Surnames and Genetic Structure

By G W Lasker. (Pp viii+148; figures+tables. £15.00.) Cambridge: Cambridge University Press. 1985.

Applications of surnames in genetic studies date back over a century. George Darwin in 1875, requiring to know the rate of cousin marriages for his study of their possible deleterious effects, reasoned that marriages to a person of the same surname (isonymy) who was not a first cousin would be proportional to the frequency of the surname in the population and any excess over this would be ascribable to cousin marriages. Darwin concluded that the first cousin marriage rate was about 4.5% among the aristocracy, 3.5% among the middle classes and landed gentry, and 2% in the cities. Later, surnames were used in blood group studies in the search for genetic heterogeneity of populations in Slough by Fisher and Vaughan (1939), in North Wales and Cornwall by Fraser Roberts (1942, 1947), and in Wales by Watkin (1952). They were used by Buckatsch (1951) and Dobson (1973) to examine the constancy of local population. But impetus to their genetic use was given by Crow and Mange (1965) who used them to calculate the degree of inbreeding of a population.

Lasker's book introduces and summarises applications of surname analysis. First the sources of error and the history of surname studies are sketched, and the sources of data and their shortcomings reviewed. In chapter 4 the methods are set out for the calculation of inbreeding coefficients from marital isonymy, the coefficient of relationship between populations, and the confidence limits of these coefficients. The applications of the methods to small human isolates are listed, leading to a measure of the overestimation that isonymy produces, ranging from zero to a factor of ten. The number of studies applying these methods in the United Kingdom is surprising. Many, in fact, are of Lasker's inspiring. Most studies are historical and rural, but there have also been a few urban ones, with some interesting results. For example, the coefficient of relationship between geographical districts in Reading (0.0005) is very similar to that between Otmoor villages and between Cambridgeshire Fenland communities. It seems that this level is very general in England and Wales.

One of the most interesting chapters is that on specific surnames in Great Britain. That there are clines in ABO and Rhesus D blood group frequencies in Britain was shown by the maps of Kopec (1970) and the regressions against latitude and longitude of Imaizumi (1974). Lasker shows that, of 49 surnames, all but 17 have a statistically significant relationship to latitude or longitude. Seven surnames thought of as Welsh show a strong tendency to decrease from the West towards the East, and there are 11 surnames particularly associated with the North. It appears that surname distributions in England and Wales show no true isolates, other than perhaps the Indian, but instead some isolation by distance; common surnames are polyphyletic and widely distributed, but not homogeneously; rare surnames are more localised and show steeper clines. An appendix maps the distribution of 100 surnames and graphs the probability of local excess or deficiencies in frequency from west to east and from south to north. Their distribution suggests that since the middle ages there has been an open population structure with considerable opportunity for the exchange of genes among geographical areas, and that rarely was there isolation sufficient to produce locally significant and enduring variation. They also suggest that past inbreeding loops were more numerous than most attempts to count them imply, giving rise to geographically localised descent lines held together by inbreeding, but interlinked by some migration and intermarriage.

Though there have been, as the book shows, many studies of surnames in different localities in the last 20 years, this is the first occasion on which all have been drawn together. The book therefore is essentially a review of what has been done. Not only is it useful as a work of reference, but it also indicates the type of problem in which analysis of surnames may prove to be useful. It is clearly written in non-technical language and with a minimum of mathematics. It is a lucid description and evaluation of studies of surnames that illuminate the genetic structure of human populations. It has clear implications for clinical genetics. In Britain it would not be surprising to find local variation in frequency of recessive conditions. Dominants are likely to be more uniform in their frequency distribution and any non-random variation that exists to be clinical in nature.

D F ROBERTS