SCIENCE

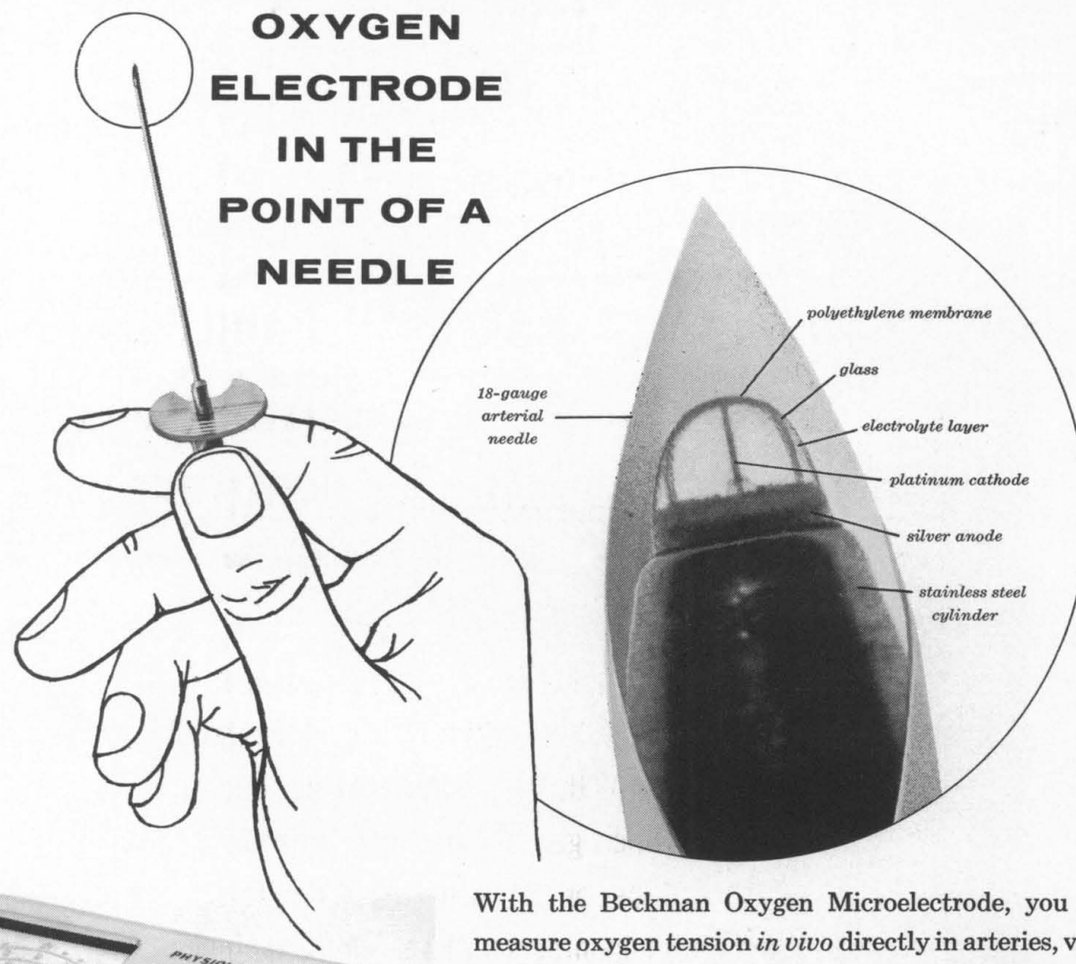
25 January 1963

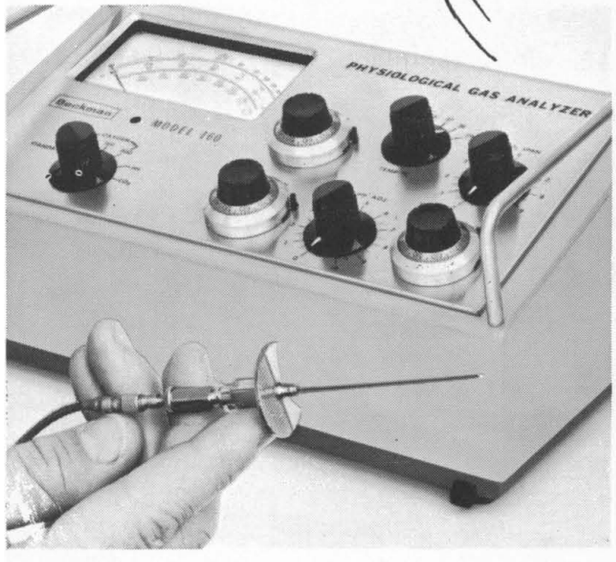
Vol. 139, No. 3552

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

NICKEL-IRON NODULE

AN OXYGEN ELECTRODE IN THE POINT OF A NEEDLE





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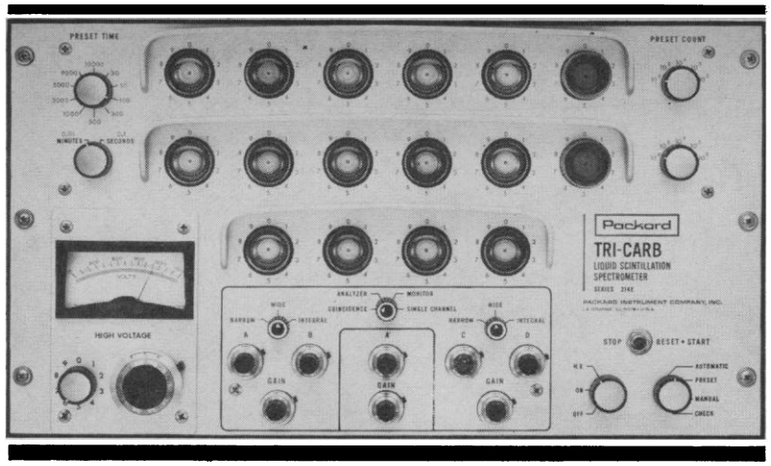

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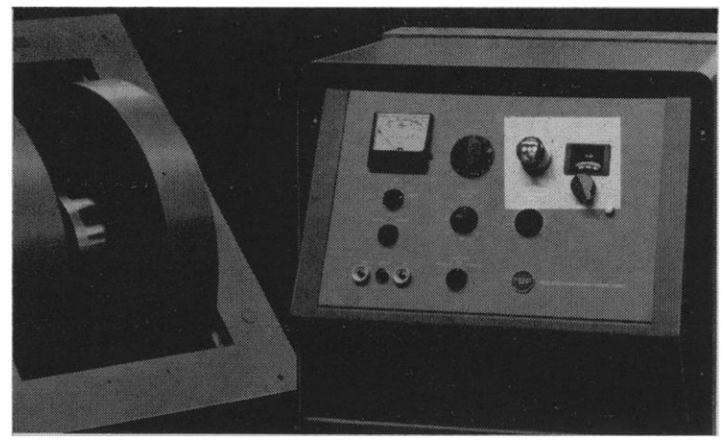

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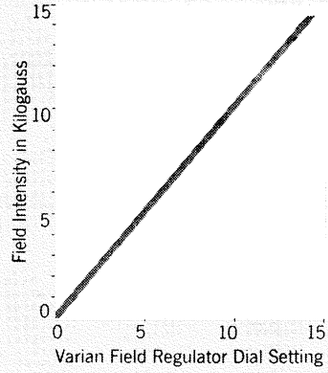
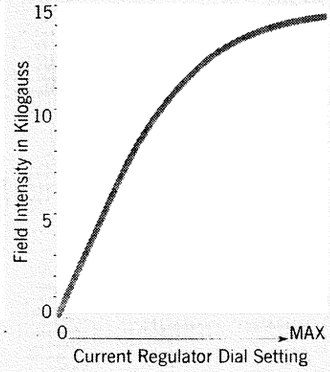




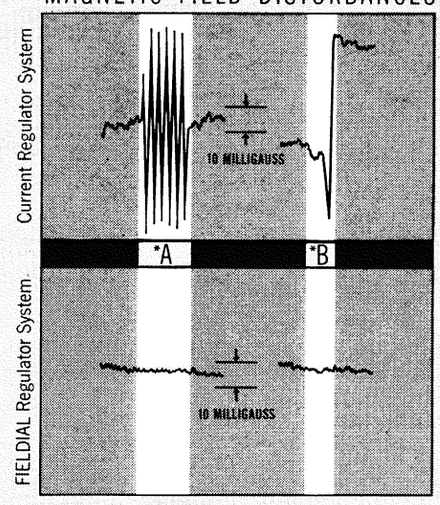
Sweep linearity is dramatically compared in curves shown above. FIELDIAL regulator sweep is essentially constant while current sweep varies by as much as a factor of seven. Data taken on Model V-3400 Magnet with cylindrical pole caps at 1.25" air gap ■

*A. Introduction of local sinusoidal magnetic field disturbance ■

*B. External field disturbance caused by fringing field of nearby magnet ■

Measurements made with proton NMR instrumentation.

REGULATION OF SYSTEMS AGAINST MAGNETIC FIELD DISTURBANCES



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Sage Model 087 with Reichert Zetopan microscope. Other models are available for use with other microscopes.

Attempts of nematode to escape adhesive hyphal loops of the predacious fungus, **Arthrobotrys conoides.** Pictures taken at 430 x, at 8 frames/min. Sequence covers ½ min of an 8 hr continuous study recorded on 100 ft of 16 mm film by Dr. David Pramer and Dr. Nergish Ghadialy, Dept. of Agricultural Microbiology, Rutgers University.

(Time lapse motion pictures taken through the microscope reveal data never apparent in a series of stills. For example, the incessant cytoplasmic activity within cells of the fungus and nematode cannot be seen in the pictures shown here—until you project them at normal speed. Let us know if you would like to see the entire film.)

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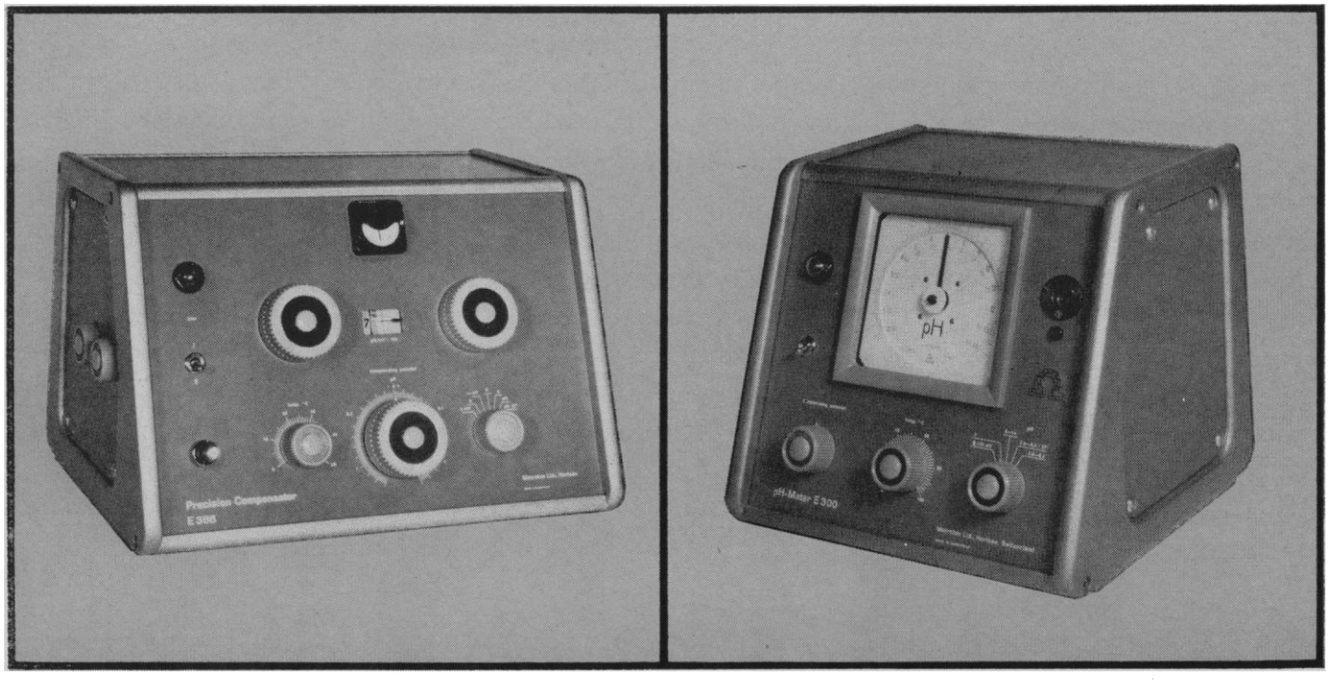

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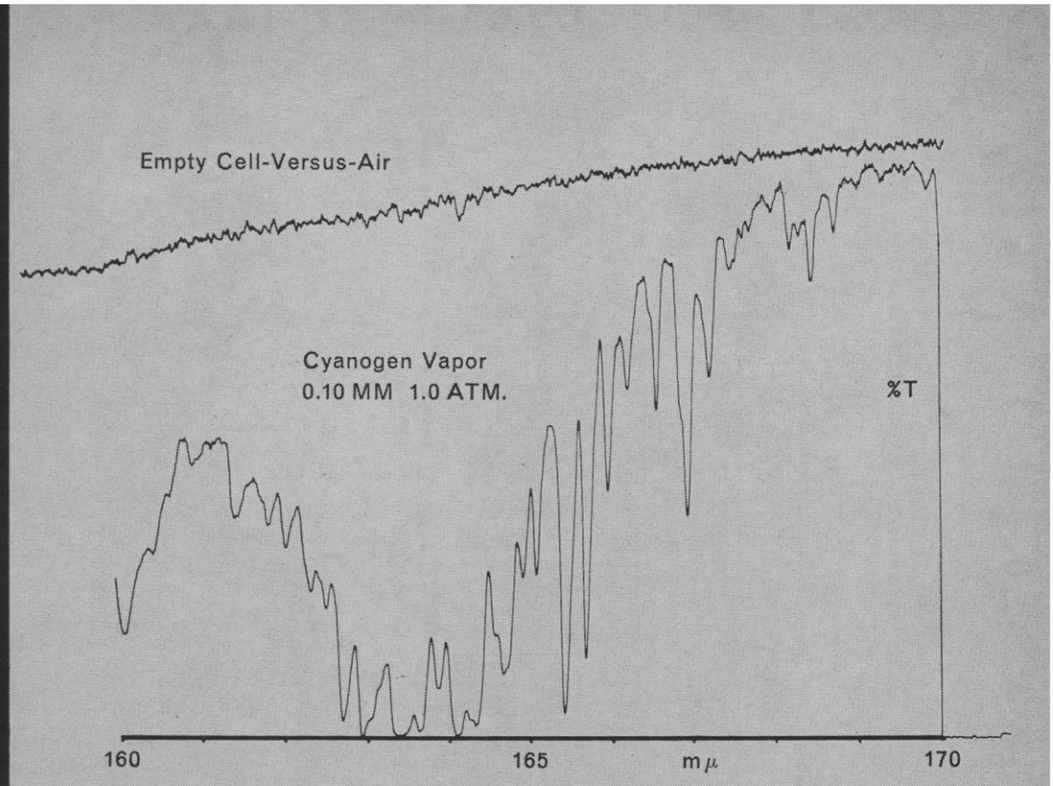

New Beckman Far Ultraviolet DK-2A Spectrophotometer at work. Note the absence of hydrogen lamp line spectra and the high level of energy still available at 160-170 mμ. Both curves demonstrate negligible stray light.

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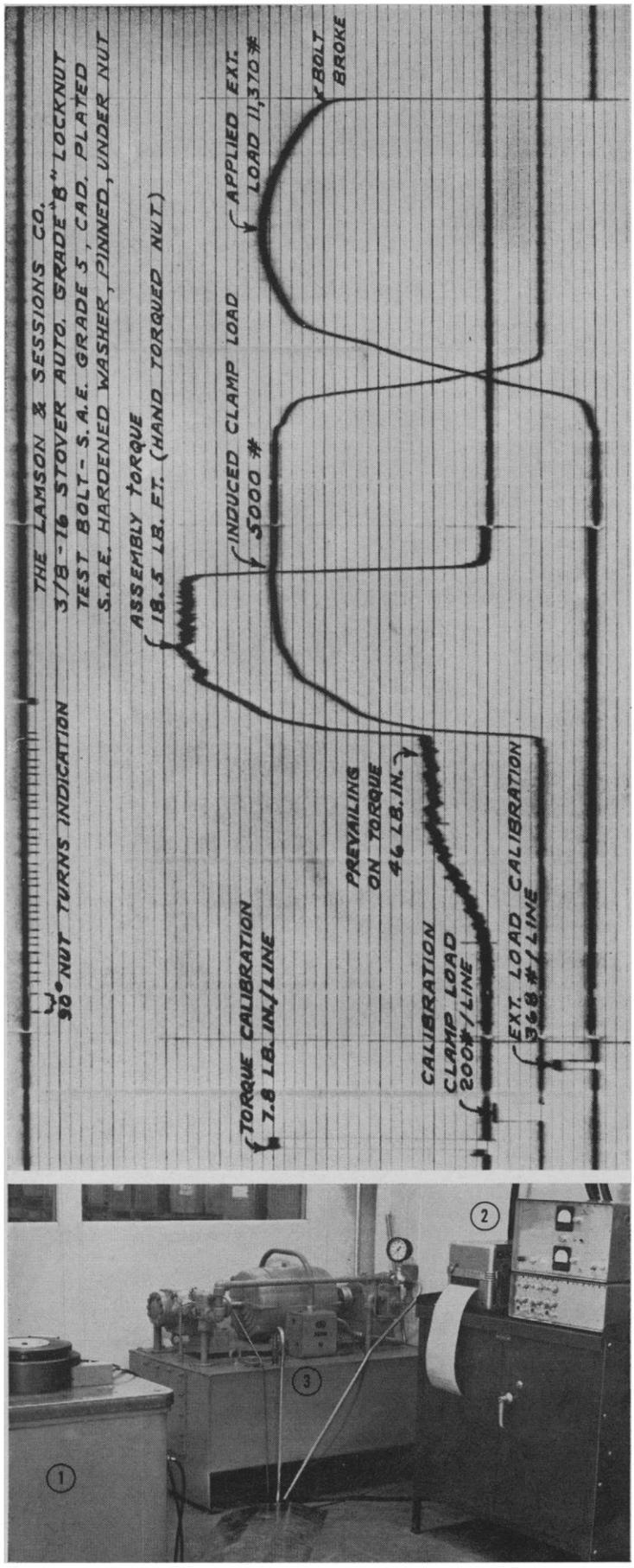

The Lamson and Sessions Load Analyzer: (1) Test block with load cell included, (2) Honeywell Model 906 Visicorder and 119 Amplifier, (3) Hydraulic pump unit.

The Honeywell Visicorder watches a bolt do the twist

When measuring the dynamic effects of torque and load on a bolt fastener, Lamson and Sessions found that fast rise-time was the most essential characteristic of the measuring instrument.

The high frequency response of the Visicorder Oscillograph (DC to 5000 cps) thus made it the choice for measuring these sudden loads applied by an impact wrench.

The Lamson and Sessions studies have charted the complex relationships of joint components under load. Some of these relationships are: fastener strength; relaxation properties; optimum clamping load for a given size and strength of fastener; bearing areas adequate to prevent embedding; the number, size, and strength of fasteners consistent with the greatest strength, lightest weight, and lowest cost; and proper assembly techniques. Visicorder recordings have provided the knowledge of these factors necessary to point the way to new fastener specifications and designs.

There are six models of the Honeywell Visicorder Oscillograph. You'll find at least one of them designed to meet your specific test program requirements. Visicorders offer recording capacity of up to 36 data channels. Paper speeds vary from .1 inch per hour to 160 inches per second, depending upon the model you select. Thus, a Visicorder can be chosen which will present your data on the time base most meaningful to your test.

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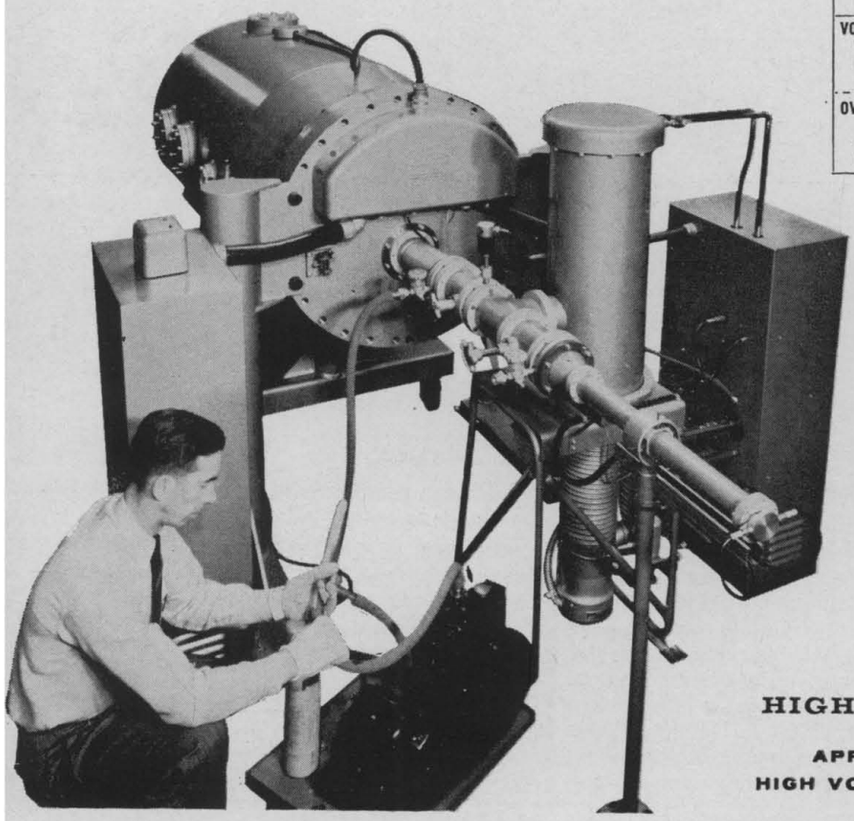
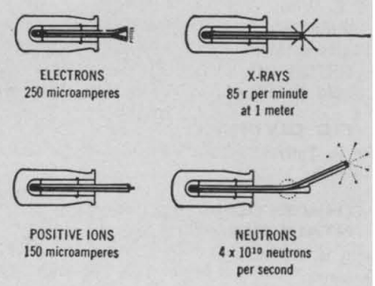
CURRENT RANGE between 0.75 and 1.5 Mev	10 to 150 μa	1 to 25 μa	1 to 250 μa
above 1.5 Mev	decreasing to not less than 10 μa at 2.0 and 0.5 Mev	—	1 to 250 μa
below 0.75 Mev			1 to 250 μa
VOLTAGE STABILITY (peak-to-peak)			
Ripple	± 10 Kv	± 10 Kv	± 5 Kv
Drift	± 20 Kv	± 20 Kv	± 40 Kv
OVERALL VOLTAGE STABILITY with stabilizing magnet	± 2 Kv	—	—





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25 January 1963, Volume 139, Number 3552

SCIENCE

Congress and Research

In almost any enterprise the agency furnishing monetary support has or can seize a predominant role in decisions affecting the way in which the money is spent. In applied research such control usually is desirable and even necessary. In fundamental research it is often well to give the investigator wide latitude to determine his own course. The wisdom of this policy has been widely recognized. The government granting agencies have been particularly enlightened in their administration of research grants and have not unduly interfered with the conduct of basic research. Science has enjoyed bounteous support from government with a minimum of onerous controls or influence.

My guess is that the honeymoon is about to end and that there could be trouble ahead. I see signs that federal policies are changing and that various interferences with the optimum development of science are likely to stem from Washington. The scientific establishment may be in the process of coming under the closer control of Congress.

One reason for concern is that to an increasing degree our academic institutions have become dependent on government grants and contracts. This one source now furnishes a greatly preponderant fraction of the money for research. Before the advent of large-scale federal support, funds were limited, but they came from many sources. Only limited harm could result if an individual grantor pursued restrictive policies. In the early days of federal grants, the agencies, in effect, were in competition with other sources of money. If government policies were onerous, investigators felt little pressure to comply: they simply obtained their funds elsewhere. Thus the wisdom and restraint shown by the agencies were reinforced by the bargaining position of the scientists. This healthy situation has changed as government has become the major source of university research funds and as the bargaining position of academic scientists has weakened. Almost inevitably the relation of the research worker to his donor is destined to be altered.

This already has begun to occur. For years the National Institutes of Health pursued increasingly liberal policies. The good scientists were supported. There was almost no bureaucratic interference. Paper work was held to a minimum. As a result we are in the midst of tremendous fundamental progress in biology and medicine, and the nation is gaining and will ultimately gain even more in better medical practice. Congressional pressure has now forced a change in NIH policies. It has been alleged that the agency is not exercising sufficient control over the expenditure of government funds. In consequence, NIH grantees are subjected to the irritating, time-consuming petty annoyance of increased paper work. This paper work will be done. Scientists receiving government support will continue to seek it even on the less attractive basis. There is in practice little alternative. Would NIH procedures have been changed in quite the same manner if the academic bargaining position were not so weak? This development is not so important in itself. It is significant because it is a sample of what could happen. Congress at this moment has the power through control of funds to alter or to channel activities of the academic scientific establishment. Further evidence that Congress has this power may soon be forthcoming—P.H.A.

Keyed to the needs of researchers in such diversified studies as Agricultural Chemistry, Biology, Geochemistry, Metallurgical and Historical Research, Organic Chemistry and Process Controls, the all-new TMC Activation Analysis Package offers the *first integrated system* for gamma radiation analysis.

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The Ellison Activatron-110 is available immediately from TMC, and priced as stated above. Depending on your application, TMC instrumentation for analysis can be tailored to your needs at equally modest cost. A TMC REPRESENTATIVE IS AS AVAILABLE AS YOUR PHONE. Call, wire or write for further information.

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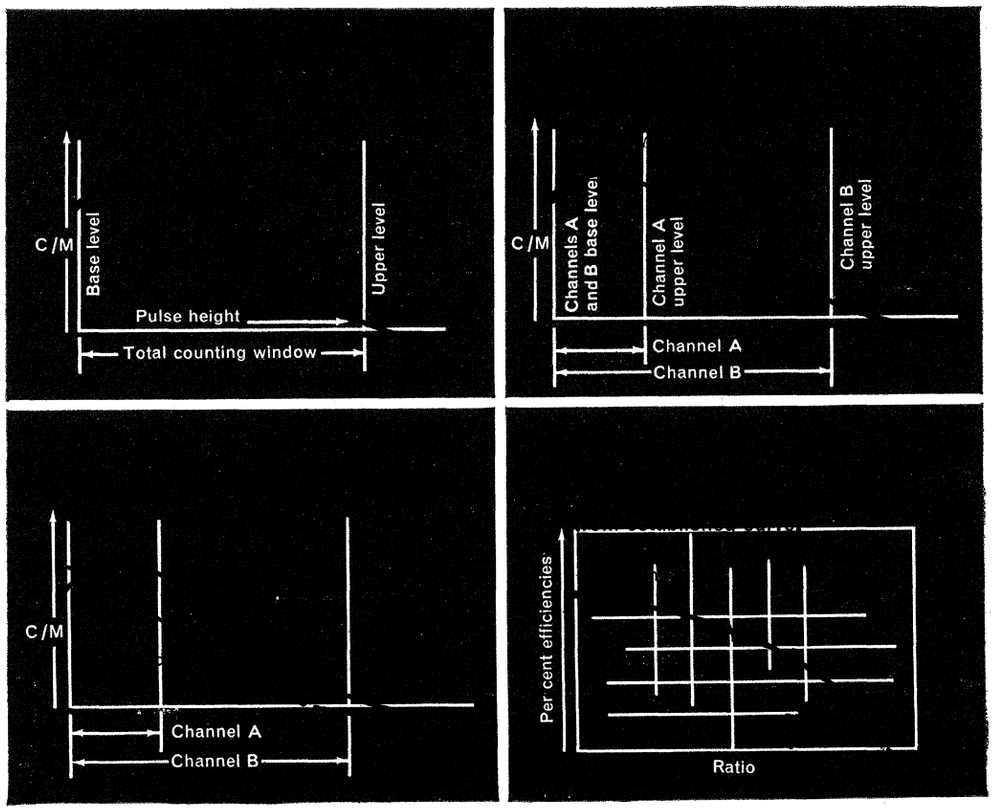
Channels ratio... an important time-saving convenience in liquid scintillation spectrometry



Every 720 series liquid scintillation system carries a one-year guarantee to assure you that it meets or exceeds the specifications and performance claimed by Nuclear-Chicago. This guarantee fully covers all service —including parts, labor, and transportation — within one year from date of shipment at no cost to the customer.

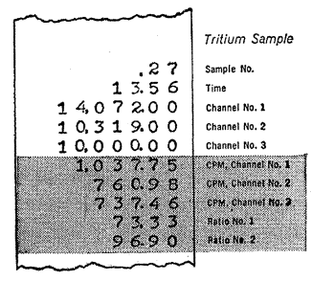
The channels ratio concept offers far more than just a highly accurate means of determining efficiency in liquid scintillation counting. It is a systematic technique that furnishes more time-saving, valid information about your samples than is offered by any other method —and with no additional cost or effort. Researchers continue to exploit the ability of channels ratio to provide accurate, valuable data on quenching. They are incorporating the advantages into their working procedure.

Even those using internal standardization methods for determining efficiency are finding that channels ratio provides an excellent check on the exacting preparation required by this method. In this application, both the unknown sample and the sample with internal standard added should produce the same channels ratio. If not, the careful worker knows that he may be experiencing error-producing phenomena such as a change in quenching or sample precipitation. This comparison technique is an extremely valuable aid when assaying large numbers of samples. It furnishes the investigator with a consistently accurate means of monitoring quench effects, thus assuring a high degree of reliability for each measurement. Please request our comprehensive data portfolio.

Channels ratio gives high accuracy with minimum sample handling time

Channels ratio counting is based on the fact that when quenching occurs the average energy of the beta pulse height spectrum decreases, and the entire spectrum shifts toward a lower energy. If the spectrum is then properly divided into two counting channels the ratio of the count rates in the two channels will change relative to the amount of quenching in the samples. Through careful settings of the counting channel window widths and detector high voltage, the ratio of the two count rates can be calibrated to represent the degree of quenching. It is this correlation between the count-rate ratio and counting efficiency that permits construction of a correction curve.

After the correction curve is plotted, the counting efficiency for unknown samples can be read directly, once the channels ratio for each is automatically calculated. Careful quenched standard preparation and instrument calibration gives a curve useful for normalization of samples containing dissimilar quenching agents. More important, the curve will cover a wide range of sample activity and counting efficiency.



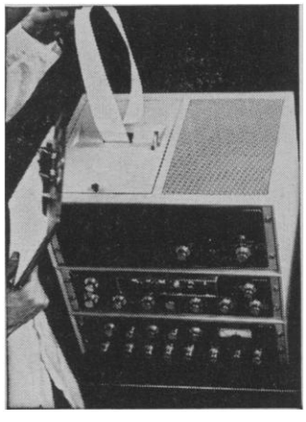
Actual data read-out of the 720 systems. Unshaded area of tape depicts data listing functions of the 722 and 724. The shaded area illustrates the additional calculation capabilities of the 723 and 725.

Counts per minute and channels ratio calculated automatically

Nuclear-Chicago's new 720 Series spectrometers permit routine application of channels ratio techniques directly to the liquid scintillation counting program. The automatic calculator furnishes the user with a choice of three read-out modes: 1) A simple listing of the data accumulated in each of the three channels together with sample number and elapsed time. 2) Calculated counts per minute for each channel. 3) Calculated ratios of total counts in one channel to total counts in each of the other two channels.

Automatic calculation is a valuable, time-saving convenience in liquid scintillation counting. It enables efficiency determination and quench correction for isotopes such as carbon-14 and tritium to become a part of every laboratory counting run with no more effort than previously required.

The automatic calculator, in combination with the three-channel analyzer and three-scaler/timer, fulfills virtually all practical requirements.



Computed sample data can be accumulated during off-hours. There is often no need to make additional calculations. Technician time and the chance of human error are eliminated.

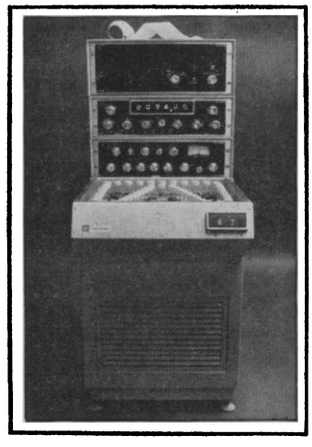
Operation at temperatures above freezing

Reproducibility of measurement is difficult with samples which undergo phase separation or precipitation at temperatures below freezing. With the 724-725, these samples can be counted from 10° to 50°F at constant temperature without appreciable loss of counting efficiency.

Research with all types of photomultiplier tubes resulted in the choice of two 11-stage EMI photomultiplier tubes in all Nuclear-Chicago systems. The gain stability of these tubes is markedly superior. As a result of high gain with stability, less amplification is required.

The inherent low noise characteristics of the phototubes, along with advanced circuitry permits operation over a wide temperature range.

If small losses in efficiency and reduced sample capacity are acceptable, the Nuclear-Chicago 722-723 room-temperature systems are recommended—at a significant reduction in cost.

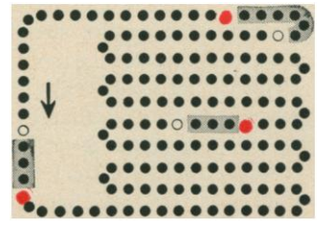


The 722 and 723 are the only commercially available room temperature, automatic liquid scintillation systems. They offer 50 sample capacity, selective sample programming, and three channel operation.

Selective sample programming

The advanced sample changing capabilities of the 724, 725 offer unusual versatility in planning the work load of your laboratory. Up to 150 samples can be handled in a single counting run with either manual or fully automatic changing. Selective programming allows counting of "preferred" groups of samples while all others are bypassed. This feature minimizes laboratory inconvenience by permitting assignment of specific sample number groups to individuals or departments. Sample-number identification is maintained regardless of the counting sequence.

A special sensing system rejects all off-size sample bottles that might accidentally jam the changing mechanism. There is no chance of bottle breakage and resultant changer contamination.

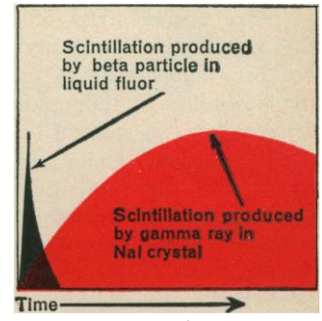


Diagrammatic presentation of selective sample programming. Red circles in the conveyor indicate sensors, white circles are empty bottle receptacles and black circles represent sample bottles. Bottles in the shaded region between sensors and empty receptacles are the "preferred" groups that will be counted when their respective sensors pass the counting station. Sensors may also be used to start the changing cycle at any selected bottle in the conveyor. Samples ahead of the selected point are bypassed.

The advantage of a beta spectrometer designed solely for liquid scintillation counting

In applications such as dual labelled sample counting and counting of samples with high specific activities, Nuclear-Chicago liquid scintillation systems give more accurate results because the spectrometer is designed specifically to handle fast beta pulses. From the experience gained in the design of gamma-ray analyzers, it was found that beta spectrometry presented substantially different design requirements.

All Nuclear-Chicago systems use a completely transistorized, three-channel analyzer specifically designed for liquid scintillation counting. The fast amplifier recovery time eliminates data losses due to circuit overloading.



The decay time of a scintillation produced by a beta particle in a liquid scintillator is approximately 1/50 of the decay time of a scintillation produced in a NaI crystal by a gamma ray. If conventional amplifier circuitry as found in gamma-ray analyzers were used for beta spectrometry, the overload recovery time would be too long because of the high-energy betas. This would result in complete loss or non-linear amplification of scintillations immediately following a high energy particle.

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VICKERS BRIEFS

Some Applications of the Cooke-A.E.I. Image-Splitting Measuring Eyepiece

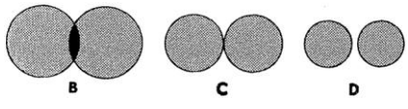
The image-splitting measuring system has been previously described in Cooke Briefs. A prism system moved by a calibrated screw shears the whole microscope field and all details in the field are seen double. Measurement is made by setting double images of objects edge-to-edge, a much more sensitive criterion of measurement than the setting of a filar micrometer reference line. Accuracies up to one-tenth of a micron (0.1μ) can easily be achieved. Reproducibility of measurement is much superior to that possible with conventional systems. Measurement errors due to parallax, thickness of scale lines, lack of rigidity in the microscope assembly, etc., are not possible.

Beyond this there are many special advantages in use which are not possessed by other measuring systems. Some of these are discussed below.

Comparative Measurements

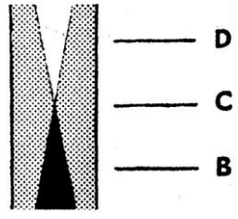
Let these three large dots represent particles of different sizes in a normal microscope field.

Below is shown the same field with double images sheared by a certain amount, as is seen with the Cooke-A.E.I. Image-Splitting Measuring Eyepiece.



Once it is understood that in operation all objects in the microscope field are sheared by an equal amount and that all objects will be examples of double-image types B, C or D, the advantage of the system for comparative measurement can be seen. One measurement might show that all particles whose double images just touch (as in C) are 20μ across in the direction of shear. It is then known, without any measurement, that double images of the B and D types are yielded by particles respectively greater than or less than 20μ.

The image-splitting system is valid for specimens of all sorts — particles, rods or even complete structures such as grids, windings, etc. Suppose that one wishes to check uniformity of width of a fine wire or fiber.



Here the double image would follow a similar scheme to that previously shown for discs. Where the double images are apart the fiber or wire width is shown to be smaller than micrometer shear value; where they touch width is equal to shear and where they overlap width is greater than shear.

Inspection and Go-No-Go Measurements

It can be seen from the above that an amount of shear representing any particular exact dimension can be dialed into the microscope. Thereafter any number of sample preparations can be checked, without further measuring adjustments, for dimensional conformity in the direction of shear.

Measurements of Moving Objects

Since in this system the object is, in a sense, induced to measure itself (i.e., without taking into account reference lines in other optical planes), it can be seen that moving objects are measured as easily and as accurately as stationary ones.

Measurements of Very Small Objects

In conventional measuring systems the width of scale lines and filar wires makes difficult and inaccurate the measurement of very small objects. The image-splitting system of setting double images of the object edge-to-edge operates most effectively in these conditions. Accuracies of up to 0.1μ are easily achieved and the standard of reproducibility is very high.

Measurements in Fluorescent, Polarized Light and Dark Field Microscopy

Oftentimes in using these techniques there is insufficient light to illuminate properly an eyepiece graticule or filar micrometer reference line. However, the performance of the Cooke-A.E.I. Image-Splitting Measuring Eyepiece is unimpaired in these conditions.

•

The image-splitting eyepiece can be used with any microscope having a monocular tube with an unobstructed length of at least 3.6″ from the top. This length is necessary in order to accommodate the tube length compensating system. Price is $490.

and heavier elements in much smaller amounts.

If hydrogen constitutes 80 percent of Jupiter's mass, there will be no fundamental difference between the deep interior and the outer layers, except that the pressure near the center will compress the hydrogen gas into a metallic phase.

Until recently Jupiter's interior had been believed to be relatively cold. This conclusion was based on the assumption that the interior consists of metallic hydrogen, a good conductor of heat. However, it now seems likely that there is a sprinkling of impurities in the interior, whose effect would be to reduce the thermal conductivity and raise the temperature.

George Field calculates the temperature at the center to be 1000° to 10,000°C. The existence of a strong Jovian magnetic field may be related to this result, because one of the theories for the origin of planetary magnetic fields suggests that they arise through convective flows in a liquid metallic core, simulating the action of an electric generator. For the flow to occur in the core, a high temperature is essential.

H. Spinrad (Jet Propulsion Laboratory) gave an important paper on his recent measurements of high dispersion spectra in Jupiter. He found that the ammonia lines occur, not with a tilt corresponding to the rotation of the planet, but with a tilt suggesting Doppler shifts and corresponding to a much slower rotation. It appears, according to these results, that some intermediate level of the atmosphere above the clouds is not rotating with the planet but is rotating 7 or 8 kilometers per second more slowly. That means a supersonic backward flow or wind, relative to the surface, of 7 kilometers per second.

One point was made very clearly at the conference: it is regrettable that so little time has been made available for planetary spectroscopy on the major telescopes.

Approximately 40 astronomers and physicists took part. The organizers were Harlan J. Smith and Rupert C. Wildt of Yale University Observatory and A. G. W. Cameron of the Institute for Space Studies. The institute was host to the conference.

ROBERT JASTROW
NICHOLAS PANAGAKOS
Institute for Space Studies,
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New York

(Continued from page 322)

to expanding teaching and research facilities in both public and private institutions through federal matching grants and loans totaling $1 billion a year, and also to increasing the supply of college teachers through a major expansion— from 1500 to 5000 a year— of graduate fellowships under the National Defense Education Act.

Proposals for both a college construction bill and amendment of the NDEA were blocked in the last session of Congress after the flareup of controversy over federal aid to private institutions. In a statement accompanying its legislative recommendations the ACE said actions by Congress and the federal government in the past, indicate that "ample precedent exists for a program designed to develop both public and private institutions as a vital national resource."

Other major proposals on the ACE's 11-point list were for federal programs of assistance in the construction of teaching facilities for medicine, dentistry, and other health professions and for liberalization of programs of financial assistance to undergraduates.

Announcements

The National Science Foundation has established an information office to act as the clearinghouse and source of **information on the Antarctic**. Projects being carried out by the office include, in "various early stages of development," a monograph series, a map folio series, and a bibliography. The information office is part of the NSF Office of Antarctic Programs.

The Armed Services Technical Information Agency (ASTIA) this month began operating the initial phase of a rapid system for providing technical information by telephone. The system, which is intended to provide 1-hour service on unclassified materials, is available to scientists and engineers working directly or indirectly for the Department of Defense and for those whose organizations are eligible for ASTIA services. Classified material will be delivered by other means.

The first subject covered by the service is semiconductor devices. Topics to be added will include radiobi-

ology, lasers, masers, ultraviolet, visible, and infrared radiation, metals and metallurgy, oceanography, plasma physics, biological warfare, rocket motors, and bionics. Documents are indexed on a specially developed "microthesaurus of specific retrieval terms."

The service is located at ASTIA, Arlington Hall Station, Virginia; the telephone number is 525-5800; extension 2479 is for information on semiconductor devices.

E. I. duPont deNemours and Company has awarded more than $1,780,000 in grants to 168 U.S. colleges and universities. These grants are part of an effort to help strengthen the teaching of science and related subjects, fundamental research, and facilities for research and education in science and engineering.

The U.S. Office of Naval Research is conducting a psychological study of the approximately 19 Americans who plan an attempt to climb Mt. Everest this spring. James T. Lester, Jr., director of psychological services, Los Angeles Orthopedic Hospital, is conducting the investigation under a $35,000 ONR grant. He began his study by gathering personality data on the climbers, for background in his observations during the ascent. No tests will be performed during the ascent, although Lester may use tape recorders to gather some data.

Group and individual tests are being made in efforts to learn more about men's actions under stress conditions, to help understand the performance of certain military tasks, such as leadership in small groups isolated on submarines or at Arctic stations.

The Everest expedition is scheduled to leave Katmandu, Nepal, about 20 February, and to return near the end of June. Norman G. Dyrenfurth, a documentary film producer who has been with four other Himalayan expeditions, will lead the group. Other scientists on the trip will be University of Cincinnati sociologist Richard M. Emerson, who plans an investigation on communication "feedback" in small groups under stress conditions; Barry Bishop, physical geographer with the National Geographic Society, who will make solar radiation studies; and William E. Siri, University of California Donner Laboratory glaciologist.

Grants, Fellowships, and Awards

The University of Wisconsin has available three graduate fellowships in the design of educational experiments. The fellowships, funded through the National Defense Education Act, are offered by the university's experimental design laboratory, department of experimental psychology, and will specialize in statistics, research design, and measurement.

Stipends are $2000 for the first academic year, $2200 for the second, and $2400 for the third. An additional $400 per year will be allowed per dependent. Deadline for applications: *15 February*. (Julian C. Stanley, Education Building, University of Wisconsin, Madison 6).

National Science Foundation grants totalling $2.5 million have been awarded for support of 74 summer institutes open to college teachers of **science, mathematics, and engineering.** The programs, which will last 6 to 10 weeks, will emphasize recent developments in the various fields, along with new approaches to classroom presentation of this material.

Participants in the program will be chosen by the institutes' staffs. Stipends will include tuition and fees, travel allowances, allotments for up to four dependents, and a maximum of $75 per week. Inquiries and applications must be sent directly to the participating institutes, the names of which are available from NSF. (1951 Constitution Avenue, NW, Washington 25)

Graduate fellowships in **cleft-palate therapy and rehabilitation** are available at the University of Pennsylvania. Clinical training is offered at the Lancaster (Pa.) Cleft Palate Clinic. The annual stipend is $5000, plus dependency allowances and annual increments. (Chairman, Committee on Traineeships and Fellowships, University of Pennsylvania, School of Dentistry, 4001 Spruce St., Philadelphia 4)

Stanford University medical school has fellowships available to qualified physicians interested in **radiation therapy**. Applicants must be graduates of an accredited medical school, and have completed 1 year of an approved internship. Stipends range from $5000 to $10,000, depending on previous experience.

The 3-year program includes work on supervoltage and conventional roent-

gen therapy, intestinal and intracavitary radium application, diagnostic and therapeutic uses of isotopes, clinical oncology, and training in clinical and experimental research. The second year of the program consists of full-time training in laboratory and clinical investigation under the immediate supervision of the departmental faculty. (Henry S. Kaplan, Department of Radiology, Stanford University School of Medicine, Palo Alto, Calif.)

Graduate fellowships and research assistantships in **oceanography and meteorology** are available for the 1963–64 academic year at Texas A&M. Twelvemonth stipends range from $2000 to $4000 for the fellowships, and a minimum of $2100 for assistantships. Fields of emphasis include physical oceanography, interaction between ocean and atmosphere, radar, satellite and agricultural meteorology, marine geochemistry and geophysics. (D. F. Leipper, Department of Oceanography and Meteorology, Texas A&M, College Station, Texas)

Fellowships in **industrial hygiene** are available from the U.S. Atomic Energy Commission. The fellowships lead to the master's degree, with some opportunities for work leading to the doctorate. A basic stipend will be allowed, plus allowances for spouse, dependent children, tuition, required fees, and travel. Complete information is contained in a brochure, "Careers in Individual Hygiene Through Atomic Energy Commission Special Fellowships." (Industrial Hygiene Fellowship office, Oak Ridge Institute of Nuclear Studies, P.O. Box 117, Oak Ridge, Tenn.)

The University of Southern California has announced a new interdisciplinary doctoral program in **chemical physics**, to begin in September 1963. The program is for graduate engineers, mathematicians, physicists, and chemists. Financial support is available in the form of fellowships and teaching or research assistantships. (Sidney W. Benson, Department of Chemistry, University of Southern California, Los Angeles 7)

Applications and nominations are being accepted for the **Kennedy Foundation visiting professorships**, recently established at George Peabody College for Teachers, Nashville, Tenn. Recipients will be investigators from fields

that can contribute to a better understanding of mental retardation, such as genetics, biochemistry, physiology, psychology, education, pediatrics, psychiatry, sociology, and anthropology. Preference will be given to scientists who have not previously worked on mental retardation. Appointments will be made on an international basis. Nicholas Hobbs, George Peabody College, Nashville 5, Tenn.)

The University of Texas is accepting applications for the Mr. and Mrs. G. Moses Knebel fellowship in the **geology of hydrocarbons**. Applicants must be candidates for the Ph.D. degree in geology. The fellowship carries a stipend of $3000 per school year, plus fees. (R. K. DeFord, graduate adviser, Department of Geology, University of Texas, Austin 12)

Publications

A warning that the U.S. must channel its research efforts in natural resources to maintain its own supply of natural resources, and to aid underdeveloped areas, was issued this month by the National Academy of Sciences —National Research Council. **Natural Resources**, a summary report by the NAS–NRC Committee on Natural Resources, is the result of a White House request for information issued in 1961. The 40-page summary states that, although the U.S. is in a "relatively favorable position" regarding supply and use of natural resources, wise management is necessary now to assure their long-range availability.

At the same time, research and technological assistance "tailored to the specialized requirements of underdeveloped nations" must be offered to help meet the increasing needs for resources caused by these nations' rapid growth.

The U.S. Atomic Energy Commission has published a bibliography entitled **"Radioisotopes in World Industry."** The 131-page volume contains 569 selected abstracts of foreign literature dealing with world-wide applications of radioisotopes. In general the abstracts are from publications printed in languages other than English, but the bibliography itself is written in English. (Office of Technical Services, U.S. Department of Commerce, Washington 25, D.C. $2.50. Order TID 6613 Suppl. 3)

Summer Institutes

Oak Ridge Institute of Nuclear Studies, 1 July to 23 August, for high school physics and chemistry teachers. Entitled **Basic Principles and Recent Advances in Chemistry and Physics**, the institute is part of the Oak Ridge science lecture demonstration program, sponsored by the National Science Foundation and the U.S. Atomic Energy Commission.

Applicants must be teachers of at least two secondary school level physical science courses. Stipends, travel allowances, and allowances for dependents will be provided. (Oak Ridge Science Lecture Demonstration Program, Oak Ridge Institute of Nuclear Studies, P.O. Box 117, Oak Ridge, Tenn.)

Pennsylvania State University, 7 July to 17 August, in **animal behavior.** A maximum of 40 college teachers of zoology, psychology, sociology, or anthropology will participate in the program, sponsored by the National Science Foundation and the American Society of Zoologists.

Applicants must possess at least a master's degree in science, arts, or education, and have a minimum of two consecutive years of teaching experience. Deadline for receipt of applications: *15 February*. (M. W. Schein, Director, Summer Institute in Animal Behavior, 105 Weaver Bldg., University Park, Pa.)

Williams College, 1 July to 9 August, general **zoology** for college teachers of introductory biology courses. The program is planned by the college, in cooperation with the American Society of Zoologists, with the support of the National Science Foundation. Deadline for applications: *15 February*. (William C. Grant, Jr., Director, Summer Institute in General Zoology, Department of Biology, Williams College, Williamstown, Mass.)

Scientists in the News

Eugene M. Landis, head of Harvard University's physiology department, has become editor of *Circulation Research*, journal of the American Heart Association. He succeeds **Carl F. Schmidt**, emeritus professor of pharmacology, University of Pennsylvania medical school, whose term as editor expired 1 January.

A. Allan Bates has been appointed chief of the building research division, National Bureau of Standards. Bates formerly was director of New York University's University Valley project, which is a new center for education and research, in Sterling Forest, N.Y.

Columbia University professors **Lawrence H. O'Neill** (dean of the engineering and applied science school) and **James Gutmann** (professor emeritus of philosophy) have received "Great Teachers" awards from the university's Society of Older Graduates.

Kurt Salomon, professor emeritus of radiation biology and biochemistry, University of Rochester (N.Y.) medical school, has become head of the biochemistry division, NIH West African Research Laboratory, Accra, Ghana.

Washington University professor **Richard E. Norberg**, has been named chairman of the university's department of physics.

Gordon H. Svoboda, phytochemist at Eli Lilly and Company, has been elected president of the American Society of Pharmacognosy.

R. Franklyn Morris, entomologist in Canada's Federal Department of Forestry, has received the first gold medal of the Entomological Society of Canada. The award was presented in recognition of "his particularly significant work in the field of insect population dynamics."

Robert H. Jerome, of Douglas Missiles and Space Division, has been elected president of the Aerospace Electrical Society.

Geoffrey F. Chew, physics professor at the University of California Radiation Laboratory, Berkeley, has been awarded the 1962 American Physical Society prize. The $2500 prize, sponsored by the Hughes Aircraft Company, is awarded for published work of a physicist less than 33 years of age. Chew received the award "for his continued efforts to understand meson-nucleon interaction."

Eugene J. Levy, senior research physicist at the Atlantic Refining Company, has been appointed senior research chemist at F & M Scientific Corporation, Avondale, Pa.