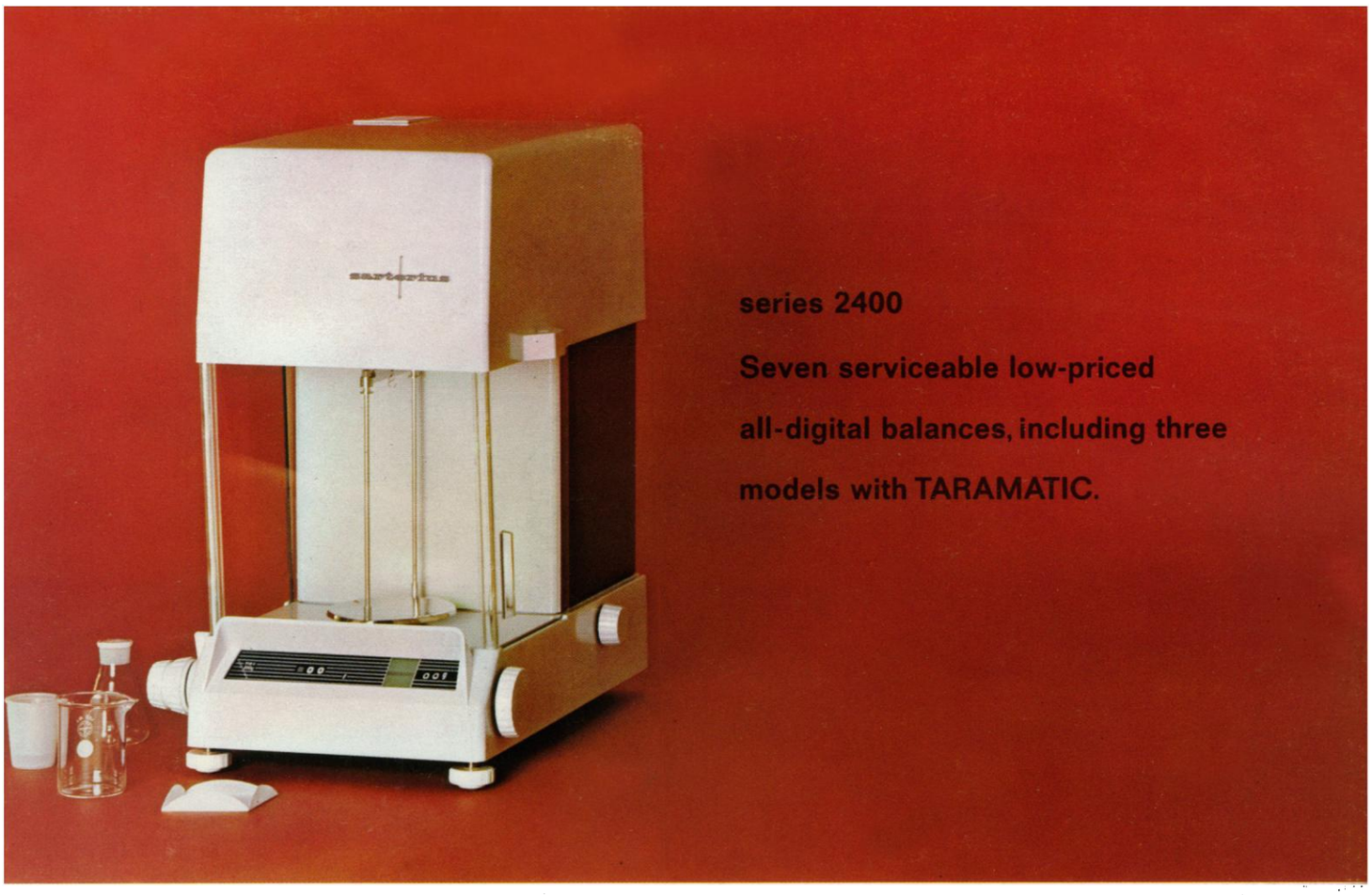

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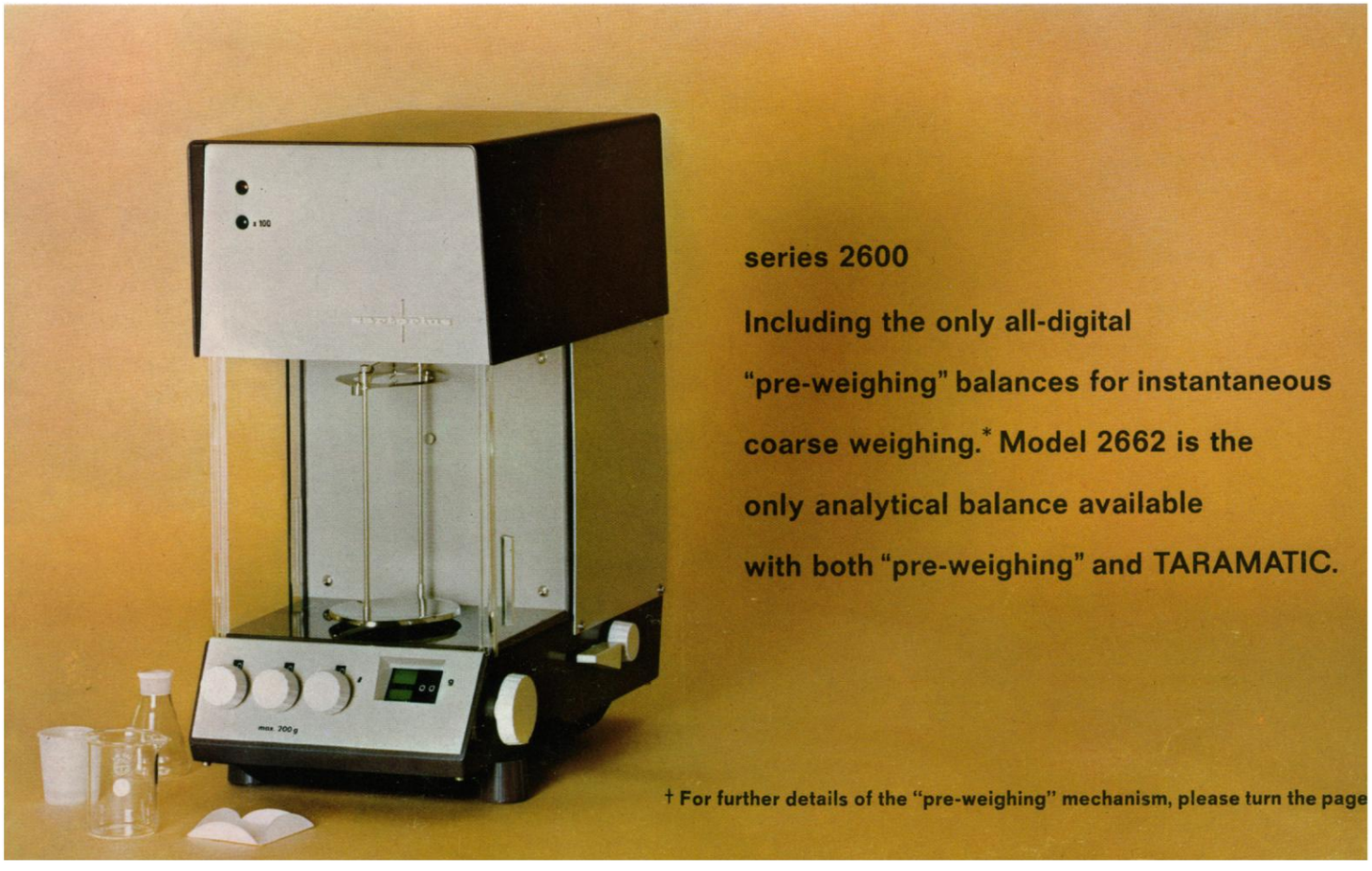

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† For further details of the "pre-weighing" mechanism, please turn the page

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†"Pre-weighing" balances feature a secondary torsion measuring spring for determination of the coarse weight. When the release lever is turned "up", the optical scale extends from 0 to 100 grams—providing an instantaneous reading to the nearest gram without need of trial-and-error weight dialing. Now the known coarse weight can be immediately dialed-in, the release lever turned "down", and the optical scale will extend from 0 to 1000 mg, providing an all-digital reading to 0.1 mg.

SERIES 2400

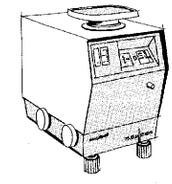
Model	2401	2401-T	2402	2402-T	2403	2403-T	2404
Capacity	200 g	200 g	200 g	200 g	100 g	100 g	100 g
Optical Range	10 g	10 g	1 g	1 g	1 g	1 g	100 mg
Digital Readability	1 mg	1 mg	0.1 mg	0.1 mg	0.1 mg	0.1 mg	0.01 mg
Precision	±0.3 mg	±0.3 mg	±0.05 mg	±0.05 mg	±0.05 mg	±0.05 mg	±0.01 mg
Manual Taring	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Taramatic	No	Yes	No	Yes	No	Yes	No

SERIES 2600

Model	2602	2603	2604	2632	2642	2662
Capacity	200 g	100 g	100 g	200 g	200 g	200 g
Optical Range	1 g	1 g	100 mg	1 g	1 g	1 g
Digital Readability	0.1 mg	0.1 mg	0.01 mg	0.1 mg	0.1 mg	0.1 mg
Precision	±0.05 mg	±0.05 mg	±0.01 mg	±0.05 mg	±0.05 mg	±0.05 mg
Manual Taring	Yes	Yes	Yes	Yes	Yes	Yes
Pre-Weighing†	No	No	No	No	Yes	Yes
Taramatic	No	No	No	Yes	No	Yes

SERIES 2100

Model	2103	2113	2106	2116
Weighing Capacity	3000 g	3000 g	1000 g	1000 g
Taring Capacity	—	1000 g(*)	—	100 g
Built-in Weights	2 kg	2 kg	900 g	900 g
Optical Range	1000 g	1000 g	100 g	100 g
Accuracy	±0.2 g	±0.2 g	±0.02 g	±0.02 g



*Can be extended another 1000 g by using a Sartorius bowl in place of the conventional pan on top of the balance. Optional 2 and 3 liter bowls have the same weight as the pan.

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3216

messenger RNA on the DNA template also occurs from the 5′- to the 3′-end, and discussed possible mechanisms by which translation and transcription interact at the DNA site.

T. Yura discussed the present status of experiments in his laboratory in which the synthesis of the enzyme tryptophan synthetase by cell-free extract is stimulated by DNA carrying the corresponding genes and is subject to specific regulatory effects, thus suggesting that the in vitro system reproduces faithfully the machinery presumed to be operative in vivo.

A. Garen (Yale University) presented a series of experiments on the effect of suppressor mutations on the translation of the genetic message for the enzyme alkaline phosphatase. These studies, as well as parallel ones in other laboratories, have made it possible to identify the nature of at least one "nonsense" codon in *E. coli* RNA as A.U.G. and to identify the nature of the amino acid replacements caused by various suppressors. Garen and Zinder also reported current experiments which attempt to make use of genetic suppressors to induce specific changes in protein synthesized in cell extracts and to identify the mode of action of the suppressors, whether on the sRNA, the activating enzymes, or the ribosomes.

One significant conclusion to be derived from the valuable exchange of information that took place at the symposium is the close similarity of goals and methodology employed by scientists in the two countries, a similarity not surprising in view of the fact that many of the Japanese workers in molecular genetics have received part of their training in American laboratories. At the same time, the emphasis is often different and the discussion, therefore, was more mutually informative than a similar discussion would have been among a group of American scientists. In part, this is due to the fact that the Japanese molecular geneticists are often in closer touch with medical research than their American counterparts, and also reflects the fact that the interest of many Japanese scientists has been concentrated on certain phenomena, such as the resistance transfer factors, which have been discovered in Japan.

S. E. Luria
Massachusetts Institute of Technology, Cambridge

Forthcoming Events

October

7–8. **Fiber** Soc., meeting, Wilmington, Del. (Fiber Soc., Box 625, Princeton, N.J.)

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. **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)

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, McDon-

nell 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.)

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)

(Continued from page 42)

promise and conservatism" in art. "France has had a national academy of arts for years," said Representative William S. Broomfield of Michigan. "But beaux arts has had a consistent habit of turning its back on the man with talent and rewarding the man who follows the safe party-line and does not dare to deviate from the norm."

Attempts at control of the arts, possibly by headline-seeking politicians, also were viewed by these critics as a possibility to be dreaded. "We will not have to worry about pop art. It will be pap art or poppa art in honor of the man who has the official word and his hands on the federal purse strings," said Broomfield, who predicted the coming of a Soviet-style "culture czar." Such forebodings were dismissed by the NFAH bill's supporters. They said that with distinguished practitioners in the arts and humanities serving on the advisory councils, unwise federal intervention in their fields could be discouraged.

Although opposed to a subsidy for the arts, Representative Albert H. Quie, a Minnesota Republican, favored support for the humanities. In a report on the NFAH bill, he cautioned, however, that it would be inappropriate to follow the NSF example of making grants to individuals as well as to institutions. He observed that grants to individuals sometimes have resulted in differences between the recipients and their institutions which have gone unresolved because of the grantees' independent status. "Such situations, when they occur, are disruptive of the normal university relationships and they ought not to be encouraged by federal programs," Quie said.

In testifying for the NFAH bill, Kingman Brewster, president of Yale University, had warned that government and the humanities scholar should be insulated from each other. If there is to be direct support of individual research projects, it should be for the development of techniques or the purchase of equipment and not for specific research raising questions of taste, ideology, and esthetic judgment, Brewster said. But he was confident that by trial and error the Endowment chairmen and advisory councils would develop appropriate policies. The NFAH legislation itself by no means precludes direct support to scholars, however.

Some members of Congress fear that the new foundation will quickly outgrow its swaddling clothes and claim a budget large enough to support comparison with NSF's. But the chances of this appear minimal, since the arts and humanities neither require such elaborate and costly equipment as the sciences nor claim so direct a relationship to the national security. Moreover, the role envisaged for NFAH is primarily that of a catalyst to engender greater support for the arts and humanities from state, local, and philanthropic sources.

The foundation's initial authorization of $20 million a year is small compared to NSF's budget of nearly half a billion. Beginning life less than 15 years ago with $3½ million, NSF has seen its appropriations rise steadily, as Congress, partly in response to cold war competition, has sought to keep American science preeminent. For NFAH to gather comparable momentum is scarcely conceivable.

—LUTHER J. CARTER

Announcements

The National Aeronautics and Space Administration and the Federal German Ministry for Scientific Research have signed a "Memorandum of Understanding" for cooperation in a space research program regarding the **earth's radiation belts**. Objectives are studies of the inner radiation belt, of electrons in the horn of the outer radiation zone, and of solar proton events. Plans call for placing a German scientific satellite in a polar orbit in 1968. The project will involve scientists from the Max Planck Institute for Physics and Astrophysics, the University of Kiel, and the Max Planck Institute for Aeronomy; U.S. participation will be under the NASA Office of International Affairs.

A **water resources research center** has been established at Pennsylvania State University to help coordinate research on water use, purification, conservation, pollution, and related problems. It will be part of the 2-year-old Institute for Research on Land and Water Resources, and will be directed by E. Bruce Jones, an assistant professor of meterology at the university. The center was set up with the help of a $140,000 grant from the Office of Water Resources Research, U.S. Department of the Interior.