

The advance in bacteriology in the last few years has been more and more developed along the chemical side, for the aim of research in this department has been to determine the nature of bacterial products and how they are disposed of in the animal cell. Considering the number of species of pathogenic bacteria and the polyphasic activity of living matter, it is not unreasonable to assume that the chemistry of microorganisms causing disease will enlist the enthusiasm of armies of researchers.

All this shows that the development of the next two or three decades is to be along chemical lines, with methods transcending those now in use and with a basis of knowledge that is to be broader, deeper and surer than we now possess.

The reason for the coming advance is that which has promoted the development of the last ten years. It is clearly recognized by those who concern themselves with such problems that the essential phenomena of disease are fundamentally the result of chemical interaction, that when an organ or a tissue becomes affected with disease the processes involved are all chemical or physico-chemical. In the case of diabetes mellitus, for example, the complicated chemical processes that are involved in the utilization of the sugar of the body are altered or do not occur, and, in consequence, nutrition is disorganized. In inflammation, in pneumonia, in typhoid fever, and tuberculosis the processes, although due to microorganisms, are themselves fundamentally chemical just as much as those in gout, rheumatism and rickets. In fact, there is no abnormal condition of the body or of any of its organs, not excluding even the malignant growths, that is not fundamentally of chemical causation.

I desire to emphasize the chemical causation of disease because, in the first place, although it is in many quarters tacitly or openly accepted, it is not allowed in reality its right place in any survey of disease, and, in the second place, because this is the line along which medicine is yet to win its great triumphs. It is the recognition of the overwhelming importance of physiological and pathological chemistry to the science of disease that has caused the extraordinary increase in the army of workers in this field.

The activity of these researchers will inevitably result in solving many of the problems which now appear so difficult and obscure. It will involve also such an addition to knowledge in this department that the whole subject will be revolutionized. Every advance in the science of disease means a limitation of the present crude treatment of disease, a growing disuse of the drugs and chemicals to which the physician of to-day resorts, and it will render possible more and more either the