ON SOME ANGIOINEURAL ARTHROSES (PERIARTHROSES, PARARTHROSES) COMMONLY MISTAKEN FOR GOUT OR RHEUMATISM.¹

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AMONG the diverse and often puzzling phenomena that, under appropriate exciting and determining influences, occur and recur in the subjects of angioneural imbalance (*vasomotor* or *autonomic ataxia*²), are pains and swellings in and around the joints. These are sometimes accompanied with fever; and, whether febrile or afebrile, the morbid complexus is commonly mistaken for gout or rheumatism.

Diagnosis and, in consequence, prognosis and treatment depend upon recognition of the underlying constitutional condition or diathesis. In other words, there must be a diagnosis of the patient, as well as of the particular collocation of symptoms that he (or she) happens to present at the moment. I have, before this Association³ and elsewhere,⁴ fully and repeatedly described the physical and functional characteristics and simple test reactions by which this diagnosis is to be made; and more recently Morichau-Beauchant⁵ in France, Herz,⁶ Eppinger and Hess,⁷ and Karl von Noorden⁸ in Germany, Barker and Sladen⁹ in this country, and

¹ Read before the Association of American Physicians, May, 1913.

² ". . . *Ataxia* rather than *hyperkinesis* or *hypokinesis*, because excessive vascular dilatation and excessive vascular constriction may be either spastic or parietic, or both spastic and parietic, as dilator or constrictor nerves, or both, are affected; and even in the extreme and opposite types of vasomotor ataxia, the phenomena, while always more or less paroxysmal, are neither exclusively those of dilatation nor exclusively those of constriction, but both abnormal dilatation and abnormal constriction are usually present in varying degrees in the same patient. The influences under which these phenomena are displayed are, more especially, temperature—and cold more than heat—emotion, visceral or external reflex excitation, and the action of toxic agents formed in the organism or introduced from without." From the author's paper of 1893. Cf. recent discussions aent "sympathicotonia" and "vagotonia." Following Langley's use of words, according to scientific precedent, I prefer to consider the autonomic or sympathetic system as a whole. Its fibers and ganglia may properly be classified according to function, upon pharmacological or other data—but to upset recognized terminology merely causes confusion.

³ S. Solis Cohen, *Vasomotor Ataxia*, *Trans. Assoc. Amer. Phys.*, 1902, vol. xvii, p. 954 et seq.; *Visceral Angioneuroses*, *Trans. Assoc. Amer. Phys.*, 1909, vol. xxiv, p. 527 et seq.; *New York Med. Jour.*, February 19, February 22, March 5, 1910.

⁴ S. Solis Cohen, (a) *Vasomotor Ataxia*, *Graves' Disease*, *Raynaud's Disease*, Philadelphia, Polyleine, Juno, 1892; (b) *Vasomotor Ataxia*, *A Contribution to the Subject of Idiosyncrasy*, *AMER. JOUR. MEN. SCR.*, February, 1894; (c) *Notes on Vasomotor (Autonomic) Ataxia*, *Med. Rev. of Rev.*, January, 1912; *Graves' Syndrome*, *Raynaud's Syndrome*, and *Allied Disorders*, *Internat. Clinica*, 1909, vol. lii, series xix, p. 41.

⁵ La diathèse angioneurotique, *Arch. méd. Ch. du Poitou*, December, 1908; *Contribution à l'étude des Idiosyncrasies*, *Le Progrès Méd.*, 1910, No. 10, p. 210.

⁶ Zur Lehre von den Neurosen des peripheren Kreislaufapparates (Ueber Vasomotorische Ataxia), Berlin und Wien, 1902.

⁷ Zur Pathologie des visceralen Nervensystems, *Zeitsch. f. klin. Med.*, 1909, lxvii, pp. 345 et seq., lxviii, pp. 205 et seq.; pp. 231 et seq.

⁸ Zur Kenntnis der vasotonischen und sympathikotonischen Fälle von Morbus Basedowii, *Inaugural-Dissertation*, Kiel, 1911.

⁹ Disturbances of the Autonomic Nervous System, *Trans. Assoc. Amer. Phys.*, 1912, vol. xxviii, pp. 471 et seq.

others have in various connections repeated and somewhat amplified the descriptions. Among the writers cited, Herz and Barker and Sladen make due acknowledgement of the earlier observations.¹⁰

"It may prove interesting, or at least amusing, to compare certain of the statements concerning vasomotor ataxia and its relations in idiosyncrasies, contained in the communication read by me before the First Pan-American Medical Congress (1893) and published in its Transactions (also in the AMER. JOUR. MEN. SCI., February, 1894) with certain paragraphs in the paper published by Moricheau-Brauchant in *Le Progrès Médical*, April 16, 1910, and in Herz's monograph of 1902. The sources of the citations are sufficiently indicated by their language—English, French, and German respectively. I have permitted myself to emphasize by small capitals in two of the French citations, and by italics in the German citation, an essential difference between the writers. The citations follow:

"For every idiosyncrasy there must be a physiological basis. By comparing the phenomena, special and general, exhibited by a group of persons presenting similar or identical idiosyncrasies, we take a step toward the recognition of the basic physiological conditions."

"I would invite attention to an idiosyncrasy of the circulatory mechanism, which, in its extreme degrees, manifests itself in the form of well-recognized symptom-complexes; in its minor degrees gives rise to puzzling manifestations of great variety of detail; and in its least developed forms often passes unnoticed. For this condition—which seems to depend upon a feebleness in the coordinating mechanisms, in consequence of which the balance of the cardio-vascular action becomes disturbed by influences that in the great majority of persons have no such effect, and greatly disturbed by influences that normally have slight effect, while the restoration of equilibrium is slow and imperfect—I would propose the self-explanatory name of *vasomotor ataxia*. . . ."

"*Force nous est donc de faire intervenir une prédisposition spéciale, un terrain commun, qui permettrait aux diverses manifestations qui ont fait l'objet de notre étude de se produire. Or, cet état morbide constitutionnel, nous avons donné le nom . . . de DIATHÈSE ANGIO-NEUROTIQUE.*"

"By the term *vasomotor ataxia* it is proposed to designate the condition of instability of the mechanism of circulation present in certain persons and characterized by abnormal readiness of disturbance, with tardiness of restoration, of the equilibrium of the cardio-vascular apparatus. The manifestations are most strikingly displayed by the heart and by the cutaneous peripheral vessels, but analogy indicates the occurrence of similar phenomena in the vessels of the glands and of the viscera, more especially in those of the kidney, of the gastro-intestinal tract, and of the brain."

"Vasomotor ataxia may be acquired as a sequela of disease; in many cases it is congenital; in some cases inherited; the condition is not rarely present in several members of a family."

"Among other symptoms and morbid associations observed are anemia, hysteria, drug and food idiosyncrasies, urticaria, local (circumscribed) edema, hyperidrosis, angina pectoris and pseudo-angina, organic heart disease, pulmonary tuberculosis, asthma, hay fever, vertigo, migraine, and other forms of headache, transient hemiplegia and other visual disturbances, persistent mydriasis, . . . menstrual irregularities, intermittent polyuria, rheumatism, rheumatoid arthritis, contractures of digits, chorea, epilepsy, neurasthenia, neurotic dyspepsia, gastralgia, enteralgia, membranous enteritis . . . as effects of a common cause, or as secondary results."

"*La diathèse angio-neurotique, d'après nous, est une prédisposition morbide héréditaire et familiale caractérisée par une instabilité particulière de l'appareil vaso-moteur, qui rend celui-ci, chez les sujets qui en sont atteints, apte à répondre par des réactions excessives à des irritations qui chez d'autres resteraient sans effets. Son domaine est des plus étendus. Il comprend: des troubles du côté de la peau: urticaire, érythèmes circonscrits, érythèmes divers, ouxquels s'ajoutent des manifestations nombreuses du côté des muqueuses et des viscères: crises gastro-intestinales, idiosyncrasies alimentaires et médicamenteuses, hypersensibilité de la pituitaire oux odeurs, asthme des foins et asthme vrai, migraines, etc.*"

"Nur Solis-Cohen hat die Wichtigkeit, die Häufigkeit und die klinische Stellung der im weiteren zu schildernden Krankheitsbilder erkannt. Er nannte den sehr mannigfaltigen Zustand, 'welcher auf einer Schwäche in dem Coordinations-mechanismus beruht, infolge wovon das Gleichgewicht der Gefässaction von Einflüssen gestört wird, die bei der grossen Mehrheit aller Menschen keine solche Wirkung haben, und sehr gestört von Einflüssen, die normaler Weise nur eine kleine Wirkung haben, während die Herstellung des Gleichgewichtes langsam und unvollständig ist'—er nannte diesem Zustand *vasomotor ataxia*. Ich glaube dass dieser Name als kurze Bezeichnung beibehalten ist."

"In many striking cases there has appeared to be morbid alteration in the thyroid gland."

"*Il existe des présomptions en faveur de l'origine thyroïdienne des divers troubles relevant de la diathèse angio-neurotique.*"

The present communication may therefore be confined to a discussion of the special syndrome group to which it is desired once more to direct the attention of physicians.

In the title of the paper, the clinical pictures to be described have been designated *angioneural arthroses*. This term, however, is not entirely satisfactory. It implies, correctly, that the nosological species embraces several varieties. It indicates, moreover, that we are not dealing with true inflammation—*arthritis*. But it is not sufficiently comprehensive. In some, and perhaps the majority of cases, the edema of overlying tissues is more important than the effusion (or other change) within the joint; in still other cases the joint structures proper are not manifestly involved. For these the term *periartroses*—or even *pararthroses* when it is only the neighboring soft parts that are affected—would be more suitable.

The term "*hydrops articularum periodica*" or "*hydrops articularum intermittens*" has been applied to the one variety of vasomotor joint disorder that has thus far been definitely recognized;¹¹ but it is applicable to that variety only. The number of varieties seems, however—as in all the related syndromes constituting the several species of the nosological genus *ataxia autonómica*¹²—to be limited only by the possibilities of variation; while the limits of variability approach closely the full extent of the possible permutations represented by the number of symptomatic and other factors.

To adopt the ancient Cuidian precedent and describe each variation of a variety as a separate species would, indeed, accord with the method of many writers upon neurovascular disorders; but my own endeavor for the last twenty-five years has been to group rather than to separate; to bring out the underlying unity rather than to accentuate the superficial diversity. Besides which, as I have repeatedly pointed out in regard to the whole subject, as well as to other special phases of it, such a course would ordinarily result in the ascription of a new diagnostic name to each recurrence of the disorder in nearly every individual. It is true that in a very few persons the successive attacks are relatively consistent—or rather, monotonous—in type; but this only emphasizes the general capriciousness and whimsicality of the phenomena.

The chief *symptomatic elements*, are pain, swelling, discoloration, and fever.

Pain and *swelling* are usually associated. They frequently develop, subside, and reappear together. Either, however, may be present without the other. Sometimes they alternate; sometimes they

¹¹ This was apparently first observed by Perrin (1845); then by Moore (1852, 1865). Fridenberg (1883) was the first American reporter. Schlesinger (1900) has made the most comprehensive study of the subject.

¹² Strictly speaking, *autonomía ataxia* is not a nosological genus in itself, but the substratum upon which a nosological genus is to be erected. As I have elsewhere shown, the several species arise out of the incidence, to the subjects of this condition, of diverse excitants and local determinants.

appear and disappear without any evident mutual relation. The extent of the swelling, moreover, is never an index to the degree or pain, whether directly or inversely; there may be intense pain with no swelling or considerable swelling with no pain. Either symptom may precede, either may outlast, the other.

The swelling may be *due* to effusion into the joint or to edema of the overlying soft parts, or both. Sometimes the painful joint and the tissues about it are not swollen, but a lump or lumps will appear on the limb, at a greater or less distance above the joint (*cardiad*).

The pain is ordinarily *referred* to the joint or joints apparently affected. Sometimes, however, it extends quite a distance along the limb, or is reflected to a distant point—most frequently, but not invariably, an articulation. Thus when the wrist is involved, the chief complaint may be of pain in the elbow, the upper arm or the shoulder—as a rule, of the same side, but sometimes of the other side—or even of substernal pain; or elbow pain may be associated with disturbed sensation in or around the mammary gland. The pain is variously described as burning, boring, stabbing, aching, or general soreness. It may be constant, remittent, or intermittent. Sometimes it is absent when the affected part is at rest and is experienced only upon active motion. In other cases it is aggravated even upon passive motion. In a few instances, the most gentle touch induces exquisite agony. This is especially marked at times when the costochondral junction is affected.

Numbness and tingling ("pins and needles" sensation) are frequently experienced in the fingers and toes; not only when these are themselves swollen and discolored, but also when their appearance is normal and the chief incidence of the disorder is elsewhere. *Paresthesiæ* of various kinds in any part of the body—thus in one patient always in the face and lips—most frequently, however, in the extremities—may be premonitory symptoms.

The skin of the affected part or of the limb at some distance from the joint to which the pain is referred, may be *discolored*. It is usually reddened; sometimes cyanotic, mottled, or pale and glistening; occasionally the seat of a papular, vesicular, or bullous eruption. Sometimes, however, there is no change of tint beyond that attributable to the distention. At other times there may be very slight and circumscribed swelling, but extensive reddish or purplish discoloration. The discoloration may be persistent. Ordinarily, however, it can be markedly lessened by gentle stroking in the direction of the venous current, or by elevation of the limb. When a terminal phalangeal joint is affected there may be ulceration at a nail margin. There may also be general or localized *erythema* of face, trunk or extremities.

Subjective *heat* in the affected part is common; but objective heat of a corresponding degree, or even sufficient to be detected by the touch of a normal hand, is relatively infrequent.

Fever is not common. When present it may be continuous, recurrent, or intermittent. It may show only as a rise of temperature, or there may also be headache, malaise, lassitude, and other constitutional disturbances. Headache or malaise or both may exist without elevation of temperature. In some persons there is both rise of temperature and constitutional disturbance, in every attack. In some there is rise of temperature only; in others, headache only. In some the pyrexia is preceded or followed or punctuated by chills or chilly sensations; or there may be chilly sensations without temperature change. In others there is never any febrile movement whatever; while still others may have fever in one attack and none in the next.

CHART I.—"Capricious" temperature curve in a case of febrile polyarthrosis of between two and three weeks' duration.

CHART II.—Portion of temperature chart from case of polyarthrosis showing irregular periodicity. The portion of chart reproduced shows two febrile periods of five days and one of three days, with one afebrile interval of five days, one of seven days, and portion of a third which was also of seven days.

In febrile cases the *temperature curve* is either entirely capricious—rising and falling without rhythm or apparent reason (Chart I)—or shows a curious tendency to what may be termed an irregular periodicity. Perhaps this might better be described as paroxysmal. As a rule the temperature rises suddenly and falls suddenly, when uninfluenced by treatment. (The times I saw it fall gradually I thought that treatment might be responsible.) The height varies. Ordinarily it is moderate, between 101.5° and 103° F. I have seen it reach 104.4° F.; and I have also seen it keep below 100° F. The time of maintained height may be a few hours or a few days, rarely a week. In most cases the temperature falls to the normal line, or to a point slightly above or below the normal line, in from twelve to seventy-two hours. Recovery may then ensue shortly, or after

a week or two, without further temperature rise. If the case be prolonged, however, the curve tends to remain low, with slight fluctuations, for a variable time—from a day or two to a week or more—and then again rises abruptly, and remains high, or with a sharp up and down movement, for two or three days or more, to subside as suddenly as it rose. This may be repeated several times in the course of a long attack; but in only one case did I observe an approximation to regularity in the periods either of intermission or of relapse. In that instance the free periods were five or seven days, and the febrile periods three or five days. There were four of the latter, the entire attack lasting about six weeks (Chart II). One would be inclined to separate the prolonged febrile cases from the afebrile and brief cases, did not the same patient exhibit at different times, both forms—and still other varieties.

Apart from the symptoms, the chief factors of the morbid complexus are *duration*, *recurrence*, *extent*, and *distribution* (or time and space).

The *duration* of a particular attack may be brief or prolonged—from a few hours to many weeks. It may be continuous, remittent, or intermittent.

Recurrence may be periodic or irregular, at short or long intervals—from days or weeks to months or years. Thus the patient may have four or five attacks every year, for two or three or more years; and then perhaps be entirely free for five or even ten or more years. Or daily or weekly brief attacks may continue for months, and freedom suddenly ensue, to be maintained for a few months or for several years. In this respect the condition parallels the more familiar angioneuroses of the skin and mucous membranes—urticaria, asthma,¹³ lingual and laryngotracheal (angioneurotic) edema, etc.

Extent may be slight or great; *distribution* constant or variable. In most of the cases of "hydrops articulorum intermittens" upon record, a single joint, and always the same joint, was affected in the recurrent attacks—in the majority of instances, a knee. In the slighter forms to which I desire to direct particular attention, and especially in those which involve rather the soft tissues about the joints than the articular structures, several joints may be affected simultaneously or in succession. A single finger-joint or a single toe-joint may indeed suffer, but this is comparatively uncommon. Recurrences may affect the same joint or group of joints, or different groups. No joint in the body is immune. I have seen three cases affecting the spine or overlying soft parts, at least two cases affecting the temporomaxillary articulation, and one case of cricoarytenoid involvement.

¹³ In hay fever and associated asthma the regular annual or other periodicity depends upon the regular annual (or other periodic) recurrence of the exciting noxa or noxae. That is a different matter.

The disorder is probably much more frequent than anyone has hitherto suspected. When I made my first special report upon the subject of articular and periarticular angioneuroses to the College of Physicians of Philadelphia¹⁴ about two and a half years ago, I selected only six cases from records extending over twenty years, as instances which I then felt prepared to defend against sceptical criticism. Since I have studied the subject more closely I am convinced that I might have reported from those same records many times that number; but when one misses the opportunity to see the recurrences and is compelled to depend upon the imperfect sort of history obtainable from the average unobservant person, perhaps a judicious conservatism is not out of place. I am able, however, to add 21 new cases, making in all 27, distributed as follows as regards sex, age, fever, recurrences, and parts affected.

Sex. Males, 12 (44.5 per cent.); females, 15 (55.5 per cent.).

Age. Less than twelve years, 8 (29.6 per cent.); between twelve and twenty-five years, 12 (44.5 per cent.); between twenty-five and fifty years, 5 (18.5 per cent.); between fifty and seventy years, 2 (7.4 per cent.).

Attacks. Observed in one attack (or series¹⁵) only, 13 (49.5 per cent.). Observed in several attacks (or series) 14 (50.5 per cent.). Total number of attacks (or series) observed in or reported by 27 persons, 110.

Fever. Febrile in all attacks, 5 (18.5 per cent.). Febrile in one or more attacks, but not in all, 6 (22.2 per cent.). Afebrile throughout, 16 (59.3 per cent.).

Parts Affected. Joints only, 3 (11.1 per cent.). Soft tissues only, 8 (29.6 per cent.). Joints and soft tissues, 16 (59.3 per cent.).

Distribution. Multiple in several attacks, 16 (59.3 per cent.). Multiple in one attack only, 3 (11.1 per cent.). Mono-articular in all attacks, 8 (29.6 per cent.).

*Intra-articular Affections.*¹⁶ Spine: cervico-occipital, 1. Face: tempromaxillary, 2. Extremities: wrist, 6; knee 3.

Intra- and Peri-articular Affections. Crico-arytenoid,¹⁷ 1; temporomaxillary, 1; lumbosacral, 1; sternoclavicular, 3; chondrosternal, 2; vertebrocostal, 4; shoulder, 5; elbow, 10; wrist, 14. Hand and fingers: metacarpophalangeal, 14; interphalangeal, 16;

¹⁴ S. Solis Cohen, Angioneurotic Manifestations in and Around Joints, Frequently Mistaken for Gout and Rheumatism. Trans. Coll. Phys., Philadelphia, 1911, series III, vol. xxxiii, p. 309 et seq.

¹⁵ Case I illustrates what is meant by a *series*; it is, of course, several brief attacks with short intervals, but to record it as twenty or more attacks seems inappropriate.

¹⁶ The figures in intra-articular affections, intra- and peri-articular affections, and peri-articular affections are not comparable with any others in the present records, since they include both multiple and mono-articular attacks and recurrences in cases in which different joints and groups of joints were involved each time, or in which at one time joints only, at another time soft tissues also, were affected.

¹⁷ Laryngoscope appearance.

hip, 1; knee, 9; ankle, 3; heel, 4; toes: metatarsophalangeal, 6; interphalangeal, 3.

Peri-articular Affections. Acromioclavicular, 1; shoulder, posteriorly, 1; hand and fingers, 10; foot and toes, 6; wrist, 7; lumbosacral junction, 2; costochondral junction,¹⁸ 4.

The foregoing figures are given more to accord with conventional methods of reporting, than because I attach any great significance to them. The total number of individuals is too small, and too many accidental factors enter into the statistics, to permit this.

Thus as regards age, for example, it so happens that I saw certain persons in childhood, others in adolescence, middle life, advanced age. Yet I feel sure that in a much larger proportion than indicated, the disorder manifests itself before the twentieth year, perhaps before the twelfth year. Ordinarily, however, it is not recognized. The present report gives, therefore, only the ages at which the patients were first seen by a certain observer. Again, however confident I may be that the history frequently given, of previous attacks of "rheumatism" or "gout" (not seen by me) really refers to the condition under discussion, I have felt justified in so recording those attacks in only about one-third of the instances. An error of judgment here, whether of omission or of commission, necessarily affects the statistics of fever, of recurrence, and of distribution. There is also a possibility of error in the anatomical diagnosis in the exclusion or inclusion of intra-articular effusion in the mixed cases.

CASE REPORTS.

Case reports sometimes convey a more vivid picture than a general description with its necessary qualifications; but in a disorder so multifarious in aspect as that under consideration, reports *in extenso* are out of the question.

From the 27 cases, however, some 7 may be selected for brief narration, as illustrative at once of the great variety in detail of the morbid pictures and their essential sameness in fundamentals.

CASE I.—*Intermittent, afebrile swelling of hands and wrist, with pain in upper arm; daily paroxysms in each series; monthly recurrence of series.* Ethel X., schoolgirl, aged thirteen years, complains of paroxysmal attacks of pain and swelling in the hands, with pain in the upper part of the arm. The trouble began two years ago. It usually affects one side only—and more frequently the right—but occasionally is bilateral. The swelling occupies the palmar surface, affecting chiefly the metacarpal-phalangeal articulations and overlying parts, including the hypothenar eminence. The

¹⁸ Probably periosteal edema. I have also seen several cases of periosteal edema at a distance from joints, which are not included in the present paper.

dorsum is not involved. Occasionally the process extends to the wrist, which it encircles. Whether from pain or mechanical obstruction by the swelling, or both, it is impossible to close the hand. The affected parts are discolored (mottled red and purple) and swollen. They are subjectively, but not objectively hot, and are not especially tender to pressure unless it produces passive motion. There is no fever. Sometimes there is pain in the thigh, and also (but rarely) in the foot as well. Swelling or discoloration, however, has not been observed in the lower extremity. The attack lasts from one to twelve hours. If prolonged beyond an hour or two, there will be remissions or intermissions. The paroxysm may occur daily, though not always at the same hour, for three or four days in succession. Until recently there would be a period of freedom of a month or more; but now the free interval is seldom longer than a week.

The child has not yet menstruated. She shows quick, hyperemic dermography, has typical tricolored nails, and exhibits slight retraction of the upper lids upon fixation of the eyes in convergence (Cohen's eye-sign). There is no tremulousness of the lids, and no lagging. The girl becomes ear-sick easily and vomits, but never has sick headache. At times she has bilateral, temporal headache. She perspires readily, even in cold weather. During a paroxysm of pain and swelling the palmar surfaces perspire freely. They are purple or mottled at that time, while the dorsum of the hand, and the wrist, even if swollen, are red. The girl thinks the attacks are more frequent in cold weather; nevertheless she prefers winter to summer, as she becomes faint and is drenched with sweat on slight exertion in warm weather. There is no discoloration except during the attacks of pain and swelling. There is no lesion of the heart and no palpitation. The thyroid is not enlarged. The blood pressure is 110 systolic and 75 diastolic. The bowels are usually constipated. The urine shows an occasional trace of albumin following an attack.

The mother of this patient is aged forty-four years. Three months ago she was subjected to a vaginal hysterectomy for myoma. She now complains of puffing of the fingers at night, with pain, which subsides during the day. This was preceded by similar pain and swelling in the left breast, which, however, came during the day and disappeared at night. She was seen but once, and at that time the hands were red and slightly swollen, the color running out and the swelling tending to disappear, upon elevation. The urine shows neither albumin nor sugar. She is a typical subject of *autonomic ataxia*.

The elder sister of the patient (also a typical *autonomic ataxia* subject), aged nineteen years, began to sneeze and present a hay-fever picture shortly after the family removed from Philadelphia to the interior of New Jersey. This, however, was in October,

and the attack subsided in a short time. It recurred in June and lasted until she went to New York City in July, when it ceased after two or three days, but returned when she came home in September. It was ascertained that this girl was susceptible to "ivy" poisoning, and that there was considerable "poison ivy"¹⁹ near the house. When this was cut down, the sneezing and associated symptoms ceased. Curiously, the younger girl who exhibited the angioneural arthrosis and dermatosis was immune toward "ivy."

Two maternal uncles have asthma, and one of these has had attacks of giant urticaria. On the father's side there is nothing significant.

CASE II.—*Afebrile, paroxysmal, intermittent joint pain, in fingers chiefly, of brief duration, at first recurring fortnightly or monthly; later assuming nightly periodicity, with redness and swelling; later becoming premenstrual and associated with chilly sensations and blueness of the extremities.*

Mrs. X., aged twenty-eight years, housewife, has been married six years and is the mother of two healthy children, the youngest of whom is two and a half years of age and has been weaned for a year. The chief complaint is of pain in the joints, principally those of the fingers, which at the time of examination are tender and swollen and have been so, off and on, for two days. The left hand only is affected at this time. All the metacarpophalangeal joints and the first interphalangeal joints of the first, second, and third fingers are involved, together with the overlying tissues. The soft parts of the dorsum of the hand and wrist are also red, tender, and swollen. The patient states that the pain first appeared some time during her first pregnancy, coming on without warning, and lasting, with intermissions of an hour or two, for a couple of days, after which she was free for a fortnight, when it recurred in the same way. Unfortunately I have no exact note of the conditions preceding and following delivery and the establishment of lactation. Apparently these events had little influence; nor was any change brought about by the return of menstruation. The pain continued to recur paroxysmally, fortnightly or monthly, without apparent definite relation to the reestablished menses. This pain is described as a dull ache, with occasional sharp exacerbations. At first it did not keep her awake. The hands and fingers were tender to the touch, but at this time were not red nor swollen nor hot. The trouble continued, despite treatment, until some time during the second lactation, when it became much worse, and assumed new features. The pain would come on shortly after 6 P.M. daily and last until she fell asleep, frequently

¹⁹ Identification of the poxa is not certain. The father was told to bring me a leaf, but did not do so.

waking her during the night. At this time, also, swellings began to appear, at first occasionally, then with each recurrence of pain. The pain and swelling affected principally the knuckles and phalanges, but also at times the wrists, the knees, and the ankles. The toes were never involved. The two sides of the body were rarely affected at one time, but the hand and knee, or the knee and ankle of either side might be painful or swollen in coincidence or in quick sequence. Sometimes a hard lump would develop on the hand or arm, at some distance from the joint, or a bruise-like patch would appear; or there might be both swelling and discoloration. The swelling did not pit upon light pressure. The spot was never red, nor did it have a red areola, nor was there any itching, but it was always tender to pressure. At no time was there fever, but there had been gradual loss of appetite and wasting. Treatment with baths and massage seemed to aggravate rather than relieve. Suddenly a period of freedom ensued, which lasted for several months. During the summer preceding her visit to me, the patient had felt entirely well, and had regained flesh to within a few pounds of her former weight. About three months before she consulted me the trouble had returned, but again with a different aspect. This new series of phenomena would come on three or four days before the menstrual period, and would be relieved with the appearance of the flow. It would begin with general chilliness, the feet would become "cold as ice," the hands and ears blue, but not cold. The tip of the nose would become blue or white. After a few hours, the finger-joints would become stiff and painful, then red and swollen, and, at times, hot. With this, the cyanosis would disappear; but the feet remained cold. There had been but three such attacks. In the first, both hands had been involved at once for four days; in the second, the right hand for two days and the left for two days; the third attack was the one I saw. The left hand only was involved for two days. The next day the patient complained of pain in the throat, with difficulty of phonation. Laryngoscopic examination showed swelling and redness of the right vocal band and arytenoid eminence, which subsided in great part under a spray of epinephrin solution.

This patient presents the typical dermatographic, ocular, and nail-bed signs of *autonomic ataxia*. She is not hysterical, but is easily startled. Among the other life-long phenomena of vascular imbalance is a tendency to perspire, even in cold weather, and paroxysmal, apparently causeless, flushing of the face and ears, with "pins and needles" sensation in the lips and ears or sometimes in the extremities. The hands frequently become blue or mottled on going out of doors in cold weather. There is slight enlargement of the thyroid gland. There is pain on pressure, both in the supra-orbital and infra-orbital notches. There is no heart, lung, or kidney lesion. Information concerning other members of the family is lacking, except that

the mother suffered with menstrual migraine and one sister died of pulmonary tuberculosis.

CASE III.—*Recurrent mono-articular swelling of the knee; afcbrile.* A. C., male, insurance agent, aged forty-one years; has had recurrent swelling of the right knee, without spontaneous pain or fever, for two years. It comes and goes suddenly without apparent reason. The swelling is evidently intra-articular, the patella floats. There is no redness, no tenderness, no heat. The attacks last from a day or two to a week, disappearing more quickly if the patient rests. There is pain upon motion only. The intervals of freedom vary from four to six weeks. The patient exhibits the signs of *autonomic ataxia*. He is of a gouty family and has had urticaria repeatedly. He has never had rheumatic fever or polyarthritis of any kind. There is no history of gonorrhea or syphilis. The patient recalls no injury to the part. There is no cardiac or renal disease. There is considerable susceptibility to drugs, especially salicylates, quinine, and iodides.

CASE IV.—*Recurrent, intermittent polyarthrosis, with coincident edema of soft parts; febrile manifestations.* Mrs. L., aged thirty-eight years, housewife, has been under my care for twenty years, and during that time has exhibited many and various syndromes of vasomotor disturbance (including many so-called "drug and food idiosyncrasies"—anaphylaxis?). Also, her mother, brother, sisters, and children exhibit the same sort of susceptibilities. During my absence from the city in 1905 she was treated for what was called "articular rheumatism" by a physician unacquainted with her constitutional characteristics and tendencies. Since that time she has frequently had attacks of pain and swelling, sometimes affecting one joint, sometimes a group of joints, and occasionally exhibiting tenderness and redness, but never heat, of the overlying soft parts. These phenomena have usually been transient, lasting an hour or two, or at most twelve hours, but sometimes continuing for two or three days with or without intermissions. No periodicity can be traced in the recurrences, these being, as a rule, coincident with emotional disturbances—"servant troubles," sickness of husband or children—or with fatigue from zealous housecleaning or prolonged dancing or "bridge," etc. Occasionally the attack has followed some dietary indiscretion. In the fall of 1910, following the prolonged incidence of measles and whooping cough among her children, during which time she had little rest, the patient complained of great pain in the left wrist, which was swollen, red, and tender, but not hot. She was anemic and weak, and was ordered to bed, but did not go. The next day both wrists and the fingers of the left hand were involved, and there was fever (103° F.). This is the case giving the curious temperature curve shown in Chart II. The pain and swelling in the joints continued with periods of exacerbation and

remission for six weeks. The last period of high temperature (there were four in all) ended in the fifth week. No connection could be traced between increase of temperature and aggravation of local phenomena, for the joints might be painful and swollen when the temperature was low or when it was high—and conversely. During the course of the attack, both wrists, both elbows, the fingers of the left hand, the toes of both feet, the right ankle and the right knee were involved; the wrists almost continuously, the other joints intermittently. Tingling in a part often preceded the swelling by twenty-four hours. At first there was considerable spontaneous pain in the affected joints; but for the most part the pain lessened or disappeared the day after the swelling developed, and would remain absent except upon active or passive motion or pressure, when it became, at times, very severe. During and after convalescence, "pins and needles" sensations in one or another extremity or in the rectum, were frequently complained of.

CASE V.—*Recurrent, afebrile, monodigital, swelling and pain, associated with a bullous eruption, occurring in a gouty subject.* Mr. P. S., manufacturer, aged fifty-five years, belongs on the paternal side to a gouty family and has had several attacks, both in hands and feet, of what was diagnosed as gout by his former attendants. I have not seen him in a true gouty attack in the five years that he has been under my care. His finger-joints are more or less thickened, but they have not become swollen or tender, except in the following manner: One finger—usually, but not invariably, the left index finger—begins to tingle and changes color. Ordinarily it becomes paler than normal, but sometimes it takes on a purplish hue. Pain now develops. The first joint swells, the skin reddens, and the swelling gradually spreads until nearly the whole finger is involved. The pain subsides. A number of small transparent vesicles appear, which apparently coalesce into fair-sized bullæ. These dry up, as a rule, without rupture unless the finger receives an inadvertent knock, in which case they may break, exuding colorless, odorless, unirritating fluid. The swelling subsides, the color disappears, and in the course of a week the finger has resumed its former condition. These attacks recur irregularly, there having been six in five years, but with one free interval of nearly three years. There is no organic disease; no recent gonorrheal infection; no evidence of persistent infection; no history of lues. The attacks have sometimes seemed to be provoked by indiscretions in diet. The patient, one son, and one daughter present the signs of vascular imbalance. The daughter recovered some ten years ago, under my care, from pulmonary tuberculosis, which exists in the patient's family on the maternal side.

CASE VI.—*Intermittent and sometimes painful swelling of soft parts about gouty finger-joints, about acromioclavicular articulation, intermittent mammary swelling, and along trapezius border and*

spine of scapula; occasional fever; Mrs. R., aged seventy years, has a life-long history of gouty and nervous symptoms of various kinds. Her finger-joints are enlarged, often painful, and some of the fingers stiffened. She is subject to sudden burning and itching in the throat, accompanied with intense redness of the mucous membrane of the palate or pharynx, and subsiding in from ten to thirty minutes, or at most an hour. The sublingual veins swell suddenly and as suddenly return to their usual state. There are numerous little venous nodules along the right border and inferior surface of the tongue. The left pupil is ordinarily dilated, but at times suddenly returns to the normal size, or may be contracted. There is excessive retraction of the upper eyelids not only upon convergence, but also spontaneously during the excitement of interesting conversation. Dermographism is readily produced upon the patient's smooth, white skin. At times during the past ten years or more, the soft parts over one or more of the gouty finger-joints swell. As a rule, the swelling is painless—but occasionally there is pain and redness. This may last for a day, or intermittently for a week. It may recur frequently, or after an interval of many months. More recently there are sudden seizures of intense pain in the upper left arm, followed by swelling along different portions of the neck and shoulder, most frequently over the acromioclavicular junction, or along the outer border of the trapezius, or above the spine of the scapula. These may be painful and are always tender, but never reddened. They appear suddenly, and ordinarily subside in from twenty-four to seventy-two hours. Sometimes they may last, with remissions, the better part of a week. Six such attacks have occurred in two years, the first four within six months. Two of them were associated with slight fever. The first attack was attributed by the patient to "cold." She is careful in diet, and the bowels are regular. There is no evidence of neuritis. There are no symptoms of angina. While there are periods of indigestion, and also periods of increased and diminished uric acid and urate output, no connection can be established between these and the swellings referred to. The patient states that at times her breasts (which are well-preserved) swell, but without pain. I have never seen this condition of the mamæ as it seems to subside very quickly. There is exophthalmic goitre and epilepsy in the mother's family; cancer and apoplexy in the father's family. The patient's bloodvessels are unusually soft for her years, and she has no disease of the viscera.

CASE VII.—*Afebrile, recurrent joint pain associated with numbness under left breast and with nausea.* Mrs. G., aged twenty-five years, has been feeling badly for six years. She has attacks of palpitation; frequent sick headache; constipation; at times, paroxysmal dyspnea. She cannot eat strawberries, as this provokes hives. During the last year there have occurred "spells" of intense pain in the left

elbow, aggravated upon motion. The pain lessens after half an hour or so, but does not disappear entirely for several hours. There is no swelling, tenderness, heat, or redness. The pain is preceded by tingling and numbness in the left ear, and followed or accompanied by numbness and stabbing pains under the left breast. With this last comes a feeling of faintness and nausea, but without vomiting, nor does the provocation of vomiting relieve it. There is no fever. The spells may come daily for several days, and then disappear for weeks. They bear no ascertainable relation to menstruation or constipation or other symptom, directly or inversely. There is no evidence of any organic disease whatever, no history of gonorrhoea or syphilis. The patient shows the dermographic, ocular, and nail signs of *vasomotor ataxia*; the thyroid is not enlarged; there are numerous petechiae and telangiectases on the body; pilomotor reflex is marked; she bruises easily and formerly bled from the nose. Glasses seem to have lessened the frequency of the headaches, which now occur only at the menstrual time, and not with every period. Four years ago the patient was operated on for appendicitis. The family history is not obtainable.

Diagnosis.—From what has been said, and from the histories given, both the difficulty and the ease of diagnosis should be evident. To mistake the condition for gout, rheumatism, muscular rheumatism, myalgia, neuralgia, neuritis, etc., is common, and is, indeed, excusable, so long as one's attention has not been directed to the subject; and the subject is ignored by most text-books and systematic writers. In members of gouty and rheumatic families and in hysterical subjects the discrimination may be peculiarly difficult—and just such persons yield the majority of the cases. I have elsewhere²⁰ discussed this relationship, as well as that of hysteria, neurasthenia, tuberculosis, cancer, diabetes and epilepsy, to autonomic disorders in general.

In *afebrile* cases the chief elements in diagnosis are the recurrent tendencies of the disorder, the family and personal history, and the characteristic signs of constitutional peculiarity²¹ (idiosyncrasy) exhibited by the patient.

In *febrile* cases, the discrimination from rheumatic fever is at first difficult. A knowledge of the patient and his family helps, but may also lead astray, since a subject of autonomic ataxia is as liable as any other person to rheumatic infection. In the absence of authoritative bacteriological, serological, or other exact tests for infective polyarthritis, the diagnosis becomes evident only as the case proceeds. It must be based on all the phenomena, not on any one point. Considerable reliance, however, may be placed on the temperature curve, which, as pointed out, may be utterly capricious or exhibit certain more or less well-defined phases, or even

²⁰ Cohen, loc. cit.

²¹ Cohen, loc. cit.

an apparent periodicity. Marked increase of eosinophiles or a disproportionately low count of polymorphonuclear leukocytes, or a marked excess of urinary indican or ethereal sulphates, favors the diagnosis of angioneural disturbance, but is not conclusive. Nor are any of the reverse conditions conclusive negatively.

Some patients cannot bear salicylates, and, as a rule, these compounds, even when well borne, are less efficacious in relieving pain than in true rheumatism. They are not, however, entirely devoid of palliative effect, and hence a conclusive "therapeutic test" is not available.

The result of medication may be taken into consideration with other evidence—that is all.

Treatment must be individualized. It is more efficacious in prolonging the intervals of freedom, and perhaps finally overcoming the tendency to recurrence, than in controlling—except palliatively—the special attack or series of paroxysms. Indeed its influence over the special attack is hard to estimate.

During the *acute stage* the chief elements of treatment are rest (local and sometimes general), regulation of diet,²² elimination, and (relative) antisepsis. In some cases, special medication (and local applications) of a symptomatic and palliative character may be needed.

During *convalescence* from prolonged febrile cases the administration of roborants and hematinics is desirable.

During the *intervals of freedom*, treatment must be directed toward prevention. To this end, measures for reëducating the vascular reactions and for restoring the tone of the vasomotor centres must be instituted; and the special exciting and determining factors, intrinsic and extrinsic, of the individual case, must be sought out and avoided or combated. In addition to the carefully individualized regulation of life and diet, persistent elimination, antisepsis, applications of hot and cold water, sometimes massage and high frequency electric currents or discharges, and the administration of angiotaxic medicaments (including the preparations and products of the glands of internal secretion) are thus among the measures applicable.

To discuss these therapeutic expedients in detail is impossible within the limits of the present article. It may be said, however, that much can be accomplished by persistence in treatment along well-thought-out lines and with measures and methods carefully adapted to all the circumstances of the individual case. This is capable not only of giving a considerable degree of relief, but sometimes seems to overcome, in great measure, the morbid tendencies.

²² For the first day or two in the more severe cases, and especially in what seems likely to be a prolonged febrile attack, the diet should consist chiefly of skimmed milk or whey with hot water in which sodium chloride (0.1 per cent.) and sodium bicarbonate (0.2 to 0.4 per cent.), and perhaps a little lemon juice, may be added. Later, barley water, sour milk, pancreatized milk, "one-minute" eggs, junket, pancreatized gruels, etc., may be given; and still later, fresh fruit and green vegetables. Meat and fish should be avoided.