
Miscellany

Research Facilities

Funds in the amount of \$4 million have been allocated by the National Science Foundation to the Association of Universities for Research in Astronomy, Inc. (AURA), for the construction of a solar telescope. A total of \$7 545 000 has been allocated thus far for the erection and operation of a national astronomical observatory on Kitt Peak in the Quinlan Mountains of Southwestern Arizona. An additional \$1 million has been appropriated by Congress for construction of an access road to the observatory site. The solar telescope will have a 60-inch image-forming mirror with a focal length of about 300 feet. The size of the image of the sun at the focal plane will be approximately 32 inches. The telescope will be several times larger than any now in existence and its focal length will be about twice that of the 150-foot tower telescope on Mount Wilson. Stellar instruments at the observatory will consist initially of a 36-inch telescope of the reflector type, and an 80-inch reflecting telescope with auxiliary instrumentation.

Kitt Peak, a mountain sacred to the Papago Indians, is on their reservation. Legislation permitting the Indians to enter into a lease with the National Science Foundation for the use of their land was enacted by the Congress and approved by the President last August. The lease permits the National Science Foundation the use of 2400 acres on and surrounding Kitt Peak for "as long as the land is used for astronomical study and research and related scientific purposes". In consideration of these rights, the Foundation has agreed to pay the Papagos \$25 000 for access rights to the site and \$10 per acre per annum for approximately 200 acres to be used for development of the facilities. Payment for the right to use approximately 2200 acres of a protective perimeter area is at the rate of 25¢ per acre per annum. The Indians will also have the right to use space on the site for the sale of their arts and crafts.

AURA, Inc., was incorporated in the State of Arizona, October 28, 1957, and presently comprises the following universities: California, Chicago, Harvard, Indiana, Michigan, Ohio State, Wisconsin, and Yale. These universities have had experience in operating large observatories and have strong programs of research and graduate instruction in astronomy. Directors-at-Large are Carl Seyfert, professor of astronomy at Vanderbilt University and director of the Arthur J. Dyer Observatory, and Peter Van de Kamp, professor of astronomy at Swarthmore College and director of

the Sproul Observatory. As the project develops, it is expected that other universities and individuals will be added to the Association.

A new laboratory for studies in mathematics and physics at the California Institute of Technology will be constructed in Pasadena under a grant of more than \$1 million from the Alfred P. Sloan Foundation. It will be built within an existing building which for many years has housed Caltech's experimental high-voltage laboratory. When completed, the new five-story structure will be renamed the Alfred P. Sloan Laboratory of Mathematics and Physics. In addition to offices, conference and seminar rooms, a lecture hall, and a library, the building will house facilities for cryogenic studies and for research on the nuclear reactions of light elements. The chief instrument to be used in the latter program will be a new 10-Mev Van de Graaff accelerator, which is being supplied by the Office of Naval Research.

Two new science buildings, one at Temple University and one at LaSalle College, both in Philadelphia, are expected to be completed by mid-1960. The \$4 million Temple Science Building will be the first unit of the school's projected university science center to be erected as part of a \$50 million expansion program. Special features will include closed television circuits for education, a planetarium and meteorological station, a science museum, and an anechoic chamber for acoustics research. The \$2 million LaSalle Science Building will have a science library and sufficient laboratory, office, and lecture-room space to enable the school to quadruple the number of science students previously accommodated.

An Institute of Space Sciences has been formed at the University of Cincinnati for the purpose of giving advanced training and carrying on research in the field of astrodynamics. Beginning with the September 1959 semester, the Institute proposes to give a three-year curriculum leading first to a master of science and then to a doctor of philosophy degree in dynamical astronomy, which will involve training in mathematics, certain branches of physics, dynamical astronomy, and observational astronomy. The Institute will be headed by Paul Herget, director of the Cincinnati Observatory and scientist in charge of the Vanguard computing center in Washington, D. C. It grew out of the recommendations of a recent National Science Foundation-sponsored conference which urged that "vigorous programs for support of training and research in dynamical astronomy be initiated without delay and without geographical restriction". In the past 14 years, according to Dr. Herget, only two doctorates in this field have been awarded in the US.

Publications

An expanded *Journal of Geophysical Research* will be published beginning with the January 1959 issue. The new publication will combine the format of the

A PHYSICIST



requires the nurture and stimulation of challenge in a creative community.

Princeton University's Project Matterhorn provides such a community. Here the search for greater understanding of hydromagnetic phenomena which will lead to the development of controlled thermonuclear reactions has been undergoing development and growth since 1951.

Broad theoretical investigations into hydromagnetic

instabilities, cooperative effects, plasma oscillations and other areas of basic plasma physics are constantly enlarging this new field of research. A new and promising experimental device, the "Model C" Stellarator, designed to confine and heat plasma to enormous temperatures, will soon be completed.

Opportunities to work toward the peaceful utilization of fusion energy in a non-classified, AEC sponsored laboratory at Princeton University, are now available to physicists with advanced degrees.

For further information write to:

RAYMOND B. STARBUCK, *Personnel Director*

PROJECT MATTERHORN, P. O. BOX 451

PRINCETON, NEW JERSEY

PROJECT MATTERHORN • PRINCETON UNIVERSITY



PHYSICIST

Technical Operations is a medium-sized research and development firm, operating in such fields as physics, electronics, chemistry, operations research, and applied mechanics. Our headquarters laboratory is at Burlington, Massachusetts and research facilities are maintained at Washington, D. C., Hampton, Virginia and Monterey, California. Our staff presently numbers about 200.

Continued development of the Company's research activities has created two staff positions for physicists at Burlington. Candidates should be on the PhD level or possess equivalent experience. The work will be on a variety of projects in both experimental and theoretical fields. Initial assignments will be in solid state physics, weapons effects, rarefied gas dynamics, and kilojoule discharge circuits.

Our interests are in scientists who can contribute unique solutions to non-routine problems in a variety of fields of physics and who like to work in an informal environment, with exposure to varied scientific disciplines. Our Company offers the usual benefit plan, including a profit-sharing program.

MR. ROBERT L. KOLLER

TECHNICAL OPERATIONS

INCORPORATED

South Avenue, Burlington, Massachusetts

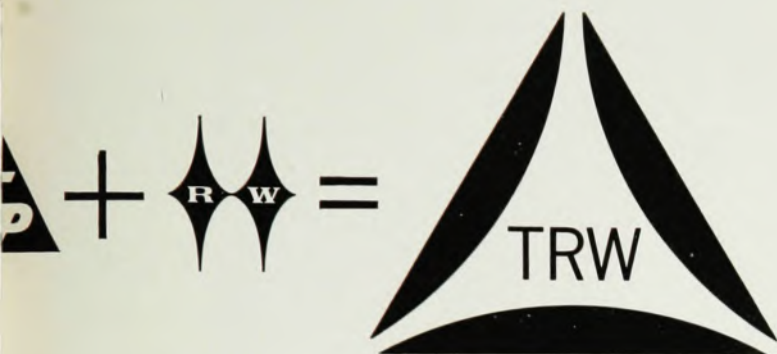
former *Journal* with the *Transactions, American Geophysical Union* and will be published by AGU with the assistance of the Carnegie Institution of Washington and the support of the National Science Foundation. It will consist of original research reports, a "Letters" section to provide for brief publication of unusual results or discussion of previous papers, and abstracts of papers presented at AGU meetings. Nonmember subscriptions are available (\$16 per year) from the American Geophysical Union, 1515 Massachusetts Avenue, N. W., Washington 5, D. C.

The Department of Commerce will begin publication this month of a periodical planned to serve as a central source of information in the US on Russian and other technical translations available to scientists. Entitled *Technical Translations*, it will be published twice a month by the Office of Technical Services in cooperation with the Special Libraries Association and will incorporate SLA's *Translation Monthly*. It will list and abstract translated materials available from US government sources, SLA, cooperating foreign governments, educational institutions, and private sources. *Technical Translations* will be sold at a subscription rate of \$12 a year (foreign rate, \$16); a single copy will cost 60¢. Orders should be addressed to the Office of Technical Services, US Department of Commerce, Washington 25, D. C.

A new set of tables of the Wigner 6j-symbol has been prepared (with the support of the British Department of Scientific and Industrial Research) as a University of Southampton Research Report, US 58-1. The tables were duplicated from stencils cut directly from the output tape of a digital computer, the Ferranti Pegasus, using a teleprinter with ribbon removed. The square of each 6j-symbol is printed as a rational fraction in terms of prime factors and not (as previously on a computer) as a decimal fraction. There are 205 pages of tables with approximately 12 500 entries. All integral and half-integral parameters are included for $(j_1 + j_2 + j_{12})$, $(j_2 + j_3 + j_{23})$, $(j_1 + j_{23} + J)$, $(j_{12} + j_3 + J)$, all less than or equal to 17. Thus all 6j-symbols with parameters less than 6 and some with parameters up to $17/2$ are included. A limited number of copies are available on application to K. M. Howell, Mathematics Department, The University, Southampton, England.

Education

The National Science Foundation will sponsor 350 summer institutes at 255 educational institutions this year. Most of the institutes will be for high-school teachers of science and mathematics, but some will be open to college teachers only and others will accept both high-school and college teachers. Tuition and fees will be paid by the Foundation and each participating teacher will receive a stipend of not more than \$75 per week for the duration of the institute, plus an allowance for travel and dependents. The summer pro-



THE MERGER

The legal act of merging two companies into one does not of itself change the sum total of their capabilities. Thus, today the competence of the Ramo-Wooldridge Division for the development of electronic systems for military and commercial applications is indistinguishable from that of its predecessor organization, The Ramo-Wooldridge Corporation, while the skills of the Thompson Products group of divisions in the design and large-scale production of precision devices also remain unchanged. Soon, however, effects of the merger will begin to appear. One early effect will be an important addition of manufacturing strength to Ramo-Wooldridge programs, several of which have passed out of development and are in the prototype or manufacturing phases. Conversely, the special skills of Ramo-Wooldridge scientists and engineers in certain fields can usefully supplement the services that the Thompson Products divisions offer to their customers.

The formation of Thompson Ramo Wooldridge Inc. is intended to provide an unusual capability for the development and production of the complex electronic and mechanical devices and systems required by today's expanding technology.



Thompson Ramo Wooldridge Inc.

Main Offices • Cleveland 17, Ohio
Los Angeles 45, California

DIVISIONS AND PRODUCTS

TAPCO: Missile and aircraft auxiliary power systems, ground support systems, fuel systems, pumps, accessories, hydraulic systems, pneumatic systems; electronic control systems, microwave switches; frame structures, pressure vessels. Jet engine compressor blades, rotors, stators, and impellers; turbine buckets, rotors, and stators; structural and fabricated components. Rocket engine cases, nozzles and pumps. Nuclear reactor control rods, pumps, accessories, and core structures. Precision investment and continuous vacuum cast parts for aircraft, missiles, jet and rocket engines. Vacuum cast super-alloy ingot, billet and mill shapes.

RAMO-WOOLDRIDGE: Electronic reconnaissance and countermeasures systems, infrared systems, analog and digital computers, air navigation and traffic control, anti-submarine warfare, electronic language translation, information processing systems, nuclear energy applications, missile electronics systems, advanced radio and wire line communications.

AUTOMOTIVE and INDUSTRIAL PRODUCTS:

Valves and associated parts for all types of internal combustion engines. Steering linkages, front wheel suspension ball joints, hydraulic cylinders and pumps, cylinder sleeves, piston rings. Truck retarders. Diesel engine turbochargers. Rock drill bits and drill rods. Alloy pistons for automotive and aircraft; impact extrusions, permanent mold and die castings. A wide variety of automotive replacement parts distributed nationally and overseas through 7,000 distributors.

CONSUMER PRODUCTS: High fidelity amplifiers; FM-AM radio tuners; magnetic tape recorders; stereophonic sound systems, public address and intercommunication systems. Television cameras for industrial and broadcast purposes; complete low-power television broadcasting stations.

THE THOMPSON-RAMO-WOOLDRIDGE

PRODUCTS CO.: Digital control computers and associated equipment for automatic control of industrial processes, data logging and computation, pilot plant operation and process research, test facility operation, and general computational use.

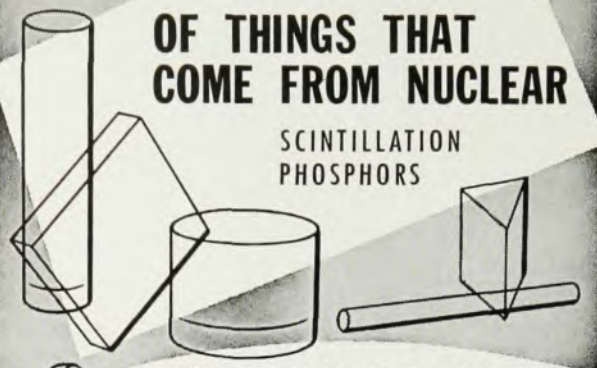
PACIFIC SEMICONDUCTORS, INC.: Germanium and silicon diodes and transistors, high voltage rectifiers, subminiature rectifiers, voltage variable capacitors.

Number of employees: 22,000
Estimated 1958 Sales: \$335,000,000
Plants in Los Angeles, Bell, Culver City and Long Beach, California. Denver, Colorado. Michigan City, Indiana. Cambridge, Massachusetts. Warren and Portland, Michigan. St. Louis, Manchester and Sullivan, Missouri. Cleveland, Euclid, Willoughby, Minerva, and Columbus, Ohio. Danville and Harrisburg, Pennsylvania. Roanoke, Virginia. St. Catharines, Ontario.

NEW SHAPES

OF THINGS THAT COME FROM NUCLEAR

SCINTILLATION PHOSPHORS



SPIRAL FLOW DETECTOR NE501

This new product opens fresh avenues to simpler and more direct methods for scintillation counting of alphas and betas. Fabricated of spirally wound thin capillary of our plastic phosphor NE102. This detector can be used for in vivo, medical and biological studies, and for efficient detection of micro quantities of active gases or solutions.

- **THIN FILAMENTS OF NE102** for image intensification, or solid scintillation detectors.

- **FAST NEUTRON DETECTOR NE404**

This is a new product and consists of concentric cylindrical annuli of hydrogenous ZnS (Ag) dispersion separated by annular light guides.

- **SLOW NEUTRON DETECTOR NE400**

This boron polyester composition is now mounted in a more efficient geometry incorporating concentric cylindrical grooves for improved light collection.

- **PLASTIC PHOSPHOR NE102**

This efficient and proven plastic scintillator is available as slabs, sheets, cylinders and an endless variety of special geometries. Unmachined ingots can be furnished in pound or ton quantities.

- **LOADED LIQUID SCINTILLATORS**

Efficient detectors loaded with Gd, Cd, Pb or newly available Sm. Also scintillating gels and scintillation chemicals.

N

**NUCLEAR
ENTERPRISES LTD.**

1750 Pembina Highway
WINNIPEG 9, CANADA
Associate Co.: Nuclear Enterprises
(G.B.) Ltd.
Sighthill, Edinburgh 11, Scotland

grams will vary in length from four to twelve weeks and the participants will be chosen by the individual institutes. Approximately 14% of the 350 institutes are listed as being under the direction of representatives of the physics departments of the host institutions; these summer institutes and their directors are given below and all inquiries should be addressed to them:

Spring Hill College, Mobile, Ala. (Rev. Walter J. Rhein, S. J.)
Alaska, University of, College, Alaska (Prof. Alfred M. Bork)
Fresno State College, Fresno, Calif. (Dr. Frederic A. Scott)
Sacramento State College, Sacramento, Calif. (Dr. S. Winston Cram)
Colorado State University, Fort Collins, Colo. (Dr. John J. Faris)
Colorado, University of, Boulder, Colo. (Dr. John M. Cleveland)
Denver, University of, Denver, Colo. (Prof. Byron E. Cohn)
Purdue University, Lafayette, Ind. (Prof. R. W. Leffer)
Bowdoin College, Brunswick, Me. (Prof. Dan E. Christie)
Bowdoin College, Brunswick, Me. (Prof. Noel C. Little)
Worcester Polytechnic Institute, Worcester, Mass. (Dr. John C. Johnson)
Eastern Michigan College, Ypsilanti, Mich. (Dr. Harry L. Smith)
Macalester College, St. Paul, Minn. (Prof. Russell B. Hastings)
Minnesota, University of, Minneapolis, Minn. (2) (Prof. Frank Verbrugge)
Missouri School of Mines & Metallurgy, Rolla, Mo. (Dr. Harold Q. Fuller)
St. Louis University, St. Louis, Mo. (Dr. Arthur G. Rouse)
Nevada, University of, Reno, Nev. (Dr. George Barnes)
Rutgers University, New Brunswick, N. J. (Dr. Charles A. Whitmer)
New Mexico College of A & M Arts, State College, N. Mex. (Dr. E. L. Cleveland)
New Mexico Highlands University, Las Vegas, N. Mex. (Dr. James P. Zietlow)
Adelphi College, Garden City, N. Y. (Dr. Howard A. Robinson)
Buffalo, University of, Buffalo, N. Y. (Prof. Harriet F. Montague)
Buffalo, University of, Buffalo, N. Y. (Dr. L. W. Phillips)
Syracuse University, Syracuse, N. Y. (Prof. William R. Fredrickson)
Union College, Schenectady, N. Y. (Dr. D. K. Baker)
North Carolina College at Durham, Durham, N. C. (Dr. William H. Robinson)
North Dakota, University of, Grand Forks, N. D. (Prof. J. Donald Henderson)
Ohio Wesleyan University, Delaware, Ohio (Dr. Howard N. Maxwell)
Reed College, Portland, Ore. (Prof. Kenneth E. Davis)
Temple University, Philadelphia, Pa. (Prof. Elmer L. Offenbacher)
Thiel College, Greenville, Pa. (Dr. B. G. Kolosvary)
Villanova University, Villanova, Pa. (Rev. J. Bernard Hubbert)
Northern State Teachers College, Aberdeen, S. D. (Prof. J. Edmund Wood)
George Peabody College for Teachers, Nashville, Tenn. (Dr. H. Craig Sipe)
Texas, A & M College of, College Station, Tex. (Dr. James G. Potter)
Texas Christian University, Fort Worth, Tex. (Dr. Joseph Morgan)
Texas, University of, Austin, Tex. (Prof. R. N. Little)
Brigham Young University, Provo, Utah (Prof. Grant O. Gale, Grinnell College, Grinnell, Iowa)
Brigham Young University, Provo, Utah (2) (Dr. Lane A. Compton)
Vermont, University of, Burlington, Vt. (Prof. Nelson L. Walbridge)
College of William and Mary, Williamsburg, Va. (Dr. Melvin A. Pittman)
Washington, State College of, Pullman, Wash. (Prof. Alfred B. Butler)
Washington, University of, Seattle, Wash. (Prof. L. A. Sanderman)
Marshall College, Huntington, W. Va. (Dr. Donald C. Martin)
Wyoming, University of, Laramie, Wyo. (Prof. Carl A. Cinnamon)
Wyoming, University of, Laramie, Wyo. (Prof. R. J. Bessey)

Descriptive material relating to twenty-three of the 1959 NSF summer institutes which are primarily designed for instructors of junior-high-school, high-school, junior college, and college chemistry has been prepared by the Committee on Institutes and Conferences of the American Chemical Society's Division of Chemical Education. Also included is a listing of an additional ten institutes which will offer instruction in chemistry and one additional subject—either biology or physics. Those interested in obtaining this information should write to the committee's chairman, Prof. William B. Cook, Montana State College, Bozeman, Mont.

Additional grants to 32 colleges and universities have been awarded by the Science Foundation in support of 1959-60 academic-year institutes for high-school

TOBE
CREATIVE
ENGINEERING

THE NRG-200 SERIES OF LOW-INDUCTANCE THERMONUCLEAR ENERGY-STORAGE CAPACITORS



NRG-200 SERIES SPECIFICATIONS				
Type No.	Watt Seconds	Rating		Self Inductance (Microhenries)
		Mfd.	DC Peak	
NRG-201	1000	5.0	20 KV	.04
NRG-202	1500	7.5	20 KV	.045
NRG-203	2000	10.0	20 KV	.055
NRG-204	3000	15.0	20 KV	.06

Tobe now announces the availability of a series of reliable, low-cost energy-storage capacitors for thermonuclear equipment and similar applications. The NRG-200 series capacitors have a minimum life expectancy of 1000 operations, and may be operated at ambient temperatures up to 40°C. Maximum permissible reversal voltage is 90%. They can be discharged into a very low-impedance load with complete safety.

For further technical information or engineering aid, write Tobe Deutschmann Corporation, Norwood, Mass.

Specify





**AERO - SPACE
RECONNAISSANCE SYSTEMS
GRAPHIC INFORMATION SYSTEMS
ELECTRONIC &
PHOTO-OPTICAL EQUIPMENT**

ENGINEERS

E.E. or M.E. with automatic machine, instrument or optical design experience for development of photo-optical graphic data processing equipment.

PHYSICISTS

M.S. or Ph.D. Background in sensitometry and processing of optics, for research and advanced development.

Send your resume to:

Dr. Arthur W. Tyler

Vice-President, Research & Engineering

Itek Corporation

WALTHAM 54, MASS.

**CREATIVE ENGINEERS—PHYSICISTS
WITH ORIGINALITY, INDIVIDUALITY**

Our engineers do not simply "operate" as a piece of machinery in a chain of events—they must react creatively and constructively in solving challenging problems in better sound reproduction. Our products—phonograph cartridges, magnetic recording devices, tone arms, microphones, stereo components and electroacoustic transducers—have already achieved international recognition as being truly creative in concept. Most represent basic advances in their fields.

Our company is large enough to offer security—but not so large that the professional dignity of the individual is swallowed up in departmental labyrinths. Your work—on your projects—and our projects—is individually evaluated by the very top level of our company management. You will not "replace" anybody—we have grown and in order to continue growing must add to our staff immediately.

Salary is excellent, potential for personal advancement is great, facilities are exceptional. Suburban location adjacent to Chicago. Write or phone collect to:

Mr. Lee Gunter

SHURE BROTHERS, Inc.

222 Hartrey Street, Evanston, Illinois

Phone DAVis 8-9000

science and mathematics teachers. The grants will provide stipends of \$3000 each to approximately 50 teachers in each institute and allowances for dependents and travel will also be provided. Six of these academic-year programs are under the direction of members of the physics departments of participating schools and are listed below. In each case, inquiries should be addressed to the person in charge of the program:

Arizona State College, Tempe, Ariz. (Prof. A. T. Wager)
Harvard University, Cambridge 38, Mass. (Prof. E. C. Kemble)
Iowa State Teachers College, Cedar Falls, Ia. (Prof. R. A. Rogers)
North Dakota, University of, Grand Forks, N. D. (Prof. J. D. Henderson)
Utah, University of, Salt Lake City 12, Utah (Prof. T. J. Parmley)
Washington University, St. Louis 5, Mo. (Prof. E. U. Condon)

A program of postdoctoral resident research associateships for advanced training in basic research in a variety of fields, including physics, will be offered for 1959–60, according to an announcement by the National Academy of Sciences—National Research Council. The participating laboratories are the National Bureau of Standards (Boulder, Colo., and Washington, D. C.); the Naval Ordnance Laboratory (White Oak, Silver Spring, Md.); the Naval Research Laboratory (Washington, D. C.); the Navy Electronics Laboratory (San Diego, Calif.); and the US Army Chemical Corps Biological Warfare Laboratories (Fort Detrick, Frederick, Md.). The Air Research and Development Command is also participating in this program at four Air Force installations: Air Force Cambridge Research Center (Bedford, Mass.); Air Force Missile Development Center (Alamogordo, N. M.); Rome Air Development Center (Rome, N. Y.); and Wright Air Development Center (Dayton, Ohio). In addition, the ARDC is sponsoring a program of postdoctoral university research associateships tenable at twenty-one universities, of which the following five will offer advanced training in physics: Columbia, Duke, Michigan, Yale, and Rice Institute. Applicants must be US citizens and must hold the doctoral degree or its equivalent and must have demonstrated superior ability for creative research. Remuneration is from \$5985 to \$7510 a year, subject to income tax. Application materials may be secured by writing to the Fellowship Office, National Academy of Sciences—National Research Council, 2101 Constitution Avenue, N.W., Washington 25, D. C. Applications must be filed at the Fellowship Office on or before January 19, 1959.

Oxford University is offering ICI and Pressed Steel Fellowships, tenable for three years, to commence at the beginning of the 1959–60 academic year. The fellowships (open equally to men and women) are for research in physics or chemistry or allied subjects. Stipends will be within the range £700–£1000 depending on seniority and qualifications; fellows must normally have a doctoral degree by the date of their appointment. Applications should reach the Registrar, University Registry, Clarendon Building, Oxford, England no later than February 14, 1959. Further information can be obtained from the Registrar.

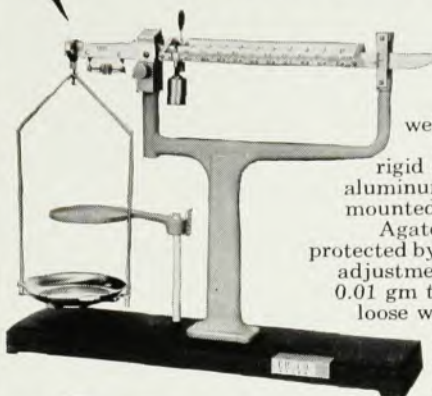
Massachusetts Institute of Technology will award two categories of industrial fellowships in electronics for the 1959-60 academic year: (1) graduate student fellowships which provide tuition and stipends of between \$1600 and \$2400, contingent upon experience and qualifications, and (2) advanced research fellowships for postdoctoral candidates carrying stipends ranging from \$3000 upwards. A limited number of research assistantships are also available. Further information may be obtained from Prof. J. B. Wiesner, director of the Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge 39, Mass.

An intensive five-day course in gas chromatography for chemists, engineers, and physicists will be given from February 2-6 at the University of California at Los Angeles. Lectures will be given by H. W. Patton (Tennessee Eastman Co.), S. A. Greene (Rocketdyne Research), H. S. Knight (Shell Development Co.), Charles M. Drew (US Naval Ordnance Test Station), Hadley Ford (Stanford Research Institute), and Robert L. Pecsock of the UCLA Department of Chemistry, who will coordinate the course. Enrollment will be limited to holders of the bachelor's degree in science or engineering or its equivalent. Information and applications may be obtained through University of California Extension, Los Angeles 24, Calif.

Space Technology Laboratories, Inc., the newly formed company that was previously a division of the Ramo-Wooldridge Corp., is offering graduate fellowships for the 1959-60 academic year. Recipients, who must have completed one or more years of graduate study in science, engineering, or mathematics by July 1959, will pursue a 12-month program, part of which is to be conducted at the firm's laboratories and the remainder at either the California Institute of Technology or the Massachusetts Institute of Technology. Each fellowship will provide for an education grant of not less than \$2000 and a salary for summer and part-time work at STL. For further information contact Gerald H. Backer, Building D, Space Technology Laboratories, P. O. Box 45564, Airport Station, Los Angeles 45, Calif.

Frank A. Waterman, emeritus professor of physics at Smith College, died in Northampton, Mass., on November 16. His age was 93. Born in Oswego, N. Y., Dr. Waterman received his PhD from Princeton University in 1896. He taught at Purdue University and at Princeton before being named a professor of physics at Smith College in 1897, a position he held until his retirement in 1933. In addition to teaching, he designed apparatus for use in elementary physics laboratories and for many years he served as chief examiner and chief reader on the college entrance examination board. A fellow of the American Physical Society, Dr. Waterman was the father of National Science Foundation Director Alan T. Waterman.

Improved READABILITY
and REPEATABILITY
CENCO®
**TRIPLE BEAM
BALANCE**



Dependable for fast accurate weighing, completely repeatable. Three rigid stainless steel and aluminum beams are step-mounted for easy reading. Agates and knife edges protected by beam arrest. Zero adjustment easy. Capacity 0.01 gm to 111 gm without loose weights. SR 20 mg.

No. 2650, low-priced at only . . . \$35.00
No. 2655, 1011 gm, SR 30 mg. . . \$50.00



CENTRAL SCIENTIFIC CO.
1718-B Irving Park Road • Chicago 13, Illinois
Branches and Warehouses — Mountainside, N. J.
Boston • Birmingham • Santa Clara • Los Angeles • Tulsa
Houston • Toronto • Montreal • Vancouver • Ottawa

CALIFORNIA OPPORTUNITIES
WITH
SYLVANIA

(San Francisco Bay Area—
Near Stanford University)

The Sylvania Microwave Physics Laboratory has openings for:

**Theoretical Physicists • Experimental
Physicists • Mathematicians •
Microwave Engineers**

TO WORK IN THE FIELDS OF:

... PLASMA PHYSICS ... PROPAGATION PHENOMENA
... IONOSPHERIC PHYSICS ... PARAMETRIC AMPLIFIERS
... SHOCK WAVE PHENOMENA ... FERRITE DEVELOPMENT
... SYSTEMS ANALYSIS

Send resume in complete confidence to:

MICROWAVE PHYSICS LABORATORY

SYLVANIA

SYLVANIA ELECTRIC PRODUCTS INC.

P. O. Box 1296, Mountain View, California