

twinning is regarded as a happy event. In this case the worship of twins entrusts them, namely, with power over water allowing to confer fertility to the soil and also to women and animals.

In the past, the mother of twins was often executed with her offspring, or simply banished. In many tribes she is still compelled to go through elaborate purification in order to forestall the evil omen. If twins are welcomed their parents are similarly respect-

ed, as they symbolize the fertility power of the clan.

Superstitions and myths pertaining to twinning are universal and often present converging features among cultures without mutual contact. This would indicate the twin cult as one of the earliest religious beliefs of mankind.

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2. The Demography of the Twinning Phenomenon

IS WEINBERG'S METHOD VALID?

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Suppose that L like-sexed and U unlike-sexed twins have been observed. Weinberg's method estimates the numbers of dizygotic and monozygotic twins as $DZ = 2U$ and $MZ = L-U$. This method is based on the assumptions that (1) the sex ratio in DZ twins is $\frac{1}{2}$ and (2) the sexes of DZ twins are determined independently and with the same probability in all parents; in consequence there should, on average, be equal numbers of like-sexed and unlike-sexed DZ twins.

The first assumption is not exactly true, but the necessary correction is negligible. Departures from the second assumption would probably lead to an excess of like-sexed over unlike-sexed DZ twins; in consequence, Weinberg's method would underestimate the numbers of DZ twins and overestimate the numbers of MZ twins. The literature on the frequencies of like-sexed and unlike-sexed pairs among twins known to be DZ through other genetic markers is reviewed. It is concluded that there is no evidence of an excess of like-sexed twins among them, and that there is therefore no reason to doubt the validity of Weinberg's method. The extension of Weinberg's method to estimate the zygosity types of triplets and quadruplets is described; it is shown that the resulting estimates agree well with the results of direct zygosity determination by blood grouping.

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RETROSPECTIVE STUDIES OF THE TWINNING RATE IN SCANDINAVIA

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The human twinning was studied in Sweden and Finland since the 1650s. The material comprises continuous series of data of single and multiple maternities compiled from the parish records and from various other, partly unpublished, sources in the archives of statistics.

Until recent times the twinning rate in these countries, and particularly on the Åland Islands, has been one of the highest known among Whites. Highly significant temporal fluctuations in the rates of multiple maternities were noted. There was a secular decline in the DZ twinning, particularly during the last generation. In Sweden the twinning rate during the last part of the eighteenth century was almost twice as high as it was in 1966-70. The triplet and quadruplet rates were about three to four times as high as they are today.

The extent to which the frequency of multiple maternities has depended on changes in maternal age, parity, marital status, and socio-economic conditions, was analysed. These environmental factors do not wholly explain the steep downward trend in the twinning rate. The marked decline in the twinning rates in Nordic populations about one generation after the break-up of isolates has been interpreted as evidence for the hypothesis that the degree of relationship between the parents of the mothers of twins

(and not between the parents of the twins) is important for the manifestation of DZ twinning.

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TWINNING FREQUENCIES IN BADEN-WÜRTTEMBERG ACCORDING TO PARENTAL AGE AND BIRTH ORDER

Comparison between 1955-59
and 1968-72

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Since the middle of the fifties, the frequency of twinning in the German Federal Republic is declining. In 1950 every 83rd confinement had resulted in a twin birth, whereas in 1970 a twinning rate of 1 : 102 could be observed. This is mainly due to a decline of the DZ twinning rate, calculated by Weinberg's differential method. Unfortunately, the official statistical publications of Germany only give the absolute figures of the three types of twins without classifying by maternal age.

We had the chance to get the original data of all twin births of Baden-Württemberg (Southwest Germany, 9 million inhabitants) from 1955 to 1972. At the moment, the analysis of these data is still going on; the comparison of two 5-year-periods (1955-59 and 1968-72) shows the following results:

1. Obviously, the decline of the DZ twinning rate cannot be explained by a maternal age effect; in all maternal age groups DZ twinning is less frequent in 1968-72 than in 1955-59.

2. There seems to be no obvious change in DZ twinning when the proportions of the

DZs in all twins are compared for the two periods in the same parity classes.

Therefore the decline of DZ twinning rates in the German Federal Republic must have other reasons; possible explanations will be discussed.

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VARIATIONS OF TWINNING FREQUENCIES IN ITALY IN THE PAST TWENTY YEARS

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In the past years, in Italy as well as in other countries, the frequency of twin births has undergone a remarkable reduction. At the same time, the ratio at birth between same-sexed and opposite-sexed twin pairs has also been modified. That is to say, according to the classic theories of twin studies, the ratio between MZ and DZ twin births has been modified.

The interdependence between variation of frequency of twin births and variation of the MZ : DZ ratio has been analysed, the reduction in time of the number of children born to mothers in advanced fertile age being considered as the possible origin of the reduction of twinning and of DZ twinning.

The reduced number of children born to mothers aged over 35 appears to only partly account for the observed variability. Socioeconomic conditions in the different regions of Italy are then taken into account, and, finally, the genetic structure of the various populations, as given by consanguinity, is considered.

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