difficulty in eliminating the products of protein metabolism, extracts, and necessary salts. Consequently we should cut down the foods that may irritate the kidneys, keep the milk low, cut out broths, meat, etc., and feed the child on carbohydrates, especially starches, diluted cream, and later green vegetables and fruits.

Dr. T. C. Allen, Chicago: I have seen two cases that I was absolutely sure were scarlet fever and in which I could find no desquamation. That there are often cases without desquamation is to be assumed, as we frequently get cases of nephritis with a history of sore throat but no history of desquamation. As to immunity in infants due to the fact that the mother is nursing the baby, Dr. Van Derslice did not say whether or not of his patients who had the disease and the mother had ever had scarlet fever then his case may be taken as an exception to the law that in general communicable diseases produce antitoxins or antibodies in the blood and that these being present in the milk confer a certain amount of immunity on the nursing child. If this mother never had scarlet fever then this case is a confirmation of the law rather than an exception to it. Dr. Van Derslice, however, is correct in believing that previous disease in the mother does not always confer immunity on the nursing baby. I recently saw a case of measles in a nursing baby six months old and I know that this baby's mother once had the measles. I have been in the habit of examining the urine of my scarlet fever patients every two or three days, but I think that Dr. Ker-

ley's plan is a better one. I commend especially his plan of leaving the necessary test tube and reagent at the home of each patient.

Dr. W. W. Betterworth, New Orleans: Dr. Morse brought out the fact that the nephritis is due to the oxinemia and it seems to me this part of wisdom not to use drugs that would only tend to precipitate such a condition. For that reason I would be opposed to the use of chlorate of potash. I think that possible the blood picture will help us to clear up the matter of diagnosis. Our experience has led us to believe that sodium sulphite or sulphurous acid may have some value as a prophylactic in this condition. It can not have any injurious effect. If it is given to children in whose surroundings scarlet fever exists, my conviction is that none of these children will develop the disease.

Dr. R. B. Blair, Lebanon, Ohio: I agree with Dr. Kerley as to the limited infectiveness of the disease in the early period of scarlet fever, also that it diminishes in infectiveness after three weeks. I also believe the danger of contagiousness is in the disease from the nasal discharge or from the discharge in otitis media so common in these cases, and also the discharge from a supplicative adenitis. I should like to ask whether it is possible by the reaction of the urine to determine whether a case of hemorrhagic nephritis is the result of scarlet fever. Hemorrhagic nephritis, I understand, more often follows scarlet fever than it does diphtheria. I had a case a few years ago that I thought was diphtheria. There was no eruption and no desquamation. A hemorrhagic nephritis developed, but an ounce of urine was voided within twenty-four hours and on being boiled it became consolidated. There was a general edema and edema of the lungs. Was that case one of scarlet fever rather than diphtheria?

Dr. T. C. Cooley, Detroit: The question has been raised whether there is any possibility of a specific diagnosis of scar-

let fever. I want to call attention to Scherelewsky's recent work on a blood reaction in scarlet fever analogous to that observed by himself and Forrester in syphilis. This was published in one of the late numbers of the Minneapolis Medical Society. This work seems to be promising. Another thing of importance is the observations made in the London fever hospitals on the infectiveness of the later desquamation. They have been releasing patients in the late stages of desquamation, and there has been no increase in the number of "return cases." They lay more stress on the infection of discharge from the mouth, throat, and ears. It is a question whether diphtheria per se is ever infectious.

Dr. C. G. Kerley, New York: In reviewing the 615 cases I had no idea of going in detail. I attempted only to give the results in some essential points. As to the late desquamation not being infectious I made that statement advisedly. Whether it is wise to teach it is another thing. What we all want is the truth. I have repeatedly seen children during the latter stages of desquamation play with their fellows and other unprotected children in their own family, and these unprotected children did not take the disease. There must be some definite time at which a child who once had scarlet fever may return to his usual life. It is a safe rule that this time shall be at the completion of the desquamation period. In both of the cases of secondary desquamation in the child referred to, many unprotected children were exposed and not one developed the disease. One of these was in a summer hotel where the child came into contact with dozens of the unprotected children. The determination whether we have a streptococcus or Klebs-Loeffler infection to deal with will not help us very much. Only last year I had two cases of streptococceous membranous laryngitis. Examination of the membrane failed to show the diphtheria bacillus. Three other cases of this nature have been reported. I believe that in all severe cases the non-milk diet is the best one. The diphtheria antitoxin is of value only if there is a Klebs-Loeffler infection. There is absolutely no reason why it should be used under any other conditions.

As to the use of chlorate of potash, the danger from its use has been greatly over-estimated. When used in rational dosage, instead of being of danger to the kidneys, I believe that it worked extraordinary well. It proved to nephritis. I believe that when we keep the throat as free as possible from infectious material we are doing much to ameliorate the general condition. The throat is unquestionably a distributing center for the contagion and other infections. If chlorate of potash had had the effect on the kidneys that is credited to it, the combination of chlorate of potash and iron used in thousand- and thousands of cases of scarlet fever and diphtheria would have resulted in the death of nearly all to whom it was given. The chlorate in small doses, three or four grains at two-hour intervals, six doses in twenty-four hours, whether in measles, scarlet fever or other illnesses, has no more effect in producing nephritis than has diphtheria antitoxin in producing paralysis. As to the use of cold air I did not mean to imply that I marvels the child, put him before a window, and let cold air blow on him. Such a procedure is not necessary in order to give the child fresh air.

Dr. C. F. Wahier, Fort Madison, Iowa: No less a man than Senator, of Heidelberg, advised the use of bacon-rod. I would not insist on bacon-rod; in fact, I advise the use of lard, with some mild antiseptic, as boracic or salicylic acid, but the bacon-rod is better than nothing. I do not know whether we find more cases of hemorrhagic nephritis in the following scarlet fever cases than we do following diphtheria, but I believe that there are. Scarlet fever and diphtheria are very much alike in many respects, and we have many of the same sequelae, so that it is not necessary for the doctor to assume that he had a case of scarlet fever without the eruption. We know that cases of diphtheria, diagnosed by the presence of the Klebs-Loeffler bacillus, have been followed by nephritis.

CHILDREN OF THE TUBERCULOUS.

THEODORE B. SACHS, M.D.

CHICAGO.

A study of autopsy statistics, with reference to occurrence of tuberculous lesions at various periods of human life, discloses a vast discrepancy between the great frequency of postmortem evidence of tubercle infection and the rate of mortality attributable to the disease itself.

The figures drawn from postmortem findings vary according to the source of material, age at death, inter-

* Read at the Fourth Annual Meeting of the National Association for the Study and Prevention of Tuberculosis, held in Chi-

cago, June 5-7, 1908.
preparation of lesions, exclusion of patients dying from tuberculosis, etc.

From Heitler's post-mortem records, giving a percentage of 4.7 of obsolete tubercle in 16,563 cases, up to Nägeli's astonishing estimate of 99 per cent., there is a vast number of observers whose figures vary between 30 and 70 per cent.

Autopsies on children dying from various causes show an increase in the frequency of tuberculous lesions with the progress of age, as would be expected from the gradually accumulating opportunities for infection.

Professor Ganghofner (quoted by Bulstrode) presents the following results of eighteen hundred autopsies on children dead of diseases other than tuberculosis:

<table>
<thead>
<tr>
<th>Tubercle Infection in Children Dying of Other Diseases.</th>
<th>No. cases</th>
<th>Age in Years</th>
<th>Percentage Infected.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-5</td>
<td>6.0</td>
<td></td>
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<tr>
<td></td>
<td>6-10</td>
<td>4.1</td>
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<td></td>
<td>11-15</td>
<td>2.7</td>
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<td></td>
<td>16-20</td>
<td>2.4</td>
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<td></td>
<td>21-25</td>
<td>2.0</td>
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<tr>
<td></td>
<td>26-30</td>
<td>1.8</td>
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<td>31-35</td>
<td>1.6</td>
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<td>36-40</td>
<td>1.4</td>
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<tr>
<td></td>
<td>41-45</td>
<td>1.2</td>
<td></td>
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<tr>
<td></td>
<td>46-50</td>
<td>1.1</td>
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<td></td>
<td>51-55</td>
<td>1.0</td>
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<td>56-60</td>
<td>1.0</td>
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<tr>
<td></td>
<td>61-65</td>
<td>1.0</td>
<td></td>
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<tr>
<td></td>
<td>66-70</td>
<td>1.0</td>
<td></td>
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<tr>
<td></td>
<td>71-75</td>
<td>1.0</td>
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<td></td>
<td>76-80</td>
<td>1.0</td>
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<td></td>
<td>81-85</td>
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<td></td>
<td>86-90</td>
<td>1.0</td>
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<tr>
<td></td>
<td>91-95</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>96-100</td>
<td>1.0</td>
<td></td>
</tr>
</tbody>
</table>

These figures have reference to children of the poor and may possibly be found high for children of all classes. The fact is, however, obvious that the extremely frequent incidence of tuberculous infection at various ages, as disclosed by post-mortem findings, is out of all proportion to the actual development of the disease or its fatality.

Corbet, in his volume on tuberculosis in Nottage's "Practice," gives the mortality from tuberculosis in children under 15 years of age to each ten thousand of the living population as 8.85 per cent., for males and 10.44 per cent. for females, the proportion being much higher for the succeeding periods of life, viz., between 20 and 30 years of age, 31.68 per cent. for males and 29.14 per cent. for females. His figures show a comparatively high mortality in the first year of life, a gradual decrease up to ten years, and then a progression in the number of cases for each following decade until seventy.

Investigation: (a) Frequency of Tuberculosis among Children of Tuberculous Parents; (b) Infection as a Factor.

If autopsies on children of various classes disclose, in a large proportion of cases, imprints of tuberculosis in the lymphatic system, lungs and other organs, the children of tuberculous families, in constant contact with the ever-present source of infection, must of necessity furnish a much higher percentage of cases.

The present investigation was undertaken with the object of determining, if possible, the prevalence of tuberculosis among children of tuberculous parentage; with this in view, 146 families with one or both parents known to be tuberculous, were selected from the records of the Chicago Tuberculosis Institute, the Visiting Nurse Association and my private practice.

The parents were classified as follows:

<table>
<thead>
<tr>
<th>Tuberculous Patients</th>
<th>Fathers</th>
<th>Mothers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>42</td>
<td>22</td>
</tr>
</tbody>
</table>

In seven families both parents were tuberculous. Fifty-eight per cent. of all deaths from tuberculosis among the parents occurred within one year preceding the investigation; 79 per cent. within two years.

The families were of the average laboring class, living in the poorer districts of this city, in most cases impoverished by the protracted illness of father or mother. It is evident, then, that the prevalence of tuberculosis among children under such conditions was dependent on the operation of various factors, as close contact with the source of infection, generally an unhygienic and crowded home, and poverty with all of its attendant unfavorable conditions of life.

The results of the investigation were as follows:

<table>
<thead>
<tr>
<th>Total number of families, 146.</th>
<th>Non-Tuberculous Deaths.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Born before parent became tuberculous, 108</td>
<td>Died, 365; Living, 290</td>
</tr>
<tr>
<td>Born after parent became tuberculous, 104</td>
<td>Died, 114; Living, 34</td>
</tr>
<tr>
<td>Total, 212</td>
<td>Died, 479; Living, 222</td>
</tr>
</tbody>
</table>

An estimate of the incidence of tuberculosis among these children can be drawn from the consideration of 72 families, in which the entire number, viz., 264 children, were examined; in 16 of the children, 29 per cent. of the total number, positive evidence of tuberculous infection was found (among children under 10 years of age the percentage was 23).

An investigation of the same seventy-seven families gives a total of 28 per cent. of tuberculosis for the children born before the parent became tuberculous and 31 per cent. for those born after; the higher percentage of tuberculous cases among the second category of children can not be solely ascribed to the lower resistance of children born of parents tuberculous at the time of their conception; consideration must be given to the effect of poorer surroundings, into which the tuberculous sufferer gradually drifts with the progress of his disease, as well as to the closer contact of younger children with the source of infection.

The mortality from various causes in the first group of cases was 20 per cent.; in the second, 26 per cent. Of the entire number of deaths up to the time of the investigation, 47 per cent. occurred in the first year of life, 16 per cent. in the second.

Ten per cent. of the mortality was ascribed to tuberculosis, 35 per cent. to whooping cough, pneumonia and measles, diseases the designation of which frequently obscures the real cause of death among tuberculous children.

Ninety per cent. of the examined children were breast-fed.

Basis of Diagnosis.

Of 171 children found to be tuberculous, 42 (or 25 per cent. of the total number) were above 20 years of age; this was responsible for a considerable increase in the total number of tuberculous cases, as well as the greater frequency of lung findings.

Fourteen individuals, mostly over 20 years of age, had tubercle bacilli in the sputum.

In 12 the diagnosis was based on physical signs, pointing generally to involvement of one apex, combined with afternoon or evening rising of temperature, chronic cough in a few and a variable degree of constitutional disturbance in all. In the majority of those under 15 years of age the physical signs consisted of impaired resonance or absolute dulness over one apex, slightly modulated breath sounds, roughened or diminished, bronchial in a few, at times a slight retraction of one.
apical region and in a certain number of cases crepitation at the end of the inspiratory note. In none of these cases was the diagnosis based on physical findings alone, unless corroborated by the existence of fever, generally a half to one or one and a half degrees above normal, and various other symptoms.

Of the remaining other 83 cases, 9 presented suppurating cervical glands; 2 miliary tuberculosis; 3 pronounced general glandular enlargement, fever and other corroborative symptoms; 7 tuberculosis of bone and joints; 1 tuberculosis of the skin; 4 Pott's disease; 4 were cases of bronchitis, considered tuberculous because of recurring fever and positive tuberculin reaction; in 25 the diagnosis was based on history, general condition, fever and positive cutaneous tuberculin reaction; 20 presented signs pointing to the possible involvement of bronchial glands, the diagnosis being based on that, the accompanying fever, general condition and positive cutaneous tuberculin reaction; 10 patients, chiefly over 15 years of age, showed signs of an arrested tuberculous lesion in the lung.

These cases were distributed among the following ages: Four under 1 year of age, 16 between 1 and 5 years, 36 between 5 and 10, 43 between 10 and 15, 50 between 15 and 20, and 43 above 20.

One hundred and six of these patients (chiefly those under 15 years of age) were subjected to the cutaneous tuberculin test, with the following results: Eighty-three positive reactions, 12 doubtful and 11 negative.

**RANGE OF TEMPERATURE.**

Of the vast number of children infected in the homes of the tuberculous, only a fraction, at a given time, may manifest signs and symptoms of a rapidly progressing tuberculous bronchopneumonia, general or miliary tuberculosis, meninitis or any other fatal type of the disease. The disturbances of temperature met in this class of cases are too well known to require further description.

Of chief concern in this investigation were the predominant class of tuberculous children who either show slight, at times indefinite, signs pointing to the site of a small lesion in whom, even after a thorough study of the mild manifestations of the disease, only a general diagnosis of "tuberculosis" can be made.

If it is a small lesion in the apex or probable involvement of the bronchial glands, the accompanying fever may be mild, requiring systematic observation for its detection and a knowledge of the normal range of temperature of the individual child.

In order to obtain a basis for comparison, diurnal measurements of temperature were taken in 250 apparently healthy children in three institutions which recruit their infants from families of working men living in various parts of the city; this last condition was considered essential in order to parallel as much as possible the social and hygienic surroundings of the tuberculous children under discussion in this paper. Children suspected of being tuberculous, either on physical examination or on application of the cutaneous tuberculin test, were excluded.

The results of this investigation showed wide fluctuations of morning (9 to 10) and afternoon (4 to 6) temperatures.

In the ages between 5 and 10, the morning temperature, taken by mouth, varied between 99.4 and 100.4 F., the average being 99; the afternoon temperature, 97.4 to 100.5, average 99.3. For the ages between 10 and 15, the morning temperature varied between 98 and 100.2, average 98.2; afternoon, 98 to 100.2, average 99.2.

In the children pronounced tuberculous in this investigation the morning temperature, taken by mouth, for the ages between 5 and 10 years, varied between 97.6 and 99.6, average 98.3; afternoon, 98.3 to 101, average 99.7. Between the ages of 10 and 15, the morning temperature varied from 97 to 99.6, average 98.4; afternoon, 98.8 to 100.4, average 99.5. Between the ages of 15 and 20 the morning temperature was 97.4 to 98.6, average 98.2; afternoon, 99.2 to 100.2, average 99.6.

In a large number of cases the noon temperature was the highest of the day.

The present investigation led to the following conclusion:

1. A child infected in the surroundings of a tuberculous patient may show but a slight rise of temperature above normal, the rise not exceeding a few tenths to one degree.

2. This deviation from normal temperature may occur late in the afternoon (4 to 6 p.m.), in the evening, or frequently at noon.

3. The existing range of temperature of a tuberculous child is subject to considerable variations, caused at times by trivial factors.

4. The children in whom mild tubercle infection causes but slight deviations from normal range of temperature may display at times "waves" of fever, of a few hours' to a few days' duration, these disturbances being caused either by extension of the lesion or more vigorous absorption of tubercle toxins.

5. In order to gain an idea of the fluctuations in temperature of a child suspected of having tuberculosis, the temperature should be taken several times a day and for a reasonable period of time.

**HABitus Pithicus.**

At the time of their birth and in the first few years of life a vast majority of children of tuberculous parents may show in their general appearance no deviation from the normal type.

An offspring of a consumptive mother in the advanced stage of the disease may be handicapped from the outset by imperfect physical development, low grade of nutrition and lack of vital resistance—a condition characteristic of the various types of children born of parents in an undermined state of health.

Cornet and others suggest that the habitus pithicus encountered in a certain number of tuberculous individuals may be the result of antecedent tuberculous infection.

On measuring the chests of three hundred children in the families of tuberculous parents, I found that in the first year of life the type of chest, in nearly all, does not deviate from the almost circular normal type, the ratio of the anteroposterior and transverse diameters being 8 or 9 to 10. This ratio gradually changes to the average of 81 or 84 to 100 during the first five years, 77 to 100 between 5 and 10 years of age, 72:25 to 100 between 10 and 15, and 74 to 100 between 15 and 20 years.

Poverty and unfavorable home surroundings were partially responsible for the low grade of nutrition in about one-third of the 322 children examined.
INFLUENCE OF ENVIRONMENT.

The 156 families under investigation were of the class in which the combination of poverty and crowded, unhygienic home would naturally favor the spread of infection. This explains the higher percentage (29 per cent.) of positively tuberculous children.

In his paper on "Schools and Tuberculosis," read at the last annual meeting of this association, Dr. J. H. Lowman gave 26 per cent. as the number of positive and suspected cases of tuberculosis among children in more or less close contact with a source of infection. Grancher found 15 per cent. of positive or suspected cases of tuberculosis among 3,226 school children of Paris.

In our quota of cases all the children examined were in close contact with a prolific source of infection in their homes, the majority of the parents suffering from pulmonary tuberculosis in the advanced stage.

CUTANEOUS TUBERCLIN TEST.

The cutaneous tuberculin test of von Pirquet (25 per cent. solution) was employed in 217 children of the 322 examined.

RESULTS OF THE VON PIRQUET TEST.

| Age | No. Children | No. positive | Percentage positive | Percentage negative | Percent.
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16</td>
<td>8</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>1-6</td>
<td>58</td>
<td>25</td>
<td>43</td>
<td>57</td>
<td>100</td>
</tr>
<tr>
<td>7-14</td>
<td>108</td>
<td>53</td>
<td>49</td>
<td>51</td>
<td>100</td>
</tr>
<tr>
<td>15-20</td>
<td>38</td>
<td>17</td>
<td>45</td>
<td>55</td>
<td>100</td>
</tr>
<tr>
<td>20+</td>
<td>35</td>
<td>11</td>
<td>31</td>
<td>69</td>
<td>100</td>
</tr>
</tbody>
</table>

These figures agree to some extent with the result of the same test employed by Dr. Petruschky, whose article appears in the May number of Tuberculosis, the monthly publication of the International Tuberculosis Association.

Dr. Petruschky's results were as follows:

| Age | No. Children | No. positive | Percentage positive | Percentage negative | Percent.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>32 sucklings</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>1-4</td>
<td>22 children from 1 to 6 years</td>
<td>22</td>
<td>100</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>5-14</td>
<td>18 children from 7 to 14 years</td>
<td>22</td>
<td>100</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>15-20</td>
<td>69 children from 15 to 20 years</td>
<td>56</td>
<td>82</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

The rare occurrence of positive cutaneous tuberculin reaction in the first year of life is as significant as the gradual increase with age in the number of positive reactions.

The occurrence of 108 positive tuberculin reactions in our 218 cases, or 49.5 per cent., can be compared with the results of application of the test by von Pirquet to apparently healthy children (about 15 per cent.).

CONCLUSION.

Incidence or infection of children by tuberculous parents must, of necessity, vary with the different conditions of life.

Lack of hygiene, combined with enforced closeness of contact in the homes of the poor, facilitate the more widespread dissemination of the infecting agent.

While the detection of the well-developed forms of tuberculosis in children is possible with the aid of the present diagnostic methods, the implantation of the tubercle germ in doubt, occur in a wider circle of instances.

To what extent hereditary predisposition is responsible for the development of the disease in individual cases can never be determined, according to Cornet, until the factor of infection is completely eliminated.

2. Quoted by E. B. Baldwin in Osler's Modern Medicine.

The question of connection between tubercle infection in infancy and childhood and the manifestations of the disease in later life is still awaiting a solution.

The researches of von Behring, Calmette and others are gradually turning the trend of modern medical thought toward an interpretation of the term "predisposition" as a susceptibility of the tissues dependent on antecedent infection.

Of the large number of children infected through close contact with tuberculous parents, only a certain proportion present the well-known manifestations of a fully developed disease of the lungs or other organs; in the vast majority the incidence of infection remains unrecognized.

The increase in the frequency of tuberculosis with the advance of age from childhood to adult life makes it evident that eradication of tuberculosis in the human race can never be accomplished unless the child, first of all, is protected from infection.

In conclusion, I wish to express my appreciation of valuable services rendered in this investigation by Dr. M. Bisenthal, my associate, and the nurses of the Chicago Tuberculosis Institute and of the Visiting Nurse Association.

100 State Street.

THE PROBLEM OF HEART MALADIES.

ALEXANDER G. BROWN, M.D.
Professor of Theory and Practice of Medicine, University College of Medicine; Physician to Virginia Hospital.

RICHMOND, VA.

In the category of disease there are many problems. Chief among these are the cancer problem, the tuberculosis problem, and the problem of the infections. These widespread disease conditions, affecting many human lives, justly engage the attention of medical men. Every means of investigation and research looking to the protection of these immense interests should be thoroughly and completely exhausted. Each one of these problems has its peculiar and individual characteristics; each has its distinctive origin, its mode of propagation and its means of correction. But I wish to emphasize the importance of another problem, no less serious, no less widespread and no less vital to the welfare of mankind than those above referred to, and that is—the heart disease problem.

By the light of recent investigation of this subject, by the great advances made in the study of the cardiac processes, and by the success achieved from the new work over those formerly unsolved problems of heart pathology, medical investigators and clinicians have forced this important question to the front, where it is now receiving just consideration. In taking up the study of the heart problem (which, in a brief paper, can only be outlined), one should point out certain facts regarding present knowledge of the physiologic action of the heart, give a resume of the most prevalent causes producing abnormality of that organ, and show the agencies necessary to abridge the frequency of its occurrence or to make this disease process most impotent in its curtailment of the comfort and safety of persons.

To show that it is a question worthy of attention, I shall adduce two illustrations. I have before me an insurance report covering the cause of death of 9,592 selected white men, dying after reaching 21 years of age. These men were chosen as to vocation, being in