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Recognition of rheumatic heart disease[1]

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Although rheumatic carditis was being diagnosed not infrequently during the first third of the 19th century, its firm establishment as a clinical entity is commonly attributed to Bouillaud who published his *Law of Coincidence* of pericarditis and endocarditis with acute rheumatism in 1836. Bouillaud himself certainly believed that he was breaking new ground and anticipated opposition to his statement that, 'This coincidence is the rule and the non-coincidence the exception'. This paper examines whether Bouillaud's claims to priority can be justified or whether the condition was already well known by the time he wrote about it.

James Hope among many others, was certainly aware of the existence of rheumatic heart disease by 1832 and, in 1839 he quoted Bouillaud's views and continued 'He (Bouillaud) . . . inculcates it as a novel doctrine and, to corroborate this opinion, does me the honour of a quotation to show that I was fully acquainted with it. I have not, however, the slightest pretension to originality in this idea; since, at the time when I wrote (1832), there was not a better established doctrine in the London schools'.

By the end of the 18th century the clinical picture of acute articular rheumatism was tolerably well known. Baillou had given an account of its manifestations, on a humoral basis, in 1591 (published posthumously in 1762) and Sydenham recognised the disease as a clinical entity in the 17th century (Keil, 1936). There was, however, probably still some difficulty in separating it from other varieties of acute arthritis and Haygarth wrote in 1805 'The term rheumatism . . . includes a great variety of disorders'.

Parallel with the gradual recognition of rheumatic fever as an entity there were many reports of various forms of heart disease much of which, in retrospect, must have been of rheumatic aetiology though the association was not suspected. Avenzoar had described pericarditis in the 12th century (Garrison, 1929); Benivieni (1507) and Senac (1749) also gave necropsy accounts of this condition. Valve lesions too had been described—by Cowper (1706), Lancisi (1707), Vieussens (1715), and Morgagni (1761).

During the early part of the 18th century the possibility of visceral complications of acute rheumatism was clearly being considered. Boerhaave, Storck and Van Swieten seemed to have some conception of such complications though cardiac involvement was not specified; Cullen, however, while giving a clear account of the articular features, denied the 'recession' of rheumatism into the internal organs (Keil, 1936). The specific association of rheumatism with heart disease was not then suspected though, as Wells (1812) said, Morgagni and Ferriar had noticed the association—apparently as an interesting coincidence.

The recognition of rheumatic carditis began about 1788 when, on the testimony of Baillie (1797) and Wells (1812), David Pitcairn began to point out the association of organic heart disease with rheumatism to his friends and pupils at St. Bartholomew's Hospital. The first edition of Baillie's *Morbid Anatomy* of 1793 contained an accurate description of pericarditis but without reference to rheumatism as a possible cause. In the second edition of 1797 Baillie quoted Pitcairn's views and stated that, 'the causes which produce a morbid growth of the heart are but little known; one of them would seem to be rheumatism attacking this organ'. This seems to be the earliest statement in print that rheumatism could affect the heart.[1] The morbid anatomical diagnosis was apparently made on the basis of pericarditis, often with an effusion with or without cardiac enlargement. Not for many years was the possibility of endocardial disease considered.

At about the same time as Pitcairn was discussing this newly recognised clinical entity with his colleagues in London, a more formal presentation

[1]Based on the Sydenham Lecture delivered on 19 January 1976 to the Faculty of the History and Philosophy of Medicine and Pharmacy of the Worshipful Society of Apothecaries of London.

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[1]Jarcho (1958) has, however, pointed out that Benjamin Rush, in 1794, quoted a letter from a correspondent in Dublin in which a case of acute rheumatism was described. Abnormalities of the pulse were present and, 'The opinion of some of the physicians was that the heart was affected as a muscle, by the rheumatism, and alternated with the limbs'. Whether these Irish physicians had, directly or indirectly, become acquainted with Pitcairn's teaching or whether this was an independent diagnostic *tour de force* is not known.

of the topic was being given in Gloucestershire. The Gloucestershire Medical Society had been meeting at the Fleece Inn in Rodborough since May 1788 and on 29 July 1789, 'Mr. Jenner favoured the Society with Remarks on a Disease of the Heart following Acute Rheumatism' (Carter, 1896). In compliance with the rules of the society the manuscript of Jenner's paper was presumably handed to the president, Caleb Parry, to be approved for publication. It appears that this paper, together with others, was lost—to Jenner's great distress. Baron (1838) wrote, 'I have often heard him lament the loss of one of them in particular. It contained observations respecting a disease of the heart which frequently comes on during attacks of acute rheumatism . . . Jenner's observations were original'. In 1805 Jenner wrote to Parry, mentioning the original paper and, quoting another case, re-emphasised the importance of the cardiac complications of rheumatism (Keil, 1936).

Thus, towards the end of the eighteenth century, it seems that some physicians in London, the West Country, and Dublin were aware of the possibility that acute rheumatism could affect the heart. From time to time the diagnosis of rheumatic heart disease was being made with varying degrees of certainty. In 1798, Wells (1812), after consultation with Pitcairn, had made this diagnosis. Dundas (1809) had been seeing cases since 1770 and had certainly acquired a clear conception of the condition by the end of the 18th century; if the Dr. Gillan whom he met at the necropsy on one of his cases was Hugh Gillan, this cannot have been later than 1798, the year in which Gillan died (Munk, 1878). Pemberton of St. George's and Marcet of Guy's had also, according to Dundas, seen and recognised cases of rheumatic carditis in the first decade of the 19th century. Rheumatic 'metastasis . . . to the heart or breast' had been mentioned in 1798 by George Fordyce, senior physician at St. Thomas' and, at the same hospital, several cases of rheumatic carditis were seen by Wells between 1800 and 1810. In 1802 Wagstaffe of Southwark, saw a fatal case of rheumatic pericarditis with cardiac enlargement (Wagstaffe, 1803) and Crowfoot of Beccles described another in 1809.

Outside Britain, the earliest reference to cardiac rheumatism seems to have been in a lecture manual published in 1803 by Louis Odier of Geneva. This consists of notes of lectures given to *officiers de santé* in 1799 and 1800 and was reviewed in the *Edinburgh Medical and Surgical Journal* in 1806. Odier had been a pupil of Cullen, whose views have been quoted above, but nevertheless described 'among the symptoms which are apt to supervene on acute rheumatism . . . an affection of the heart'. Wells suggested that Odier was probably 'not unacquainted' with Baillie's description and the appearance of such comments in a lecture manual rather suggests that Odier believed that heart disease was already well recognised as a complication of rheumatism.

Meanwhile, in Bath, the very existence of rheumatic carditis was still being questioned. Haygarth, who had been in that city since 1798, failed to mention cardiac involvement in his book on acute rheumatism published in 1805. In addition, a book on carditis was published in 1808 by John Davis. Davis regarded carditis as a disease *sui generis* and was unclear about the aetiology of the condition. Joint pains were not conspicuous in his accounts and Davis was reluctant to accept the possibility of involvement of the heart, or of other viscera, in acute rheumatism. This is despite the fact that he must have been acquainted with Parry who was called in consultation on one of the cases he described. It was Dr. Sherwen, late of Enfield, who pointed out to Davis the probability that 'all the cases were . . . varieties of acute rheumatism attacking the heart'. The reviewer of Davis's book in the *Annual Medical Register* (1809) was of the opinion that 'the suggestion of Dr. Sherwen is worthy of attention'. In this review there is clear recognition of the clinical entity and the categorical statement that 'the heart seems particularly liable to suffer in rheumatism'.

In London the situation became somewhat clearer in 1808 when David Dundas read a paper on, 'A peculiar disease of the heart' to the Medico-Chirurgical Society (Dundas, 1809); this paper had not escaped the attention of the reviewer of Davis's book and his views were clearly fortified thereby. Dundas, an apothecary practising in Richmond, described 9 cases of rheumatic carditis seen during the previous 36 years. He believed the condition had never been described before and Wells later castigated him gently for failing to quote, at least, Baillie's account of 1797; this is even more surprising as Baillie was present at, and described the findings of, the necropsy of one of Dundas's cases.

The cases described by Dundas seem, in most respects, typical of acute rheumatic carditis. The cardiac illness began after, or occasionally at the same time as, an attack of articular rheumatism. The dominant complaints were praecordial pain, cough, dyspnoea, palpitations, and 'violent pulsations of the carotid arteries'. The condition most commonly affected the young and had a high mortality, most patients dying with features suggesting congestive cardiac failure. At necropsy evidence of old or recent pericarditis was found with cardiac enlargement including, particularly, dilatation of the

left ventricle without hypertrophy; the muscle was often soft and friable. Endocardial lesions were rarely mentioned in the early accounts though Dundas comments that in one case 'the valvulae mitrales were edged with a substance of a spongy appearance, perhaps coagulable lymph'.

On the appearance of the paper by Dundas, William Charles Wells very nearly abandoned his project of publishing his cases of rheumatic carditis. He had contemplated publication as early as 1806 as he 'had good reason to believe that it was unknown to many practitioners of medicine in this country'. Further consideration, however, persuaded him that 'even a repetition of what had already been said (by Dundas) might be useful' and on 3 April 1810, he presented his classical paper 'On Rheumatism of the Heart' to the Society for Improving Medical and Chirurgical Knowledge; the paper was published in the *Transactions* of that society in 1812. Space does not permit a detailed review of this admirable paper which is, in all respects, greatly superior to that of Dundas. After a brief, but comprehensive, account of previous publications on the subject, he presented each of his 14 cases individually, some in considerable detail, with accounts of the necropsy findings in the 6 who died. The clinical histories and postmortem appearances were similar to those described more cursorily by Dundas. In one case 'very minute excrescences resembling small warts' were seen on the internal surface of the left atrium; these were, almost certainly, rheumatic vegetations, a feature which had not previously been specificially noted in this connection.

Wells acknowledged the co-operation of several friends and colleagues in the collection of his cases, particularly William Lister of St. Thomas' and Benjamin Brodie of St. George's. His paper seems to have made a considerable impact as, over 20 years later, in evidence to the Select Committee on Medical Education, William MacMichael, who, unlike his colleagues, could find little good to say of Wells, did at least admit, 'There is one paper I do recollect, which is very important, that on the Rheumatism of the Heart' (Keil, 1936). There certainly seems little doubt that, by the second decade of the 19th century, many physicians were well aware that cardiac involvement could occur in acute rheumatism and that the manifestations of that involvement included pericarditis and disease of the heart muscle. Of rheumatic endocarditis, leading to valvular deformities, very little or nothing was known. Nor does there seem to have been any certainty concerning the frequency with which carditis supervened in acute rheumatism.

During the next two decades knowledge of the existence of acute rheumatic carditis spread widely in Britain and elsewhere, though there were still dissenting voices, among them F. J. Kreysig who wrote a commentary on a German translation by J. L. Choulant of Wells's paper; in Kreysig's opinion Wells's cases were examples of 'gouty heart' (Keil, 1936). The failure of Laennec and Bertin to comment on rheumatism of the heart was even more noteworthy (Brown, 1828). The high, and apparently increasing, incidence of this complication of rheumatic fever gradually became apparent; still more gradually was it realised that the endocardium was very commonly affected and that the long-term sequelae of chronic rheumatic heart disease with valvular lesions frequently dominated the natural history of the disease.

Between 1812 and 1818 knowledge of rheumatic carditis was consolidated. Individual cases, with recovery, were reported by Russell from Birmingham and by Penkivil from Plymouth in 1814. In 1815 Mathey reported 5 cases from Geneva with necropsy reports in 2 in a paper which was reviewed, later that year, in the *London Medical and Physical Journal;* the reviewer commented that no advance had been made on the account of Dundas 6 years earlier. In 1816 an early American account came from James Jackson of Harvard who commented that affection of the heart in rheumatism 'is neither new nor very rare' and, in the same year, John Armstrong touched briefly on rheumatic carditis in a more general discussion on fevers. Also in 1816 Charles Scudamore published a monograph on gout and rheumatism and, after describing a typical case of acute rheumatic carditis, made the following rather unhelpful comment: 'I should rather be disposed to consider the general rheumatism of the constitution to be a predisposing cause of this disease of the heart, than to pronounce it rheumatism of the organ'—a 'risk factor' in modern parlance. In 1817 a London correspondent of the *Edinburgh Medical and Surgical Journal* discussed current views on rheumatic heart disease and pointed out, perhaps for the first time, that, 'the supervening affection of the heart does not always kill during the rheumatism; it frequently remains as a chronic disorder for many months, *or a year or two*'.[1] This phase of consolidation was completed in 1818 by James Johnson who reviewed all that had previously been written about cardiac rheumatism in a work in which were implicit the epidemic constitutions of Hippocrates and Sydenham. Thus, referring to rheumatic metastasis to the heart and writing in the year before the Peterloo massacre, Johnson commented that, 'this is a subject of only modern observation' and 'in a turbulent

[1]My italics.

era . . . certain erratic inflammations, as those of gout, rheumatism, erysipelas, etc., may fall more frequently on an organ preternaturally deranged, than at other periods'. To the previously recorded cases Johnson added several others reported to him by his naval colleagues and emphasised the increasing importance of the condition as follows: 'there are reasonable grounds of belief that the influence of the disease has lately increased, is still increasing, and ought to be diligently watched'.

Until the introduction of mediate auscultation (Laennec, 1819) the clinical diagnosis of carditis in acute rheumatism depended, perforce, on symptoms and signs which were largely non-specific. Inevitably many cases with less severe degrees of cardiac involvement must have been missed and the true frequency of carditis cannot have been appreciated. Nevertheless, among the increasingly numerous publications written on the subject (Reeder, 1821; Armstrong, 1823; Chisholm, 1824; Peyron, 1826; Hawkins, 1827) several emphasised the great frequency with which the heart was affected. The writer of a review article in the *London Medical Repository* for 1823 said 'The translation of this affection (rheumatism) to the heart has become of so frequent occurrence, that it is no longer looked on as an unusual circumstance'. Thomas Cox, in 1825, described the 'numerous cases' of rheumatic heart disease he had seen in and around Guy's Hospital. Robert Adams, in Dublin, had seen 'many cases' by 1827 and commented, 'It is scarcely necessary to dwell upon this subject, as rheumatism of the heart, since Doctor Baillie introduced the subject to notice, has been much spoken of.' Samuel Broughton, surgeon to the Life Guards, presented yet another case in 1827, though, as he said, the condition was 'now well known and understood' and Joseph Brown of Sunderland was so impressed with the importance of rheumatism in the aetiology of heart disease that he wrote, in 1828, 'when called to a case of affection of the heart, my first enquiry is whether the patient has been subject to rheumatism'. Only Scudamore (1827) of the more important writers on the subject, regarded carditis as a rare complication of rheumatism; indeed he adduced the rarity of carditis compared with the frequency of rheumatism as evidence in favour of his reiterated thesis that rheumatism was a predisposing cause of heart disease rather than a 'metastasis'.

In none of the publications hitherto discussed did endocarditis receive any significant emphasis and it was not until 10 years after the introduction of mediate auscultation that cases of rheumatism were, at last, being described in which cardiac murmurs were heard during life. Among five cases from St. George's Hospital described in 1829 and 1830 in the *Medico-Chirurgical Review*, a *bruit de scie* (saw sound) was heard in one and, in two cases from the London Hospital described in 1830 in the *London Medical and Physical Journal*, a 'bellows-sound' was heard; in one of these right ventricular and left atrial hypertrophy and tight mitral stenosis with ossification of the valve were found at necropsy. Particularly in the writings of James Hope (1832) one finds, as in so many other respects, an account of rheumatic heart disease which could almost have appeared in a modern textbook. Among the causes of pericarditis 'far above all', in his view, was rheumatism. Even more impressive is his account of the aetiology of chronic valve disease. He described the 'Exciting causes of valvular induration' as follows: 'These are, first, such as overstrain the valves by increasing the force of the circulation; namely violent efforts, hypertrophy, increased action of the heart from nervous, febrile or inflammatory excitement: secondly inflammation of the internal membrane of the heart, resulting from carditis . . . especially rheumatic'.

The importance of auscultation was further emphasised, implicitly, in a short paper by Roots of St. Thomas' Hospital (1836) in which he described a case in which a pericardial friction rub was heard, but 'there was not the slightest bellows-sound'; he inferred from this that no endocarditis was present. Whether or not this was a correct inference is irrelevant; the important fact is that Roots realised that both pericarditis and endocarditis could be present in rheumatic carditis and that each could be diagnosed separately.

Thus it would seem, perhaps, that Hope was correct in stating that Bouillaud's 'novel doctrine' was already established in the London schools by 1836. Hope and Roots, however, were leaders of the profession; Hope 'opened wide the portals of the heart'[1] and Roots raised the reputation of St. Thomas' Hospital 'to a point which has not been equalled at any other period in the history of that institution' (*Lancet*, 1861). It is not possible to say with certainty how widely diffused was the knowledge that rheumatic carditis is a pancarditis. However advanced was the practice of some London physicians, Bouillaud's publication of 1836 was the first to state that, in patients suffering, or even convalescent, from rheumatic fever, examination by percussion and auscultation would, more often than not, reveal evidence of cardiac enlargement and valvular disease. It is also, perhaps, not without significance that, in his third edition of 1839, Hope inverted his original order of 'Exciting causes of

[1]From a elegy on Hope by C.L.M. (perhaps Charles Lewis Meryon), quoted by East (1958).

valvular induration', placing rheumatism above 'violent efforts' and other causes of 'overstrain' of the valves. Hope and his colleagues were certainly aware of the clinical pictures of acute rheumatic carditis and chronic rheumatic heart disease, but Bouillaud was the first to describe them clearly and in detail. From the time of his publication, there was no longer any dispute about the relation between acute articular rheumatism and inflammation of the pericardium, myocardium, and endocardium with consequent valvular deformities. After 40 years of debate, the clinical picture was complete and there seems no reason to disagree with Ackerknecht's (1967) pithy comment that 'only Bouillaud made it stick'.

References

Ackerknecht, E H. (1967). *Medicine at the Paris Hospital, 1794–1848*. The Johns Hopkins Press, Baltimore.

Adams, R. (1827). Cases of diseases of the heart accompanied by pathological observations. *Dublin Hospital Reports*, **4**, 353.

Armstrong, A. (1823). Case of acute rheumatism translated to the heart. *London Medical and Physical Journal*, **49**, 215.

Armstrong, J. (1816). *Practical Illustrations of Typhus and Other Febrile Diseases*, pp. 206 and 208. Longman, London.

Baillie, M. (1793). *The Morbid Anatomy of Some of the Most Important Parts of the Human Body*, J. Johnson and G. Nicol, London.

Baillie, M. (1797). *The Morbid Anatomy of Some of the Most Important Parts of the Human Body*, 2nd ed. J. Johnson and G. Nicol, London.

Baillou, G. (1762). *Liber de Rheumatismo*. Geneva. (Cited by Major, 1945.)

Baron, J. (1838). *The Life of Edward Jenner, M.D., LL.D., F.R.S.*, Vol. 1, p. 45. Colburn, London.

Benivieni, A. (1507). *De abditis nonnullis ac mirandis morborum et sanationum causis*. Florence. (Cited by Long, E. R. (1928). *A History of Pathology*. Williams and Wilkins, Baltimore.)

Bouillaud, J. (1836). *Nouvelles Recherches sur le Rhumatisme Articulaire Aigu en Général, et Spécialement sur la Loi de Coincidence de la Pericardite et de la Endocardite avec cette Maladie*. Baillière, Paris. Translated by Kitchen, J. (1837). Haswell, Philadelphia.

Broughton, S. D. (1827). Case of pericarditis, connected with acute rheumatism, successfully treated. *London Medical and Physical Journal*, n.s. **3**, 508.

Brown, J. (1828). *Medical Essays, on Fever, Inflammation, Rheumatism, Diseases of the Heart, etc.*, p. 166. Longman, London.

Carter, A. H. (1896). Records of an old medical society. Some unpublished manuscripts of Edward Jenner. *British Medical Journal*, **1**, 1296–1298.

Chisholm, R. (1824). A report of the medical cases treated at the Kent and Canterbury Hospital, from the 1st of January to the 30th June, 1824. *London Medical Repository*, n.s. **2**.

Cowper, W. (1706). On ossifications or petrifactions in the coats of arteries, particularly in the valves of the great artery. *Philosophical Transactions of the Royal Society*, **24**, 1970–1977. (Cited by Major, 1945.)

Cox, T. (1825). Observations on acute rheumatism and its metastasis to the heart, etc. London, 1824. Reviewed in *Medico-Chirurgical Review*, **2**, 428–432.

Crowfoot, W. H. (1809). Two cases of carditis. *Edinburgh Medical and Surgical Journal*, **5**, 298–300.

Davis, J. F. (1808). *An Inquiry into the Symptoms and Treatment of Carditis or the Inflammation of the Heart Illustrated by Cases and Dissections*. Longman, London.

Davis, J. F. (1809). Review of. *Annual Medical Register*, **1**, 112.

Dundas, D. (1809). An account of a peculiar disease of the heart. *Medico-Chirurgical Transactions*, **1**, 37–46.

East, T. (1958). *The Story of Heart Disease. The Fitzpatrick Lectures for 1956 and 1957*. Dawson, London.

Edinburgh Medical and Surgical Journal (1817). Extracts from a letter from a physician in London, **13**, 249–253.

Fordyce, G. (1798). *A Third Dissertation on Fever*, Part 1. J. Johnson, London.

Garrison, F. H. (1929). *An Introduction to the History of Medicine*, 4th ed., p. 132. Saunders, Philadelphia.

Hawkins, F. (1827). Goulstonian Lectures for 1826. Reviewed in *London Medical and Physical Journal*, **57**, 260.

Haygarth, J. (1805). *Clinical History of Diseases, Part 1. Clinical History of the Acute Rheumatism or Rheumatic Fever*. Cadell and Davies, London.

Hope, J. (1832). *A Treatise on the Diseases of the Heart and Great Vessels*. Kidd, London.

Hope, J. (1839). *A Treatise on the Diseases of the Heart and Great Vessels*, 3rd ed. J. Churchill, London.

Jackson, J. (1816). On rheumatism in the heart, eyes, etc. *London Medical and Physical Journal*, **36**, 200. (Reprinted from *New England Journal of Medicine*.)

Jarcho, S. (1958). Rheumatic carditis: Bouillaud and some unknown Irish precursors. *American Journal of Cardiology*, **1**, 514–516.

Johnson, J. (1818). *The Influence of the Atmosphere, More Especially the Atmosphere of the British Isles, on the Health and Functions of the Human Frame*. Underwood, London.

Keil, H. (1936). Dr. William Charles Wells and his contribution to the study of rheumatic fever. *Bulletin of the Institute of the History of Medicine*, **4**, 789–816.

Laennec, R. T. H. (1819). *De l'Auscultation Médiate*. J. A. Brosson and J. S. Chaudé, Paris.

Lancet (1861). Obituary of H. S. Roots, **1**, 279–280.

Lancisi, G. M. (1707). De subitaneis mortibus libri duo. J. F. Buagni, Rome. (Cited by Major, 1945.)

London Medical and Physical Journal (1830). Hospital Reports: London Hospital, **63**, 322.

London Medical Repository (1823). Historical sketch of the progress of medicine for the first six months of 1823. **20**, 26.

Major, R. H. (1945). *Classic Descriptions of Disease*, 3rd ed. Thomas, Springfield, Illinois.

Mathey, A. (1815). Memoir on rheumatism of the heart. Reviewed in *London Medical and Physical Journal*, **34**, 84.

Medico-Chirurgical Review (1829). Hospital Reports: St. George's Hospital. Diseases of the heart. **11**, 556–563.

Medico-Chirurgical Review (1830). Hospital Reports: St. George's Hospital. On pericarditis. **13**, 183–190.

Morgagni, G. B. (1761). *De sedibus, et causis morborum*. Translated by B. Alexander (1769). A. Millar and T. Cadell, London.

Munk, W. (1878). *The Roll of the Royal College of Physicians of London*, Vol II. London.

Odier, L. (1803). Manuel de médecine pratique, ou sommaire d'un cours gratuit donné l'an vii et l'an viii de la Republique Francaise aux officiers de Santé du département du Léman. Reviewed in *Edinburgh Medical and Surgical Journal*, 1806, **2**, 446–453.

Penkivil, J. (1814). Case of rheumatism of the heart. *Edinburgh Medical and Surgical Journal*, **10**, 355–357.

Peyron, M. (1826). Case of rheumatism of the heart, treated by acupuncture. *London Medical and Physical Journal*, **56**, 379. (Reprinted from *Revue Médicale*.)

Reeder, H. (1821). A practical treatise on the inflammatory, organic and sympathetic diseases of the heart. Reviewed in *London Medical and Physical Journal*, **46**, 569.

Roots, H. S. (1836). Acute pericarditis supervening in rheumatism. *St. Thomas's Hospital Reports*, **1**, 397.

Russell, J. (1814). Case of rheumatism of the heart successfully treated. *Edinburgh Medical and Surgical Journal*, **10**, 18–21.

Scudamore, C. (1816). *A Treatise on the Nature and Cure of Gout Comprehending a General View of a Morbid State of the Digestive Organs; and of Regimen; with Observations on Rheumatism*. Longman, London.

Scudamore, C. (1827). *A Treatise on the Nature and Cure of Rheumatism with Observations on Rheumatic Neuralgia, and on Spasmodic Neuralgia or Tic Douloureux*. Longman, London.

Senac, J. B. (1749). *Traité de la Structure du Coeur, de son Action et de ses Maladies*. Vincent, Paris. (Cited by Willius, F. A., and Keys, T. E. (1961). *Classics of Cardiology*, Vol. 1. Dover, New York.)

Vieussens, R. (1715). *Traité Nouveau de la Structure et des Causes du Mouvement Naturel du Coeur*. Guillemette, Toulouse. (Cited by Major, 1945.)

Wagstaffe, M. F. (1803). A case of thoracic adhesions. *Medical and Physical Journal*, **9**, 359.

Wells, W. C. (1812). On rheumatism of the heart. *Transactions of the Society for Improving Medical and Chirurgical Knowledge*, **3**, 373–424.

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