

## TWIN STUDIES IN RELATION TO THE MECHANISMS OF AGE-DEPENDENT DISEASE

P.R.J. BURCH

*Department of Medical Physics, University of Leeds, England*

The problem of discordance for age-dependence disease among MZ twins is considered first. A brief outline is given of the author's unified theory of the aetiology and pathogenesis of diseases with a reproducible age-distribution. Theory states that each well-defined age-dependent disease is initiated by a characteristic set of random gene mutations in stem cells of the central system of growth control. The random nature of the initiating events is a common source of discordance for age-dependent disease among MZ twins. A method of allowing for incomplete penetrance is discussed in relation to Abe's (1969) study of the onset of schizophrenia in MZ twins. Attention is drawn to the severe difficulties posed by genetic heterogeneity in certain categories of disease. Possible sources of discordance between MZ twins, initiated during embryogenesis, are described with reference both to congenital abnormalities and age-dependent disease. Methods of distinguishing between the several possibilities are described.

Doubt is cast on the widespread assumption that DZ twins have, on the average, the same degree of genetic resemblance as pairs of ordinary sibs. In certain circumstances, genetic associations between disorders on the one hand, and the maternal tendency to DZ twinning on the other, will vitiate this assumption.

The significance of the ratio: (age-corrected concordance in MZ twins)/(age-corrected concordance in DZ twins) is considered in relation to some simple examples. Finally, the importance of twin studies to epidemiology is stressed.

Prof. P.R.J. Burch, Department of Medical Physics, University of Leeds, Leeds LS1 3EX, England

## FIDUCIALITY, REDUNDANCE, AND SELECTION

CARLA ROSSI

*Department of Calculus of Probability, University School of Science, Rome, Italy*

Abstract not received

## VARIABILITY OF INFORMATION'S QUANTITY AS STARTING ERGON PARAMETER

CARLA ROSSI

*Department of Calculus of Probability, University School of Science, Rome, Italy*

Abstract not received

## TWIN CONCORDANCES IN THE UNITED STATES FOR EARLY MORTALITY AND THEIR VARIATION WITH ZYGOSITY

ZDENEK HRUBEC, JAMES V. NEEL

*Department of Environmental Hygiene, The Karolinska Institute, Stockholm, Sweden*

The Twin Registry of the National Research Council consists of a panel of 16,000 pairs of male twin veterans, born between 1917 and 1927, who are being followed for morbidity and mortality through the Veteran's Administration and through questionnaire mailings. At the end of 1973 there were 2828 deceased individuals in the entire panel, and there were 217 twin pairs with both members deceased. Only 124 such pairs would be expected in the panel under the hypothesis of no association of death within twin pairs.

Of the concordantly deceased twin pairs it has been possible to classify 49 pairs as MZ and 49 pairs as DZ by means of fingerprint-anthropometric scores, and by questionnaire responses received before death. Significantly higher intrapair correlations of age at death appeared among MZ twin compared to DZ twins. MZ twins had significantly higher concordance rates for