

## Contributors to this Issue

R. V. L. HARTLEY, A.B., Utah, 1909; B.A., Oxford, 1912; B.Sc., 1913; Instructor in Physics, Nevada, 1909-10. Engineering Department, Bell Telephone Laboratories, 1913-50. Mr. Hartley took part in the early radio telephone experiments and was thereafter associated with research on telephony and telegraphy at voice and carrier frequencies. Later, as Research Consultant he was concerned with general circuit problems. Mr. Hartley is now retired from active service.

J. R. PIERCE, B.S., in Electrical Engineering, California Institute of Technology, 1933; Ph.D., 1936. Bell Telephone Laboratories, 1936-. Dr. Pierce has been engaged in the study of vacuum tubes.

CLAUDE E. SHANNON, B.S., in Electrical Engineering, University of Michigan, 1936; S.M. in Electrical Engineering and Ph.D. in Mathematics, M.I.T., 1940. National Research Fellow, 1940. Bell Telephone Laboratories, 1941-. Dr. Shannon has been engaged in mathematical research principally in the use of Boolean Algebra in switching, the theory of communication, and cryptography.

GEORGE C. SOUTHWORTH, B.S., Grove City College, 1914; Sc.D. (Hon.), 1931; Ph.D., Yale University, 1923. Assistant Physicist, Bureau of Standards, 1917-18; Instructor, Yale University, 1918-23. Editorial staff of The Bell System Technical Journal, American Telephone and Telegraph Company, 1923-24; Department of Development and Research, 1924-34; Research Department, Bell Telephone Laboratories, 1934-. Dr. Southworth's work in the Bell System has been concerned chiefly with the development of the waveguide as a practical medium of transmission. He is the author of numerous papers relating to a diversity of subjects such as ultra-short waves, short-wave radio propagation, earth currents, the transmission of microwaves along hollow metal pipes and dielectric wires and microwave radiation from the sun.