Editorial

THE PAPERS in this issue arose largely as a result of a conference on high-power tubes held at Monterey, California, in March 1976. While the conference itself was a closed meeting with no published proceedings, it was felt that a number of the papers presented were suitable for open publication. The three Guest Editors were all present at Monterey (David J. Bates as General Chairman of the conference). We therefore solicited both written versions of suitable papers and permission to have a special issue of this Transactions devoted to tubes. Owing to a scheduling problem, a special issue was not initially approved; this, coupled with a shortness of time, caused the number of papers submitted to be less than expected, but three papers unconnected with the conference were added. Subsequently, rescheduling of another issue resulted in this becoming a de facto Special Issue on Electron Tubes.

There is no doubt that a renewed interest in tubes is being shown by the US Department of Defense; this, as well as an ever increasing commercial application of microwaves, indicates that tube research and development activity will be greater in the coming decade than during the last decade. It is quite possible that more than an occasional tube paper will once again be published in this Transactions.

The distribution of subjects is of interest: there is one klystron paper, two on crossed field devices, two on traveling wave tubes, and three on refocusing and collector depression, with applications to TWT's mainly in mind. The increasing dominance of the TWT as a subject of interest is clear, while the magnetron (which still retains the largest volume of sales because of the microwave oven) is not represented at all. Then, there is one paper on gas tubes and two in the area of failure analysis, which ought to receive more attention. It is a curious irony that the problem discussed by Haas *et al.* stemmed directly from a decision on brazing taken by one of us (J. Rodney M. Vaughan) in the early 1960's. It is also a good example of the cross-disciplinary nature of failure analysis problems: the component actually failing was a transistor, but its destruction was caused by a momentary malfunction (arc) in the tube, and once the problem had been unraveled by Haas and his colleagues, the immediate solution was seen to be a modification of the supply circuit, with revised processing of the ceramics as a longer-term approach. The need to be prepared to cross boundaries in order to find the most cost-effective solutions to failure problems was a major topic of discussion at the Monterey conference and requires further study.

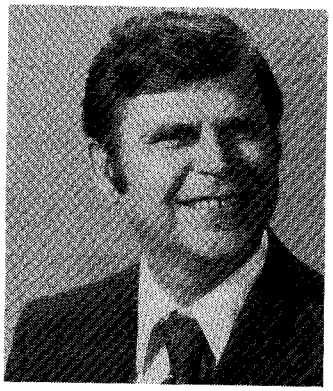
DAVID J. BATES
LESTER M. WINSLOW
J. RODNEY M. VAUGHAN
Guest Editors

David J. Bates (S'55–M'57–SM'60) was born in Portland, OR, on October 22, 1928. He received the B.S. and M.S. degrees in physics from Oregon State University, Corvallis, in 1951 and 1953, respectively, and the Ph.D. degree in applied physics from Stanford University, Stanford, CA, in 1958.

From 1952 to 1957, he successively held appointments as Research Assistant and Research Associate at the W. W. Hansen Laboratories, Stanford University. From 1957 to 1959, he was a Member of the Technical Staff and a Section Head in the Research Laboratory at Hughes Aircraft Company, Culver City, CA. From 1960 to 1962, he was a Section Head in the Research and Development Department of the Hughes Microwave Tube Division, Los Angeles, CA, doing advanced development work on a number of high peak and average power coupled-cavity TWT's. In 1962 and 1963, he was with the Physical Electronics Laboratories, Menlo Park, CA, where he was engaged in the development of linear electron accelerators, microwave tubes and components, and electron beam optics. In 1964 and 1965, he was a Senior Engineering Manager at Varian Associates, Palo Alto, CA, working on state-of-the-art high-power CW and pulsed TWT's. In 1966, he joined the Watkins-Johnson Company, Palo Alto, CA, as Head of the Medium Power Tube Research and Development Section working on a variety of high-performance TWT's. Starting in 1968, he headed the pioneering industry effort to develop electron bombarded semi-

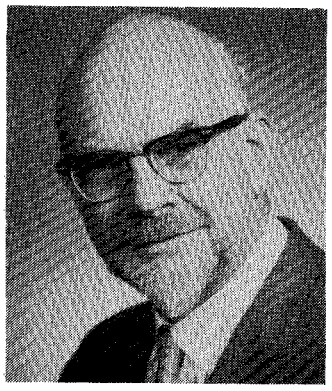
conductor (EBS) devices. He is presently Manager of the Power Tube Engineering Department. He is coinventor of the laminar flow electron gun, holds 12 US patents, and has authored over a dozen technical papers.

Dr. Bates is a member of Pi Mu Epsilon, Sigma Pi Sigma, Sigma Xi, the Association of Old Crows, and RESA. He has served on a number of IEEE Committees and in 1970, was Chairman of the San Francisco Chapter of the IEEE Electron Devices Group. In 1973, he was Subcommittee Chairman for Electron Tubes for the International Electron Devices Conference. He was General Chairman of the 1976 Power Tube Specialists Conference, jointly sponsored by the IEEE and the US Department of Defense Advisory Group on Electron Devices. The Association of Old Crows has awarded him the Technology Medal for 1976.



Lester M. Winslow (S'53–M'59–M'69) was born in Los Angeles, CA, on September 6, 1927. He received the B.S.E.E. degree from the University of Southern California, Los Angeles, CA, in 1953 and the M.S.E.E. degree and Degree of Engineer from Stanford University, Stanford, CA, in 1955 and 1956, respectively.

From 1954 to 1958 he was a Research Assistant at the Microwave Laboratory, Stanford University. During 1958 and 1959 he was a Senior Engineer with Raytheon Company, Goleta, CA. From 1959 to 1962 he was a Senior Staff Physicist at the Microwave Tube Division of Hughes Aircraft Company. From 1962 to 1964 he was with the EMI Division of Capitol Records, which was subsequently acquired by Eimac. From 1964 to 1967 he was a Senior Staff Research Scientist at the Eimac Division of Varian Associates, where he was active in most fields of research in high-power broad-band helix-type traveling wave tubes. From 1967 to 1968, he was with Watkins-Johnson Company. In 1968 he joined Warnecke Electron Tubes as a Senior Scientist, where he engaged in studies of gaseous discharge phenomena. In 1971 he joined the Naval Research Laboratory, Washington, DC, as a Consultant, where he was engaged in research and development work on new methods to obtain very high efficiency in high-power broad-band traveling wave tubes. He is presently a Program Manager of Research and Advanced Development of Microwave Tube Programs, Electronics Technology Division, Naval Research Laboratory.



J. Rodney M. Vaughan (SM'58) was born in Margate, England, on May 2, 1921. He received the B.S. degree with honors in mathematics in 1948, the M.A. degree in 1957, and the Ph.D. degree in electrical engineering in 1972, all from Cambridge University, Cambridge, England.

During World War II, he served in the British Army and had technical responsibility for the long-range direction-finding network in the Mediterranean area with the rank of Captain. From 1948–1957 he was with EMI Research Laboratories, Hayes, England, in charge of millimeter-wave magnetron research. From 1957–1968 he was with the Tube Department of the General Electric Company. Since 1968 he has been with the Electron Tube Division of Litton Industries, San Carlos, CA, where his present position is Chief Scientist in the Linear Beam Department. His particular interest and responsibility is in the application of computers to both tube design and production. He also holds seven patents.

Dr. Vaughan was chairman of the EIA Microwave Tube Committee (JT-13) from 1963–1967 and a member of the EIA Tube Council from 1967–1968.