biologists in the new Institute is full of possibilities not only of scientific and academic interest but also of great practical economic importance to India.

Sir Edward Mellanby emphasized that, for a nation's health, drugs can at best form the second line of defence; the first line must always be the public health services. He referred to ancient India's contribution to the foundation of medicine, especially in the treatment of disease by plant products. It is a paradox, he said, that "whereas a large part of the plants, from which official drugs in the pharmacopœia are made, are already grown in this country, yet many of these drugs are imported in large quantities".

METHODS OF LABOUR STATISTICS USED BY LONDON TRANSPORT

IN a paper submitted to the Institute of Actuaries and entitled "Personnel Statistics and Sickness Absence Statistics", Messrs. F. H. Spratling and F. J. Lloyd, of the London Transport Executive, discuss the importance of a systematic collection of data on numbers of staff, wastage and sickness absence in a large organization. Simple enumerations of the numbers employed as well as turnover and sickness absence rates, they argue, do not form a sufficient basis for the development of a successful staff policy. Policy should be based on a study of the age and length-of-service distribution of the population, which makes it possible to estimate the numbers of skilled and experienced staff that will be required and to calculate the financial cost of pensions and sick pay.

To meet the requirements of administrative, financial and medical planning, London Transport, which employs a hundred thousand people, has developed specialized methods of collecting and analysing personnel statistics. The information, obtained from the employees' personal record files at the various employing departments, is collected and recorded in a Central Record of Staff Statistics which consists of three files of punched cards. The Main File gives up-to-date details for each member of the active staff. A duplicate copy, made on December 31 of each year, is used to work out the age and length-of-service distribution of the population, and appears to be a useful device for adoption in personnel departments. The Wastage File consists of cards providing information for all leavers. The Sickness Absence File consists of cards for each spell of sickness absence; this differs from systems employed elsewhere, which collect on to one card all the absences of an individual employee.

Wastage is usually measured by the labour turnover rate, which expresses the annual number of leavers as a percentage of the average number employed during the year. This rate shows similar shortcomings to the crude death-rate, which ignores demographic factors such as the age-distribution of the population, and is not suitable for comparing experiences of different populations. In vital statistics it is therefore customary to calculate age-specific mortality rates. Similar techniques can be applied to turnover statistics, and the authors describe in detail a method of calculating specific rates which refer the number of leavers in a special age and length-of-service category to the number employed in that category.

A method for making adjustments for irregular rates of recruitment is also discussed. The problem of calculating specific rates for very short periods is complex, and an alternative approach is the statistical analysis of the behaviour of new entrants in a given period of time.

Just as age-specific mortality rates are used for the construction of life-tables, so specific wastage rates can be used for constructing service-tables, and for estimating the trend of the working population. This represents an advance over the ordinary turnover rates which cannot be used for making accurate forecasts of staff changes. It is hoped that the specific wastage rates will prove a more reliable guide for estimating future employment requirements.

In the section on sickness absence, Mr. Spratling and Mr. Lloyd discuss the difficulties of collecting comparable sickness absence statistics. Absence rates are known to vary with the period for which sick employees are kept on the books. The authors advocate six months as a reasonable period. Other research workers consider a period of one month more suitable, and suggest that prolonged absentees should be kept on a special register, and excluded from the ordinary sickness returns. The authors recommend that separate records should be kept of short absences lasting less than four calendar days, and of long absences lasting four or more calendar days. This does not follow the line adopted by other organizations, which divide sickness into certified and uncertified sickness, where certified sickness may be less than four days, and the statistics are based on working days lost, not calendar days.

Mr. Spratling and Mr. Lloyd distinguish three absence-rate functions: the attack rate, which shows the average annual number of absences per worker; the average length of sickness absence during the year; and the sickness absence rate, which is the product of the other two functions. The punched-card system makes it possible to analyse the records by age, length of service, duration of absence and type of disease. For the latter purpose, London Transport uses the three-figure International Statistical Classification of Diseases and Injuries adopted in 1948 by the United Nations World Health Organization, and a discussion of suitable groupings of various diseases is included in the paper.

A number of appendixes discuss the recording and classifying of sickness absences, ways of dealing with absences occurring in separate calendar years, and methods of calculating specific absence rates. The latter refer the number of days lost by special groups of staff to the numbers employed in those particular groups. It should be pointed out that the absence rates used by London Transport are not the usual percentage absence rates used in factories, but are a measure of the number of days lost per working year, which may be 250-300 per worker, while the percentage rates refer to 100 working days.

The specific sickness absence rates, like the specific wastage rates, have the advantage that they can be used for making reasonable forecasts of the expected sickness absence of a population (given normal climatic conditions and the absence of epidemics) if particulars with regard to age, sex and length of service of the numbers exposed to risk are known. A knowledge of the likely future loss of time might prove very useful for the production, personnel and planning departments of industrial organizations.

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