number of instances to free the system from excess of uric acid and to restore the body to its normal weight, whether the previously existing dyscrasia have resulted in excessive deposit of fat or in loss of weight. In the last-named cases a liberal quantity of milk may be taken in one of the many forms in which it can be prepared for the table without admixture with farinaceous substances.

I will now only turn for a moment to the objection most frequently advanced against the effects which it is claimed that the therapeutic movement has upon the dimensions of the heart, namely, that the diminution of the area of cardiac dulness is due to increased pulmonary inflation. In reply, it may be pointed out in the first place that increased inflation of the lung would not account for the indisputable physiological and therapeutic results of the treatment; that where the horizontal plane of the diaphragm changes as the result of the movements, it is found to rise and not to fall. There is one argument, however, which appears to me to be conclusive. It is that, under the influence of both baths and exercise, an apex beat appreciable by sight as well as touch may be observed in a few minutes to migrate towards the mesial line and at the same time to increase in force.

NOTE ON THE TREATMENT OF DILATED HEART AS PRACTISED AT NAUHEIM BY DR. SCHOTT.

By W. ALLEN STURGE, M.D., F.R.C.P.,
Nice.

At the recent meeting of the Association at Bristol an account was given by Dr. Wethered of a visit he paid to the baths of Nauheim for the purpose of studying the influence of the saline waters, combined with the system of gymnastics advocated by Dr. Theodor Schott, of Nauheim, upon diseases of the heart.

As I went through a course of these baths (but without gymnastics) in the past summer for a dilated and irritable condition of the heart, it may interest the readers of the *BRITISH MEDICAL JOURNAL* to have a short account of my experiences. I was seized with influenza in February, 1894, which took the form of acute muscular rheumatism (with alkaline phosphatic urine), pneumonia of a low type; and, later, moderate dilatation of the heart, with quick irritable, somewhat feeble pulse. As I found that no treatment would reduce my pulse below 100, I decided to go to Nauheim. There Dr. Schott found the apex beat to be about 2 centimetres outside the nipple line. I began to take baths on June 15th, and continued them three days out of every four until July 21st. After the bath I had massage according to Dr. Schott's special method. I made notes of my pulse (1) in the early morning, (2) before and after the bath, (3) before and after massage, (4) after going to bed at night.

The first marked change was in the early morning pulse, which, after three baths, was on June 19th, 64—a very marked descent in rapidity. The bath pulse (after walking) remained about 100 until towards the end of the treatment, but on July 17th it had come down to 96, and on July 21st to 88.

The after-massage pulse (lying down), which on June 20th was still as high as 82, was on June 22nd 72, and 64 on July 8th, at which point it remained stationary. It is worthy of note that though the massage was vigorously carried out, it produced a slowing, and not a quickening, of the pulse.

The evening pulse (lying down), which varied from 82 to 86 during all the earlier part of the treatment, came down suddenly on July 13th to 72, and rarely much exceeded that rate afterwards.

At the end of the treatment Dr. Schott noted that the apex beat was one centimetre within the nipple, and the sphygmograph showed a pulse of good average fulness and tension.

It is a fact of some interest that on each occasion when there was a sudden drop in the pulse rate, namely, on June 19th, when the early morning rate (which had hitherto ranged between 80 and 90) dropped to 64; and again on July 13th, when the evening rate dropped suddenly to 72, the sudden drop was accompanied by an absolutely sleepless night, with great nervous erythema. This fact points to a pos-

sible explanation of the action of the baths—the explanation, in fact, put forward by Dr. Schott. This is, the soaking of the skin in very strong, warm brine, produces a powerful stimulant effect on all the surface nerve endings. This in its turn being passed up to the nerve centres, acts as a strong tonic on them. Hence the good effect produced on weak centres—such as the heart centres in cases like mine. When the stimulation was so great as to produce a sudden marked change in the pulse, the general centres being over-stimulated would behave as mine did on these two occasions.

The gymnastics, about which so much has been said in connection with the Nauheim treatment, were tried in my case, but they seemed to irritate the heart, and were discontinued. This was probably due to the fact that the muscles of the limbs were still to some extent under the influence of the rheumatism from which they had suffered, and owing to stiffness the resistance they offered to movement was greatly augmented, and hence the increased heart's action under gymnastic treatment.

THE MILROY LECTURES ON THE NATURAL HISTORY AND AFFINITIES OF RHEUMATIC FEVER.

Delivered before the Royal College of Physicians of London, 1 March, 1895.

By ARTHUR NEWSHOLME, M.D. LOND., M.R.C.P.,
Medical Officer of Health for Brighton.

[ABSTRACT.]

LECTURE I.

AFTER a brief sketch of the history of the word "rheumatism," the lecturer outlined the different theories of its causation, and stated that his lectures would be restricted strictly to the consideration of rheumatic fever, which he regarded as a specific febrile disease, caused by a pathogenic micro-organism, endemic throughout Europe and America and other parts, and at times becoming epidemic, or even pandemic. Such a view did not exhaust the entire causation of the disease. It had certain relationships to season, locality, weather, climate, and ground water. It occurred chiefly in certain predisposed persons, under the influence of certain excitants, as injury or fatigue.

EPIDEMIOLOGY OF RHEUMATIC FEVER.

Epidemics were described by Pringle, Stoll, Mertens, and others in the eighteenth century. Their true character was doubtful. Senator had described unusual prevalence of the disease in certain years, but denies "the essential feature of an epidemic-infective power." Longstaff had noted the occurrence of four periods of excessive mortality shared by scarlet fever, erysipelas, pyæmia, puerperal fever, "rheumatism accompanied with heart affection," and five other diseases. Lange, of Copenhagen, Hirsch in Berlin, and others had described local "epidemics." There had, however, so far as the lecturer was aware, been no general investigation of the epidemiology of rheumatic fever. The word "epidemic" was used in these lectures to mean excessively prevalent, the question of infectivity being left for consideration later.

EVIDENCE FROM DEATH RETURNS.

The curve of death-rate from rheumatism in England and Wales from 1851 to 1892 showed crests in 1855 (15 per cent. excess), in 1859 (18 per cent. excess), in 1864 (23 per cent. excess), in 1869-70 (18 per cent. excess), and in 1875 (52 per cent. excess above the respective preceding minimal years). This curve dealt with "rheumatism," the separation into (a) rheumatic fever and rheumatism of the heart, and (b) rheumatism was not made until 1881. For the remaining years the two curves ran parallel, and (a) forming 73.5 per cent. of the whole is the predominant partner.

The curve of death-rate from rheumatism in London showed similar maxima to the above in 1864, 1868, and 1875 and 1884. The 1868 maximum replaced the 1869-70 maximum for England and Wales. Curves for large provin-

cial towns were very similar. The Paris curve showed a similar maximum mortality from rheumatism in 1875. So also did the Berlin curve, which related to rheumatic fever only. The direct case mortality from rheumatic fever was very low. It had been stated at from 3.0 to 3.75 per cent. Dr. Southey gave the percentage at 1.16 for St. Bartholomew's Hospital in 1861-75, varying from 3.4 at ages under 10, 1.5 at 10 to 15, 1.4 at 15 to 25 to 0.4 over 45 years of age. There was considerable evidence that the fatality and the tendency to complications varied in different epidemics and at various seasons.

EVIDENCE FROM HOSPITAL RECORDS.

The chief source of error in regard to rheumatic fever statistics was the varying systems of classification. Explanatory curves for acute, acute *plus* subacute, and total rheumatism were shown indicating that inasmuch as the lecturer was dealing, not with the actual amount of rheumatic fever in a given hospital as compared with other hospitals, but only with the excess or deficiency of the hospital experience from its average experience for a series of years, the records might be trusted. The earlier cure by salicylates in recent years had probably led to fewer rheumatic patients finding their way into hospitals than formerly, but this, although it might partially account for the decline in hospital incidence of rheumatic fever in London shown by the curves, did not invalidate conclusions drawn from the oscillations displayed by the downward curves.

METROPOLITAN HOSPITAL RECORDS.

A combination of all the hospital curves for London showed a curve with a chief maximum in 1868, a lower peak in 1871, and a higher in 1874. After an uninterrupted decline to 1878-79, lower peaks are visible in 1881, 1884, 1887, 1890, and 1893. The curve appears to show an elevated plateau with minor undulations from 1868 to 1874, then a sloping declivity also with minor undulations from 1874 to 1889. Since then there had been a gradual rise.

PROVINCIAL HOSPITAL RECORDS.

The lecturer dealt with the statistics of a number of provincial, Scottish, and Irish hospitals, which in every case gave evidence of periods of unusual prevalence, which, however, were not usually synchronous with similar prevalences in London. The curves for the Queen's and General Hospitals, Birmingham, showed some discrepancy in 1868-72. In 1874, 1876, and 1877 both hospitals showed an epidemic. In 1880 an epidemic began, lasting with a remission in 1886 until 1888. It started a year later in the experience of the General than of the Queen's Hospital. The course of the curves for these two hospitals seemed to confirm the impression derived from the metropolitan hospital curves that the infection of rheumatic fever might spread gradually from one part of a town to another, the epidemic being at its height in one district when it had not well begun in another district of the same town. Such a conclusion could obviously only be tentative in view of the uncertain character of the data, but it was confirmed by other curves to be discussed later.

LECTURE II.

EVIDENCE FROM FOREIGN COUNTRIES.

The evidence from Scandinavian countries was exceptionally complete.

In Norway rheumatic fever was compulsorily notified by the medical attendants. Comparing the curve for Norway with that for Christiania, deduced from the statistics for the thirty-three years 1861-93, several important differences were evident. The maximum of the first epidemic was reached in 1866 in Norway, in 1864 in Christiania; of the second, in 1871 in Norway, in 1870 in Christiania; of the third, in 1876 in Norway, in 1875 in Christiania; of the fourth, and greatest epidemic, in 1888-89 in Norway, in 1885 in Christiania. The Christiania curve was sharp and angular, the Norwegian curve smoother and more protracted. With epidemics starting in the same year the Christiania curve fell to the mean line in 1889, and to its absolute minimum in 1890, while the curve for Norway in 1891 was still 20 per cent. above the mean line. This might be explained by the more gradual spread of infection in the widely scattered population, or possibly by climatic or other differences.

In Sweden rheumatic fever was only notified compulsorily among the poor. Dr. Linroth had furnished hospital figures for a long series of years, and returns of cases among the poor for ten years, which show a maximum incidence of rheumatic fever in 1888, instead of 1885, as in Christiania. In Denmark every case of rheumatic fever was notified compulsorily. There was an epidemic reaching its maximum in 1871, a second with its maximum in 1873, and a third in 1883-88, as in Christiania. There was in the Scandinavian curves a curious inverse relationship between the case curves and the death curves, the lowest of the high case curves corresponding with the highest of the high death curves, and *vice versa*. There are some indications of the same thing in London, and it may be surmised that sometimes the intensity of the specific infection of rheumatic fever is in inverse proportion to the extent of its distribution.

The Norwegian curves for rheumatic fever show a general upward tendency; the Danish curves are fairly stationary, allowing for epidemic variations. With this may be compared a general decline in London hospitals and an increase in Scotch hospitals. It is possible that these differences expressed real facts and not merely differences of notification or of hospital administration. The lecturer then reviewed

hospital statistics obtained from Cronstadt, Paris, Berlin, Munich, Vienna, Montreal, Philadelphia, New York, and Boston.

SUMMARY.

From a general view of the available data it was evident that:

1. There were great irregularities in the incidence of rheumatic fever year by year.
2. These epidemic prevalences of rheumatic fever were of two kinds—one lasting from one to three years and the other from six to eight years. The latter were seen chiefly in very large centres of population or when dealing with a country as a whole, and it was possible, therefore, that they represented in reality the fusion of several epidemics of the former kind.
3. There had been certain favourite years for epidemics, though different localities did not as a rule have all these. In England these favourite years were 1855-56, 1859, 1864-65, 1868-71, 1874-76, 1884-85, 1888, and 1893.
4. There was no regular periodicity in the epidemics, but they tended to recur at intervals of three, four, or six years.
5. In many of the curves a severe epidemic was followed by a light epidemic or even two light epidemics before the next severe epidemic was reached. This appeared to be the rule, but there were several exceptions to it.

CLIMATE AND GEOGRAPHY.

Rheumatic fever was ubiquitous, but it was most difficult to gauge its relative prevalence in different districts and countries. Deaths from rheumatic fever, of which details were given, afforded a very uncertain indication.

Scandinavia.—In Scandinavian countries there was the more certain basis of notifications. In Norway, in the 29 years 1863-91, the sickness-rate was 1,270 per million persons living; in Denmark, in the 24 years 1870-93, was 2,183 per million; and in Helsingfors, in the 13 years 1881-93, was 4,500 per million. It was higher in the towns than for the whole country. Some of the difference doubtless means varying completeness of notification.

Scotland.—From hospital returns it appeared that in Scotland there was more rheumatic fever in Aberdeen than in Kilmarnock, more in Kilmarnock than in Glasgow, more in Glasgow than in Paisley, more in Paisley than in Edinburgh.

London.—The admission to hospitals in London for rheumatic fever for a long series of years averaged 8.43 per cent. of the total medical admissions varying from 6.41 per cent. in University College to 10.7 per cent. in Middlesex.

England.—Southern districts: The admissions varied from 7.0 per cent. in Brighton to 10.1 per cent. in Chatham. The amount was excessive in Reading, and in Birmingham also exceeded that in London. In Yorkshire towns the amount was very variable.

Much of the differences might be accounted for by varying hospital administration, but it could hardly be owing to hospital administration that in Glasgow in 1870-93 rheumatic fever formed only 4.35 per cent., and in Aberdeen (1865-93) 7.21 per cent., while in London it was (1865-93) 8.43 per cent. of total medical admissions. In Birmingham the proportion was 9.71 per cent., in Manchester (1870-93) was 5.69, and so on.

These unfortunately lacked precision, all forms of rheumatism being massed together. The death returns for the English counties 1881-90, corrected for age and sex distribution, appeared to indicate that rheumatic fever was most fatal in those counties like Lancashire and the West Riding, which had large urban populations. Cumberland did not fit in with this view. Lincolnshire and Cambridge had a low rheumatic fever mortality, which did not support the view that rheumatic fever had taken the place of malaria.

INFLUENCE OF SEASON.

The notification returns for Christiania and Stockholm showed a minimum number of cases in August after a gradual decline to this point; then a more rapid rise to a maximum in January. At Helsingfors the maximum was in July, and there was but little winter rise.

In Berlin the hospital experience of fifteen years showed much more rheumatic fever in the first half of the year, but the excess lasted till midsummer instead of ceasing early in May as in Christiania and Helsingfors.

At Munich the maximum was in March, a second almost equal maximum occurring in May. The minimum was in September.

The London hospital curves showed a larger number of cases in the last three than in the first three months of the year, unlike most of the foreign returns.