more completely the influence of genes on each other in biochemical terms.

The fact that the group substances possess a characteristic immunological specificity which is gene controlled and which sharply differentiates one type of mucopolysaccharide from another establishes these materials as markers of outstanding value and, in the field of human biochemical genetics, they can be used to examine the possibility of gene interaction. This important aspect will be considered later in this session by Dr. Winifred Watkins, who will present some interesting information we have obtained about the multiple group specificity of the group substances and will suggest a possible scheme involving a sequence of steps in the formation of the ABH or Lea specific substances in the body.

Much remains to be done but I believe that the information collected in the last few years has allowed the biochemist to make a useful contribution to the basic knowledge required for more complete control and understanding of blood transfusion, and to add to the broader and rapidly growing subject of human biochemical genetics.

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Phenogenetics of Blood Group Specificity in Man

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Abstract

Blood group antigens are usually inherited as simple Mendelian traits and the current opinion regards them as the immediate product of one corresponding unit of inheritance, in accordance with the template theory of gene action. Actually blood group antigens are complex macromolecules and their serological specificity derives from relatively simple chemical groupings ; thus the question arises whether one unit of inheritance is directly responsible for the synthesis of the macromolecule as a whole, or of only some serologically significant groupings.

In regard to ABO and Lewis blood groups and soluble substances the available biochemical and genetical data suggest that: 1. more than one serological and genetical specificity may be carried by the same macromolecule (A and B, A and H, A and Lewis) ; 2. the final product is at least in some instances reached through a series of metabolic steps (the synthesis of H, controlled by the Xx locus, is necessary for the action of the AB genes) ; 3. interaction of genes at independent loci may induce a new serological specificity ($X + Sec + Le = Leb$).