INBREEDING OR CONSANGUINOUS MARRIAGE

Inbreeding or consanguineous marriage is found in many communitiesacross the world. Impacts of inbreeding aremainly deleterious. This social phenomenon having implications on human health can only be controlled by cultural response.

Inbreedingmeans marriage between close relatives who consider themselves having common ancestor a few generations back. The degree of consanguinity depends upon the distance of relationship and it also varies from society to society.

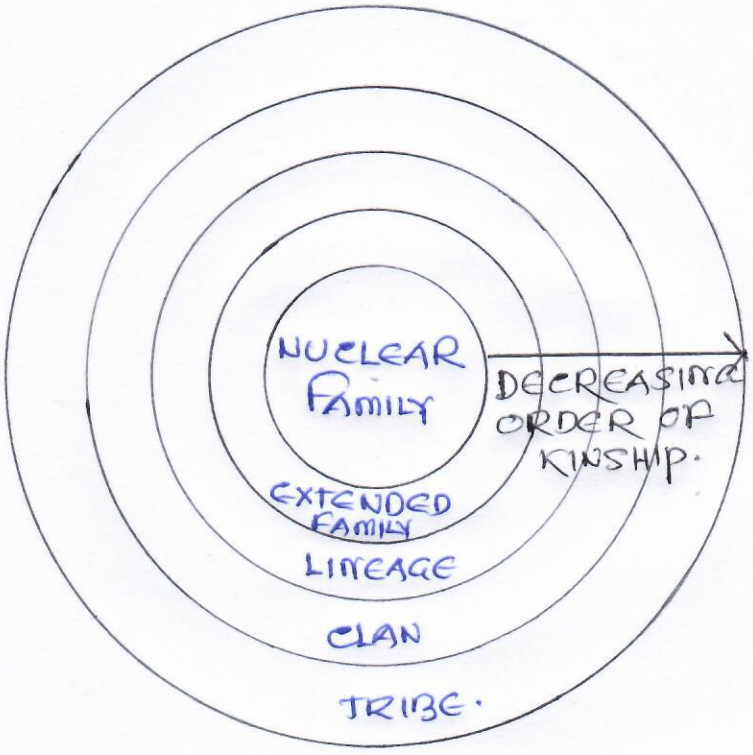


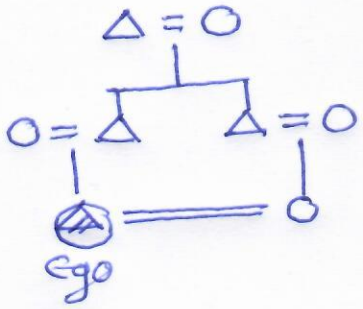
Fig: showing decreasing order of closeness from society to society.

Thus, highly consanguineous marriages are between fathersand daughters, mothers and sons, and brothers andsisters. It is because a large no of genes shared by them.

TYPES OF CONSANGUINOUS MARRIAGE:Most common typesof close marriagesare parallelcousin marriages and cross cousin marriages.

Parallel cousin marriage: Marriage between offspring of same sex and same generation having common ancestry. It is divided into two types such as paternal parallel cousin and maternal parallel cousin marriage.

Parallel cousin marriage:



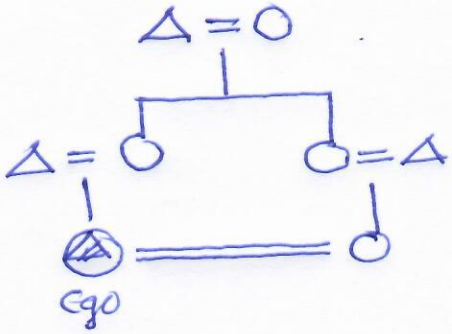


Fig: Paternal parallel cousin marriage. Fig: Maternal parallel cousin marriage.

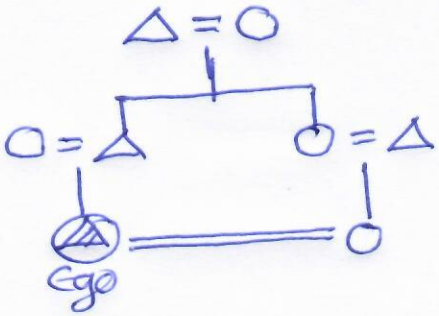
Whereas, △ = male, ○ = female, △=○ - married couple,

△=○ Parents

Children.

Cross cousin marriage: Marriage between offspring of different gender and same generation having common ancestry. It is divided into two types such as paternal cross cousin and maternal cross cousin marriage.

Cross cousin marriage:



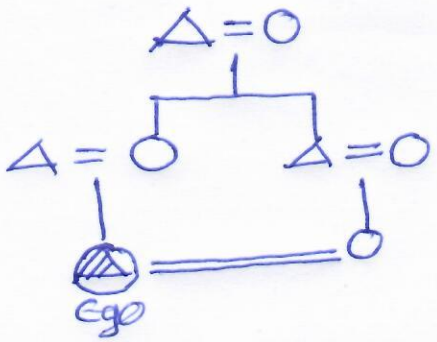


Fig: paternal cross cousin marriage, Fig: maternal cross cousin marriage.

Impactsof inbreeding:Inbreeding has no effect on the inheritance of dominant alleles but haseffects on that of recessive alleles in the following ways:

1. Effects of inbreeding or consanguineous marriage in the short run: Close relatives share several alleles or genes in common. Because of inbreeding the probability of carrier mating another carrier increase. Consequently, there is increasing homozygosity of recessive alleles or recessivegenetic disorders get exposed or appear in the population.Example-1:Although 0.1 % of marriage in USA is between first cousin. However around 8% of albino children is found among them.
   Example-2: Dwarfism is prevalent among the Amish people in Pennsylvania in USA. The number of Amish people is small and do practice inbreeding to maintain cultural identity. There is found a high percentage of some rare allele such as one responsible for ELLIS-VAN CREVALD syndrome, characterized by dwarfism, polydactyly and malformed heart etc. the syndrome is very rare with fewer than 50 cases are found outside the Amish population but among the small Amish population around 45 cases are known.
   Example-3: Recessive autosomal disorders are quite frequent among the communities practicing cousin marriages.
   Effect of inbreeding in the long run: Inbreeding is not always considered to be harmful. It is found that people who have a tradition for hundreds of years of practicing consanguineous marriage or inbreeding, do have the incidence of harmful recessive alleles less or nil. Since consanguineous marriage of much longer duration reduce the proportion of homozygosity through natural selection i.e. through the death of individuals, harmful recessive alleles are lost from the population. There by normal alleles continues in the population. Thus, in the long run the net result of consanguineous marriage is like those populationswithout such practices.Because of elimination of recessive alleles, population looses genetic diversity in the gene pool. Since environment is ever changing, mutant gene though mainly harmful can be proved to be beneficial under changing environmental

circumstances.eg. Sickle cell allele can provide resistance against malaria.

Control of impacts of inbreeding: - Though inbreeding is mainly harmful and helps in the appearance of genetic disease in the population which cannot be cured at the present level of medical advancement. Hence, prohibition of inbreeding through incest taboo can reduce the impacts by preventing from the appearance of recessive disorder.

Thus, impacts of inbreeding are biological in nature which could be controlled by cultural phenomena i.e. incest taboo.