Rheumatism, rheumatoid arthritis and subcutaneous nodules / by C.O. Hawthorne.

RHEUMATISM RHEUMATOID ARTHRITIS AND SUBCUTANEOUS NODULES.

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With kind regards from

P. T. Hawthorne

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AND

SUBCUTANEOUS NODULES

BY

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PREFATORY NOTE.

THE term rheumatism, though widely employed, and provided with the justification of practical utility, by no means possesses a definite and precise significance. Among the several definitions that have been attached to it, there is not one which has been received with anything like a unanimous welcome. It is perhaps not unreasonable to anticipate that a definition commanding general assent is hardly likely to be produced until the etiology of the disease is placed on a satisfactory scientific basis. Then, and probably only then, will it be competent to determine what, if any, relationship exists between the various events that are more or less commonly designated "rheumatic." The discussion whether the phenomena forming the clinical condition known as rheumatoid arthritis are, or are not, to be included under the term rheumatism, can at present, therefore, hardly be pressed to a definite issue. In essence the question may be presumed to mean: Is the deformed condition of the joints in rheumatoid arthritis due to the same agency as that which produces the acute polyarthritis of rheumatic fever. When that agency is known, but hardly before, the problem may be within measurable distance of solution. In the meantime, the careful collection of clinical facts, if insufficient to establish a generalisation embodying a well-defined scientific doctrine,

may at least warn us against the danger of taking refuge in a conclusion possessing the accents, but not the essentials, of a definite statement.

This essay does not pretend to any more ambitious purpose than to assist in the avoidance of such an error. The questions it deals with are doctrinal rather than practical. But they have their own measure of interest, and even of importance. If it appears that on the most material points no confident conclusion is reached, the reply is, that the apparent contradictions which the facts disclose forbid any dogmatic declaration. The profession of a mere individual belief, either on one side or the other, can in no sense advance the question at issue. The field is already rich, even to embarrassment, in personal creeds.

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C. O. H.

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A CLINICAL STUDY.

THE area or province commanded by the term Rheumatism has varied widely in its scope and contents in different periods of medical history. For the most part, the movements of opinion have been in the direction of restricting the application of the term within narrower and narrower limits, though in comparatively recent times a number of phenomena previously unsuspected of any association with it, have been, with more or less general assent, included within the contents of its claim. It is only since the seventeenth century that the significance of the word has in any degree corresponded to its modern definition. Previous to that date the disease now known as articular rheumatism was placed, together with gout, and indeed with all other affections of the joints, under the term "arthritis," any

distinction which was recognised being one merely of locality and degree.[1]

In so far as the actual word Rheumatism was used by ancient writers, it appears to have been applied to conditions attended with a "rheum" or mucous discharge, such as would nowadays be called a "catarrh."[2] The two words, indeed, are medically no less than etymologically related, and a well-known modern author has proposed to define a "rheumatic person" as one "who is prone to catarrhal cold in his joints."[3]

According to Scudamore,[4] and in this respect he is confirmed in a recent article by Dr. Church,[5] the use of the word rheumatism in anything like its modern sense is to be attributed to Ballonius, who died in 1616, his works[6] being published in 1642. The same writer is also credited with establishing the distinction between gout and rheumatism, a distinction which was strongly insisted on by Sydenham[7] (1624-1689), and which, of

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[1] On Arthritis: "When, therefore, the humour is situated in the joints of the feet only, the complaint is called podagra; but when the cause is diffused all over the body we commonly call it arthritis, in which the vertebræ, scapulæ, jaws, and every other joint are attacked with the disease. . . . . When the disease is protracted in the joints, the humours become thick and viscid, so as to form what we call tophi or chalk-stones."—Paulus Ægineta. Adams's Translation, p. 657.

"Cælius Aurelianus (fifth century) states that various as are the situations of the disease (arthritis), its nature is the same."—Scudamore: "The Nature and Cure of Rheumatism," p. 3.

[2] "According to ancient writers the word rheumatism seems to have been applied to affections to which they attached the idea of a 'humoral defluxion,' especially to those characterised by mucous and pituitous discharges."—"Copland's Medical Dictionary, 1858," Vol. III., p. 609.

"Cælius Aurelianus . . . speaks of rheumatism not as a term for diseases of the joints, but as an internal defluxion of a thin humour. Galen uses the term in the same sense."—Scudamore. Preface, p. 3.

[3] Jonathan Hutchinson. "Transactions of the International Medical Congress, 1881. London." Vol. II., p. 93.

[4] "A Treatise on the Nature and Cure of Rheumatism." By Chas. Scudamore, M.D., F.R.S., 1827.

[5] "A System of Medicine" (Clifford Allbutt). Vol. III., p. 1.

[6] "De Rheumatismo et Pleuritide, 1642."

[7] Sydenham on Rheumatism: "This disease when separated from the fever is often called arthritis (gout). Nevertheless it differs essentially from that disease." — "The Works of Sydenham." Translated by R. G. Latham, M.D. Vol. I., p. 254.

course, at the present day is recognised medical doctrine. Similarly, other varieties of joint diseases have, with a fair measure of general agreement, been established as entities distinct from both rheumatism and gout. Thus the several joint affections which accompany pyæmia, gonorrhœa, hæmophilia, certain nervous diseases, and some of the specific fevers, have at various times been removed from the rheumatic area, and placed in new positions and amidst new relationships.[8] In these instances, however, at least for the most part, the questions in debate concern the position and limits of rheumatism, as this displays itself in the form of articular disturbances more or less *acute* in character. But there is also an attack upon the area of the rheumatic claim from an entirely different quarter—an attack in which the position of rheumatism as a *chronic* disorder of the joints is seriously challenged. And the contest, apart from minor issues, involves the large question whether those manifestations of articular disturbance commonly grouped under such terms as rheumatic or rheumatoid arthritis, rheumatic gout, osteo-arthritis, etc., are to be placed within or without the rheumatic boundary. The dispute here alluded to took origin fully a hundred years ago. It has produced very acute differences of opinion, and the controversy, so far from being concluded, is found in active progress in the medical writings of the present day. That the disease now known as rheumatoid arthritis existed from the earliest times there is not the slightest doubt, for its

[8] There are no doubt dissentients from this general statement, at least as regards the inclusion of some of the instances named. For example, Mr. Hutchinson would not allow that gonorrhœal synovitis is non-rheumatic, but then the definition which he applies to the word rheumatism is a very wide one ["Under the term rheumatism we include all arthritic maladies which are not proved to be gouty. . . . Whenever arthritis occurs in connection with food we call it gout, and whenever such association is wholly absent we name it rheumatism." —Hutchinson. "Transactions of International Medical Congress, 1881." Vol. II., pp. 92, 93], and those who would enter the lists against him must either accept his definition or propose an alternative, and there are difficulties about either course. The attacks of synovitis that are sometimes associated with scarlet fever have long been a subject of controversy. The arguments and opposing conclusions are well stated on the one side in Garrod's "Treatise on Rheumatism," and on the other in "A Manual of Infectious Diseases," by Goodall and Washbourn, 1896.

record is written in clear characters on various collections of human bones of almost prehistoric date.[9] And a reference by Sydenham[10] shows that the facts of the disease attracted his attention, though there is nothing in his writings to suggest that he regarded the condition other than as a mere variety of rheumatism. It is to Heberden (1710-1801), and Haygarth (1740-1827), that the responsibility of first endeavouring to advance rheumatoid arthritis to the position of an independent disease must be attached. References to the condition may be found in three of Heberden's chapters.[11] In the section dealing with "Arthritis (Gout)" he describes a "malady whatever it be named," in which "the pains are less violent than in the common gout though the swellings are greater," and in which the "remarkable circumstance is that of great and lasting feebleness"; and claims that "the continuance of the pain, the return of it, and its consequences will differ so much from ordinary gout, that it is either to be called a rheumatism or should be distinguished by some peculiar name from both these diseases." In writing of "Rheumatism," Heberden says, "The chronical differs from the acute rheumatism in being joined with little or no fever, in having a duller pain and commonly no redness, but the swellings are more permanent, and the disease is of much longer duration"; and again "in the limb affected in the chronical sort the use has at least in many cases been wholly taken away." Then in the appendix to his book he treats specifically "Of the Chronical Rheumatism," which, he writes, "often passes under the general name of rheumatism and is sometimes supposed to be the gout," but "is in reality a very different distemper from the genuine gout and from the acute

[9] See article by Senator in Ziemssen's "Cyclopædia of the Practice of Medicine," Vol. XVI., p. 147, also article by Eve, "British Medical Journal," 1890, Vol. I., p. 423.

[10] Sydenham on Rheumatism: "The pains . . . may cease of their own accord; the patient, however, shall be a cripple to the day of his death, and wholly lose the use of his limbs; whilst the knuckles of his fingers shall become knotty and protuberant (as in gout) with the knots showing most on the inside. With all this the stomach shall be strong, and the patient be sound in other respects."—Op. cit., Vol. I., p. 255.

[11] "Commentaries on the History and Cure of Diseases." By Wm. Heberden, M.D., London, 2nd edit., 1803.

rheumatism, and ought to be carefully distinguished from them both; . . . it would be useful," he adds, "if it were distinguished by a peculiar name which might prevent it being confounded with other disorders, as by being called a spurious and wandering gout or a chronical rheumatism." Haygarth,[12] in his two papers dealing with the subject, shows an equally distinct appreciation of the clinical facts, and proposes the separation from both gout and rheumatism of a chronic affection of the joints under the term "Nodosity of the Joints." "The term rheumatism," he writes, "has been applied without sufficient discrimination to a great variety of disorders, which, except pain, have but few symptoms that connect them together." He separates rheumatism from "tic douloureux, sciatica, and lumbago . . . which nosologists have placed under this denomination," and announces that his experience has convinced him that "there is one painful and troublesome disease of the joints of a peculiar nature, and clearly distinguished from all others by symptoms manifestly different from the gout and from acute and chronick rheumatism." It is for this condition which has "hitherto passed under the name of gout or rheumatism, or perhaps has more commonly been called rheumatick gout," that he proposes the name, *nodosity of the joints*. Among its features he describes the gradual enlargement of "the structures which form the joint," so that there are formed "nodes. . . . which feel as if they were enlargements of the bones themselves;" the gradual spread of the disease "to many joints without recession in those first affected, and without shortening the patient's life;" the existence of "a crackling noise when the joints are moved;" and the slow "distortion, and even dislocation" of the joints affected. And in a paper[13] read before the College of Physicians in 1812, Haygarth emphasises the distinction between chronic rheumatism and nodosity of the joints, pointing out *inter alia* that "the pain of chronic rheumatism is not accompanied with any tumour of the morbid part." For treatment, Haygarth advised repeated leeching of the joints with the use of warm baths

[12] "A Clinical History of Acute Rheumatism." "A Clinical History of Nodosity of the Joints." By Jno. Haygarth, M.D., 1805.

[13] "Medical Transactions of the College of Physicians," Vol. IV., p. 294.

and douches which may "perhaps be employed with most advantage at Bath or Buxton," but as he finds that "many valuable matrons cannot conveniently leave their houses or desert their domestic duties," he suggests methods of treatment suitable for employment under these circumstances.

Towards the departure thus inaugurated by Heberden and Haygarth various attitudes have been adopted, but, on the whole, opinion has steadily grown, at least in this country, in the direction of their views.

Brodie[14] was inclined to regard the disease now under consideration as gouty in nature, though he allows that there are features in its manifestations which justify the term "rheumatic gout."

On the other hand, Scudamore,[15] in his treatise on rheumatism published in 1827, when dealing with Haygarth's position, expresses the opinion that the condition termed nodosity of the joints is merely "a species of chronic rheumatism." Many of the passages in his book show very distinctly his familiarity with the more prominent features of the disease now commonly called rheumatoid arthritis. Thus, in speaking of the various structures of the joint concerned in the rheumatic process, he expresses the opinion that the cartilages are rarely attacked by the same primary inflammatory changes which affect the ligaments, and then adds, however, that "in the ultimate consequences of protracted and inveterate rheumatism the cartilage becomes involved in the disease, even to the extent of change of structure;" and that as far as this part of the joint is concerned "erosion and partial absorption constitute the principal kind of morbid alteration proceeding from rheumatism" (Op. cit., p. 33). And again, "the fingers present the most frequent instances and the most remarkable of such distortions . . . as indicate diseased organisation in all the textures which composes the joint" (Op. cit., p. 34); also "I have met with cases in which the knees have been almost wholly locked with ankylosis, and the extraordinary grating produced on attempting to move the joint seems such as might arise from a roughened state of the cartilage" (Op. cit., p. 34). These passages can leave no doubt that it was in the light

[14] "On Diseases of the Joints." First edition published in 1818.
[15] Op. cit.

of a careful and exact experience that Scudamore adhered to his view in favour of the essentially rheumatic nature of the various conditions he describes.

In a paper on the symmetry of disease (1842), Wm. Budd[16] figures the hands of a patient manifestly distorted with osteo-arthritis, and remarks on the absorption of the articular cartilages, the alteration of the heads of the bones, the presence of ankylosis and dislocations, and adds "this affection is much less prone to shift than gout or common rheumatism; it is more common in women than in men, it seldom comes on before middle life, and it is occasionally excited by the puerperal state."

Todd[17], after alluding in detail to the principal clinical features of the disease, which he recognises as the condition described by Haygarth, states his preference for the term "chronic rheumatism of the joints," adding that in his experience the manifestations of the disease are "clearly traceable to a rheumatic state of the constitution."

Watson[18] also describes the disease as a form of chronic rheumatism, and dwells upon the symmetrical arrangement of the deformities it produces as a proof of the "constitutional origin of the disorder" and "the infection of the blood."

The great majority of English authors, since this date, however, have maintained that rheumatoid arthritis is neither a form of rheumatism nor a form of gout, but is an independent disease entitled to a special nosological position.

Fuller,[19] without qualification, asserts that "Rheumatic gout is not a mere variety of gout or rheumatism, nor is it a compound of the two diseases; it is essentially distinct from them both, has a special pathology of its own, and requires a distinctive title." In the classical study of the disease by Adams[20] of Dublin, a similar though perhaps

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[16] "Medico-Chirurgical Society's Transactions," 1842, p. 160.

[17] "Practical Remarks on Gout, Rheumatic Fever, and Chronic Rheumatism of the Joints." By R. B. Todd, M.D., F.R.S., 1843.

[18] "The Principles and Practice of Physic." By Sir Thomas Watson, M.D., Fourth Edition, p. 751. First Edition, 1843.

[19] "Rheumatism, Rheumatic Gout, and Sciatica." By H. W. Fuller, M.D., Third Edition, p. 332. First Edition, 1852.

[20] "Rheumatic Gout or Chronic Rheumatic Arthritis of all the Joints." By R. Adams. First Edition, 1857.

somewhat less confident view is maintained; and A. B. Garrod,[21] who first proposed the name "rheumatoid arthritis," throws the weight of his authority into the same scale.

With what general sympathy this teaching has been received is at once evident when the pages of the more recent text-books on medicine are consulted. Hilton Fagge,[22] Bristowe,[23] and Osler,[24] for example, all adhere more or less decidedly to the doctrine that rheumatoid arthritis is not rheumatism, though voices on the other side are by no means silent. Thus Jonathan Hutchinson's[25] view is that there exists "a state of tissue health transmitable by inheritance which involves liability to inflammations of joints and fibrous structures, and upon this arthritic diathesis as a foundation may be built up, under the influence of special causes, a tendency to gout, rheumatism, or any of their various modifications and combinations"; also that "much of what is called rheumatoid arthritis . . . is the result of inheritance of tendency to both diseases." According to Sir Dyce Duckworth,[26] though rheumatoid arthritis possesses certain distinctive features "the disease is a form of true rheumatism," and "one of several manifestations of the rheumatic branch of the basic arthritic diathesis." The term "rheumatic gout" he believes to be quite inapplicable save for a minority of cases where true coalescence occurs. Mitchell Bruce[27] is quite convinced that the "two diseases are expressions of one morbid process which differ from each other partly in intensity, and partly in the manner of their evolutions."

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[21] "Gout and Rheumatic Gout (Rheumatoid Arthritis)." A. B. Garrod, M.D., 1859.

[22] "The Principles and Practice of Medicine." Third Edition, Vol. II., p. 729.

[23] "The Theory and Practice of Medicine." Seventh Edition, p. 916.

[24] "The Principles and Practice of Medicine." Second Edition, p. 305, *et seq.*

[25] "Transactions of the International Medical Congress." London, 1881, Vol. II., pp. 95–99. See also "The Pedigree of Disease," pp. 126–127, by the same author.

[26] Heath's "Dictionary of Practical Surgery," Vol. I., p. 294. See also the same author in "British Medical Journal," 1884. Vol. II., p. 263.

[27] Quain's "Dictionary of Medicine." Second Edition, Vol. II., p. 662.

Further, there is the great authority of Charcot,[28] who, whilst he allowed that there were different types of chronic rheumatism, and that one of these might be named nodular or progressive chronic articular rheumatism, stated his opinion "that there are not two fundamentally distinct diseases to be dealt with as certain authors fancy, but only two manifestations of one and the same diathetic state." Charcot, it may be noted, denied the accuracy of the statement made by several authors that in rheumatoid arthritis cardiac lesions do not occur. He held, indeed, quite the contrary view,[29] and thus necessarily could not allow a distinction which his experience convinced him was not founded on fact.

Trousseau[30] was much less decided in his views. He was convinced that "nodular rheumatism" was neither gout nor rheumatism, though he recognised certain facts which he held "decisively connect the nodular malady with the rheumatic diathesis," and one of these was the occasional occurrence in nodular rheumatism of extensive inflammatory lesions of the pericardium.

But the position of those who deny the rheumatic nature of rheumatoid arthritis has not been confined to mere denial. On the contrary, there has been advanced in recent years at least one very definite theory of its etiology and nature which has received a considerable measure of support. It is hardly within the scope of this essay to deal in detail with theories of rheumatoid arthritis, except in so far as they involve a negation of the identity of the disease with rheumatism, and therefore only a brief allusion is here made to this part of the subject. It is sufficient to refer to the fact that the symmetrical manifestations of the disease, the existence of muscular atrophies and other suggestions of trophic disturbance, the recognised analogies between the joint conditions and articular disturbances known to depend on spinal lesions, the at times exaggerated tendon-jerks, and the apparent sequence of the disease on circumstances which have an exhausting influence on nerve force, have all been advanced in support of an interpretation which would

[28] "Lectures on Senile Diseases." Sydenham Society's Translation, pp. 154–163–180.

[29] Op. cit., p. 173, *et seq.*

[30] "Lectures on Clinical Medicine. On Nodular Rheumatism, erroneously called Rheumatic Gout." New Sydenham Society's Translation, Vol. IV., p. 410, *et seq.*

regard the whole of the phenomena as the results of disturbed innervation. This theory of the disease was first offered by Remak (1858), who proposed the name "arthritis myelitica," though long before this date, it is not uninteresting to note that Scudamore (Op. cit., p. 339) had suggested that the conditions were due to "a slow perversion of nutrition."

The dystrophic theory has received the adhesion and support of Senator,[31] Ord,[32] A. E. Garrod,[33] Osler,[34] Hyde,[35] Kent-Spender,[36] and others. Opinions differ as to the exact part of the nervous system in which the primary disturbance originates, but the more frequent occurrence of the disease in women, and its admitted development at periods of life when menstrual disturbances and other evidences of intra-pelvic disorders are not uncommon, have suggested the view that the disease may be, at least in a number of cases, of the nature of a reflex tropho-neurosis. Ord[37] has argued strongly in favour of this suggestion, though he believes that the lesion in some cases is a primary one in the spinal cord itself; and the facts as to the sex relations of the disease have attracted general attention quite apart from any theory. Haygarth, Todd, Fuller, Charcot, Trousseau, and others, draw attention to the greater frequency of the disease in women and to its associations with abnormal uterine conditions, though on this aspect of the subject A. E. Garrod remarks that he has found men to be frequent sufferers, and he therefore doubts whether any special stress can fairly be laid on uterine disturbances as a cause of the disease.

Another and more recent theory of the nature and causation of rheumatoid arthritis is the one which teaches it to be dependent on a specific micro-organism[38]; and yet again,

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[31] "Ziemssen's Cyclopædia of the Practice of Medicine," Vol. XVI., p. 152.

[32] "British Medical Journal," 1880, Vol. I, p. 155.

[33] "A Treatise on Rheumatism," A. E. Garrod, M.D., 1890.

[34] "The Principles and Practice of Medicine," second edition, p. 305.

[35] "The Causes and Treatment of Rheumatoid Arthritis," by S. Hyde, M.D., 1896.

[36] "Osteo-Arthritis," by J. Kent-Spender, M.D., 1889. See also same author in "Clifford Allbutt's System of Medicine," Vol. III., p. 173.

[37] "Transactions of the Clinical Society," Vol. XII., 1879; and "Lancet," 1887, Vol. II., p. 1,067.

[38] "Rheumatoid Arthritis: its Pathology and Treatment." By Gilbert Bannatyne, M.D Second Edition.

it is claimed that whatever be the exact nature of the disturbing influence, the essential fault is in "the internal secretion of the structures of the joint,"[39] this view carrying with it the almost inevitable suggestion that patients may be usefully treated by the administration of "an extract from the articular cartilages and synovial membranes of healthy animals."

No doubt these more positive positions have in some sense strengthened the standing of those who contend against the rheumatic nature of rheumatoid or osteo-arthritis, if only for the general reason that a positive theory usually commands more support and sympathy than an attitude of mere negation, though it is not suggested here that the advocates of these views have not some more valid basis for their doctrines. The division of opinion, however, remains, and the resolute attitude of those to whom rheumatoid arthritis is simply a form of rheumatism has not been modified because their opponents have been able to set up a competing positive hypothesis. Still it must be admitted that the dystrophic theory of rheumatoid arthritis has made a not unsuccessful appeal to many of the leaders of professional opinion, and that it is one of a series of movements by which the extent of the authority of the term rheumatism over abnormal conditions of the joints has been, in the judgment of a large constituency, seriously diminished. There are, however, compensations, for though as a disease of the joints the boundary of rheumatism may have been pushed back, the enlarged claims advanced at different dates during the present century in reference to the area of the disease in other directions, have carried its authority into new and important territories. And some of these claims are hardly in dispute.

Certainly it will not be denied that endocarditis and pericarditis are frequently, and indeed usually, as true manifestations of the rheumatic influence as synovitis. Chorea, tonsillitis, erythema multiforme, and erythema nodosum, are in a position scarcely less secure, and authorities whose views must be received with every respect would include pleurisy, peripheral neuritis, iritis, purpura, meningitis, pneumonia, and indeed many other conditions as at least possible

[39] "The Causes and Treatment of Rheumatoid Arthritis." By S. Hyde, M.D., p. 78.

members of the rheumatic series.[40] There remains to be added to this list the occurrence of subcutaneous fibrous nodules. And the addition is the more important to the present purpose, because it has been claimed that whilst the majority, if not all, of the conditions enumerated above may result from influences other than those which produce rheumatism, the eruption of fibrous tumours in the subcutaneous tissue is an event which in any given case closes the discussion. It is a final and unequivocal proclamation in favour of rheumatism.[41] Moreover, the fibrous nodule has been held to influence prognosis as well as to determine diagnosis, and has even been dignified as the typical rheumatic structure. Thus it has been detected in characteristic form in the thickening of rheumatic pericarditis,[42] has been regarded as the homologue of the endocardial vegetation,[43] and has been offered as justification for a suggestion that the manifestations of chorea depend upon proliferative changes in the neuroglia.[44] Because of this position, and bearing in mind the antagonistic views held in reference to the rheumatic or non-rheumatic nature of rheumatoid arthritis, it becomes a matter of great interest to enquire whether, in any undoubted cases of that disease, subcutaneous fibrous tumours do or do not occur. For if they do so occur, one of two conclusions is inevitable. Either rheumatoid arthritis is rheumatism, or the development of fibrous tumours in the subcutaneous tissue is not a special and distinctive note of rheumatism. Once grant the appearance of such tumours in admitted cases of rheumatoid arthritis, and from the dilemma just presented there is no escape.[45] It is not the ambition of this essay to

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[40] *See* Bibliography in Garrod's "Treatise on Rheumatism;" "The Rheumatic State in Childhood," W. B. Cheadle; "On Peripheral Neuritis," Jas. Ross and Judson Bury; and Barlow on "The Forms of Rheumatism," "British Medical Journal," 1883, Vol. II., p. 511.

[41] See note at end of essay.

[42] Cheadle, Op. cit., p. 89; "Pathological Society's Transactions," Vol. XXXIV., p. 45; Angel Money, "Lancet," Vol. II., p. 265, 1893.

[43] *Ibid.*, p. 118 (Dawtrey Drewitt).

[44] Cheadle, Op. cit., p. 67.

[45] At least, there is no escape as long as all cases of osteo-arthritis are regarded as included in one and the same etiological category. If, however, it is allowed that the condition of osteo-arthritis is merely symptomatic, and that it may result from several independent causes, the claim may be made that some cases are and some are not rheumatic.

suggest which alternative should be selected, but rather to collect and produce evidence to show that, in cases that are beyond dispute cases of rheumatoid arthritis, there may and do appear fibrous tumours which are essentially the same as those affirmed to be characteristic and decisive results of rheumatic influence.

The existence of swellings or tumours in the immediate neighbourhood of joints affected by what is now called rheumatoid arthritis, was noted in some of the earliest descriptions of the disease, and even in descriptions written prior to any attempt to separate the condition from rheumatism. Sydenham, as already quoted, speaks of the knuckles becoming "knotty and protuberant (as in gout)." Heberden's chronical rheumatism is distinguished from the acute variety by its "more permanent swellings"; whilst to Haygarth, the special feature of the disease was the development of the "nodes," which led him to suggest the term "nodosity of the joints." That these "nodes" were osseous in character there can be little doubt. Haygarth himself says of them "they feel as if they were enlargements of the bones themselves" (Op. cit., p. 155), and as he found them in connection with all the joints (Op. cit., p. 153), it is reasonable to conclude that his descriptions apply to those bony outgrowths which in more recent times have been termed "osteophytes."

The swellings which not infrequently are found at the bases of the terminal phalanges of the fingers, and which are known as "Heberden's nodes," may here be noted, because, though Heberden himself did not suggest that they had any relation to his "chronical rheumatism," they have been claimed as one form of the disease now under consideration. Heberden[46] described them under the term "digitorum nodi," and confined his assertions concerning them to the statement that "they have no connection with gout, being found in persons who never had it," but Charcot, A. B. Garrod, Kent Spender, Osler, and A. E. Garrod, all agree that these nodes are a variety

But, as the sequel will show, the occurrence of subcutaneous fibrous tumours is by no means limited to those cases of rheumatoid arthritis which carry in their history suggestions of rheumatism in its generally admitted forms. Hence for these cases, at all events, the dilemma as above stated practically remains.

[46] *See* note at end of Essay.

of the disease which the first mentioned considers to be merely chronic rheumatism, and the others regard as a special disease, viz., osteo- or rheumatoid arthritis.

The elaborate study of the clinical history and pathological anatomy of rheumatoid arthritis conducted by Adams[47] of Dublin, demands attention and regard from many points of view, and among these most certainly is the question of tumours or swellings in the neighbourhood of the affected joints. In dealing with this point, Adams sets out with the statement that it is common to find bursal enlargements near the joints. Some of these, he says, are the normal bursæ morbidly developed into fluctuating tumours; others are, "as it were, accidentally developed in the cellular tissue." (Op. cit., p. 17.) In these bursæ are often to be found some of the "foreign bodies" which Adams insisted were so frequently, and in great numbers, present within the joint cavities, and which he regarded as developed from the synovial membranes. But in one of his cases described in detail (Op. cit., p. 38) some of the "foreign bodies" were present not only within the knee joint but also "outside the synovial membrane in the popliteal region." Adams also recognised yet another way in which firm fibrous masses may develop outside the joint, for he states that as the disease advances the fluid contained in the extra-articular bursæ may be absorbed, and the bursa be converted into a small solid tumour.

He describes one case in which a tumour "quite superficial, about the size of a hen's egg," was present on the inner aspect of the upper extremity of the tibia; this, when cut into, was "found to be intersected by delicate membranous bands resembling chordæ tendineæ of the heart" (Op. cit., p. 398); and again, after describing the distention of the bursa which normally exists at the decussation of the semimembranosus with the internal head of the gastrocnemius, he adds that "in the ordinary course of the disease the redundant quantity of the fluid is absorbed, and the popliteal tumour disappears;" and he quotes a case in which the obliterated popliteal bursa had "its walls converted into a small solid tumour about the size and shape of an almond." (Op. cit., p. 197). This last

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[47] "Rheumatic Gout or Chronic Rheumatic Arthritis of all the Joints." Third Edition, 1873.

case is figured in his Atlas[48], where also are to be found other drawings representing tumours associated with joints affected with rheumatoid arthritis. One of these, it may be noted, is said to be "ossific," and another, which is shown as a subglobular projection from the dorsal aspect of the olecranon, is described as "a large additamentary bone placed in apposition with the olecranon posteriorly." (Atlas, Plate IV, fig. 5.)

There are thus, according to Adams, three forms of solid tumours which may be met with near to joints attacked by rheumatic gout, viz.:--(1) additamentary bones; (2) foreign bodies outside the synovial membrane; and (3) fibrous nodules, which he regards as formed by absorption of fluid from, and thickening of the walls of, extra-articular bursæ. It is of interest in this connection to observe that Scudamore[49] has a special chapter on "Chronic Rheumatism of the Bursæ," in which he says that these structures may become indurated in a remarkable degree, so indeed as to acquire sometimes the condition of bony hardness, and that under such circumstances "the complaint may take the name of nodosity." Writing of chronic rheumatism generally, the same author says "we sometimes find the bursæ enlarged, thickened, and hardened." (Op. cit., p. 348). Fuller[50] merely remarks that the disease, rheumatic gout, usually causes thickening and permanent enlargement of the parts, but does not allude to any distinct nodules or tumours. Charcot's selection of the term "nodular rheumatism" would appear to be based on osteophytic or other enlargements of the ends of the bones, for he speaks of "bony nodes which deform the ends of the bones" (Op. cit., p. 181); and of nodosities that "pierce the underlying skin . . . . as in gout" (Op. cit., p. 189). Charcot also alludes to "foreign bodies" in the joints and to osteophytes, but does not describe any fibrous or bursal tumours near the joints. According to Senator[51] "hard excrescences and nodular masses may not infrequently be detected round the joints," and in some cases "more or less painful

[48] "Illustrations of the Effects of Rheumatic Gout." Second Edition, 1873.

[49] Op. cit., p. 487. [50] Op. cit., p. 333.

[51] "Ziemssen's Cyclopædia of the Practice of Medicine." Vol. XVI., p. 147.

thickenings of variable size" are found "in the soft parts of the upper arm or forearm;" these thickenings, he suggests, may possibly be due to a circumscribed proliferation of the connective tissue between the muscles or to swellings in the course of the nerves. Fagge[52] mentions as one of the less common symptoms of osteo-arthritis the presence of "fibrous nodules" at a distance from the joints, as for example, among the muscles of the arms or forearms, and Lyman[53] describes "fibrinous nodules" in similar situations, but neither of these authors speaks of the nodules as "subcutaneous," and Lyman insists upon their distinction from the "nodule of articular rheumatism." Several other text-books of medicine may likewise be consulted without finding any reference to the occurrence of subcutaneous fibrous tumours in rheumatoid arthritis. Even some of the special monographs do not allude to their existence. Thus Hyde, in the work already quoted, whilst he describes "increased secretion in synovial capsules or adjacent bursæ, and swellings of cartilages, ligaments, tendons, and the fibrous attachments of muscles" (Op. cit., p. 14), makes no mention of fibrous tumours. The same is true of Lane and Griffiths,[54] who, in 1890, published an analysis of 1,200 cases of chronic joint affection with a view to establish a distinction between rheumatic and rheumatoid disease.

There can be no doubt, however—and the statement will be substantiated in the sequel—that fibrous tumours do develop in the subcutaneous tissue in the course of rheumatoid arthritis, and though certain broad clinical distinctions can be drawn between such tumours and the subcutaneous nodules not infrequently observed in the acute and subacute rheumatic attacks of childhood, there are intermediate forms which link together the two extremes. Such differences as exist are differences of degree and not of kind, and it therefore becomes impossible, even allowing that clinical confusion is very unlikely, to insist upon the appearance of such growths as a conclusive proof of rheumatism and at the same time to maintain

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[52] Op. cit., Vol. II. Footnote, p. 227.

[53] "A Text-Book of the Theory and Practice of Medicine," 1894. Edited by Wm. Pepper, M.D., Vol. II., p. 131.

[54] "The Rheumatic Diseases (so called)," 1890. By H. Lane and C. T. Griffiths.

the doctrine that rheumatoid arthritis is not rheumatism. Manifestly one or other conclusion must go by the board.

The special clinical features of the rheumatic nodules, as emphasised in the earlier part of their career, were, in addition to their undoubted rheumatic significance (1) their small size; (2) their non-occurrence after puberty; (3) their rapid evolution and temporary duration; and (4) their painlessness. On the other hand, in the majority of cases in which subcutaneous fibrous growths have been noted in rheumatoid arthritis, these have been of some considerable size, have occurred almost necessarily in patients at or near to the middle period of life, have been slow in development and of prolonged or permanent duration, and have caused more or less pain. In reference to the latter point it may be suggested that the occurrence or non-occurrence of pain depends mainly on the situation and size of the tumour, for obviously the more considerable the projection the more likely is the tumour to receive irritation from external influences. This is supported by the fact that in the first two cases related in connection with this essay there were both large and small tumours, and that the latter led to no complaint, the patients not always being aware of their existence. Further, in the second case, a tumour of moderate size which was well protected by subcutaneous fat on the inner aspect of the olecranon had never been a source of annoyance to the patient. And in any view of the matter, the existence or non-existence of pain can scarcely be insisted upon as a vital distinction between growths which are identical in structure (see on), and are closely related in other respects. It may be noted, too, that in a few cases typical rheumatic nodules have been painful. One such case is reported by Judson Bury,[55] another by Futcher,[56] and Mahomed,[57] describes a case of subacute rheumatism with large subcutaneous nodules showing evidences of more or less irritation. With reference to the other distinctions that have been drawn between the subcutaneous tumours of rheumatism and those of rheumatoid arthritis some clinical

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[55] "On Peripheral Neuritis." By Jas. Ross and Judson S. Bury, p. 341.

[56] "John Hopkins Hospital Bulletin," October 10, 1895.

[57] "British Medical Journal," 1883, Vol. I., p. 622.

experiences are now quoted to show that these distinctions are not absolute.

1. *Age of Patient.*—Cavafy[58] has published a case of typical nodules with rheumatic fever in a man æt. 18 years; West,[59] one of numerous nodules with acute rheumatism in a woman of 39; Middleton,[60] one in which the development of the nodules followed a second attack of rheumatism at 36 years; Coutts[61] has seen a woman of 40 years with rheumatism, heart disease, and numerous nodules; Futcher, in the paper already quoted, records two cases in which the nodules appeared at 41 and 47 years respectively; and Cheadle[62] also has met with two cases of rheumatism with subcutaneous nodules in adults. On this point, too, Osler[63], after remarking upon the infrequent occurrence of rheumatic nodules in Baltimore and Philadelphia as compared with London, remarks "since 1881 I have been in the habit of looking for them . . . and I have seen a larger number of instances in adults than in children."

2. *Size of Tumours.*—In Middleton's case, though some of the tumours were small, others were of considerable size; Cheadle has, in extreme instances, found rheumatic nodules of the size of half a walnut (Op. cit., p. 69); in one of Futcher's cases they varied from the size of a pea to that of a walnut; and Coutts describes a case in which the rheumatic nodules were "open, gross, and palpable excrescences." On the other hand, in two of the cases submitted with this essay—cases, it is claimed, which correspond exactly to authoritative descriptions of rheumatoid arthritis—there existed some tumours certainly not exceeding in size the nodules described as typical of acute rheumatism. Newton Pitt,[64] too, has published a case of osteo-arthritis, with both large and small tumours, the latter being the size of small shot. In reference to the size of the subcutaneous nodules of rheumatism, Futcher, in the paper already

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[58] "Transactions of the Pathological Society," 1883, p. 41.

[59] "St. Bartholomew's Hospital Reports," Vol. XXII., p. 213, 1886.

[60] "The American Journal of the Medical Sciences," Vol. XCIV. p. 433, 1887.

[61] "Illustrated Medical News," 1889, Vol. III., p. 267.

[62] Cheadle. Op. cit., p. 69.

[63] "On Chorea and Choreiform Movements," p. 16. William Osler, M.D., 1894.

[64] "Transactions of the Clinical Society," Vol. XXVII., p. 54.

quoted, comes to the conclusion that there are two varieties which differ from one another in structure as well as in size. The first is comparatively small, extremely firm, distinctly rounded, and easily movable beneath the skin. This is the typical rheumatic nodule, and is composed of fibrous tissue. The second and less frequent variety attains a larger size, is softer in consistence, somewhat flattened and lobulated, and is occasionally slightly adherent to the skin. This variety Futcher considers to be fibro-lipomatous in structure. In Case 4 recorded with this essay it will be found that numerous small subcutaneous tumours exist and have exactly the characters just quoted. But that case is not one of acute or subacute rheumatism. It adheres rather to the type of rheumatoid arthritis. This is seen in the nodular osseous masses at the bases of certain of the metacarpal bones, in the presence of Heberden's nodes, in the chronicity of the condition, and in the development of the symptoms about the time of the menopause and after a habit of frequent child-bearing extending over a number of years. The case is therefore of considerable interest, as showing that a variety of subcutaneous tumour, described by a previous observer as occasionally occurring in rheumatic patients, may also be found in association with symptoms which suggest osteo-arthritis rather than unequivocal rheumatism. And such an association is obviously a matter of much significance in connection with the question now under review.

3. *Duration of Tumours.*—It is of course to be expected that in a chronic affection like rheumatoid arthritis, the process of tumour formation, if it occurs, should partake of the general obstinacy of the disease, and should contrast in this respect with the more fleeting phenomena of an acute or subacute rheumatic development. Yet even here an absolute distinction between the subcutaneous growths which at times mark the two conditions cannot be erected, for in the cases described with this essay there is evidence of diminution in size, and even of actual disappearance, of tumours in rheumatoid arthritis; Garrod[65] also reports a case of osteo-arthritis (the patient having had a slight attack of rheumatism fifteen years previously) in which tumours present in the subcutaneous tissue diminished in size under

[65] "Twentieth Century Practice of Medicine." Vol. II., p. 452.

observation ; Payne[66] has seen subcutaneous tumours completely disappear in a case of rheumatoid arthritis ; and in one of Newton Pitt's cases the disappearance of some of the tumours was associated with the development of others in new situations. As opposed to this, the nodule of acute rheumatism has been shown at times to be much more persistent than was at first believed to be the case. The maximum duration in Barlow and Warner's cases was five months, and this was regarded as quite exceptional ; but in one of Cavafy's cases the nodules persisted for at least a year ; and in Middleton's case they were still present three years after the attack of rheumatic fever. Amongst Futcher's cases is one of a man of forty-nine in whom rheumatic nodules has been present for eight years, another in which they had a similar duration, the patient being fifty-five years, and a third, a man of twenty-eight, in whom some of the nodules had persisted for no less than fifteen years. Coutts also has recorded his impression that in adults, rheumatic nodules, when they occur, are much more persistent than they are in younger patients.

There is, therefore, a considerable body of evidence in favour of the contention that neither as regards the period of life at which they occur, their size, nor the characters which mark their duration, can any rigid line of distinction be drawn to separate the so-called rheumatic nodules from the subcutaneous tumours which have been noted in occasional cases of rheumatoid arthritis.

In the foregoing paragraphs reference has been made to the evidence of recorded cases of subcutaneous tumour formation in rheumatoid arthritis. These records may now be stated in a more systematic manner. In 1883, Sir Dyce Duckworth[67] showed to the Clinical Society a woman, æt. 24, with subcutaneous nodules on the hands and knees, the patient being the subject of "chronic, painful swellings of the joints" ; cracklings were felt on moving the knee and shoulder joints, and Heberden's nodes were present on the fingers. There was neither personal nor family history of rheumatism, but the first cardiac sound was "roughened and reduplicated." In the same year Payne[68], in a discussion at the Pathological

[66] "Lancet," 1883, Vol. I, p. 545.
[67] "Transactions of the Clinical Society," Vol. XVI., p. 52.
[68] "British Medical Journal," 1883, Vol. I., p. 622.

Society, described the existence of nodules in the skin in cases of rheumatoid arthritis, and Hutchinson and Mahomed each quoted individual experiences in support of this statement. Howard,[69] in "Pepper's System of Medicine," published in 1885, says, in so many words, that "the so-called rheumatic nodules occur also in rheumatoid arthritis." Middleton's case was recorded in 1887, and though the patient had had two attacks of rheumatic fever, the fact that crepitation was present in the joints of the fingers, and that there were movable bodies in the wrist joints, would, according to some authorities, justify the view that the case had become one of rheumatoid arthritis, even those who are most opposed to the rheumatic nature of this disease allowing that not infrequently it develops after rheumatic fever. Leonard Weber,[70] in 1888, reported the case of a woman, æt. 37, who was the subject of osteo-arthritis, and in whom subcutaneous nodules were present in the upper limbs. One of the most striking cases in relation to the matter now under consideration was recorded by Wallace Anderson[71] in 1891; the patient, a woman of 50, displayed the characteristic deformities of rheumatoid arthritis, whilst over the backs of the hands and toes were small nodules, with much larger masses over each olecranon; there was no cardiac disease, and no personal or family rheumatic history. In 1893 Hector Mackenzie[72] described the case of a man, æt. 43, who suffered from a disease undistinguishable from acute rheumatoid arthritis, with nodules all over the scalp and body; post-mortem examination showed fibrous nodules on the mitral valve and pericardium and in the substance of the kidney. The patient had had four attacks of acute rheumatism in early life. Newton Pitt[73] in 1894 published three cases of osteo-arthritis with subcutaneous nodules; in one of these there had been "acute arthritis" some years previously, but the others were free from suspicion of ordinary rheumatic manifestations. In addition to the nodules, one of the patients had diffuse thickening of the subcutaneous tissue of the hands with a degree of Raynaud's

[69] "Pepper's System of Practice of Medicine," Vol. II., p. 84.
[70] "Reference Handbook of the Medical Sciences," Vol. I., p. 367.
[71] "Glasgow Medical Journal," March, 1891.
[72] "British Medical Journal," 1893, Vol. II., p. 1324.
[73] "Transactions of the Clinical Society," Vol. XXVII., p. 54.

phenomenon and sclerodermia; Middleton's case also showed wide-spread induration of the soft tissues of the hands. A. B. Garrod[74] in 1895 put on record the case of a man, æt. 39, with osteo-arthritis of hands, subcutaneous tumours, and freckles on the hands, the last-named symptom being according to Kent Spender a most suggestive circumstance towards the diagnosis of rheumatoid arthritis. In this case, however, the patient was by no means free from suspicion in reference to "ordinary rheumatism," for he had had a slight attack of rheumatism when aet. 24, and there were evidences of cardiac valvular disease. Such a relationship in any particular case must necessarily lessen to some degree the value of the case as a proof that subcutaneous tumours occur in rheumatoid arthritis, because it leaves a manifest possibility that the tumours were the result of an ordinary rheumatic influence. But in some of the cases quoted above there is no room for this suggestion, and the cases recorded with this essay are singularly pure in this respect. Attention from this point of view may be particularly paid to Case 1, for it is not too much to say that if there ever existed a case of rheumatoid arthritis which was not rheumatism, then this is the case. The man's personal and family record are practically free from rheumatic incidents; until he is of forty years of age he enjoys good, and even robust health; his illness, which begins with pains in the feet, follows a period of considerable mental anxiety and strain; the manifestations of articular disturbance show marked symmetry, and beginning in the peripheral joints of the limbs, gradually approach the trunk; the deformities of the hands exactly correspond to the classical descriptions of rheumatoid arthritis; there is evidence during the course of the case of implication of the temporo-maxillary articulation; some of the joints give coarse grating on movement; though muscular atrophy is not extreme, it exists; some of the tendon jerks appear to be exaggerated; the pulse is unduly rapid (no cardiac disease); and there are local sweatings of the hands and feet. Yet with this combination of features, every one of which has been urged more or less strongly as giving a special character to rheumatoid arthritis, there develop subcutaneous tumours, some of

[74] "Twentieth Century Practice of Medicine," Vol. II., p. 452.

which are no doubt larger than the usual "rheumatic nodule," but others, even as regards size, exactly correspond to that structure. Further, there are also nodular thickenings in some of the tendons, and according to the patient's judgment at least, some of the tumours in the skin had but a temporary existence. Moreover it happens that in this case (see on) we have an actual knowledge of the structure of the subcutaneous tumours, and this is seen to be identical with the structure of the "rheumatic nodule," as described and figured by Cheadle, Cavafy, and Middleton. It is impossible, therefore, to imagine a more complete demonstration of the accuracy of the proposition that subcutaneous fibrous tumours may be found with rheumatoid arthritis, even when the record and the condition of the patient are otherwise entirely free from evidence of rheumatic tendencies or manifestations. Detailed reference to the other cases here reported is not necessary. They support more or less definitely the testimony which is offered by the case just described, and help to form a distinctive body of evidence in favour of the conclusions that subcutaneous fibrous tumours develop in rheumatoid arthritis as well as in acute and subacute rheumatism; that whilst certain broad distinctions hold good between the nodules which are found in rheumatism and rheumatoid arthritis respectively, these distinctions are not absolute; and that it is necessary to bear in mind the fact of such tumour formation in discussing the mutual relationship of the two conditions.

But there is something more to be said. Had the facts in reference to subcutaneous tumour formation remained at the point to which they have been brought in the above paragraph, it is manifest they would have offered strong presumptive support to the views of those who contend that rheumatoid arthritis is chronic rheumatism and nothing more. But if clinical evidence goes beyond this point, and shows that such tumour formation is confined neither to rheumatism, nor to rheumatism and rheumatoid arthritis, whilst the contention that the subcutaneous fibrous nodule is a distinctive note of rheumatism in the generally admitted sense of the term is still more completely overthrown, the argument in favour of the identity of the two conditions just mentioned is sensibly weakened. If in rheumatism and rheumatoid arthritis only, fibrous tumours are found in the

subcutaneous tissue, that would be a fair fact to urge in favour of the essential unity of the two diseases, but every new and added disorder accompanied by such tumours lessens, though it does not necessarily destroy, the force of such reasoning. It is therefore quite to the present purpose to collect recorded cases in which subcutaneous fibrous tumours have appeared, though the patient was free from evidences both of rheumatic and rheumatoid disease. There are several such cases, and though no very distinct indication for classifying them is apparent, the very fact of their variety is not unimportant to the issue now under consideration. The following may be quoted :—

1. (Stephen Mackenzie.) The patient, a woman æt. 40, was the subject of secondary syphilis ; there were several subcutaneous nodules having physical characters identical with those described by Barlow and Warner ; some of the tumours had persisted for two years. No personal or family history of rheumatism ; and no arthritis.[75]

2. (Sir Dyce Duckworth.) A woman, æt. 38, who had probably had secondary syphilis. The nodules, which were numerous, were present in the skin, subcutaneous tissue, and periosteum ; they had existed for nearly three years. A distinct family history of rheumatism, but no personal rheumatic incidents.[76]

3. (Kingston Fowler.) A man, æt. 35, with a history of a venereal sore, but no recognised secondary symptoms, and no personal or family suggestion of rheumatism. Numerous nodules, symmetrically arranged, were present over the bony prominences of the limbs ; some of them spontaneously disappeared to reappear later. Nodules shown to consist of dense fibrous tissue with blood vessels having "thickened muscular coats."[77]

4 (Sir Dyce Duckworth.) A woman, æt. 32, the subject of chronic lead poisoning and acute gout, in whom there appeared a number of subcutaneous nodules over each tibia.[78]

5. (Carver.) Two cases of nodules in palms and flexor aspects of fingers. Patients—men over fifty—described as

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[75] "Transactions of the Clinical Society," Vol. XVI., p. 188.
[76] Ibid., p. 190.
[77] Ibid., Vol. XVII., p. 65.
[78] Ibid., Vol. XX., p. 266.

"rheumatic, dyspeptic, and somewhat gouty." Nodules disappeared under treatment.[79]

6. (Jonathan Hutchinson.) A man, the subject of inherited gout, with periosteal outgrowths, bursal enlargements, and thickening of tendons.[80]

7. (F. R. Walters.) A male adult who, after influenza followed by double pleurisy, developed numerous nodules about the finger joints, with thickenings of the palmar fascia. The nodules here are named "rheumatic," and the first cardiac sound is described as harsh and reduplicated at the apex.[81]

8. (R. T. Godlee.) Male patient, æt. 27. No personal or family history of rheumatism; no syphilis; scars in neck and on cornea. Complained of a "peculiar swelling of the nose and eyelids," and developed numerous fibrous nodules over forehead, backs of hands and sacrum. The bursa over the olecranon was enlarged.[82]

9. (H. G. Turner.) A man, æt. 45, who was the subject of a firm, non-œdematous swelling above and below the eyes, and complained of numbness and tingling about the finger tips, had numerous nodules over the head and upper extremities, some superficial, others attached to the periosteum; none related to tendons or nerve trunks. No history of either rheumatism or syphilis.[83]

These instances necessarily qualify to some extent the statement that subcutaneous nodules are conclusive evidence of rheumatism. At the same time, they must needs give pause to the advocates of the view that the occurrence of such tumours in undoubted cases of rheumatoid arthritis is a demonstration of the rheumatic nature of that affection.

On a review of the whole question, it must then be allowed that whilst subcutaneous nodules having the characters described by Barlow and Warner are frequently of the highest clinical value as evidence of rheumatism, too sharp a conclusion has been drawn in reference to the size and duration of such nodules, and also in reference to the age at which they occur. Further it must be recognised that

[79] "Lancet," 1888, Vol. I., p. 475.
[80] "Transactions of the Clinical Society," Vol. XXII., p. 241.
[81] Ibid., Vol. XXV., p. 241.
[82] Ibid., Vol. XXVII., p. 272.
[83] Ibid., Vol. XXX.,, p. 218.

in a distinct proportion of cases of rheumatoid arthritis nonsequential to acute or subacute articular rheumatism, subcutaneous tumours appear, which, neither in their histological characters nor in other respects, can be definitely separated from the so-called "typical rheumatic nodule." And, again, as clinical evidence shows that subcutaneous fibrous tumours have been present in certain cases, in which neither rheumatism nor rheumatoid arthritis could be diagnosed, it is impossible to admit as established medical doctrine the contention that the mere presence of such tumours is a proof of rheumatism, even if that term be held to include some or all cases of rheumatoid arthritis, and allowing that in numerous individual cases of rheumatism the development of fibrous nodules in the subcutaneous tissue is an event of high diagnostic value and much prognostic significance.

CASE RECORDS

CASE RECORDS.

CASE 1.—Robert D., æt. 49 (May, 1893), complaining of stiffness in his joints. He appears to have followed the development of his present condition with great care, and is evidently a very observant and intelligent man. According to his story, he enjoyed very good health until nine years ago. At that time, in consequence of a break-up of the firm for which he had worked for many years as a "power-loom tenter," he had to take a new situation, where he found his duties very heavy and trying, mainly in consequence of certain unexpected responsibilities for which his previous experience had not fitted him. He was very much worried, and feared he would have to give up the situation; his appetite failed, he could not sleep, and, as he puts it, his "body got down altogether." After this experience had continued for some months, he began to complain of pain and soreness across the "tread of each foot." After a few months the left knee became stiff and painful, and similar conditions with more or less swelling gradually appeared in some of the finger joints, the right knee, and the wrists and elbows. Much more recently he has had to complain of difficulty and pain in the movements of his shoulders and hips. He has also had pain and stiffness in the left side of his neck, as well as pain and a sense of "cracking" when moving his lower jaw; but in all these respects he has much improved.

It is to be noted that at no time has there been any acute pain. His complaint is of "a dull pain and stiffness

in his joints." He dwells particularly on this last feature and on the difficulty which attends his efforts to move his limbs when first waking in the morning, the stiffness always being very noticeable after the limbs have been kept at rest for a time.

Some four years ago he had to give up his occupation partly on account of the stiffness of his joints, but mainly, he says, because of the great decline of his general strength.

Enquiries into his family history elicit no record of rheumatism or joint troubles except the statement that he thinks one of his grandmothers had "rheumatic joints." He is a married man, father of eight children, all living and healthy; he has never indulged in alcoholic excess; no history or evidence of venereal disease. His own health, previous to his present illness was, he considers, unusually good.

In reference to the actual condition of the patient, it may be said at once that in repeated examinations made at intervals during several years no evidence of disease in the thoracic or abdominal viscera was ever discovered. The only features of importance noted, apart from the condition of the articulations and the tumours subsequently to be described, were the tendency of the pulse to range above the average (the usual record was between 90 and 100); the frequent occurrence of attacks of local sweating, more especially on the hands; the somewhat glossy condition of the skin over the finger tips; the existence of longitudinal ridges on the nails; the presence of two patches of psoriasis, one in front of each shin; and the existence of several small darkly-pigmented spots on the skin of the forearm, which patient was sure had appeared in recent years.

The condition of the joints need not be given in detail. The state of the hands is fairly well seen in the accompanying photograph (Fig. 1). It is sufficient to add that all the joints of the limbs betrayed evidence of disease in a greater or less measure, and the "lipping" of the articular ends of some of the bones, the coarse grating on movement, the restriction of the range of movement by "bony formations," and the resulting deformities, combined to form a condition which none would have difficulty in recognising as one of osteo-arthritis. The muscular condition generally was poor, but evidence of more distinct atrophy were appreciable in

the thenar and hypothenar eminences, the dorsal interossei, more especially each abductor indicis, and the extensors over the back of each forearm. The knee-jerks were very decided and were regarded as exaggerated; in each upper limb the biceps- and triceps-jerks were present, but not to an excessive degree.

In the features recorded above, the present case is nothing more than an ordinary example of poly-articular rheumatoid or osteo-arthritis.

Attention must now be given to the subcutaneous tumours which are judged to be the special feature of the case. The largest of these are in the neighbourhood of the elbow joints, and are well displayed in Fig. 2. In addition to the considerable mass seen over the dorsal aspect of each olecranon, there is a smaller tumour over the internal condyle of the left humerus, and one also over the internal surface of the right olecranon. Each tumour is firm, is free from adhesion to the skin, and is more or less movable in the subcutaneous tissue. Except in the case of the one over the left internal condyle the skin over the tumours is not reddened. The last-mentioned tumour sometimes causes the patient pain; he attributes its irritated condition to pressure, and as the internal condyle is considerably enlarged the projection of the tumour is rendered very prominent. The history of these masses is that they have appeared at various dates during the last four years, commencing as small, firm nodules, and slowly increasing to their present size.

Several small firm nodules are present in the subcutaneous tissue over the dorsum of the left hand. The most prominent of these is on the dorsal aspect of the fifth metacarpo-phalangeal joint (see Fig. 1). They are all free from attachment to the skin, and have never caused the patient any pain or discomfort.

In the lower limbs there is a nodular mass about the size of a horse bean attached to the posterior aspect of each tendo Achillis. These, patient says, have been present for six months; formerly he was aware of several other nodules along the outer side of each foot, but these latter have entirely disappeared.

Patient permitted the removal of the tumour over the left olecranon. It is an almond-shaped mass, measuring 30 by 20 mm. and weighing 3 grammes. The tumour lay

in the subcutaneous tissue and was not adherent to the periosteum. It is a hard, resistant mass, which is found to consist of dense fibrous tissue. (Fig. 3.)

The further history of the case may be briefly stated. During the next four years patient was seen at intervals. The disease made some but no very marked advances. In the scar left by the removal of the tumour a new fibrous mass soon began to appear and gradually enlarged, but no new tumours appeared, and the existing masses remained without change. Patient died in the spring of 1897 of acute pneumonia. A post-mortem examination was not permitted.

There cannot be the slightest doubt that this was a case

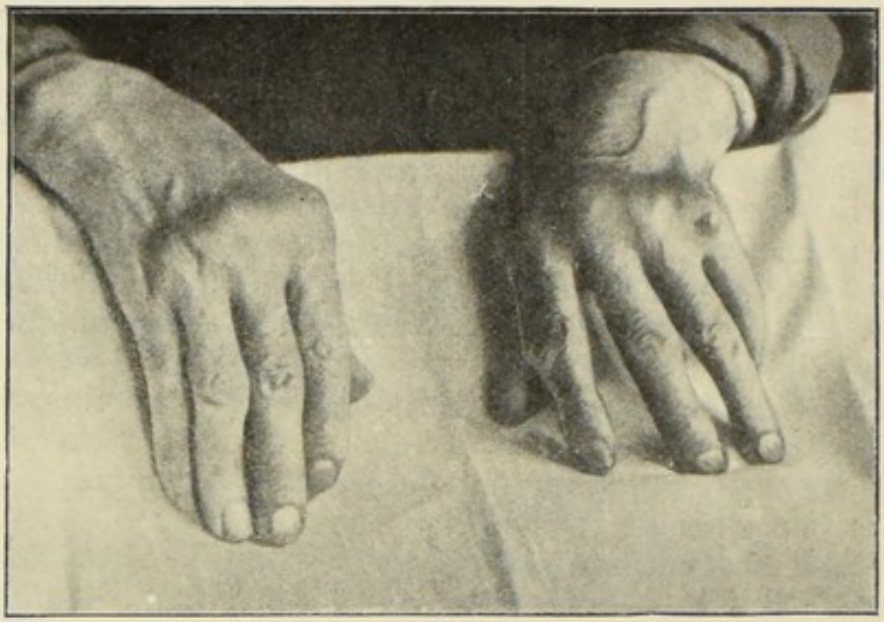

Fig. 1.—Rheumatoid arthritis, showing ulnar deflection of digits, enlargement of heads of metacarpal bones, and in the left metacarpo-phalangeal region a small subcutaneous tumour.

of rheumatoid or osteo-arthritis. Apart from the deformities of the hands and the articular conditions generally, there existed a number of non-articular facts which have been claimed by various authorities in support of such a diagnosis. Thus Kent Spender emphasised the diagnostic value of pigment spots in the skin; Garrod refers to the existence of psoriasis in such cases; the sense of stiffness and rigidity in the joints on waking in the morning is noted

by Adams and Senator; and the last mentioned author, as well as Garrod and other writers, remark upon the frequency with which rheumatoid arthritis appears after circumstances which cause much mental anxiety and depression. Undue rapidity of the pulse and a tendency to excessive sweating are advanced by several authorities as features of the disease. In this connection it is interesting to note that Graves, in his "Clinical Medicine," alludes to certain cases of

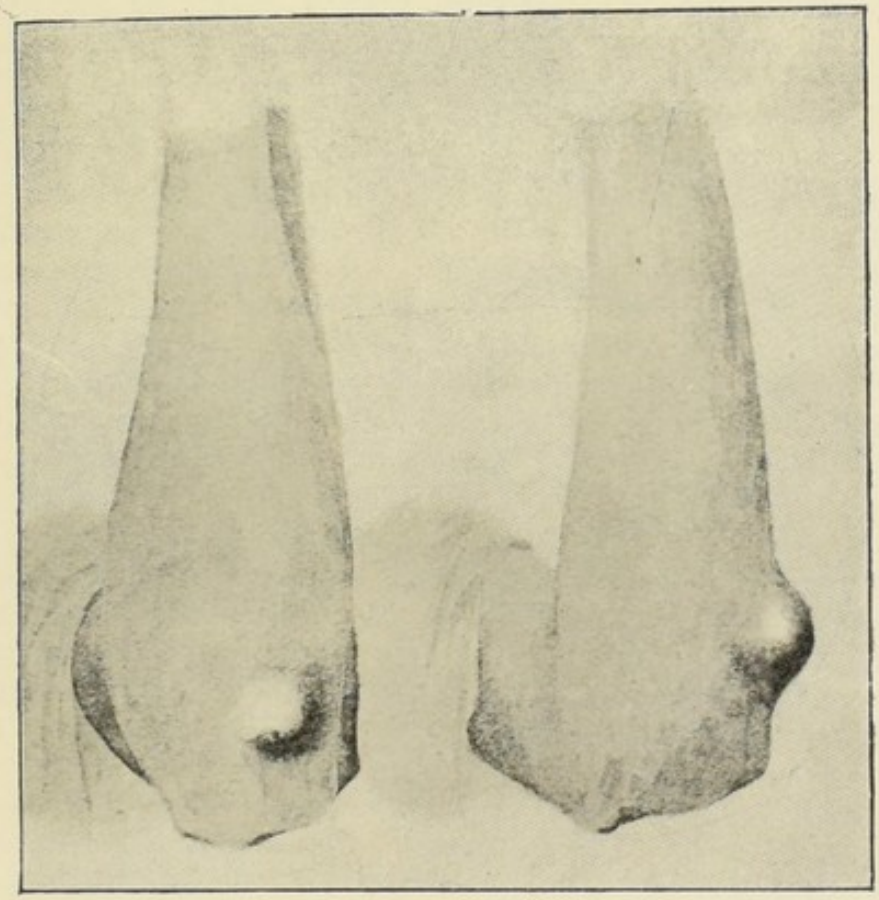

Fig. 2.—Rheumatoid arthritis, showing large subcutaneous tumours in the neighbourhood of each elbow joint. (From a drawing by Dr. Alex. Macphail.)

arthritic rheumatism attended with prolonged excitement of the circulation and copious sweating, and remarks that persons whose limbs are permanently stiff or distorted from rheumatic affections are generally found to have been suffering for years from this "sweating arthritis."

CASE 2.—Lizzie N., æt. 43 (August, 1898), has had fair health except for "rheumatics," which commenced in her hands in 1886 and gradually extended to all her joints, so that four years ago she was practically a cripple and could hardly move from one room to another, a condition which persisted for two years but has gradually improved, so that at present her gait appears quite easy and free from peculiarity. She now only complains of occasional aching in her joints. She has never had rheumatic fever. Patient

Fig. 3.—Section of subcutaneous fibrous tumour, showing dense fibrous tissue. The section includes two veins, with thickened walls, and partly occupied by incompletely organised fibrin, presumably the result of a phlebitis accompanied by thrombosis.

was married at 23, and has had twelve children, of whom six died in infancy from "bronchitis and convulsions"; the survivors enjoy good health, the youngest is five months. She has had one miscarriage, but has never suffered from any menstrual disturbance or disorder of the womb.

In the family history it is noted that patient's mother had deformed hands from "chronic rheumatism" and that she died of "consumption;" father killed in an accident; three sisters, all free from rheumatism, but subject more or less to bronchitis.

The condition of the hands is shown in the photograph (Fig. 4), and it is only necessary to add that in the elbow and knee joints there was decided evidence of osteophytic formation. Movements of the knee joints were free, but complete extension of the forearms was impossible on account of the enlargement of each olecranon.

No cardiac disease, pulse about 80, tendon-jerks normal, no appreciable muscular atrophy except as seen in the hands.

The nodular mass seen over each olecranon is entirely subcutaneous and is quite free from pain. Patient is sure that each tumour at one time was very much larger and occasionally very painful. In the web between the finger and thumb in each hand is a small subcutaneous nodule.

In reference to the subcutaneous tumours, there is, beyond the fact of their existence, the interest of their diminution in size, this diminution coinciding with distinct recession of the joint symptoms. Of course, it is possible that these masses were originally the distended bursal sacs described by Adams, and that their diminution in size was the result of absorption of their fluid contents. Patient's impression is that they had always been hard, but her observations can scarcely be claimed as conclusive evidence. In Case 1, however, with a much more trustworthy patient, the history lent no support to the suggestion that the swelling over the olecranon was at any time a bursal sac, and the appearance of a second mass in the site of the excised tumour may be quoted against the suggestion that in Case 1, at any rate, these olecranon tumours had a bursal origin.

Apart altogether from tumour formation, this case is well worthy of note on account of the undoubted improvement in the condition of the joints. Testimony is only too unanimous as to the sure, if slow, advance of rheumatoid arthritis, and therefore any justification, however slight, for lessening the gravity of the prognosis may well be welcomed. It must be observed that in this case there was not merely suspension of the advance of the disease, but a very decided

retreat of some of its worst symptoms. It is also noteworthy that this improvement took place during a period of active sexual life.

Case 3.—Chas. B., æt. 63 (August, 1898), the subject of extreme deformities of the hands. (Fig. 5.)

Patient was a strong and healthy man until his present trouble began some fifteen years ago. His first symptom

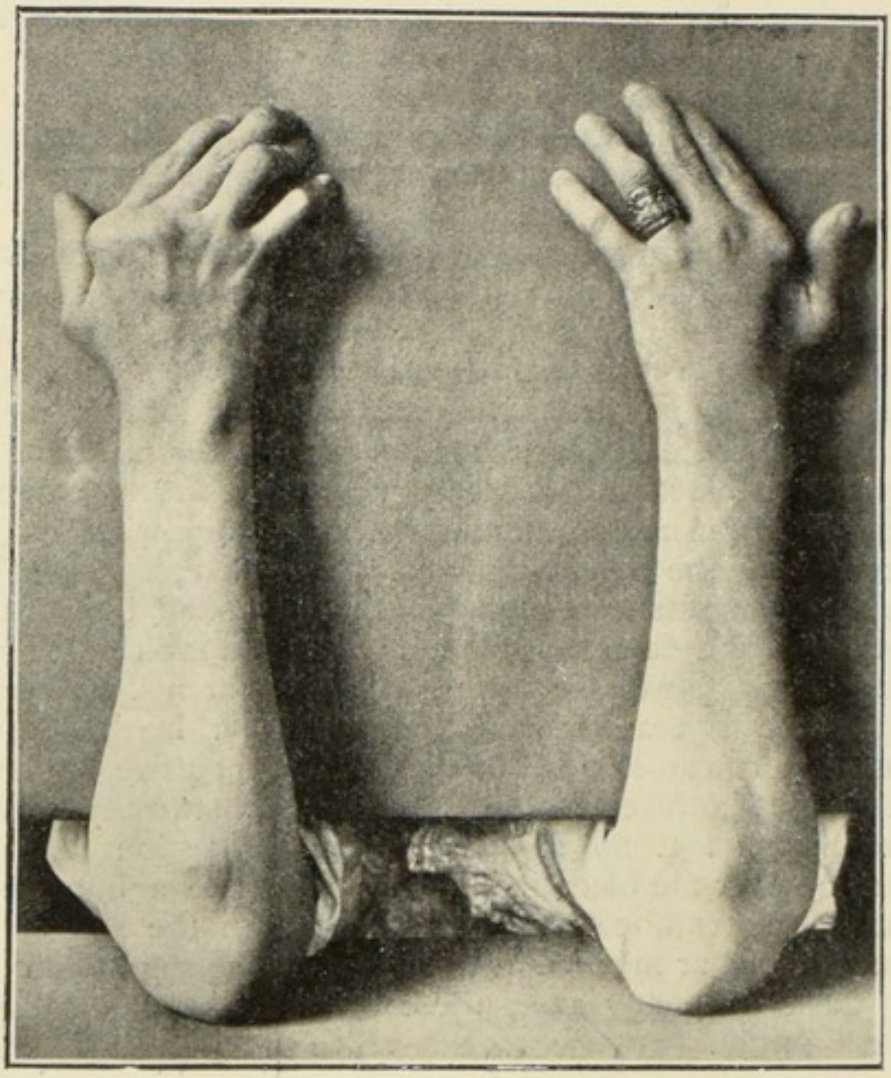

Fig. 4.—Rheumatoid arthritis with characteristic deformity of hands and atrophy of dorsal interossei, especially of left abductor indicis. Over each olecranon is seen a nodular subcutaneous tumour.

was the sudden onset of severe pain in the ball of the right great toe, and he was told this was an attack of gout. Pain and stiffness next appeared in the fingers and gradually

spread to all the joints, though there is no history to suggest involvement of the intervertebral or temporo-maxillary articulations. On several occasions since the commencement of his illness he has had attacks distinguished by pain and swelling of various joints, the skin over the affected joints becoming "red and glazed." One of these attacks about ten years ago laid him up for six months, and was called "rheumatic fever."

He is married, the father of four living children; ten children died in early life. Has always been moderate in the use of alcohol. He appears to have a good knowledge of his family history, and denies that any of his relatives ever suffered from gout or any other form of joint disease.

The evidences of osteo-arthritis are seen more or less conspicuously in the hands, wrists, elbows, feet and knees. Further, there is some muscular wasting in the hands, the nails are longitudinally ridged, and the tendon-jerks both in the upper and lower limbs are very marked. There is no cardiac disease, and the pulse which numbers 78 is regular and of good tension. The prominence over the right olecranon is partly due to periosteal thickening, but superficial to this and freely movable in the subcutaneous tissue is a firm nodular mass having exactly the same characters as seen in Case 2.

In the skin of each ear near to the helix and antihelix are two or three small tophaceous deposits, and patient says he has had "chalk-stones" removed from the skin over his great toe.

There is no doubt in this case of the existence of gout. The only question is whether the condition of osteo-arthritis is a consequence of the gout or the co-existence of the two is a mere coincidence. Some authorities hold that osteo-arthritis is not a disease, but is a symptom which may appear as one expression of several different diseases, and here certainly the history of the case does seem to suggest that the original articular disturbance was gouty in character. Sir Dyce Duckworth, whilst allowing that both gout and rheumatoid arthritis may co-exist in the same patient, thinks that proof is needed before it can be admitted that gout, like rheumatism, may cause osteo-arthritis.

The feature of the case which brings it into relation to the present paper is the demonstration it affords, that, however produced, the phenomena of rheumatoid arthritis may

include evidence of tumour formation in the subcutaneous tissue.

Case 5.—Fred. H., æt. 66 (May, 1899). Patient has been suffering from pains in his joints at frequent intervals for fully thirty years. The first part to suffer was the great toe, in which he has had many attacks of acute gout. On

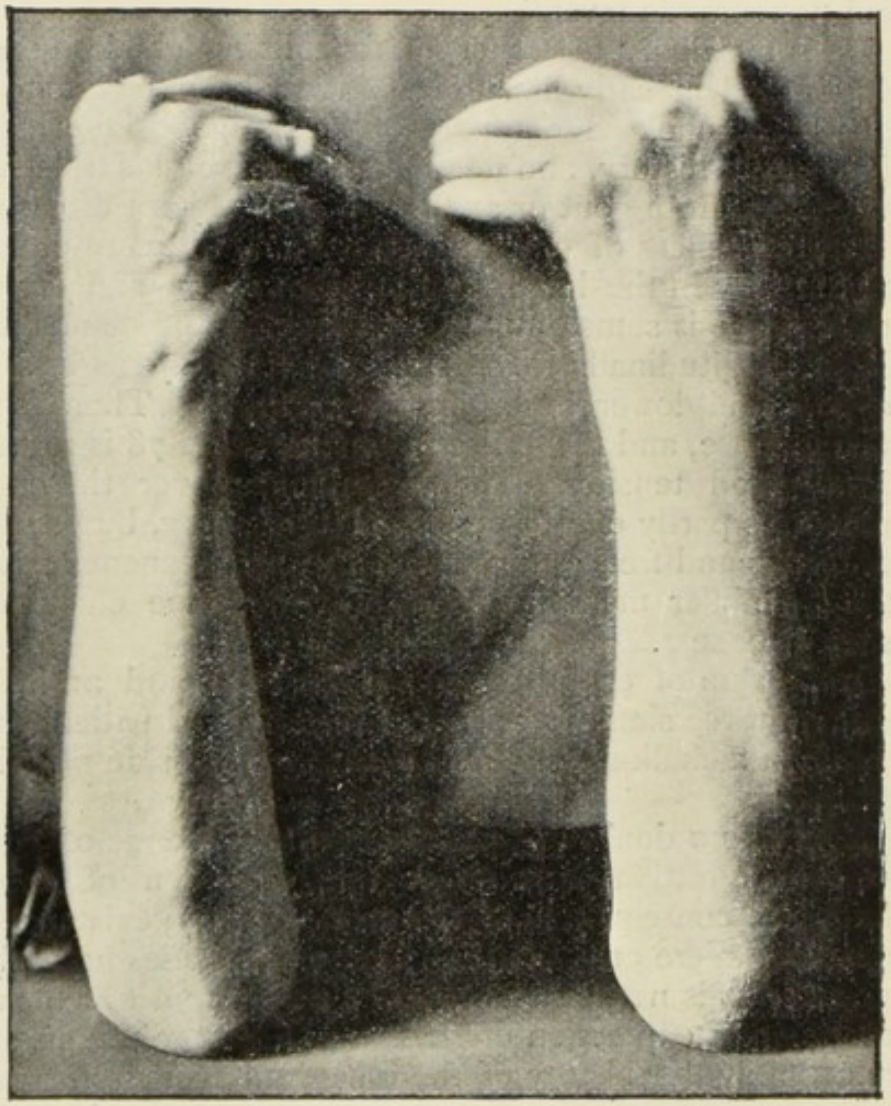

Fig. 5.—Extreme deformity of hands from osteo-arthritis. The prominence over the right olecranon is due, at least in part, to a firm subcutaneous tumour.

several occasions he has been confined to bed with pains in all the joints. The hands have been deformed for eight or ten years. His maternal grandfather suffered from gout,

but he knows of no other member of his family who has had either gout or rheumatism. The evidence of gout in this case is decisive, for numerous tophaceous deposits are present in each pinna and in the neighbourhood of the phalangeal joints of the fingers. The features of the case which are of special interest in the present connection are shown in Fig. 6.

With regard to the condition of the hands it is to be noted that the appearances are not at all unlike the state of matters existing in rheumatoid arthritis, though there is much less symmetry than in the other cases here figured. The firm subcutaneous mass over each olecranon has exactly the characters of the tumours similarly situated in the other cases. Both of these facts have a manifest bearing on the question of the etiology of osteo-arthritis. If gout may not produce osteo-arthritis, it certainly produces osseous deformities of a very similar character (see also Case 4). And the present case proves conclusively that with such deformities there may exist subcutaneous tumours having exactly the same features as those found in rheumatoid arthritis. Why such tumours should specially develop over the olecranon is somewhat of a difficulty. But in none of the present series of cases is there any evidence to suggest that they originate from bursæ. Indeed, as already pointed out, the facts of Case 1 are strongly opposed to any such suggestion. Possibly the relationship of the region concerned to the occurrence of external irritation is a factor of some moment.

Case 6.—Selina V., æt. 67, widow (November, 1898). Patient came under observation on account of "failure of sight." She was found to have three dioptres of hypermetropia, and with the appropriate glasses enjoyed quite good vision. The discovery of the conditions now to be described was quite accidental, or at least was not due to any complaint on her part. On several fingers of each hand there are very prominent Heberden's nodes, the most marked being on the middle finger of the left hand, and over these the skin is very decidedly reddened. Examination also detects at the base of the extensor aspect of the first metacarpal bone in each hand a considerable osseous thickening. This has an irregular nodulated surface and projects towards the carpus in a somewhat beak-like process which seriously restricts extension of the metacarpal bone; passive move-

ment of the joints produces some fine crepitus, but no coarse grating. Comparison of the conditions in the two hands shows a very high degree of symmetry. There is no definite deformity of the phalanges or metacarpus other

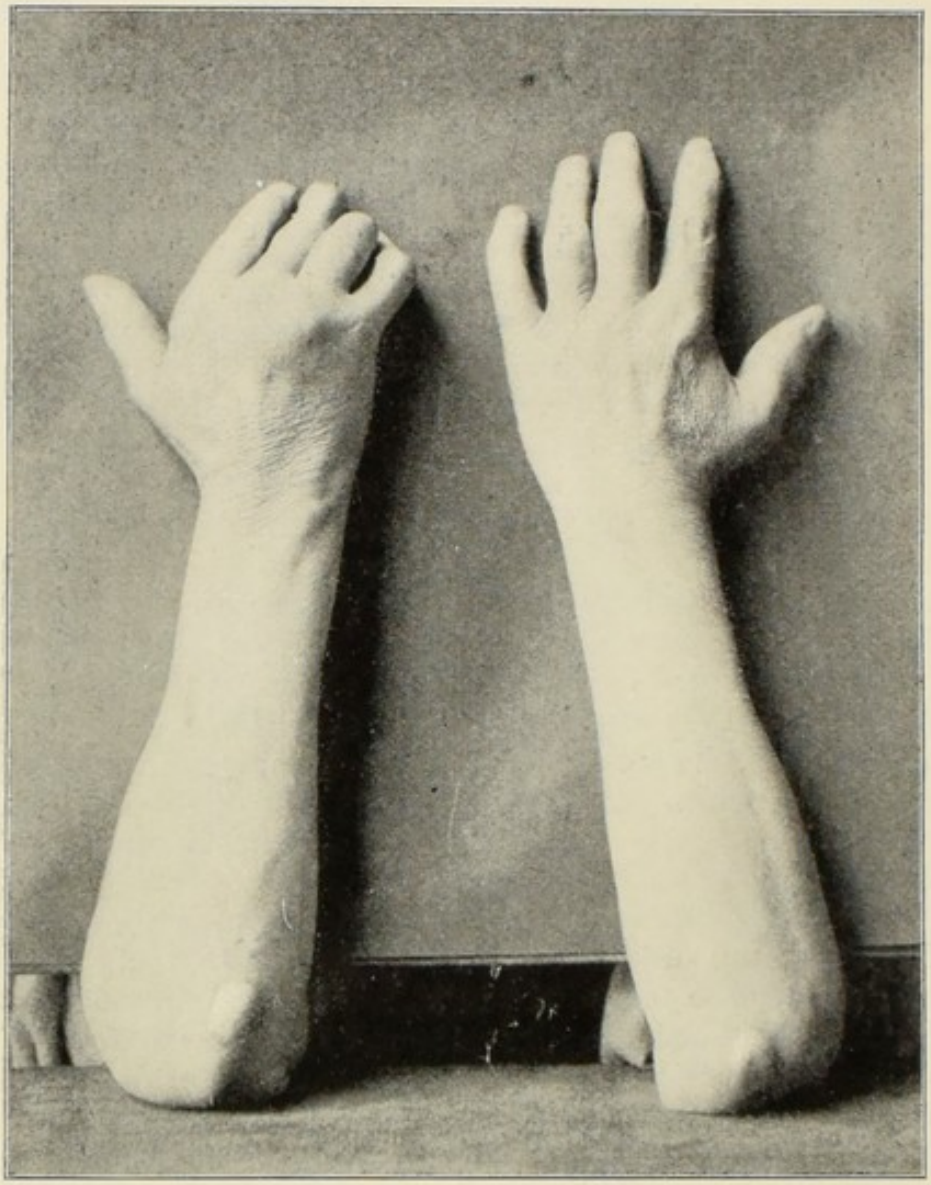

Fig. 6.—Photograph showing deformities of hands produced by gout and the presence over each olecranon of a firm subcutaneous tumour.

than the above; muscular wasting, little or none; no pigmentation of the skin; nails normal. All other joints in the body seem free from evidence of disease.

The history of the state of her hands is, that about the time of the menopause, some twenty years ago, she began to be conscious of pains and stiffness in various joints, the shoulders and hands being, she thinks, the first affected. At one time her right hand was so stiff that she could not bend the fingers into the palm, and the whole limb was so weak that she could scarcely use it at all. She also had pains and stiffness in her knees but was never confined to bed. She remembers that for some time she was much troubled wiih pain and swelling "at the root of each thumb," and the skin here was "red and shiny." After this the "swelling of the bones" gradually appeared, and this has remained without apparent change for many years. The history of the development of Heberden's nodes is of the same chronic order, but has occurred without much pain; at times, however, the most prominent of these are, she says, very painful.

Patient had good health until the time of the menopause, since then she has had a great deal of worry and her health has "broken down;" she looks, however, a fairly vigorous woman for her years. She married at twenty-nine, and during the succeeding twelve years gave birth to twelve children. Of these five died in infancy. The eldest of the survivors had rheumatic fever when a boy; no other rheumatic incidents. Patient's mother died of phthisis, but there is no known history of gout or rheumatism in the family.

The tumours which appear to bring the case within the present series have been present for many—between ten and twenty—years. They are in the subcutaneous tissue and are so much flattened that even the largest hardly catches the eye as a distinct projection. On passing the hand over the surface they are readily appreciated. They are firm with, however, a distinct degree of elasticity, and are not very movable. They only cause complaint of pain on firm pressure. The skin over them is not reddened.

The tumours are situated as follows:—In the left forearm there is one measuring about 1 inch in diameter in the upper third of the outer aspect, another of rather smaller size about the middle of the inner aspect, and a third still smaller in the front of the forearm some 3 inches above the wrist. In the right forearm there is a tumour similar in size and position to the one last named, and in both forearms there are here and there small nodules which can just

be felt as more resistant points when the hand is passed over the surface. The last described condition also exists over the extensor aspect of each thigh, but no larger nodules are present in the lower limbs. Patient says that at times she has pain in the larger tumours. The knee-jerks are distinct; cardiac sounds normal; urine free from albumen and sugar.

It will be observed that the tumours which are the special feature of this case have the characters of small lipomatous or fibro-lipomatous masses. They thus exactly correspond to what has been described as one variety of the so-called rheumatic subcutaneous nodule. Here, however, the tumours are associated with evidences of rheumatoid arthritis. The significance of such association is suggested on page 19.

SUPPLEMENTARY NOTES

SUPPLEMENTARY NOTES

ON MUSCULAR ATROPHIES IN RHEUMATOID ARTHRITIS.

THE occurrence of muscular atrophies and exaggerated tendon-jerks in certain cases of rheumatoid arthritis is sometimes urged in support of the theory that the articular lesions of the disease are essentially dystrophic changes—the result of disturbances in the spinal cord, either primary in nature, or caused by peripheral irritation in the pelvic or other viscera. But admitting the truth of the events, and admitting that they indicate spinal disturbance, the conclusion suggested does not follow. For it has long been known that any arthritic lesion may produce muscular wasting, and that, like the wasting in rheumatoid arthritis, this, in some instances, may be too extreme and too rapid in development to be the result of mere disuse. Sir James Paget, many years ago, in treating of the arthritic complaints met with in hysterical patients, advanced the proposition that "if a joint has long been very painful, and yet there is no wasting of the muscles near it,

it is not inflamed." He also directed attention to the muscular atrophies which may follow injuries to the joints; taught that such atrophies were not due to non-use of the

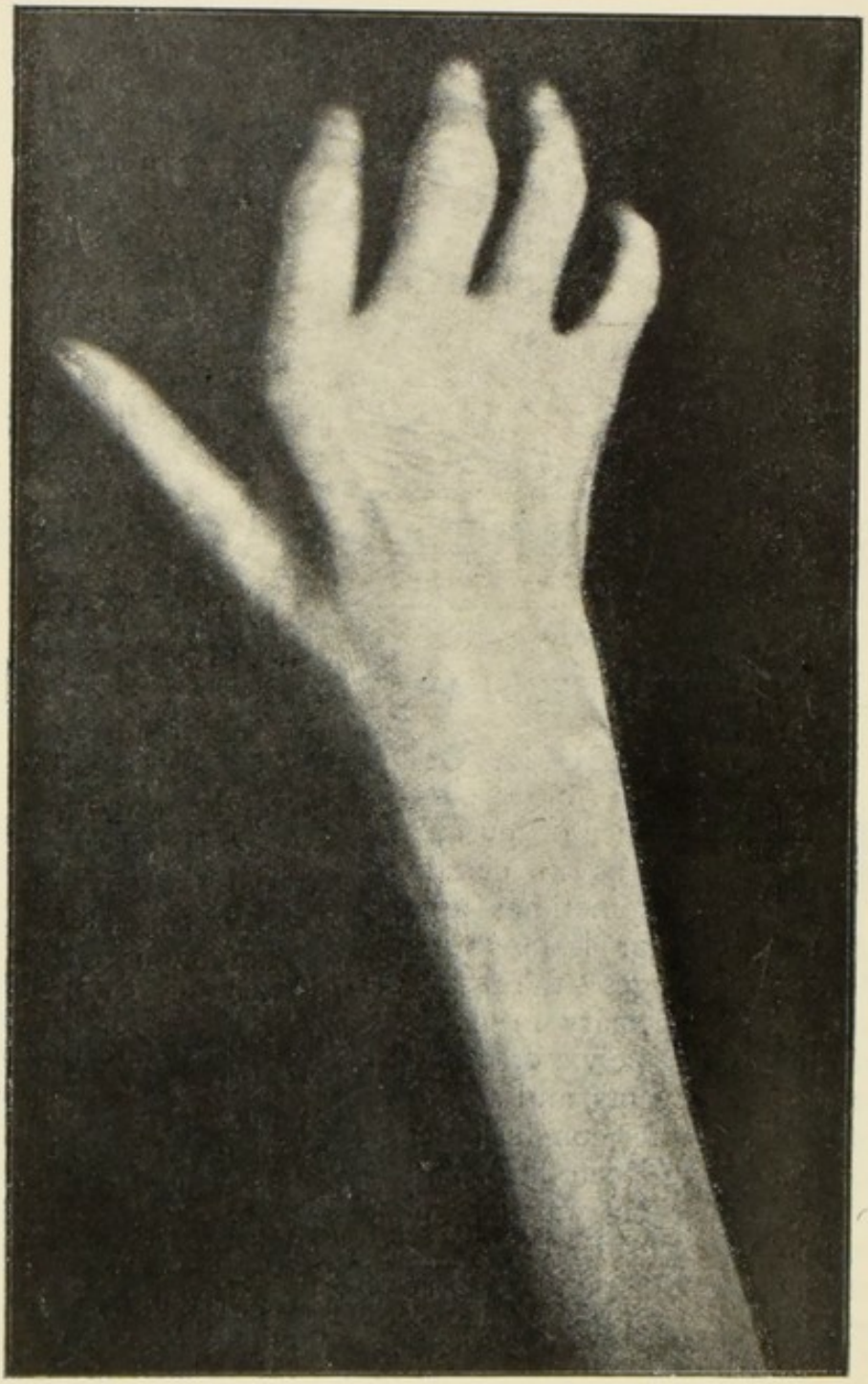

Fig. 7.—Rheumatoid Arthritis, with wasting of muscles of hand, especially of abductor indicis. (From a photograph by Dr. John Reid.)

muscles; and suggested their causation in the "disturbance of some nutritive nervous centre irritated by the painful state of sensitive nervous structures." Charcot maintained similar views. He also pointed out that not only is the arthropathy the primary fact, but further, that there is no necessary relation between the intensity of the joint affection and the atrophic phenomena, "a slight and easily cured sprain, a simple collection of fluid in a joint, non-inflammatory and non-painful," being quite sufficient to cause even extreme atrophy. The text of his lecture on this subject indeed is an individual case in which a slight injury of the knee was followed by great wasting of the extensors of the joint. Charcot also showed that these arthritic atrophies have a special tendency to display themselves in the extensor muscles—a conclusive argument against their causation being a mere disuse of the part. Again, it has been shown by Judson Bury, that acute rheumatism provides a certain percentage of cases with marked muscular atrophy, and that, excluding those dependent upon a peripheral neuritis, a definite proportion remains to support Charcot's teaching. If further proof is needed, it is provided by the muscular atrophies which have promptly followed attacks of synovitis artificially induced in dogs by the injection of solution of ammonia into the synovial cavities.

Hence the natural conclusion in reference to the muscular atrophies of rheumatoid arthritis is that, like the atrophies which accompany other arthropathies, they are secondary to the joint lesions, which probably produce them through a reflex mechanism. The only fact which can be set against this conclusion is the claim that in certain cases the muscular wasting has preceded the changes in the joints. This, of course, means the *recognised* changes in the joints, but remembering how insidious may be the pathological process, and how, as in the instances given by Charcot, a slight disturbance in the joint may determine a high degree of muscular atrophy, this exceptional experience cannot be held to justify an attempt to place the muscular atrophies of rheumatoid arthritis on a different platform from the atrophies which accompany other diseased conditions of joints.

The increased tendon-jerks are in much the same position, for when muscular atrophy follows a disease of,

or injury to, a joint, there is at the same time evidence of increased myotatic irritability.

The argument which can be derived from the existence

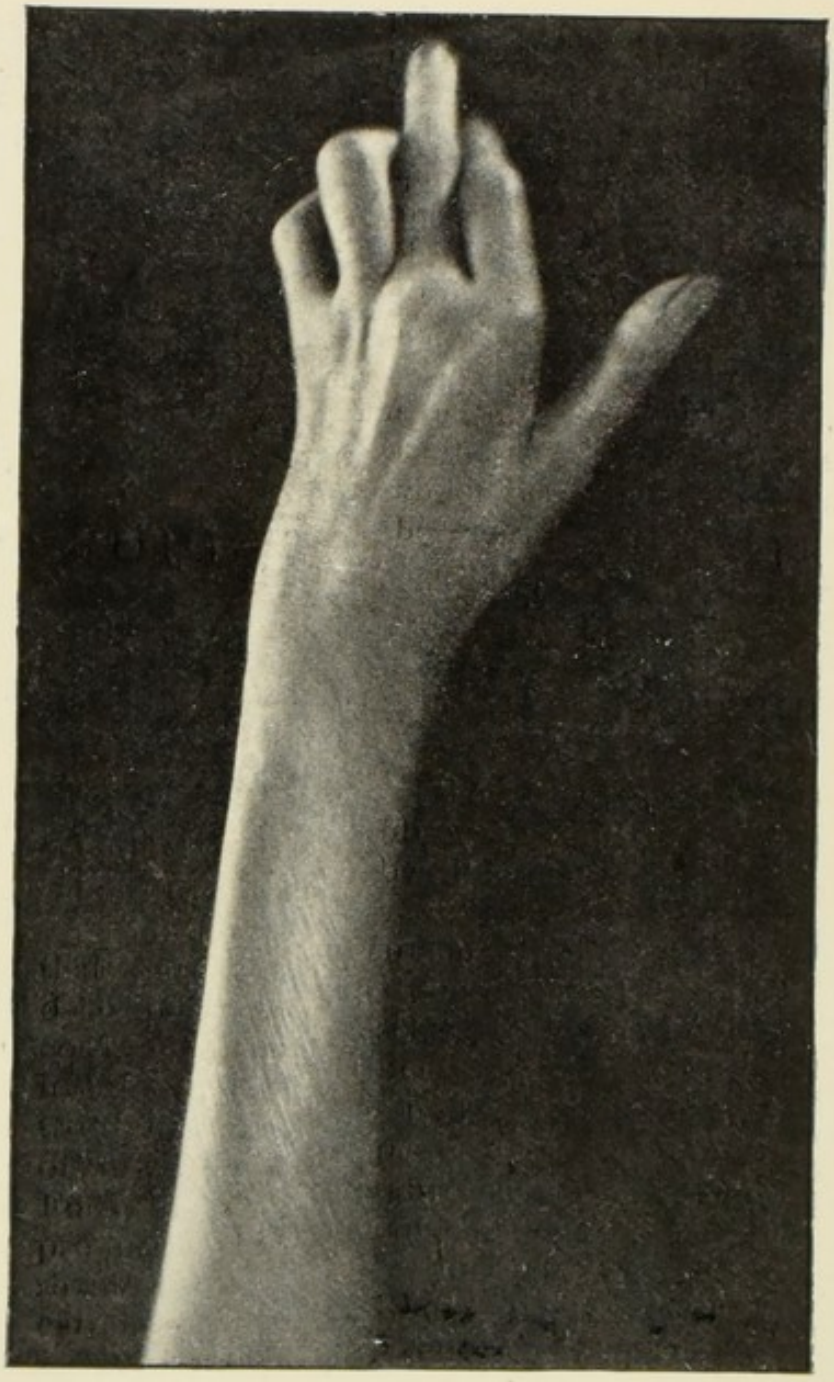

Fig. 8.—Rheumatoid Arthritis, showing deformities of fingers, and atrophy of dorsal interossei and of extensors in forearm. (From a photograph by Dr. John Reid.)

of muscular atrophies and increase of the tendon jerks in rheumatoid arthritis cannot be carried in favour of the dystrophic theory of the disease beyond this point: It is admitted that peripheral disturbances in the joints may produce reflexly muscular wasting and exaggeration of the tendon-jerks, therefore it must be allowed as possible that peripheral irritation in other organs (*e.g.*, the uterus) may cause a like result; and again, if changes produced in the spinal cord may lead to disturbances in the nutrition of muscles, they may also surely lead to changes in the nutrition of the joints—a contention which is supported by the arthropathies known to accompany certain recognised central nervous lesions.

All this may be admitted, but the point which it is now desired to emphasise is, that the mere fact of the existence of muscular atrophies and exaggerated tendon jerks in rheumatoid arthritis, is no proof that the *articular conditions* are dependent on a spinal lesion.

ON THE SUBCUTANEOUS FIBROUS NODULES OF RHEUMATISM.

The attention given to the occurrence of subcutaneous fibrous nodules in rheumatism dates from the paper read by Barlow and Warner at the International Medical Congress in 1881. They concluded that such nodules are in themselves "indicative of rheumatism even in the absence of pain," and that, though unimportant in themselves, "they are nevertheless of serious import, because in several cases the associated heart disease has been found actively progressive." ("Transactions," Vol. IV., p. 116.) These authors also remarked on the occurrence of the nodules in children, their spontaneous tendency to subsidence, and their proneness to relapse.

Cheadle, in his most valuable and lucid work on "The Rheumatic State in Childhood," confirms the above positions. He regards the nodules as common in children, rare in adults, and as "absolutely and solely rheumatic," having, as far as he can judge, "no other origin or connection." (P. 73.) Though usually small, and often felt rather than seen, they may in extreme instances attain

to the size of half a walnut. The time occupied by their evolution varies from a few days to several months, and the large ones may have an existence of many months. As regards their prognostic value, they are "signs serious apparently in proportion to their size and number" (p. 74); when large and numerous they mean persistent cardiac disease, generally uncontrollable, and marching almost infallibly to a fatal ending (p. 75), though even when "few and small" they must be regarded as serious signs. (P. 108.) They "practically disappear with the advent of puberty." (P. 8.)

A. E. Garrod, in his "Treatise on Rheumatism," concludes that "subcutaneous nodule formation is very likely pathognomonic of the rheumatic state." (P. 32.)

Hilton Fagge speaks of the "rheumatic nodules" as having both "pathological and diagnostic interest" (Op. cit., Vol. II., p. 692); and Osler considers that "their presence may be regarded as a positive indication of rheumatism." (Op. cit., p. 297.)

It is necessary to add here that testimony from various sources had led some of the most devoted adherents to the doctrine of the rheumatic significance of subcutaneous nodules to somewhat modify their position. Thus Cheadle, in 1897, in Clifford Allbutt's "System of Medicine," writes that the connection of the nodules with rheumatism and *rheumatoid arthritis* is apparently absolute. (Vol. III., p. 49.) And in the same volume Garrod recognises that occasionally "nodules closely resembling those met with in young rheumatic patients are seen in sufferers from rheumatoid arthritis with no obvious rheumatic antecedents." (Pp. 91-92.)

ON HEBERDEN'S NODES.

It is not very infrequent to find that Heberden is credited with more definite views in relation to these nodes than he actually claimed. Except that he denied their occurrence in gout, his attitude towards them was purely that of the open mind, and in reference to his denial it must be remembered that in his day gout was not regarded as indulging in the subtle manifestations with which it is now largely credited. Heberden's short chapter on *Digitorum Nodi* is as follows :—

"What are those little knobs about the size of a small pea which are frequently seen upon the fingers, particularly a little below the top near the joint? They have no connection with the gout being found in persons who never had it, they continue for life, and being hardly ever attended with pain or disposed to become sores, are rather unsightly than inconvenient, though they must be some little hindrance to the free use of the fingers."—("Commentaries," Chapter 28, p. 148.)

Charcot regarded the nodes as revealing "a constitutional state which is none other than the rheumatic diathesis." He says they are often accompanied by asthma, migraine, neuralgia, sciatica, and muscular rheumatism, and that it is not uncommon to meet with them in patients suffering from cancer of the breast or of some other organ. He agrees that they have no connection with gout, though they may co-exist with that disease. (Op. cit., pp. 197–201.)

A number of writers, as already mentioned, regard them as a simple form of rheumatoid arthritis; and several consider their development more frequent as an isolated event, than in association with evidences of the disease in other parts.

James Begbie was very definite that "these little knobs . . . are the product of the gouty diathesis," though he allowed that they are often found in those who had never experienced a fit of the disease. He has seen them develop after "an inflammatory affection of the fingers more or less acute in its character, and attended by the same constitutional disturbance which marks the fit of gout; but more commonly they are the consequences of a slow and chronic disorder in which dyspeptic derangement has been chiefly noted." They are seldom, in Begbie's experience, found on "the hands of the industrious labourer or the hard working mechanic."—("Contributions to Practical Medicine," 1862, pp. 21–29.)

Sir Dyce Duckworth, on clinical grounds, concludes that whilst the nodes are not specially characteristic of either pure gout or pure rheumatism, they often in women co-exist with hemicrania, asthma, severe headaches, menorrhagia, and other troubles which are properly recognised as gouty manifestations of the sex. They also occur in rheumatic arthritis and as a purely senile change."—(St. Bartholomew's Hospital Reports, 1880. Vol. XVI., p. 190.)

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