REPORT OF THE DIRECTOR OF THE HOSPITAL

June, 1914.

Owing to the brief period intervening since the last meeting of the Board and to the fact that the year is approaching a close, very little new work has been undertaken in the hospital, and the activities of the Staff have been confined mainly to the completion of work reported as in progress in the last report.

Pneumonia During the year 73 patients suffering from pneumonia have been treated in the hospital. A complete statistical study of these cases has not yet been made. The type of organism concerned has been determined in all cases.

In addition to the cases studied here, the type of organism has also been determined, by means of immune serum sent out from here, in the Kings County Hospital, in Brooklyn by Dr Lyle, in the Brigham in Boston by Dr. Walker, and in the Pennsylvania Hospital in Philadelphia under the direction of Dr Lewis. These observer have had satisfactory results in determining the types of organism in about one hundred and fifty cases. Sera have been sent also to other hospitals, but reports have not yet been received. When this material is all collected, we shall have considerable data as to the relative frequency of occurrence of organisms of different types in different cities Dr. Lewis in Philadelphia is now immunizing horses to the organism of type I and type II and expects next year to carry out serum treatment in the Pennsylvania Hospital according to the method employed here.

The next important problem as regards therapy is the emprovement of the method of treating cases due to organisms of type II. Whether this end will be attainted by concentration, ~~xxxxxxx~~ of the serum alone is not yet certain. Work is being continued on methods of concentration, and while a considerable number of facts have been determined in regard to the protein fractions which contain the protective substances, a practical method of concentration has not yet been devised. We hope to do this during the summer. It is probable, however, that an important factor in immunity against organisms of type II and Pneumococcus mucosus must be supplied by the infected organism. Efforts are being made to determine the nature of this factor.

Dr Avery has also conducted a number of experiments studying (a) the rate of disappearance of antibodies in serum;(b) the effect of inactivation on immune serum and the effect of the addition of complement on its efficacy;(c) the absorption of antibodies in immune serum by means of homologous and heterologous types of organisms. The effect of such absorption on agglutinins, precipitins, protective substances and also the effect on complement deviation has been tested. Experiments in regard to the bacteriolytic effect of immune serum are now being carried out. The published reports of these investigations will be made within a very short time.

The second important problem which we have had in mind in the studies on pneumonia is related to epidemiology. It is evident that it is of great significance to learn whether or not the fixed types of organisms are only present in the mouths of those infected with the disease, and whether organisms of these types quickly disappear during convalescence. Lastly it is important to learn, if possible, whether transformation of the types of organisms ordinarily found in the mouth into the more fixed types may or may not occur. From Dr Dochez's study it may briefly be stated that organisms of the fixed types are not ordinarily present in the mouths of healthy individuals. The patients who have been treated here for pneumonia are returning from time to time, in order that it may be learned whether or not the type of organism found during the disease persists. As previously stated, organisms of the fixed types have persisted for from two to three months following an attack of pneumonia. It is possibly significant that in these cases where the fixed types have persisted, delayed resolution has occurred. If it is shown by these studies that the fixed types are not ordinarily present in the mouths of healthy individual, though they may persist in the mouths of convalescent patients, these persons then acting as carriers, it is evddent that these observations may have considerable significance in devising means for the prevention of this disease. At present, however, these question are not fully answered, and it has seemed of importance that we extend these studies to a considerable degree in order to obtain definite information in regard to these points. The problem as to whether

transformation of the so-called atypical types into the more fixed types may occur in the mouth or not, and whether the occurrence of the disease may be due to such transformation, is an extremely difficult one to solve. It is hoped that by studying the antigenic properties of the organisms existing in the mouth during the disease and those of the organisms present during convalescence, some light may be shed on this question. Such work is now in progress.

Dr. Chickering has carried out studies on the agglutinating power of the patients blood for the type organisms and for organisms isolated from the patient's own sputum. This work is now ready for publication. Dr Chickering is also conducting some experiments to determine whether or not the antigenic properties of the organisms isolated from the sputum correspond to their agglutinating properties. To do this has required the immunization of a large number of small animals.

Dr Avery is also carrying out an extended series of studies on the fermentative reactions of pneumococcus in order to determine whether or not the different types of organisms show any difference in their fermentative reactions.

The work on pneumococcus toxins and on the production of methaemoglobin by pneumococci and on the haemolytic action of pneumococci has been completed and very soon will be ready for publication.

Diabetes: The work in diabetes has been continued along the lines outlined by Dr Allen in his extensive report at the last meeting. So far there have been three patients suffering from diabetes under treatment in the hospital, and the results of efforts to lower the total metabolism have been most encouraging. All of the three patients are now free from glycosuria and free of acidosis. They have all been clinically unfavourable cases. It is intended to continue this work quite actively during the summer, as Dr Allen will remain here during the entire time.

Syphilis. Dr Swift and Dr Ellis are now busy collecting all the material of the work on syphilis since the opening of the hospital, and it is hoped to publish this, probably as a monograph, during the coming summer.