Synthesis of Normally Dispersed Wave Trains by means of Linear System Theory

Stephan Mueller and Maurice Ewing have published a thesis with this title as contribution No. 559 of the Lamont Geological Observatory, Columbia University, Palisades, New York. Examples of natural wave propagation processes with normal dispersion are seismic surface waves and explosion sounds in shallow water. If transient signals of this kind are analysed by a new technique, it is possible to display directly the group travel time as a function of frequency. A quantitative description of this empirical dependence in the frequency domain yields an explicit system function, the inverse transform of which, for regular dispersion, has the form of an Airy function in the time domain. For inverse dispersion the solution leads to a Bessel–Clifford function, while for wave propagation processes associated with minimum group travel time the convolution integral of these two types of functions is obtained. These system transfer functions include instrumental distortion caused by the amplitude and phase characteristics of the recording system. The most important system property is the relation between the phase characteristics deduced from the group travel time and the logarithmic amplitude function of wave propagation systems with energy losses due to leakage. By means of the known transfer function the system response due to various physically plausible input functions can be synthesized. If these theoretical results are compared with actual observations, it is possible to draw certain conclusions with regard to the transient excitation at the focus of the disturbance. The deductive method described, therefore, not only permits us to make statements about the behaviour of wave propagation systems in the complex frequency domain, but also allows us to find some essential criteria concerning the little-known mechanism of the focal transient.

Small-Animal Anæsthesia

A SYMPOSIUM organized by the British Small Animals Veterinary Association (BSAVA) and UFAW (Universities Federation for Animal Welfare) at the Middlesex Hospital Medical School during July 23–24 achieved outstanding success and is likely to lead to studies, far better co-ordinated in the future than in the past, of the techniques for anæsthetizing laboratory animals and animals dealt with in veterinary practice. The Organizing Committee, comprising Mr. Oliver Jones of the Zoological Society, who acted as chairman, Mrs. Joyce Wright of the BSAVA, who acted as organizing secretary, Dr. Phyllis Croft and Miss Felicity Charig of UFAW, and Dr. Lane-Petter of the Medical Research Council, brought together a remarkable array of experts to deal with the techniques of anæsthetizing primates, reptiles, amphibians, aquatic animals including fish and porpoises, rodents and lagomorphs, birds including fowls and cage birds, the smaller ungulates, and carnivores including, among others, stoats and weasels. The proceedings were opened by Dr. S. J. Folley and closed by Prof. J. G. Wright, a historic figure in this field who directed particular attention to the risks incurred in the use of muscular paralysants as adjuncts to anæsthesia. The proceedings, which will be published by the Pergamon Press, exhibited a combination of technical expertise and unashamed humaneness which cannot fail to stimulate thought and research in the important and difficult field with which they deal.

U.S. Air Force Office of Scientific Research: Research Grants and Contracts

THIRTY-SEVEN universities and sixteen research firms in the United States and Europe were awarded research grants and contracts, amounting to more than three million dollars, during the month of May, by the U.S. Air Force Office of Scientific Research. The May grants and contracts bring the total for this fiscal year to more than twenty-eight million dollars. The primary mission of the Air Force Office of Scientific Research is "to support research through grants or contracts based on unsolicited proposals both within the United States and throughout the free world". Grants in Europe, Africa and the Near East are administered by the European Office of Aerospace Research, Brussels.

The Jane Coffin Childs Memorial Fund for Medical Research

THE Jane Coffin Childs Memorial Fund for Medical Research supports investigations in the fundamental aspects of neoplastic growth, and awards post-doctoral fellowships to candidates of outstanding potential in the same field. Applications for grants-in-aid are reviewed by the Board of Scientific Advisers and the Board of Managers of the Fund three times a year, in the fall, winter and spring. Final dates for receipt of applications are September 1, November 1 and March 1. Fellowship applications are reviewed at the winter meeting of the Fund, the final date for applications being October 1 of each year. Grants-in-aid and fellowships are not restricted to U.S. nationals. Information may be secured from the Office of the Assistant Director, 333 Cedar Street, New Haven 11, Connecticut.

Registrar General's Quarterly Return for England and Wales

THE *Registrar General's Quarterly Return for England and Wales* for the last quarter of 1962 (H.M.S.O., 1962. 2*s*. 6*d*. net) makes it possible to calculate the natural increase for that year. The total number of live births was 840,557, the largest number since 1947. There were 557,446 deaths, in absolute numbers also the largest figure since 1940. Natural increase therefore amounted to some 283,000 persons, a figure which is very considerably in excess of the average of 203,000 in the period 1952–60 and nearly 30,000 higher than the figure of 252,000 for 1961. The acceleration in rate of population growth in Britain is well brought out by these data. It has become customary to have a new record low in the infant mortality rate each year, and 1962 is no exception, though the decline was marginal from 21·6 to 21·4 per 1,000, indicating perhaps that the minimum rate likely to be achieved under present conditions is slowly being reached. Stillbirths have decreased more significantly from 19·1 to 18·1 per 1,000, but neonatal and perinatal rates have not yet become available.

Effects of Atomic Radiation

DR. C. AUERBACH has written to the Editor of *Nature* stating that, in her review of the second report of the United Nations Scientific Committee on the Effects of Atomic Radiation (*Nature*, 198, 343; 1963), she warned readers that most of the literature references in the chapters were wrongly numbered. "The Secretary of the Scientific Committee on the Effects of Atomic Radiation has pointed out to me that this warning rests on a misconception, and that the correct use of the reference numbers is explained in a note on p. ii of the report. Unfortunately, this note is not prominently displayed and has been overlooked by most readers. I, therefore, wish to draw attention to it. I should, however, like to add that the present procedure for locating literature references is very cumbersome: the reference number does not refer to a page but to a paragraph in one of the appendixes, and since there are no running headlines it takes some time and effort to find the relevant paragraph. I feel that the usefulness of this extremely useful publication would be greatly enhanced by (1) references to literature by page numbers, (2) running headlines showing appendix and paragraphs, (3) a full index. The latter is of special importance. Many items are discussed in more than one appendix, and at present location of any particular piece of information is a time-consuming job."