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The belief that a marriage between cousins usually produces unhealthy and defective children is frequently expressed. Apparently many people believe that the abnormal children occur as a form of punishment because of consanguineous marriage. In that sense, obviously, the belief is a fallacy; yet it probably has served man well. Very likely the belief has acted as a preventative in that it has kept many close relatives from marrying. Often, defective children do have parents who are related. Since man goes to great expense to protect his abnormal fellow-beings, a belief which may prevent an increase in these abnormal persons can be considered to be useful.

Most people are carriers (heterozygous) for many recessive traits, although, of course, not all of the traits can be considered detrimental. A person who is heterozygous for a recessive trait will not develop that characteristic. Nevertheless, he can pass the potentiality through his germ-cell to his child. If the potentiality happens to be for a defective trait, and if he receives the same type of defective hereditary complex from both parents, the child will be pure (homozygous) for the trait, and will under the average circumstances develop the abnormality.

Owing to the hidden possibilities, the marriage of related persons is more likely to be harmful than to be good. If a family history shows any evidence of a rare recessive abnormality, two people who are members of that clan have a common ancestor, and are more likely to be carriers for the defect than are people who are not related to the family. As a consequence, marriage between two members of the family offers a chance for the defective hereditary material to be brought together; and the resulting homozygous condition will be an abnormal child. These conditions apply only for a recessive trait. A person who receives the germ-plasm for a dominant defective trait from one parent will ordinarily develop that characteristic regardless of the hereditary material which he receives from the other parent.

In many known histories of recessive defective traits, the frequency of consanguineous marriages in the family histories is much greater than that found in the population as a whole. Approximately thirty per cent of the known cases of albinism occur among children from known consanguineous marriages. Parents are related in about twenty-five per cent of the reported histories of retinal atrophy, and in about twenty per cent of the cases of deaf-mutism in which both parents were normal for hearing. Not over two per cent of the marriages of the population as a whole are between relatives. If the trait is very rare, it will seldom appear in any mat-

ing other than that between relatives. The two conditions are so closely associated that one usually inspects first for a possible relationship between the parents if the anomaly is rare.

In the family history reported here, the relationship of the parents is an important factor. In a sib-ship of eleven children, three have similar abnormalities associated with general weakness. The three, occurring as children numbers two, five and seven, were polydactylous on hands and feet; there are scars present where the extra fingers and toes have been removed; there are no extra metacarpal or metatarsal bones. The three are weak physically, and are feeble minded. The mental ability of child number five is slightly higher than that of the other two. The other members of the sib-ship are strong physically and are perfectly sound mentally. The descendants and ancestors of the sib-ship show no condition similar to the defect. The three deficient members have no descendants. With one questionable exception, the condition is not found in any of the sixty blood-relatives of the immediate family. The members of the family know of no history of a physical or a mental weakness in the earlier generations.

A study of the family history indicates that the trait probably has a hereditary background and that it is inherited as a recessive trait. Polydactylism usually behaves as a dominant trait; but since both parents in this case were normal for that as well as for the other conditions, the polydactylous characteristic cannot be dominant in this family. The similarity of the traits in the three members supports an interpretation that hereditary factors are involved, especially since the three were scattered throughout the sib-ship. An even stronger evidence in favor of heredity is the relationship of the parents of the children. The grandfathers of the children were brothers. This history is associated with a marriage between cousins, a condition expected in the development of hereditary recessive traits. If only one child had been defective, heredity would still have been operative, although the evidence would not have been so clear.

This case clearly shows the danger of consanguineous marriages. No earlier abnormality was known in the family history. The parents had no reason to suspect that they were carriers of a germ-plasm capable of producing the defect. Yet the marriage proved to be harmful, and the results indicate that some members of the clan have been carrying this potentiality through several generations. The marriage of the cousins made it possible for the homozygous condition to develop, since each parent was a carrier for the defect. If each parent had married a non-relative, the chance that either would have produced a child similar to the ones considered would have been highly improbable.

It can be said that cousin-marriages are not harmful provided the germ-plasm for a defective trait is not present. The fact, however, that no history of a defect is known in the family does not

indicate that the germ-plasm carries only good qualities. Often defective germ-plasm can be carried, unknown to the family until the birth of a defective child. Under the circumstances, it seems wise to marry outside the family. If a person knows that he is a carrier, or if he knows that he may be a carrier for some defective trait, he assumes a grave responsibility if he marries a relative or if he marries a person who has a similar defect in her family history.

I express my appreciation to Dr. M. C. Petersen of Willmar, Minnesota who examined one of the members of the family.

FURTHER PROGRESS IN THE SEARCH FOR NATURAL HISTORY AREAS IN MINNESOTA

Report of the Committee on the Preservation of Natural Conditions

by

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In 1937 the Minnesota Academy of Science undertook a program of encouraging natural history studies on the indigenous plant and animal communities in the state. The first step in this program was a search for tracts of forest or prairie which were well enough preserved and large enough to be suitable for such studies. The search was begun by the Committee on the Preservation of Natural Conditions, which was appointed in 1937 and made its first report in 1938.[1]

Since the annual meeting in 1938, the work of the Academy along this line has included a careful survey of the southern part of the state for well preserved and large remnants of the deciduous forest, of a vigorous but unsuccessful effort in cooperation with other agencies to obtain passage of an act to establish the Nerstrand Woods State Park, and of a more detailed investigation of the Cedar Creek Bog, all of which were carried out by the Committee on the Preservation of Natural Conditions, and of the location in Itasca State Park of an area suitable for natural history studies, carried out by the Subcommittee on Itasca State Park. The work of this subcommittee, which was appointed by the president, is described in a separate report.

A survey of all of the southern Minnesota counties which once contained deciduous forests was made for the purpose of determining just how many remnants of this type are left which are suitable for natural history studies requiring a considerable area, and how well preserved and how desirable they are. The aerial survey photo-

[1] Report of the Committee on the Preservation of Natural Conditions. Proc. Minn. Acad. of Science 1938, 6:20–25.