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Physical Science Study Committee films on physics, directed the 1965 MIT Study on Occupational, Vocational and Technical Education, and became chairman of the MIT-Harvard Educational Development Center, to implement the study's findings. In 1970 he began his continuing participation in the Experimental Study Group, an academic program for undergraduates at MIT that offers individual instruction in the core subjects through tutorials, seminars and independent study projects. Frank worked closely with this group until five days before his death, tutoring a few students each year and counseling the undergraduate physics tutors.

A few quotations from his colleagues and former students will illuminate Ned Frank's impact on the physics community. David Saxon, now chairman of the MIT Corporation, attributes his becoming a physicist to Frank's influence and describes Frank as a "demanding but sympathetic... teacher." Holly Sweet, associate director of ESG, wrote, "What we will miss the most about Ned is his wonderfully entertaining combination of wit and warmth that inspired us, amused us and occasionally irritated us, but always surrounded us with his care for us." A student, Jonathan Weitsman, describes his first experience with Frank as "very frustrating; no problem had anything called 'the answer.' Ned seemed to see physics problems more as adventures, with more subtleties to be probed. He would always ask, 'What does your answer mean physically?'" Finally, Peter Dourmashkin, a graduate student in physics at MIT, wrote, "Ned touched many people's hearts and minds, including mine. I will miss him. I'm sure his memory will be an inspiration to me for as long as I teach, as an example of a truly creative and free thinker, unshackled by convention."

PHILIP M. MORSE

Massachusetts Institute of Technology

Allen V. Astin

The US lost one of its most distinguished government scientists when Allen V. Astin, former director of the National Bureau of Standards, died of a heart attack 28 January. In a career spanning nearly four decades at NBS, Astin made important contributions to US economic and military security: As a scientist he advanced radio research and led the World War II development of the proximity fuze; as director after the War, he strengthened and broadened NBS programs in many areas of civilian technology.

Perhaps Astin's greatest contributions on behalf of the US technical



ASTIN

community were his insistence on the highest standards of scientific integrity and his opposition to political pressure. His independence was exemplified in the famous battery additive controversy. On that occasion Astin, as director of NBS, refused to withdraw his defense of scientific tests in which staff members had established that the battery additive AD-X2 was ineffective. He was fired by the Secretary of Commerce on the grounds that the Bureau's test failed to take into account the play of the marketplace. In the face of vigorous and widespread support from US scientists, the Secretary reinstated him. Later the matter was resolved resoundingly in NBS' favor. As an account of the incident, Astin liked best the report to the Subcommittee on Science, Research, and Development of the House Committee on Science and Astronautics, Legislative Reference Service, of the Library of Congress, (Serial A, 25 April 1969). As an immediate result of the incident, Astin was able to set up two NAS committees, one to report on the AD-X2 findings and the other "to evaluate the present functions and operations of the NBS in relation to present national needs." The latter had far-reaching effects on the future operations of NBS, in particular, in changing NBS from a predominantly ordnance laboratory, which it had become during World War II, to its proper peace-time task of serving science, industry and commerce.

Astin was born in Salt Lake City, Utah, in 1904. He received his bachelor's degree in physics from the University of Utah in 1925 and his master's degree and PhD from New York University in 1926 and 1928, respectively. From 1928 to 1930 he was a National Research Council Fellow at Johns Hopkins University.

He joined NBS in 1932, devoting his early years there to radio telemetry,

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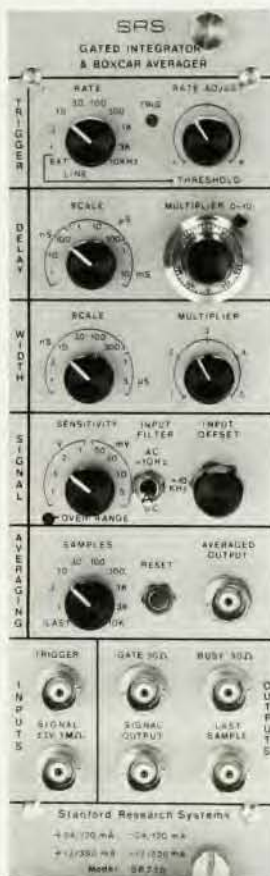
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particularly as applied to meteorological problems in the Earth's atmosphere and cosmic rays. In 1940, he joined the group working on proximity fuzes, a very important military development of American World War II research. Astin's own particular contributions were in electronics, particularly in circuit design. He also contributed to the study of dielectrics both at Johns Hopkins University and NBS. He was named Director of NBS in 1952 by President Harry S. Truman, and he served in that position until his retirement 17 years later.

Astin understood the mission of NBS extremely well and, in his characteristically low-keyed way, did a superb job of guiding and developing the Bureau. He believed deeply that to oversee measurement standards NBS needed to have a strong in-house capability in basic research, and that scientists did their best work when they were given considerable freedom to chart their own directions. Notable among the many NBS achievements during his tenure was the experimental demonstration of the non-conservation of parity. Astin obtained for NBS a 100-MeV linear accelerator, a 10-MW research reactor, and other tools for nuclear and radiation research. He extended the range of NBS formal measurement services beyond instrument calibration to standard reference materials and standard reference data. He was instrumental in persuading Congress and the Eisenhower Administration to provide the handsome, efficient facilities NBS now occupies in Gaithersburg, Maryland. Astin directed the planning and building operations through to their completion and subsequent operation.

The sort of leadership Astin brought to NBS is well illustrated by his role in the establishment, with the University of Colorado, of the Joint Institute for Laboratory Physics. In the words of Lewis M. Branscomb, who became the first chairman of JILA,

When the idea of a research laboratory devoted to the atomic physics and radiation theory underlying the science of astrophysics was conceived in 1959, Allen Astin proposed this laboratory be established by the Bureau of Standards at a leading university. It was understood that a partnership recognizing an academic role for NBS scientists and research participation for the university colleagues in the Institute needed to be formed. Allen Astin took this general concept and sold the idea of a partnership institution to the lawyers and to the Secretary of the Department of Commerce. . . . He, as Director, and the President of the University of Colorado estab-

lished a partnership to create and solve problems that might arise. This structure was completely unique at that time and played a critical role in the integration of government and state university resources and purposes into a very successful scientific institution. . . . As the Institute's success has become widely known, this form of organization has been often studied and replicated, a living tribute to Allen Astin's perseverance and imagination as a government science executive.

Astin was determined that NBS would be the best laboratory that he could possibly make it. This excellence required NBS to be able to attract and hold highly qualified scientists, and Astin worked diligently and skillfully within the US Government personnel system to enhance the professional status of government scientists and to secure for them working conditions and compensation comparable to those in the private sector.

Astin also played a strong role in international science. He served on the International Committee on Weights and Measures, from 1958 to 1968. He helped plan and obtain support for a program on ionizing radiation standards at the International Bureau of Weights and Measures in Paris. He demonstrated his deep conviction that international cooperation in science and technology contributed to world social and economic development by serving as chairman of the panel on materials and information exchange under the US-Japan Program on Natural Resources and as the US coordinator for the US-France cooperative program. Concerned that SI units are used nearly everywhere outside the US, he initiated a three-year study of the subject. That NBS documentation of US isolation in standards led to the passage by the Congress of the Metric Conversion Act of 1975.

Astin's career was a demonstration of what can be done by calm, quiet, dignified, but relentless pursuit of worthy objectives. His many accomplishments stand as a memorial to his life and his way of doing things.

ERNEST AMBLER
National Bureau of Standards

Paul Jeremy Dean

Paul Jeremy Dean died 18 February 1984 at the age of 49. An expert in the electronic properties of semiconductors, he held the post of Deputy Chief Scientific Officer at the Royal Signals and Radar Establishment at Great Malvern in Worcestershire, England, at the time of his death.