gives the egg certain information about the way it is to develop and function.

Mr. Gilbert: Mr. Speaker, I wonder if the hon. member would permit a question.

Mr. Haidasz: After I have finished my speech, if the hon. member does not mind.

Mr. Gilbert: The answer to my question would greatly elucidate what the hon. member is saying.

Mr. Haidasz: If the hon. member does not mind, I shall answer questions after I have finished my speech. Through mitosis these genes are reduplicated and appear in each nucleated somatic cell of the body. The reason for this is that in order for genetic information to guide the development of the organism, the information which is carried by the genes must reach to each cell cytoplasm. It is through the desoxyribonucleic acid component of the chromosome that information is transmitted, and it is the particular order at some particular place on the chromosome that determines a particular function in deciding the nature of the cell that it is in. This information must be transmitted from the gene to the cytoplasm. It is thought that this is probably performed through the ribonucleic acid that is synthesized in the nucleus and in some way receives the patterns determined by the desoxyribonucleic acid component.

Mr. Gilbert: That was quite a mouthful.

Mr. Haidasz: The ribonucleic acid migrates to the cytoplasm and imprints corresponding patterns on the enzymes, globulins and other large molecules being synthesized there. This concept of the work of DNA and RNA is similar to that of some process that reproduces a pattern by a cast or template and is referred to as the template hypothesis. At our present state of knowledge, this is the accepted explanation of how the child receives from its parents the blueprint that guides its development and function. The template hypothesis has been confirmed recently by new developments in the study of abnormal human hemoglobins. It has been discovered that sickle-cell disease is caused by a change at a single gene locus and is characterized by a normal hemoglobin. In sickle-cell disease it seems that both normal and sickle cells produce their own type of hemoglobin, and this is what one would expect according to the template hypothesis.

Genes are also known to determine the presence or absence of enzymes, the antigenic specificity of the red blood surface, the nature of the serum globulins and many other biologic properties of the organism. The template hypothesis suggests that with any recessively inherited disease in which there is a known biochemical defect it should be possible to detect the gene in clinically normal carriers by the appropriate tests. Tests of this nature can be used to demonstrate such diseases as galactosemia fibrocytic disease of the pancreas, glycogen-storage disease and an increasing number of other errors of metabolism.

Another interesting development in medical genetics is the demonstration of chromosomal diseases. Recent improvements in the techniques of observing human chromosomes now make it possible to count them accurately and identify them by their length and shape. The presence of an extra chromosome is evidence of Downs' syndrome which results in a mongoloid child. Also, abnormal chromosomal numbers have been demonstrated in Turner's syndrome and in Kleinfelter's syndrome, diseases which affect the sexual physiology of the offspring.

How can medical practioners benefit by and contribute to understanding the advances in medical genetics? First, this can happen through research. The practitioner has the best opportunity to know family groups and there is a great deal which can be learned about the inheritance of disease. For example, observing the occurrence of unusual conditions in several members of the family may provide a clue to identifying new genetic disease. The medical practitioner can also benefit from medical genetics in the early diagnosis and treatment of his patients. Knowing that another member of the family has a particular disease could be a useful clue to determining the patient's condition. Knowing that there is genetic disease in the family can be of invaluable assistance in early diagnosis.

Early recognition is vital in conditions where early treatment may prevent irreversible consequences of disease, especially at childbirth. The siblings of a child with phenylketonurea can be tested in early infancy for biochemical abnormalities associated with the disease. This disease can be treated with a suitable diet. Early identification can prevent irreversible changes occurring in either the brain, glands or the liver, and it is through prophylactic therapy that the defects of some genetically inherited diseases can be ameliorated. For that reason, Mr. Speaker, knowledge of the former history of the disease patterns of a family may be of great value to the physician as well as parents seeking advice concerning family planning.

• (5:50 p.m.)

Much has been said about genetic counselling. I do not intend to dwell deeply on this aspect of genetics. I merely say that parents of a child with a genetically transmitted disease usually want to know the chances if the same condition may occur in the future. The family physician in this case may be the best qualified person to interpret the risk figures to the parents in terms that make sense to them.

Due to the medical advances, especially in the twentieth century, one unavoidable consequence of this progress is that where in the past people with hereditary disease tended to die young or were unlikely to have children, improved methods of treatment are greatly increasing their chances of reproduction. There is little doubt that there will be some increase in inherited disease. It may be necessary to counsel parents to limit the size of their families if they are known to carry genes of a deleterious nature. The decision, of course, whether to limit family size is an individual one which must be