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Genes-A Double-Edged Sword

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It is said that the human body contains one hundred trillion cells. All of them, except mature red blood cells, have nuclei. The nucleus is the central, more-or-less encapsulated portion of the cell that contains the life controlling activity. Each nucleus contains 23 paired chromosomes. One chromosome of each pair is from each parent. Usually we speak of 22 pairs plus the X and Y chromosomes, for these are the ones that determine the sex of the offspring. A female has two X chromosomes-one from the mother and one from the father. A male has one X (from the mother) and one Y (from the father). So we see that the father is the one that determines the sex of any child. If the Y chromosome has a gene for hemophilia, it is easy to see that all the males in the family will have this disease. None of the females will have the disease, because there is no Y chromosome to carry the disease-causing gene. Maleness and male characteristics, as well as some other diseases, are carried by the Y chromosome and are manifested only in the males of the family. Femaleness and female characteristics are carried by the X chromosome from the mother. The X chromosome from the father is required to manifest the baby as a female.

Within each chromosome is the tightly folded DNA (deoxyribonucleic acid), which is the double-helix arrangement of molecules that divide symmetrically in order to reproduce the host cell exactly. DNA was discovered in 1952, and since 1953 its chemical structure has been mapped. Each individual determining factor of DNA is called a "gene," and there are billions of them. It is being learned that the genes determine, individually or in groups, all of the physical characteristics of a person as well as the body's ability to allow certain diseases or gross malformations. Certain genes may also be the direct cause of diseases. This leads the scientist and the philosopher to visualize a time when we know enough about the billions of genes to predict the characteristics and health of the person.

Research is coming up with identifications of up to 300 genes per day, and new disease sites at about one a day. There is continuing research on the various methods through which genes can be either repaired if damaged, replaced if defective or removed if mutated. There has also been some success in causing "whole" genes to enter the cells of a sick person to overcome the disease. Even at present a genetic profile can determine whether the embryo, in utero, carries the identification markers for certain diseases.

In utero genetic screening may also determine if the fetus has a serious inhereted disease or the pattern to develop the disease later in life. In some cases it is possible to change this genetic pattern and prevent the disease from developing. This, however, is rare. Thus we see developing a double-edged sword with our increasing knowledge. Politically, it is possible that genetic screening could be used to attempt to control the type of children produced. Insurance companies may be able to accept or reject clients according to their propensity for long and healthy life. Many horrible plots can be imagined. However, by voluntary effort and continued research, a healthy and happier future is possible.

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