

Beams Retires at Virginia but Only to Go on Working

Jesse W. Beams was retiring at the University of Virginia, and he objected to any fuss about it. So posters about the grounds referred to "A Special Sesquicentennial Symposium" (Virginia is in its 150th year), and only in small print on the program were the words "Marking the Occasion of the Retirement of Professor J. W. Beams."

Speakers were Robert H. Dicke, Princeton ("Gravitation") and Howard K. Schachman, Berkeley ("Ultra-centrifugation, Present and Future").

"The retirement is probably technical," said John W. Mitchell, a solid stater at Virginia. State law says that when a man is 70, as Beams was on Christmas Day, he must relinquish regular faculty status and stop teaching. As we talked to Beams the day before the symposium, he spoke with enthusiasm of his plans to improve the accuracy of the gravitational constant, to extend to superconductors his measurements of electrical fields near materials under strain, and to continue his work with frictionless centrifuges on molecular weights and volumes.

"Beams improves with age," said W. Dexter Whitehead, present head of the Virginia department. "In the last

Not quite all of Beams's career has been at Virginia. He came there in 1923 with an AB from Fairmont College (now Wichita State University), an MA from Wisconsin and a year of teaching at Alabama Polytechnic Institute (now Auburn University). When he got his PhD, he was appointed to a two-year term as a National Research Council fellow, and after spending part of a year on the fellowship at Virginia, he went to Yale to complete it. Then he was an instructor at Yale for one year before coming back to Virginia.

During his subsequent career he has served as principal investigator for the Navy, the Army, the Office of Scientific Research and Development and the National Aeronautics and Space Agency. He has also served on the advisory committee of the Aberdeen Proving Grounds and the general advisory committee of the Atomic Energy Commission.

The American Physical Society elected Beams its president for the year 1958, and in 1968 he received the National Medal of Science.

The precision with which Beams measures many quantities depends largely on his magnetic suspensions. As I talked to him he turned on a power supply near his desk and demonstrated operation of one of them. An iron cylinder hung quite stably suspended with a 1/8-inch gap between it and a solenoid.

How do you do it? The question occurred to Beams when, with a solenoid, he supported about 95% of the load on a bearing. Then a colleague and coworker at Virginia, Frederick T. Holmes, succeeded in freely supporting a piece of iron. The way to complete suspension was to put a pickup coil beneath the solenoid. The pickup responded to iron approaching it, and the signal could be fed back to control the solenoid current. By "playing around with a few of the derivatives," Beams told me, he could make the suspension entirely stable.

It is also entirely frictionless and has made possible speeds of 1.5×10^6 revolutions per second, centrifugal fields 10^9 times that of gravity at the



BEAMS 1959. He served as president of the American Physical Society.

earth's surface and devices that will lose only 1 rps in ten days while coasting at 50 rps. Down to a pressure of 10^{-9} torr, air resistance accounts for all friction.

The device has another useful property. Current in an air-core supporting solenoid is a very sensitive function of the weight suspended. So Beams suspensions designed for the purpose will weigh such quantities as a monomolecular layer deposited on a foil. Auxiliary Helmholtz coils extend the applicable ranges of masses and forces.

Experiments. Among many of Beams's precision measurements is his recent contribution to the debate about electric fields near metals under strain (PHYSICS TODAY, July 1968, page 71 and December, page 59). In a spinning rotor the potential difference between center and edge depends on centrifugal forces on ions and electrons. Beams is even now pursuing two extensions of the first measurement. One is to rotate a superconductor and see how it behaves. Another is to investigate sudden discontinuities in contact potential that occur when the metal commences plastic flow.

We talked of all these things in Beams's own laboratory. Then we



BEAMS 1969. He explained current research with the magnetic suspension.

five years he has taken on some very significant work." Whitehead is glad that Beams will have a new position as senior research scholar at the institution where he has been graduate student (PhD, 1925), faculty member (from 1928), and department head (1948-62).

walked into another laboratory to see a stabilized rotor with speed that is constant to a part in a million. When such rotors are suspended in vacuum you can examine molecular weights and volumes. For example, when everything becomes stable in a slow rotor (25 rps) the density of solution and its variation with radius depend on molecular weight of solute. To measure density you shine light through the centrifuged sample. Meanwhile sensitive measurement of the weight of a buoy in the solution leads to molecular volume. Former methods required large samples, but



IN HIS HONOR the University of Virginia invited physics alumni back for a symposium and reunion.

Norman L. Oleson, formerly professor at the Naval Postgraduate School, has become department chairman and professor at the University of South Florida, Tampa.

Bolt, Beranek and Newman Inc named **James E. Barger** as director of the physical science division and **Francis J. Jackson** as associate director of the division.

Former chairman of the physics department at Texas Christian University, **Joseph Morgan** was promoted to director of research coordination.

The Atomic Energy Commission named **Robert A. Conrad** of Brookhaven National Laboratory to conduct medical surveillance of the people of Bikini, site of 23 nuclear tests during 1946-58.

these give solution density to a part in a million with small, pure samples.

Gravitational constant. From this biophysics laboratory we walked across campus to electrical engineering. Here Beams, graduate student Robert Rose and Professors Ralph Lowry and Herman Parker are at work on a new determination of the gravitational constant. Henry Cavendish in 1789 measured the forces between two suspended balls and two fixed ones. The result was indicated as the torsion in a suspension fiber. At the US Bureau of Standards in 1930 Paul R. Heyl changed it to a vibration experiment and in 1934 pushed accuracy to a part in 500.

Beams is challenged by a natural constant known only so crudely and hopes to measure it with 50 to 100 times the present accuracy. His modification requires a Cavendish-like apparatus on a rotating table. Instead of looking for displacement, he plans to feed back a signal to make the table follow displacement of a suspended horizontal cylinder and observe angular acceleration. Thus the device will integrate a displacement over a long time. Eventually Beams hopes to see a magnetic suspension in the system, but now it is being tested (with and without 10-kg tungsten spheres to provide gravitational forces) with a fiber suspension.

Teaching. Beams expressed his sadness at giving up the teaching he has enjoyed. "My students have



BEAMS 1937. He was author of an article on "High Rotational Speeds" in the *Journal of Applied Physics*.

made many of the improvements in the technique," he said. "In fact I have been extremely fortunate in having outstanding graduate students who are mostly responsible for the developments I have been associated with. Perhaps my principal virtue is that I did not succeed in spoiling them."

The day that honored Beams's retirement had the symposium speeches, many alumni and other friends, a luncheon and banquet in his honor. All was informal to please him. The smiling, white-haired guest of honor gave us the impression that matters in a busy retirement would be much like matters in a busy period before. —RHE

Norman Christ, a 25-year-old physicist, was named associate professor at Columbia University.

At Stevens Institute of Technology **Earl L. Koller** was promoted to professor and **Edward A. Friedman** and **Norman J. Horing** to associate professor. **Milos Seidl** was appointed professor and **Jeremy Bernstein** will be on leave during the fall term to serve as a Ford Foundation Distinguished Professor at the University of Islamabad in Pakistan.

The Naval Postgraduate School promoted **Alan B. Coppens** to associate professor. **Arthur Lubin** was named president and chief executive of Image Optics, Inc, succeeding **Mason C. Cox**, who is now chairman of the board. Lubin was formerly with the laser division in Santa Monica, Calif.

Hsu Yun Fan, Duncan Professor of Physics at Purdue University, received the 1968-69 Herbert Newby McCoy Award, given annually to a student or faculty member for a major contribution to science. Also honored was **Anna M. Akeley**, who received the Helen B. Schleman Gold Medallion.

Elected president of the American Nuclear Society is **Louis H. Roddis**, of Consolidated Edison, and vice-president, **N. Joseph Palladino**, Pennsylvania State University. New directors are: **Bengt G. Carlson**, Los Alamos; **Jack Chernick**, Brookhaven National Laboratory; **William A. Chittenden**, Sargent and Lundy Co; **Eric T. Clarke**, Technical Operations Inc; **Richard Ehrlick**, Knolls Atomic Power Laboratory; **Henry J. Gomberg**, Puerto Rico Nuclear Center; **Harry J. Lawroski**, Argonne National Laboratory.

ry; and **Walter J. McCarthy**, Detroit Edison.

Louis G. Stang was given an award by ANS for his work as editor of *Nuclear Applications*.



MARGENAU

Henry Margenau, Eugene Higgins Professor of Physics and Natural Philosophy at Yale, was honored with a dinner and symposium commemorating his retirement after 41 years on

the Yale faculty. An authority on the philosophical foundations of physics, Margenau also has worked on intermolecular forces (on which he has recently published a book), spectroscopy, nuclear physics and electronics. He now plans to become editor of a new journal, *Foundations in Physics*, which will begin publication in 1970, but also will continue as a consulting editor for the Time-Life Science Series and as editor-in-chief of *Main Currents*.

Promoted to director of the electron-devices process and battery laboratory at Bell Telephone Laboratories is **G. G. B. Garrett**. **Ira Jacobs** has been promoted to director of the transmission-systems research center.

Candidates for president-elect of the Optical Society of America are **Bruce H. Billings**, US Commissioner on the Joint Commission on Rural Reconstruction and special assistant to the US Ambassador for science and technology, Taiwan, and **Roderic M. Scott**, vice-president and chief scientist, Perkin-Elmer Corp. Nominated for directors-at-large are **Louis F. Drummer**, Naval Research Laboratory; **Stephen M. MacNeille**, American Optical Corp; **Lloyd G. Mundie**, RAND Corp; **Frederick W. Paul**, Goddard Space Flight Center; **Brian J. Thompson**, University of Rochester; and **Dudley Williams**, Kansas State University.

Leonard Reiffel received the George Foster Peabody Award for radio education during 1968 for his science program "The World Tomorrow." He is a consultant at the Apollo Program Office at the National Board of Aeronautics and Astronautics.

The Gold Medal for Scientific Achievement, given by the Naval Radiological Defense Laboratory, was awarded to **Eugene V. Benton**, head of the heavy-particle program.

Sigvard Eklund has been reappointed director general of the International Atomic Energy Agency for a four-year term. Appointed members of the Scientific Advisory Committee are: **M. A. El-Guebeily**, UAR; **Bertrand Goldschmidt**, France; **Hans Kronberger**, UK; **W. B. Lewis**, Canada; **I. Malek**, Czechoslovakia; **S. Mitsui**, Japan; **L. Cintra do Prado**, Brazil; **Isidor I. Rabi**, US; **Homi N. Sethna**, India; and **V. I. Spitsyn**, USSR.

The Institute of Advanced Study appointed **Stephen L. Adler** and **Roger F. Dashen** professors in the School of Natural Sciences.

Frank H. Attix and **Albert W. Sáenz** were the recipients of the Scientific Research Society of America Awards from the Naval Research Laboratory branch. Attix, a consultant in the nuclear-physics division, won the applied science award for his work in radiation dosimetry; Sáenz, head of the theory branch in the nuclear-physics division, for his analysis of spin waves in crystals.

Effective 1 July, **John J. Turin** becomes dean of the Graduate School at the University of Toledo. He will continue as chairman of the physics and astronomy and engineering-physics departments and as director of the Ritter Astrophysical Research Center.



HILDEBRAND

Effective 1 Oct., **Roger H. Hildebrand**, professor in the physics department and in the Enrico Fermi Institute, will become dean of the College of the University of Chicago. He is former director of the Fermi Institute and is known for his work in elementary particles. He is also the recipient of the 1960 Llewellyn John and Harriet Manchester Quantrell Award for excellence in undergraduate teaching.

At the University of Chicago **Mark G. Ingham**, professor and department chairman, is the Samuel K. Allison Dis-



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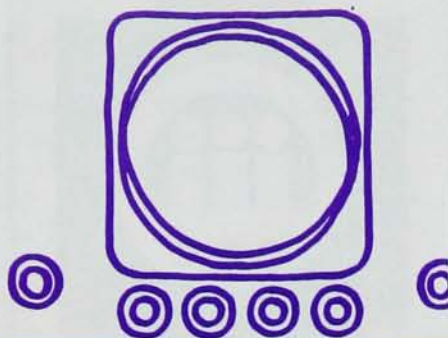
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tinguished Service Professor in the department. **Stuart Rice**, professor in the department of chemistry and in the James Frank Institute at the University, is the Louis Block Professor of Physical Sciences.

Richard S. Lindzen, associate professor of geophysical sciences at the University of Chicago, received the James B. Macelwane Award given by the American Geophysical Union. The award recognizes scientific achievements by young scientists. The 29-year-old Lindzen has done research on the physics of the upper atmosphere, atmospheric waves on various planets and stratospheric conditions above the equator.

New appointments at Los Alamos are **Norman H. Magee**, **John S. Beardall**, **David G. Gerke**, testing division; **John-dale C. Solem**, **Gerald I. Kerley**, **Ralph S. Cooper**, **Leland La Velle Carter**, **Lonnie Harrison**, theoretical; **Richard E. Siemon**, **Thomas G. Worlton**, physics; **Robert J. Macek**, **Dennis L. Roeder**, medium-energy physics; **Victor S. Starkovich**, weapons; **Robert E. Seamon**, reactor development; **Max J. Seamon**, computer science and services; and **Charles B. Ross Jr.**, chemistry and metallurgy.

Joining Columbia University as its youngest current full professor is **Richard N. Zare**, 29, formerly an associate professor of physical chemistry at the University of Colorado.

New president of the Australian Institute of Physics is **A. F. A. Harper**, who succeeds **A. Walsh**. Other officers are **R. Street**, Monash University, as vice-president; **J. K. Mackenzie**, Commonwealth Scientific and Industrial Research Organization, as honorary treasurer; **R. D. B. Fraser**, CSIRO, as honorary registrar; and **J. G. Campbell**, Perkin-Elmer, as honorary secretary.

R. W. Bussard resigned as corporate chief scientist of Electro-Optical Systems and has become chief scientist of Cerberonics.

At Bell Telephone Laboratories, **James A. Collinson** was named head of the military communications techniques department, **Elliott R. Nagelberg** the military optics and electromagnetics research department and

Morton B. Panish the materials science research department. **L. A. D'Asaro**, supervisor of the electroluminescent-device group, received an Award of Merit from *Materials Engineering* for his work on the use of industrial-grade diamonds for heat sinks.

Nominated for councilors of the American Physical Society are **Fay Ajzenberg-Selov**, Haverford College; **Freeman J. Dyson**, Princeton University; **Vernon W. Hughes**, Yale University; **Marc Ross**, University of Michigan; **William V. Smith**, Watson Research Center, IBM; and **Jeremiah D. Sullivan**, University of Illinois.

At Humboldt State College, Arcata, Calif., **Theodore Fishman** from Purdue, **Toufiq A. Siddiqi** from Indiana University and **Patrick Tin-Ming** have joined the faculty.



BOROWITZ

Sidney Borowitz, formerly acting chairman of the physics department, became dean of University College of Arts and Sciences, New York University. His research is in atomic

physics, electromagnetics and atomic and nuclear structure; he was recently made chairman of the American Physical Society Division of Electron and Atomic Physics.

New manager of the physics laboratory at COMSAT Laboratories is **Edmund S. Rittner**, who was formerly director of exploratory research at the North American Philips Corp.

Jesse L. Mitchell and **Joseph Purcell** were the recipients of the NASA Distinguished Service Medal for their contributions to the Orbiting Astronomical Observatory 2. Mitchell is director of physics and astronomy for the NASA Office of Space Science and Applications, and Purcell is OAO project manager at Goddard Space Flight Center.

The Distinguished Public Service Medal was given to **Frederick Seitz**, president of the National Academy of Sciences, for his work in solid-state physics.

Paul F. Bartunek, professor at the Colorado School of Mines, retired after 19 years on the faculty. Promoted to

professor is **Frank S. Mathews** and to associate professor **Jeffold J. Burnett**. **Joseph A. Moyzis** was named assistant professor, as of September.

Victor F. Hanson has retired after 35 years with Du Pont Co. He served as the first director of the applied-physics section and of the radiation-physics laboratory. In 1963 he was named manager of engineering-physics research.

At MIT the Everett Moore Baker Award for outstanding undergraduate teaching was given to **Harry M. Schey**.

S. S. Penner, professor of engineering and physics at the University of California, San Diego, completed his term as vice chancellor for academic affairs and will continue as director of the Institute for Pure and Applied Physical Sciences.

Joining KEV Electronics as senior physicist in the advanced development group is **Francis Harper**, formerly of Bell Telephone Laboratories.

Effective as of Sept., **Joseph W. Weinberg**, professor at Case Western Reserve, will join Syracuse University as Kenan Professor of Physics. He succeeds **William R. Fredrickson**, who will continue to teach. **K. C. Wali**, senior physicist and head of the high-energy theory group at Argonne National Laboratory, was named professor. New assistant professors are **Robert Geroch**, **Yoshiaki Ueda** and **Maurice Blackmon**.

Kenneth Young, a senior at Cal Tech was awarded the Richard P. Feynman Fellowship for graduate work in high-energy physics.

OSA Ives Medal to David Rank of Pennsylvania State

The Optical Society of America will award its Frederic Ives Medal to David Rank during its October meeting in Chicago. Rank is Evan Pugh Research Professor of Physics and head of the physics department at Pennsylvania State University.

Rank has worked on atomic and molecular spectroscopy in the ultra-violet, visible and infrared regions of the spectrum and is also known for his work on Raman and Brillouin scattering. He has also worked on geometri-

cal optics, optical instrumentation, optical shop practice and testing and the application of diffraction gratings to high-resolution spectroscopy.

In 1966 he began laser studies on nonlinear and stimulated optical phenomena and has since discovered the stimulated Rayleigh scattering, stimulated thermal Rayleigh scattering and optical mixing in stimulated Brillouin scattering. He is currently an associate editor of *The Journal of the Optical Society of America*.

Given annually, the medal was endowed by the late Herbert E. Ives in honor of his father, who was a pioneer in color photography, photoengraving and three-color process printing.

Lark-Horovitz Prize Goes To Spears for Ultrasonics

The Lark-Horovitz Prize in Physics, given by Purdue University, went to David L. Spears for his studies of intense beams of ultrasonic waves in semiconductors. The award honors Karl Lark-Horovitz and is given for exceptional ability and research by a physics graduate student.

Spears received his PhD this June and is now working at the MIT Lincoln Laboratory. Working under Ralph Bray, Spears studied how ultrasonic beams can deflect the light or greatly vary their intensity as they pass through the crystals.

ANS Special Award To Arthur G. Ward

Arthur G. Ward is the recipient of the American Nuclear Society Special Award for his fuel burn-up predictions and measurements. Ward is director of the applied-physics division, Atomic Energy Limited, Chalk River Nuclear Laboratories, and has supervised the development work for the Intense Neutron Generator.

Ward has also guided the program on fuel burn-up including determination of reactivity and isotopic composition. He derived and published the first criterion for xenon instability.

Spencer Gets Gray Medal For Charged-Particle Work

Lewis V. Spencer is the first recipient of the L.H. Gray Medal given by the International Commission on Radiation Units and Measurements. Spencer, with the Center for Radiation Research, National Bureau of Standards,

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