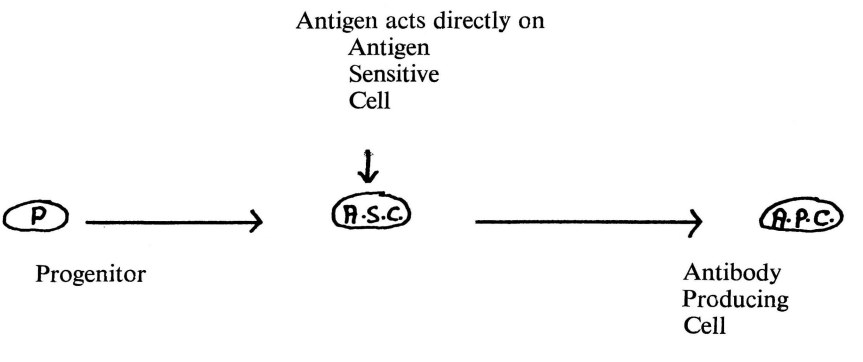
PANEL II: EVOLUTION AND DEVELOPMENTAL BASES OF IMMUNE REACTIVITY

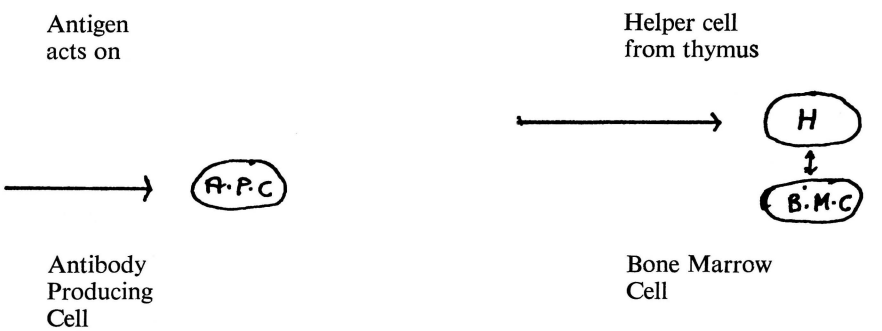
Reporter - TOM MARRIE

Dr. James Ebert from the Department of Embryology of the Carnegie Institution of Washington in Baltimore chaired this panel. He stated that immune reactivity is confined to the vertebrates. In the development of immune reactivity there exists at some time in the life of an individual a cell, or group of cells capable of responding to an antigenic stimulus. From some source these cells move into the thymus and become determined in an immunological sense. He raised the question of the origin of the cells that are determined in the thymus.

The cellular aspects of antibody production with emphasis on the control mechanisms in antibody production were considered by Dr. Osoba from the University of Toronto. He concluded by postulating two models:



Model I



Model II

Dr. Oliver Smithies from the University of Wisconsin postulated how the ability to recognize foreignness and distinguish self from non self arose. He noted that only those animals which have a tolerance mechanism will be able to reject grafts. Immune mechanisms are advantageous in handling viruses. When a virus leaves an infected person it carries some of his cell membrane with it. Now the host can react against the foreign cell membrane. Apparently self recognition is not confined to the animal kingdom. The lily has an arrangement so that if pollen from itself falls on the stylus fertilization does not occur. However if fertilization by foreign pollen does not occur within five days then self fertilization can occur.

PANEL III: IMMUNE RECOGNITION AND TRANSPLANT TOLERANCE

Reporter - MABEL GREENE

This panel began by introduction of the speakers by Dr. N. A. Mitchison. Dr. Roberts, started his immunology with Sir Howard Florey in Oxford. Dr. Roberts has recently joined the staff of Memorial University and previously had been a member of the Department of Medicine in New York University.

Dr. Roberts began by showing slides of lymphocytes, and describing them as undistinguished cells smaller than a red blood cell which if cultured in pure preparation and then cultured with phytohemagglution will develop into large pyronenophylic basophilic cells which are fundamental to the immunological responses. These large cells continue to move like small lymphocytes but in contrast to lymphocytes however they are somewhat inherent to each other. Both blood and thoracic duct lymphocytes unlike leukemic lymphocytes react in this way. Besides phytohemagglution, other ways of stimulating small lymphocytes exist such as plant extracts, staphylococcal filtrate and antileukocytic serum. It has been shown that when the serum balanced RBC'S are injected into rabbits they cause stimulation of lymphocytes when added to a lymphocyte suspension. Likewise, homologous sera cause the same reaction. Further study has shown that lymphocytes from different donors mixed together in cultures will cause transformation.

Dr. Marshall discussed the tuberculin reaction in cultured lymphocytes. Lymphocytes from Mantoux positive individuals cultured with tuberculin are shown to increase in number by convect proliferation. Practically speaking, these experiments indi cate that when lymphocytes of a patient are faced with antigen from a donor, a small number respond by growing and dividing, the others being capable of responding to all sorts of other antigens. These cells grow big and it should be possible to actually remove them by filtrating or centrifuging. So, if you had a specifically inactivated population unable to react to that antigen you could then introduce the graft into this environment and it would not be rejected.

Dr. Mitchison then spoke on immunological tolerance and immunosuppressants. One type of interference is blocking the access of antigen to the immunologically competent cell. This is seen in blocking RH sensitization where introduction of antibody competes with the antigen for sites on the cell thereby limiting the amount of antigen picked up. A second type of interference is inhibition by haptene. A third type is absorption of the formed antibody by preumococcal polysaccharide. The fourth and considered the most important group of immunosuppressive agents are the antimitotic drugs which block multiplication of cells which follows the natural act of recognition. There are hazards with these drugs, however, because they act in a non specific manner and thus leave the individual open to infection. The newest type of immunosuppressive drug is antilymphocyte serum (ALS) which is believed to act by selective destruction of the cell which is the immediate target for antigen i.e. the cell which performs the initial act of recognition.