and the endocarditis was secondary. It might be regarded as pyaemic or as cardiac; but the rigors were only few in number, and the thoracic symptoms were mainly due to pericardial and pleural effusions.

In conclusion, I will mention a case which I saw with Dr. Marshall of Huddersfield as illustrating a condition of illness which led me to suspect a septic process, although no fever was at that time present.

CASE VIII.

A gentleman under 40 years of age lost flesh in March, found he could not go uphill with ease, and became sallow. A systolic apex bruit was discovered, and the urine contained albumen. Under treatment the albumen diminished. I saw him two months later on June 1st. He was pale and waxy in appearance, with a little flush on the cheeks. The heart's apex was in the nipple line, and there was a systolic murmur audible here, reaching into the axilla. The pulse was 120, rather full and hard. The liver was felt as low as the umbilicus level; the spleen was not felt, but there was pronounced dullness in the usual position; the urine now contained a good amount of albumen, but the feet were not swollen. He complained of perspiration at night, occurring twice or thrice weekly. The optic discs and fundi were normal.

Though there was no fever recorded, and though he had improved under treatment, I suspected malignant endocarditis, for the following reasons: His anaemia, wasting, loss of appetite, and sweating at night; a cardiac valvular lesion without the symptoms of cardiac incompetence; and the presence of albumen in the urine, also out of proportion to the evidence of cardiac incompetence.

He went to the South Coast for a short time without material benefit; he returned home, and towards the end of July pyrexia developed.

I saw him again on August 11th at his home. He was very ill, there was a double murmur at the base and at the apex, râles abundant at the left base, and an enlarged liver. Injections of antistreptococci had been given. He continued to have high temperatures at night, and he died about a fortnight later.

Here there was a case in which febrile temperature was only observed four or five weeks before death; though it is probable, if my view be accepted, that he was suffering from microbic infection in connexion with his cardiac valves for at least two months before that. Cases have been recorded in which even to the time of death pyrexia has been absent, and in such a case as that recorded above it can be only a matter of conjecture what determined the occurrence of pyrexia at one time rather than another. No doubt, in a great many cases, the onset of subjective sensations of illness coincides with the beginning of the pyrexia.

Other cases could be recited showing the great variety in the symptoms, course, and duration of this disease. But I think I have said enough to show that the familiar divisions do not cover the whole of the ground, and that many cases might be easily placed in two, or even in three, of the divisions.

What is important is to bear in mind that this disease is a form of pyrexial complaint which may be easily confounded with typhoid fever, tuberculosis, pneumonia, or other severe infection; that it has no one definite course or duration; that, as a rule, it is characterized by a valvular lesion, by pyrexia, by other signs of general infection, and by the evidences of vascular obstruction or embolism; that in different cases pyrexia may be absent, or murmurs may be absent, or there may be no evidence of vascular obstruction; that while some cases resemble typhoid fever, others pyaemia, in others pyrexia is grafted on marked cardiac symptoms, in others cerebral symptoms are prominent; there are cases which can come under neither of these groups, and others which may be included in two or three.

TENDERING FOR PUBLIC APPOINTMENTS.—The following resolution was unanimously passed at a special meeting of the Council of the Society of Public Analysts and other Analytical Chemists on October 1st: "The Council of the Society of Public Analysts and other Analytical Chemists has had under consideration the practice which has been adopted recently by certain public bodies of inviting applicants for the office of public analyst to state the terms upon which they are prepared to accept such appointments. The council is of opinion that it is against the interests of the public and degrading to the profession of analytical chemistry for appointments to be offered 'on tender,' and calls upon the members of the society to resist the practice."

BEES' STINGS AND RHEUMATISM.

By E. W. AINLEY WALKER, D.M.Oxon.,

FELLOW AND TUTOR OF UNIVERSITY COLLEGE, AND LECTURER IN PATHOLOGY IN THE UNIVERSITY OF OXFORD.

IN consequence of certain observations previously recorded,¹ which seemed to suggest a possible relationship between some of the phenomena of acute rheumatism and an abnormal production of formic acid in the body under the action of a streptococcal micro-organism, the attention of the writer was directed to the alleged popular belief that the poison of bees is protective against "rheumatism," and may also be successfully employed for its cure.

An inquiry was therefore set on foot with the object of ascertaining:

1. The extent to which this belief is prevalent.
2. The amount and kind of evidence available in its favour.
3. The amount of evidence which could be obtained to the contrary.
4. The clinical characters of the "rheumatism" thus stated to be cured.

A series of questions was published in the *Lancet* and the *BRITISH MEDICAL JOURNAL* on June 22nd, 1907, and subsequently in *Nature* and the *British Bee Journal*. They appear to have been widely copied into various newspapers in most English-speaking countries; and as the result the writer has engaged in a considerable correspondence with persons, both lay and medical, who have either recorded their own experience and information, or sent references to statements in the press bearing on the subject.

I was also fortunate enough to succeed in getting into correspondence with Dr. Terc, an Austrian physician of Marburg (Styria), whose observations are referred to in some of the press notices, and who has carried out the bee-sting treatment for many years past.

Apart from Dr. Terc's results, which appear to be worthy of special consideration, and must be referred to later, the material collected cannot be regarded as establishing anything beyond the fact that a widespread belief in the efficacy of the bee's sting for "rheumatism" exists. But it is highly suggestive, and should be sufficient to justify the removal of the subject from the realm of mere folklore into the sphere of practical investigation. But all that the writer has at present the opportunity of doing is to submit the statements which he has collected on the subject to the consideration of those who have facilities for clinical research.

It will be noted that the conditions referred to in the evidence which follows are for the most part what may be classed as "chronic rheumatism," but that the inquiry as to the actual characters of the affection concerned failed in nearly all cases to elicit any very satisfactory statement as regards its clinical features.

LETTERS FROM MEDICAL MEN.

1. Dr. W. Hammond (Cornwall) states that the belief is quite common in Cornwall; knows no facts bearing on it.
2. Dr. W. R. Gore (Wales) had a patient who started keeping bees as a cure for rheumatism, and stated that the stings did cure him; knows that the belief is common in Shropshire.
3. Dr. H. P. Cholmeley (London) used to hear the story as a boy in Bath.
4. Dr. Boswell Dodds (Devon): The belief is common in Switzerland, where also the peasants in the Canton of Berne say that extract of ants is equally useful. His wife's godfather used to cure his rheumatism by making bees sting him. Also refers to a case at Bâle, Neuchâtel, cured of rheumatism by bees' stings.
5. Surgeon-Major Johnston (Virginia, U.S.A.): The belief is prevalent in the States. Has seen the treatment applied in a case of acute rheumatism (temperature 103° F., etc.), with the result that in twenty-four hours the temperature was normal and the joint free from pain and freely movable. The same patient (Colonel W. T.), informs him that he has had one subsequent attack, similarly cured.
6. Dr. R. McLay (Lincolnshire) mentions a case of rheumatism of the shoulder (stiff and painful) of two or three months' standing, cured by an accidental sting of the hand.
7. Dr. Stawell (Australia) knows of the belief, and has met a man who claimed to have been cured by bee stings.
8. Dr. Valentine Rees (Wales) saw a case of lumbago treated by bee stings applied to the back; the patient was then able to walk about with ease and comfort, which he had not been able to do for weeks previously, but the condition returned in a few days. The clergyman who applied the treatment stated that he had been practically free from "gout and rheumatism" since he began to keep bees.

9. Dr. B. W. Winckworth (Somerset): The belief is widespread in Somerset. Communicates a letter from a solicitor narrating a case of "lumbago" thus cured; the patient, a military man, is now in the habit of catching bees in order to make them sting him.

10. Dr. M. S. Pembrey (London) is familiar with the belief.

11. Dr. F. W. Mackenzie (New Zealand) himself suffered for five years from muscular pains in the right scapular muscles, and the outer side of the right arm. These have disappeared since he began to keep bees (one year).

12. Dr. Sidebotham (California) mentions a case in which the patient attributes the cure of his rheumatism, and twenty years' subsequent freedom from it to bee-keeping.

13. Dr. F. Vicars (London) is familiar with the belief. Has been to see a woman, aged 46, near Salisbury, who suffered for ten years from severe rheumatism. She then began to keep bees, and was frequently stung. She has been quite free from rheumatism ever since—about ten years; no other remedy had been of any use to her. He also heard of another case—a man who had his ankles swollen from rheumatism, and who, hearing of the bee-sting cure, applied several bees to his ankles and was relieved, subsequently remaining free from rheumatism.

14. Dr. W. E. Moore Ede (Northumberland) states that a lady who suffers from chronic rheumatism gave no local reaction when accidentally stung by a bee—that is, is immune to a small dose of bee poison. Her sister began to keep bees some time ago, but was made so ill on each occasion by a chance sting that she was obliged to give them up. She is apparently very highly susceptible to rheumatic poison also, for she has since had the most acute attack of rheumatic fever (with endocarditis) that Dr. Ede has ever seen.

LETTERS FROM LAYMEN—FAVOURABLE.

15. W. O. C. (England) has heard of the belief from three independent sources, and knows of a case of "well-authenticated" cure by bee stings.

16. T. D. (England) narrates the case of "a chimney sweep and a great sufferer from rheumatism, so much so that he could not use his brushes, and who was stung several times by bees, and now is very much better."

17. S. J. (England) has known many cases. Used to suffer from rheumatic pains himself, but has been quite free since he kept an apiary. His attention was first drawn to the matter when his dog, which was quite a cripple, got badly stung, and after this became quite well and free from rheumatics. Then a gentleman who was a cripple came to get stung, was quite cured, and can now walk twelve miles. A letter is sent from the gentleman in question confirming the statement as to cure, and referring to his medical attendant as able to give confirmation if necessary.

18. J. M. (Ireland) names a case of cure in a bee expert under the Department of Agriculture (Ireland); no details.

19. T. C. B. (Queensland) mentions a case of "a man stung by a swarm of bees and cured of his rheumatism"; no details.

20. J. H. A. (England) mentions two cases: (1) has suffered from rheumatic fever, and has found considerable benefit by allowing bees to sting him; (2) is subject to rheumatism in the legs, and causes bees to sting his legs whenever he feels an attack coming on, and so wards it off.

21. J. B. (England) mentions a case in bed seven weeks with rheumatism, then cured by bees' stings (three applications of twelve stings each).*

22. B. M. (France) mentions two attacks of rheumatism in himself, the first of six months' standing, cured accidentally by bees' stings, the second cured intentionally by the same means. He informed his London physician (Dr. de N. W., since dead) of these experiences, and the doctor subsequently induced another patient to try the remedy with good results. Mr. B. M. refers to the homeopathic remedy, *Apis mellifica*, prepared from bee poison, and says, "Throat troubles respond like magic to this remedy."

23. A. E. (England) has met with the belief, and was informed by an observatory attendant at Potsdam, Germany, that a member of his household who had been subject to rheumatism had remained free from it since being severely stung by bees.

24. R. E. (Scotland) knows of the belief, and communicated a letter from a rector, an authority on bees, who is acquainted with the alleged cures, and writes, "I was myself rheumatic till I kept bees; I have not been so since; but I do not say *post hoc, propter hoc*. A man at B. P. suffered acutely at night from rheumatism. He took bees to bed with him in a little box and applied them. In a paroxysm of pain one night he applied the boxful! And he has had no rheumatism since."

25. M. S. (Australia) formerly lived in South Africa, where her father was advised by his doctor to try bees' stings for rheumatism in the knees. He did so, and was cured. She has since persuaded her husband to try the same remedy for incapacitating rheumatism in the right arm; cure resulted.

26. J. L. C. (U.S.A.) is 42 years old, suffered for many years from rheumatism, and was three times severely ill with it, then heard of the bee-sting treatment, and cured himself with it. He has now been completely free from rheumatism for more than two years. He persuaded three other persons to try the treatment; each was greatly benefited, though in two of the cases the treatment was not persevered with.

27. J. W. Y. (U.S.A.) suffered from rheumatism in the hands and arms for four years; there was pain at night, preventing

sleep; then began to keep bees. While feeding them last winter got three stings in the left hand; rheumatism much relieved, especially in left arm; later on got stung in right arm also; no rheumatism since.

28. L. B. A. (England) communicates a letter from a friend whose uncle discovered the bee-sting cure himself accidentally, and a few months later read of it in a newspaper. Since then he has regularly caused bees to sting him whenever his rheumatism returned.

29. J. B. M. (Australia) writes that in 1892, having suffered from rheumatism in the shoulders for about twenty-five years, he decided to try the bee-sting cure. He applied a few bees about the shoulders each morning, and at the end of a week was free from rheumatism, and remained so for twelve months. In the following year he had a severe attack, not being able to move about without pain; he therefore began treatment with twelve stings, followed by six more forty-eight hours later. He was free from pain the same evening, and remained well for another year. A third attack similarly treated was followed by two years' freedom. Up to 1905 he had four years entirely free from rheumatism, and has had no attack since 1905. He narrates the following case: "... Mrs. R., whose hands were stiff and gnarled in all manner of shapes, so that she could not use them to lift a small plate off the table ... she ... in some way so angered the bees that they flew out on to her hands, literally covering them and stinging them all over. At the end of a week ... Mrs. R. came out of her back door and ... called out, 'Look, see what the bees have done for me!' raising up her hands and opening and closing them frequently. The fingers had become almost as lissom as ever they were."

30. E. W. C. (Egypt) is acquainted with a German lady who spent some time in an establishment in Austria under treatment by bees' stings. She received no benefit, but stated that she was encouraged to persevere for some time by seeing other patients who had to be carried into the institute, but after a few weeks' treatment were almost completely cured.

31. F. S. (Germany): The belief is common in Germany.

LETTERS FROM LAYMEN—INDEFINITE AND NEGATIVE.

32. P. L. F. (England) has kept bees since 1870, and was formerly often stung severely, but now only keeps a few hives, and in recent years has not been stung much, owing to his long experience in manipulation. In November, 1904, he had a first attack of rheumatic fever, and has since then never been free from slight twinges of rheumatism, which fly about from joint to joint. The rheumatism is so slight that he is unwilling to accept the suggestion of experimenting on it with bees' stings.

33. A. T. (Scotland) has kept bees since he was 12 years old, and is now 67. Thirty to forty years ago he was much troubled with lumbago and rheumatism. In later years has been comparatively free; he also finds that he is now relatively immune to bees' stings.

34. J. P. (England) a "bee expert." "In the early part of the year (1907) I was off duty five weeks, and did not get one hour's sleep per night for three months with rheumatism, therefore I am no believer in it (the bee-sting protection)."

35. J. P. P. (England)—an official of a bee-keepers' association—writes: "There is no doubt that these (bees' stings) have been beneficial in many cases, but I could gather only negative evidence among bee keepers I was acquainted with. A. is an enthusiastic and most successful bee keeper of thirty or more years' standing, and he has on more than one occasion written ... stating that he was laid up with rheumatism. B. was formerly employed as an expert ... and was sometimes prevented ... by an attack of rheumatism. C., although having charge of several apiaries besides his own, suffers much from rheumatism."

36. J. B. (England). See No. 21. One successful and one unsuccessful case.

37. M. D. T. (U.S.A.): "Kin Sir, I read in the *Gleanings in Bee Culture* that you would like to correspond with American Bee Keepers in regard to the formic acid from a bee sting in the human body will cure rheumatic fever I have bin in the Bee Business for over 50 years and have Bin stung thousands of times and have had rheumatis for over 30 years and have never relieved a bit of benefit from bee sting often haven bin stung eight and ten times in handling one colony of Bees my Father always kept Bees and he had rheumatism for years Before he died he always said that Bee stings caused him to have the rheumatism one of my neighbors had rheumatic for years and keep Bees and was some times stung Bad and it never helped him and he had the rheumatic so bad buy times he could hardly walk I have travelid over United States a good deal and I never cam a crost a man that ever has bin benifited by Bee stings it is all Bosh to think of sutch a thing if this reaches you I would like to hear from you in return."

FROM THE LAY PRESS.

38. *Beekeepers' Record*, May, 1904.—Mr. G. B. (Northamptonshire) relates having been a sufferer from gout and rheumatism, sometimes being "prostrated for weeks at a time"; he was severely stung on one occasion, and had to go to bed. After that he never suffered from rheumatism again, and writes this at the age of 70.

39. *Beekeepers' Record*, November, 1905, quotes the *Rheinische Bienen-Zeitung* to the effect that nothing is better for rheumatism than bees' stings. In winter (the writer continues) nothing is better than honey diluted with water, to which is added lemon juice.†

* It should be added that another case of six years' standing, "totally incapacitated," hearing of the foregoing cure, tried the treatment for three months without improvement.

† Note, as regards the use of honey, that before sealing up each cell in the honeycomb the worker bee injects into it a small amount of its poison, as a preservative.

40. *Beekeepers' Record*, October, 1906: Mr. W. S. P. (Birmingham) writes that after being severely stung by bees he never suffered from rheumatism or lumbago again. He had at the time of writing had six years' immunity.*

41. *Weekly Scotsman*, November 9th, 1907: Mr. H. H. (Johannesburg) writes: While visiting some people here . . . I heard of a friend who had been crippled, and perfectly unable to work (in mining) for some time past, but who is now quite restored by the above (bees' stings) remedy. He simply allowed about five insects to sting him where the pain was at the time. This went on for several days, and after he had received 98 stings he was cured, and was able to resume work.

42. An unidentified cutting: "Since the insertion of my letter of June 28th, 'Bees and Rheumatism,' I have received several letters, asking how many stings ought to be applied in bad cases. Well, my first case was bad enough—a man with a very bad foot. He had to have the better part of the upper leather of his boot cut away, and when I saw him he was lying on a sofa and could not use his foot. I put six stings in his foot, and the second day he was at work, and the foot quite better."

The next case was a man that had been off work six weeks with rheumatism in his leg. He got seven or eight stings, and started work the next day.

43. *Rugby Advertiser*, March 31st, 1904: "On Tuesday, March 22nd, Mr. C. . . . gave a lecture on Bees and Bee Keeping. . . . The lecturer narrated how he got severely stung in the arms while taking honey, and continued: 'That morning I took four arms to school with me instead of two, but, strange to say, I felt no pain. In three or four days the swelling had gone—yes, and something else had gone too. For years I had suffered from rheumatism in my shoulders, often lying for hours without being able to sleep. Since that stinging the rheumatism has quite gone!'"

44. *British Bee Journal*, October 3rd, 1907: In publishing my letter of inquiry, the editors append the following note: "Since the first publication, some seventeen or eighteen years ago, of the theory advanced by an Austrian physician, Dr. Terc . . . that . . . the virus of the bee sting is an infallible remedy for acute (sic) rheumatism, it has had ample confirmation in a number of cases recorded in the *British Bee Journal* and other bee papers. . . ."

FROM THE MEDICAL PRESS.

45. The *London Medical Record*, 1885, xiii, p. 178: "Cure of Rheumatism.—*El Siglo Médico* relates the following singular case from La Paz, Bolivia. A woman had suffered so much from rheumatism that for six months she had hardly slept. Her right arm was so affected that it was quite useless; she could not work with it, nor dress herself. While in this state she heard of a countryman who suffered in the same way, and who had been cured by the accidental sting of a bee. As the pain caused by the sting could not be worse than that due to the rheumatism, she determined to try the same remedy. Three bees were obtained and made to sting her on the right arm. The success of the treatment was surprising and complete. On the following night she was able to sleep, and the acute pain had all but completely disappeared. The arm was naturally a good deal swollen, but the swelling quickly disappeared with cold water dressing. The use of the arm gradually returned, and since there has been no symptom of rheumatism. It is said that the same remedy has been equally successful in several other persons."

46. *Medical Press*, 1889, i, p. 175: "Dr. Terc has noticed that rheumatic subjects are less susceptible to the effects of bee stings than most people, the tumefaction only presenting itself after several stings. If these be repeated a point of saturation is soon reached at which it can no longer be induced. Curiously enough, when that point is reached, the patients are also relieved of their rheumatism, and appear to be proof for some time against a relapse. Dr. Terc considers, therefore, that it is possible to procure an immunity against rheumatism by saturating the patient with the poison of the bee. He has even tried it in 173 cases in which 39,000 stings were inflicted. He claims to have obtained some success in the treatment of acute cases, but it was especially of benefit in the chronic forms, when the patients seemed almost past help. Some of them, however, required several hundred stings before they expressed themselves satisfied, but the author hastens to inform us that rheumatic patients are less sensitive to bee stings than ordinary healthy persons."

47. *BRITISH MEDICAL JOURNAL*, 1896, i, p. 383: Dr. J. W. Gill records experiences with bees' stings, and mentions the case of a friend under treatment for "gout and valvular disease," who was severely stung by a bee over the left eyebrow with great local reaction. His gout disappeared, and for several months he was never better. (See also the same *JOURNAL* for July 6th, 1907. Letter from Dr. Gill.)

48. *Medical Press and Circular*, June 3rd, 1903, refers to Dr. Terc's treatment.

49. *British Journal of Nursing*, September 19th, 1903, refers to Dr. Terc's treatment.

50. *Medical Annual*, 1904, Acute Rheumatism, refers to Dr. Terc's treatment.

51. *BRITISH MEDICAL JOURNAL*, 1907, i, p. 1579: The late Dr. Bertram Abrahams wrote, in reply to my inquiries: "I am sure that any one with much experience of treating joint affections will have met with many patients who have tried the bee sting as a means of cure. Belief in its efficacy is widely

diffused, especially, it would appear, in the Midlands and the Fen Country. As far as I can ascertain, it is used chiefly in cases of acute articular rheumatism. I have known it to be applied also in the acute exacerbations of arthritis deformans, but I have so far not met with an instance of its use in gout. . . ."

52. *La Province Médicale*, No. 38, September, 1907: "Piqûres d'abeilles . . . le Dr. Lamarche de Saint-Marcellin, a adressé la communication suivante à la Société nationale de médecine de Lyon . . . Vous connaissez certainement l'usage populaire des piqûres d'abeilles contre les douleurs rhumatismales. Plusieurs clients m'ont dit en avoir usé avec succès après m'avoir consulté sans succès. Moi-même, souvent atteint de rhumatisme musculaire ou de névralgies rhumatismales autrefois, je n'en souffre plus jamais depuis que je suis souvent piqué (*post hoc, ergo propter hoc?*). J'ai alors essayé ce moyen dans un cas de sciaticque extrêmement douloureuse et chronique, et la malade, qui depuis plusieurs mois passait ses nuits à gémer, immédiatement après une séance de cinq piqûres a passé quarante-huit heures à peu près indolores. Une série de séances avec augmentation progressive de la dose d'abeilles a amené une guérison presque complète."†

ARTIFICIAL PREPARATIONS OF BEE POISON IN RHEUMATISM.

53. Alumni Report of the Philadelphia College of Pharmacy, September, 1904.—A Thriving Industry.—Since the discovery, a few months ago, that formic acid from bees' stingers is a sure cure for rheumatism and lumbago, the demand for the stingers has leaped far in advance of the supply. . . . Experiments made by the H. K. Mulford Laboratories, near Glenolden, proved the efficiency of the bees' stingers as a cure for rheumatism and lumbago.

54. *Lancet*, 1907, i, p. 1306: "Tattoo" writes describing an apparatus shown him some eight years ago by the mate of a cargo-boat. It was armed with concentric rings of needles which were made to puncture the skin by the action of a spring. After the skin had thus been scarified, a viscous solution (said to have been prepared from the stings of bees by a German chemist) was rubbed in, and was stated to produce a smart inflammatory reaction. The mate stated that his father had cured himself of very severe and obstinate "rheumatism of the spine" by the use of this apparatus.

55. H. H. G. (California) writes: The sting of the honey bee (*Apis mellifica*) is used in medicine (? homeopathic) in certain synovial affections, especially where there is an oedematous condition and the knee is swollen, shiny, sore, and stinging pain accompanies. Crushed ants . . . is another very useful remedy in pathological conditions of the joints, such as rheumatism. I have used the latter in homeopathic doses of the sixth potency (?), and have obtained some remarkable results.

56. B. M. (France) refers to the homeopathic use of *Apis mellifica*, and says "throat troubles respond like magic to this remedy."

The statements assembled in the foregoing columns may fairly be regarded as at least establishing a presumption that bee poison can exert some striking influence in rheumatic subjects, and one which deserves an exact investigation. Nor is the action merely that of a counter irritant, as might at first be supposed, since many of the alleged cures are stated to have exhibited a more or less abiding character.

Here important information may be gained from the results of Dr. Terc, who has, in fact, made an extended series of clinical observations on the subject, and informs the writer that he has employed the bee-sting cure since 1879. He has now treated over 700 cases of rheumatism and rheumatoid arthritis by this method.

Dr. Terc's first paper was published in 1888 in the *Wiener medizinische Presse*, No. 35, but his work has unfortunately failed to receive favourable attention in his own country, and he has published little since that date, except a lecture (*Das Bienergift in der Heilkunde*) in the *Steirischen Bienenwater* of February 11th, 1904, and a letter in the same journal for May 1st, 1907 (printed at Graz). Indeed, in writing to me in September, 1907, he says, after referring to the very scanty consideration shown towards his work by his colleagues in the profession, "The lecture which I gave in Vienna before the K. K. Gesellschaft der Aerzte on May 15th, 1903, on the results of my treatment was not even noticed in the official journal of the society."

Nevertheless, Dr. Terc's results are extremely interesting, and his conclusions in the first paper are supported by a detailed account of 23 out of the 173 cases which he had then treated. The following is a brief account of Dr. Terc's observations and results:

If a normal individual be stung by a bee, there appears immediately around the point of puncture a rapidly-formed wheal; but if the sting has been withdrawn from the wound, both the wheal and the accompanying pain

* Nos. 33, 33, and 140 were communicated by Dr. Frederic Vicars.

† Kindly sent me by C. Louis Taylor, Esq.

soon disappear—within two or three hours at most. Besides this strictly local *primary* reaction to the sting, there occurs also *secondarily* an oedematous swelling of the skin around the wound, spreading outwards from the point of puncture, and accompanied by a variable amount of burning, itching, and irritation. The duration of this secondary reaction varies, but is in general from three to five days.

If the individual receives sufficiently numerous and repeated stings an immunity is developed, which consists in this—that the secondary swelling gradually becomes less marked after each sting, and eventually entirely fails to appear, only the immediate (*primary*) effect occurring, so that within two or three hours of even a severe stinging all visible reaction has disappeared.

The immunity thus obtained persists for perhaps six months, gradually diminishing, and finally disappearing. If it be repeatedly restored by renewed stinging it acquires a more persistent character; and, after frequent and long-continued exposure to bees' stings—as, for example, among bee keepers, who take no special precautions to avoid being stung—the immunity may at length become fixed, and persist for years, or even throughout life.

If, on the other hand, a *rheumatic subject* receives a bee sting, the *secondary* (itching and irritable) swelling entirely fails to appear, and may only be induced after the application of two, three, ten, or even fifty or more stings, according to the intensity, the type, and the duration of the rheumatism in question. This stage is spoken of by Terc as the stage of *negative reaction*.

When the secondary swelling first appears it is slight and of brief duration, but as the stings are continued it increases in extent and duration with each fresh sting until it reaches the size and persistence (three to five days) usual in normal persons. This is the stage of *positive reaction*.

By continuing the treatment the third stage, or stage of actual *immunity*, is reached, when, however many stings be applied, no secondary swelling can be evoked.

With the appearance of the second stage there is always a marked improvement in the symptoms, and the development of immunity to the stings (third stage) is accompanied by a complete cure of the rheumatism, the cure enduring as long as the immunity remains.

In slight cases cure may result so rapidly (especially if the treatment has been begun with a number of stings at once) that the various stages cannot be differentiated. Thus, among Terc's cases I find one (No. 4) where the immediate application of eight stings resulted in cure and the return of the patient to work on the following day. (Compare with this many of the alleged cures recorded above.) On the other hand, in severe and very chronic cases treatment has to be continued, it may be, for many months before immunity and the accompanying cure are attained. And in the worst cases many hundreds of stings may be required. Two of these cases of which I have an account are of special interest, because in each case there was a history of some two and a half years' duration, and the patients were completely crippled when treatment was begun. Both were absolutely cured and restored to their normal occupations, and have remained free from any sign of rheumatism since. The first, G. H. (now a high school director), No. 5 in Dr. Terc's first paper, was treated as long ago as 1879–1880; the second, J. G., treated from 1902 to 1905, and able to go about her work from the end of the first six months of treatment (previously bedridden), is recorded in the papers in the *Steirischen Bienenwatter*, and in a private letter of September, 1907, received from Dr. Terc. Dr. Terc has now treated over 700 cases of rheumatism and rheumatoid arthritis, and writes: "The cure of true rheumatism, whether simple or complicated, . . . depends only on the perseverance and intelligence of the patient. Every case is curable." The foregoing observations and statements of Dr. Terc, if accepted, at once suggest an explanation both of the cures and of the failures to cure by the bee-sting treatment, which are collected and set forth in the earlier part of the present paper.

The treatment is naturally painful, and a number of Terc's patients appear to have been satisfied with a relief of symptoms, continuing the treatment only when a relapse occurred. But, fortunately, as Dr. Terc affirms, the stings

are less painful in rheumatic subjects than in normal persons. The use of cocaine or other local anaesthetic does not seem to have been attempted as an amelioration of the treatment, but might no doubt be resorted to with advantage.

THE ACTION OF FORMIC ACID AND THE FORMATES IN RHEUMATISM.

The next step in following up the subject of the present inquiry, should evidently be to determine if possible the nature of the active agent in bee poison. Considerations of space, however, do not permit me to do more than refer briefly to the fact that the nature of bee poison has been investigated by Langer of Graz (as Dr. Terc informs me); by Phisalix, in a paper presented to l'Académie des Sciences in 1904; by Calmette in his work on Venoms; and by Morgenroth, and it appears that the poison in the sting contains in addition to the acid, formic acid, an alkaloidal base akin to the venoms. There are therefore two important constituents to be considered. But if a provisional conclusion may be drawn from the few statements subjoined as to the effects of formic acid and formates, the action of bee poison in rheumatic subjects would appear to be attributable to its formic acid content.

1. BRITISH MEDICAL JOURNAL, 1907, ii, p. 184.—A. M. writes: On reading Dr. Ainley Walker's letter regarding the popular belief that the sting of bees is both protective and curative for rheumatism, it occurred to me that if it were so then the formates should be useful in that affection. I was suffering at the time from an attack of lumbago, which had been more troublesome than usual to get rid of. After taking two doses of 15 grains the pain had quite gone. In two other cases I have had equally good results . . .

* (Ed.) Formic acid diluted with an equal quantity of water has been used in the treatment of neuralgia and rheumatic pains. . . .

2. BRITISH MEDICAL JOURNAL, 1907, ii, p. 303.—Dr. H. M. Sutton writes: With reference to the letter of "A. M." in the JOURNAL of July 20th, and the question of the use of formates in rheumatism, I have met with what is practically a liniment of formic acid prepared from ants as a popular remedy for rheumatism in Germany. An open bottle containing brandy is placed in an ant-hill. The ants swarm into the bottle, which is then removed, corked, shaken, and set aside for a time. This household remedy is called *Ameisenbranntwein*, a name equivalent to spiritus formicarum. . . .

3. *Lancet*, 1907, ii, p. 985: "Hesperus" writes, referring to an interesting review of the history and literature of formic acid as a therapeutic agent in the *Journal of the American Medical Association*, April 28th, 1906, p. 1258: Stern believes its effect on rheumatic joints is simply due to its action as a counter-irritant. The writer continues: "Several cases of arthritis deformans, lumbago, and acute sciatic rheumatism are described by Dr. L. B. Couch in the *Medical Record* (New York), June 24th, 1905, p. 972, full details being given as to the symptoms, treatment, and results. As regards bees' stings, Dr. Couch heard of a bee farmer in Long Island who had been speedily cured of chronic rheumatism by being stung by his honey-bees. He wrote to the farmer for corroboration, and was informed that the story was true. . . ."

4. *Medical Annual*, 1906, p. 21: "Couch (*Medical Record*, 1905, p. 972) has found formic acid a marvellous remedy in rheumatic conditions and in arthritis deformans. He injects formic acid in a 2½ per cent. solution just under the skin in the neighbourhood of the painful joints. A preliminary injection of 5 to 8 drops of 1 per cent. cocaine solution is employed, and then an equal amount of the formic acid solution . . . larger doses cause painful swellings. . . . Several areas may be injected provided that they do not come within 2 in. of each other. As many as thirty injections have been made, but, as a rule, twelve to fifteen are sufficient for one day. They should be repeated every day, or every alternate day, till the pain ceases." (For fuller details Dr. Couch's paper should be consulted.)

If an apology is needed for thus bringing forward a series of scattered statements which the writer has himself no opportunity of testing, the interest and importance of the subject may be urged as an excuse. There is, perhaps, no disease which in this country causes more continued suffering and more widespread incapacity for work, especially among the labouring classes, or in which our present treatment is more lamentably inefficient, than chronic rheumatism in its various forms. Doubtless the bee-sting treatment readily lends itself to ridicule (as Terc has found); but the common beliefs and household remedies of country folk have before now—as in the familiar case of "foxglove tea"—revealed important remedies previously unknown to the medical profession. That such is the case in regard to the poison of the bee is steadfastly maintained by Dr. Terc, who speaks of the bee's sting as "the poor man's remedy." It is at least desirable that the value of Couch's method of formic acid injections should be submitted to trial, and the whole

question might form a fitting subject for collective investigation. It is at present merely interesting—possibly, in some aspects, also humorous.

REFERENCE.

¹ Ainley Walker and J. H. Ryffel, BRITISH MEDICAL JOURNAL, September 19th, 1903.

ANEURYSM OF THE HEART DUE TO SYPHILITIC GUMMATA.

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[Communicated by the Director-General, R.N.]

THE number of cases recorded of true sacculated aneurysms of the heart are so few that I have thought this one of sufficient interest to report.

The patient was a plethoric though apparently healthy man, aged 34, who was actively employed in the canteen at his barracks. Beyond a few periods of temporary disablement from traumatism there was no entry of interest in his medical record except that he had suffered from secondary syphilis in 1900.

Death occurred quite suddenly while at duty.

At the *post-mortem* examination the pericardium contained a quantity of fresh blood clot and serum; the heart was rather large. On opening the left ventricle the surface of the endocardium below the semilunar valve showed an irregular mottled cicatrized appearance over an area the size of a three-penny piece, and exactly opposite to it, by the mitral cusp, was a dense white patch of endocardium. The section of the heart wall below the auricular-ventricular ring showed marked evidence of myocarditis with fibroid degeneration.

Externally, below the left auricular appendix, was a definite globular aneurysm, the size of a small

tangerine orange, having an opening from the left ventricle large enough to admit the tip of the little finger. The wall of the aneurysm became thinner as its distance from the ventricle increased, at the site of the rupture being like thin paper. There was no laminated clot in the interior.

The aorta showed numerous atheromatous patches, and the coronary arteries were rigid but not occluded. A microscopical examination of the diseased heart wall showed a decrease of muscle fibres, with a marked small-celled infiltration and sclerosis of the small vessels.

There is little doubt that the aneurysm was due to degenerative changes in the myocardium following gummatous infiltration, "a true sequela of syphilis."

Osler states that aneurysms of the heart are due to acute or chronic myocarditis, gumma of ventricle, or traumatism, and that the apex of the left ventricle is the most common seat (59 out of 60 cases, Legg). Dr. Wickham Legg attributes these aneurysms to fibrous degeneration of the heart muscles, which is commonly due to impaired coronary circulation, but adds that many cases of aneurysms of the heart are found in people under 40 in

whom the coronary arteries show no change, so that he doubts whether coronary obstruction is responsible for the myocarditis in all cases.

Sir Samuel Wilks first drew attention to the occurrence of syphilitic lesions of the myocardium in 1856. These may be due to:

1. Syphilitic arteritis, and secondary or combined chronic myocarditis.
2. Gummatous formation in the heart wall causing chronic myocarditis.
3. Diffuse chronic myocarditis due to scattered gummatous deposits.

These gummatous formations occurring most commonly in the ventricular walls and in the septum.

As to the relative frequency of cardiac aneurysms,

Legg records 3 cases in 1,890 *post-mortem* examinations, Heschl had a proportion of 1 in 200, and Willigh 1 in 177. From an examination of the records of the last 300 *post-mortem* examinations made at Haslar I find that death was due to aneurysm of the large vessels in 25. In 2 there was an aneurysm of the heart itself: The present case, a sacculated aneurysm of the left ventricle due to syphilitic degeneration of the heart wall; the other an aneurysm at the apex of the left ventricle in an old pensioner, due to extensive thrombosis of the left coronary artery.

The fact that so large a proportion of men in the naval service have been subjects of secondary syphilis undoubtedly predisposes them to these aneurysmal lesions.

Aneurysm at base of left ventricle, rupture. Endocarditis and myocarditis due to gummata in wall. A, Atheroma of aorta. B, Fibroid patch in wall of left ventricle. C, Endocardial patch. D, Left auricular appendix. E, Fibroid patch in ventricular wall. F, Aneurysm. G, Site of rupture. H, Entrance of aneurysm. I, White thickened endocardium by mitral valve.

A SOCIETY for the study of beri-beri has been formed at Tokyo. The President is the Chief of the Medical Department of the Japanese Army. The society aims at discovering an effectual means of stamping out the disease.

DR. VERA DAUTSCHAKOFF was recently licensed as a private lecturer in histology by the Medical Faculty of Moscow. The appointment has been vetoed by the Russian Minister of Public Instruction on the ground that, as the law does not give women the right to study in universities, *a fortiori* they cannot be allowed to teach. He has further ordered that no licences of the kind be granted in future.

At a meeting of the General Purposes Committee of the Metropolitan Hospital Sunday Fund on October 17th it was announced that the subscriptions for the year would reach £80,000. The gross sum thus exceeds that received last year by some £1,500. It is to be noted, however, that it includes some £35,000 received as interest on the estate of the late Mr. George Herring; and it was reported that there had been a serious falling off in the amounts received from collections at places of worship.