

## Alexander E. Douglas FREE

Gerhard Herzberg



*Physics Today* **34** (10), 116–117 (1981);

<https://doi.org/10.1063/1.2914316>



View  
Online



Export  
Citation

CrossMark

chairman of the Farmingdale physics department.

**George W. Preston** has been appointed director of the Mount Wilson and Las Campanas Observatories in Pasadena, California. Preston has been serving

as acting director since the breakup of the Hale Observatories in July 1980. The Hale Observatories had encompassed the Carnegie Institution's facilities at Mount Wilson (California) and Las Campanas (Chile) as well as the Caltech facilities at Palomar and Big Bear (California).

## obituaries

### Harvey Fletcher

Harvey Fletcher, born in 1884 at Provo, Utah, had a long and distinguished career as a scientist and engineer. He was a trail-blazing investigator of the nature of speech and hearing and a worldwide benefactor of humanity, including those with vocal and auditory tract deficiencies. He made contributions to movies, music and stereophonic reproduction of sound. He was also a skilled teacher, the first president of the Acoustical Society of America and a president of the APS.

Uncle Harvey, as he was affectionately known, particularly during his later years at Bell Telephone Laboratories, received his early training at Brigham Young Academy. He graduated from BYU in 1907. After teaching full time at BYU during the academic year 1907-08, he left for the University of Chicago, where he participated with Robert A. Millikan in the famous oil drop experiment. Initially, Millikan had attempted to use tiny atomized water droplets in a reversible electrical field as a means of determining the charge on the electron. Fletcher bases his approach on the use of atomized oil after discussing the need for a nonvolatile mist with Millikan and Beggeman. Within a day he had a preliminary setup that gave a fairly reasonable value of  $e$ . Millikan became very much excited when he looked through the telescope into the test chamber and saw the beautiful sight of the droplets jumping around. Even Charles Steinmetz from the General Electric Company, who previously didn't believe there were such things as electrons, said "I never would have believed it. I never would have believed it."

Fletcher graduated in the spring of 1911 from the University of Chicago, receiving the first PhD *summa cum laude* degree awarded by the physics department. That summer he returned to Provo, where he was appointed chairman of the BYU physics department. His skill as a teacher is indicated by the stature later achieved by such students as Carl F. Eyring, Wayne B. Hales, Vern O. Knudsen, Milton Marshall, Joseph Nichols, A.

Ray Olpin and Dilworth Walker.

In 1916 he accepted a long-standing invitation from Frank B. Jewett, head of research at Western Electric in New York City, where, at the time, most of the research of the American Telephone and Telegraph Company was conducted. He was appointed director of acoustical research in 1925, when



**Harvey Fletcher** (seated) with Mark B. Gardner in the anechoic chamber at Bell Labs.

the Bell Telephone Laboratories were organized to take over the research and development responsibilities of the Bell System. Later he became director of physical research at the Laboratories. While there, he was responsible for the development of early Western Electric hearing aids—a pioneering effort that subsequently blossomed to give comfort and increased capacity to hundreds of thousands all over the world. He supervised the development of the clinical

2A audiometer and of a survey method of testing hearing that had wide acceptance in the schools throughout the nation. He and his group of highly skilled scientists and assistants were also first to demonstrate stereophonic sound transmission (1933) and stereophonic recording (1939)—with the assistance of Leopold Stowkowski. During his Bell System career he published some 40 papers in addition to two books: *Speech and Hearing* (1929) and *Speech and Hearing in Communication*. In addition, he coauthored or authored three other books: *Modern Communication* (1932), *Science and Your Faith in God* (1958) and *The Good Life* (1963). Upon his retirement from Bell Laboratories, he taught for two years at the Columbia University Engineering School, following which he returned once again to his native Provo and Brigham Young University.

MARK B. GARDNER  
Spanish Fork, Utah

### Alexander E. Douglas

One of the most distinguished Canadian physicists, Alexander Edgar Douglas, died on 26 July at the age of 65. Born on a Saskatchewan farm, he was educated at the University of Saskatchewan, where he obtained his BA and MA degrees. He interrupted his studies to do defense research at the National Research Council of Canada during the last war. After the war he completed his PhD at Pennsylvania State University under David Rank. After that he and I worked together in establishing a spectroscopy laboratory that in a few years' time gained an international reputation. Douglas' contribution to the organization and to the output of this laboratory was pre-eminent. His critical advice was sought by everyone in the laboratory and by many outside it as well. His ability to spot a weak point in an argument was uncanny.

Douglas' own output of original research in molecular spectroscopy was prodigious. It is difficult to find an important molecule (diatomic or triatomic) for which Douglas did not make a significant contribution to the understanding of its energy levels and its spectrum. It was he who first observed the spectra of  $B_2$ ,  $Si_2$ ,  $CH^+$ ,  $SiH^+$ ,  $NF$ ,  $PF$ ,  $BN$ ,  $CN^+$ , and it was he who first identified the 4050 group of lines observed in comets as being due to the  $C_3$  molecule. Using an elegant method that he developed, he was the first to study the Zeeman effect in polyatomic molecules. Douglas was an extremely skillful experimenter who could work with "string and sealing wax" but who also was very familiar with modern techniques of data collection.

One of Douglas' most important contributions was his recognition of the reason for "anomalous lifetimes," that is, the failure of a simple relationship between absorption coefficient and lifetime to account for lifetimes in such compounds as  $\text{NO}_2$ ,  $\text{SO}_2$ ,  $\text{C}_6\text{H}_6$ . This phenomenon, referred to in the most recent literature as the Douglas effect, is closely connected with internal conversion in larger molecules.

Throughout his life Douglas was interested in astrophysical applications of molecular spectroscopy. He made such extremely important contributions to this field as the identification of interstellar  $\text{CH}^+$ , of cometary  $\text{C}_3$ , the reproduction in the laboratory of the Meinel bands of  $\text{N}_2^+$  and other spectra. His most recent contribution in this field was his attempt to identify the diffuse interstellar lines that have baffled astronomers for the last 50 years. Although his interpretation has already had considerable support, only the future can tell whether Douglas had the right hunch. His last seminar talk was devoted to this subject. He was well aware of all the pitfalls and doubts.



DOUGLAS

Douglas was elected fellow of the Royal Society of Canada in 1956 and of the Royal Society of London in 1970. He was a president of the Canadian Association of Physicists and a fellow of the American Physical Society. Douglas made a distinguished contribution to Canadian physics by serving as Director of the Division of Physics of the National Research Council from 1969 to 1973.

In June 1980 Douglas' associates at NRC organized in his honor an international meeting on molecular spectroscopy. It was a great success and showed the high esteem and affection in which Alex Douglas was held by colleagues throughout the world, especially those who had been postdoctorate fellows under him.

GERHARD HERZBERG

National Research Council of Canada

# Vacuum leak detection made easier!



**JOIN THE HUNDREDS OF DELTA USERS WHO HAVE DISCOVERED ITS TRUE COST EFFECTIVENESS.**

## FEATURES:

**COST EFFECTIVE:** SAVES TIME IN LOCATING LEAKS REDUCING EQUIPMENT DOWN TIME, LITTLE POWER TO USE, ANY TECHNICIAN OR ENGINEER CAN OPERATE

**FINE LEAK DETECTION:** DOWN TO  $1 \times 10^{-8}$  ATM CC/SEC WITH JUST MECHANICAL PUMPING

**REAL/VIRTUAL LEAKS:** POSITIVE DIFFERENTIATION

**TRACER:** USE ANY GAS OR LIQUID, NO SIGNAL SATURATION

**PORTABLE:** UNDER 6 POUNDS, BATTERIES INCLUDED FOR REMOTE USE

**GROSS LEAK DETECTION:** PRECISE LOCATOR, WILL NOT LOSE SENSOR WITH LOSS OF VACUUM

**TIME RESPONSE:**  $\lesssim 1$  SECOND OVER 10 DECADE PRESSURE RANGE

**PUT ONE IN YOUR PLANT - ENJOY THE DIFFERENCE**

**PRICE \$2,250.00 U.S.A. MODEL AD-100, COMPLETE**

## U.S. REPRESENTATIVES:

PAT PATTESON ASSOCIATES	SAN RAMON, CALIF.	(415) 837-4416
YARBROUGH SOUTHWEST	RICHARDSON, TEXAS	(214) 690-0800
CAPITOL RESEARCH EQUIPMENT	FAIRFAX, VIRGINIA	(703) 573-1600
BLAZE-COMPANY	OSTERVILLE, MASS.	(617) 428-5171
EMPIRE TECHNOLOGY	CLIFTON PARK, N.Y.	(518) 371-2480
BYRON ELLIS ASSOCIATES	DES PLAINES, ILL.	(312) 298-7626
BYRON ELLIS ASSOCIATES	BEREA, OHIO	(216) 826-0559
MICRO-TEC WEST	WHITTIER, CALIF.	(714) 547-5941
MICRO-TEC WEST	MESA, ARIZONA	(602) 892-6662
SEALEY	ATLANTA, GEORGIA	(404) 491-3777
PALMBORG ASSOCIATES	MERCER ISLAND, WASH.	(206) 232-3444

## FOREIGN:

MEGATECH	ENGLAND	(0705) 472868
DOMO-TECHNICA	AUSTRALIA	85-7761
INTECHMIJ	HOLLAND	(070) 251212
VACOTEC	SWITZERLAND	(032) 914488



**DELTA ULTRA SENSE INC.**

1070 EAST DOMINGUEZ, UNIT H  
CARSON, CA 90746 · (213) 632-6638

Booth #83 AVS Show

Circle No. 85 on Reader Service Card