heat, one of the gravest of forms, and which speedily proves fatal unless you come to the rescue with active antipyretic treatment.

I shall have finished, gentleman, the hints which I wished to give you in reference to the treatment of acute rheumatism, when I shall have set forth the dietetic and hygienic principles which should govern you in these cases. These general rules, save always the milk regimen counselled by Biòt of Lyons,[3] are much more applicable to chronic rheumatism and to gout. I will then defer them till my next lecture, when I shall speak of the treatment of these two affections.

hyperthermia is more common in man than in woman, in the proportion of 1.8 to 1.; the influence of age and professional occupation is nil.

3. Hereditary predisposition to rheumatism is not a cause of hyper-thermia.

4. Generally hyperthermia complicates the first attacks of rheumatism.

5. It is not generally accompanied by accidents on the part of the viscera. The most common visceral complications are pericarditis and pneumonia.

6. The mortality of acute rheumatism with hyperthermia is very high; hyperthermia is one of the principal causes of death in acute rheumatism.

7. Sometimes, but not always, it is preceded by suppression of the joint pains and by perspiration.

8. It is often preceded by delirium or other nervous accidents.

9. The date of the appearance and the duration of the hyperthermia are very variable.

10. Death, when it takes place, comes on generally on the second or third week of the rheumatism.

11. It does not give place to the special lesions of the viscera; when there exist visceral lesions, these are not necessarily very extensive.

12. The best treatment consists in making cold applications to the skin; these are the more efficacious, the earlier they are resorted to. The temperature ought not to exceed 40.5° C. (105° F). If the baths do not suffice, one should have recourse to applications of ice, to cold lotions, to the wet pack, to injections of ice water, etc. (*a*)

[3] Biòt, of Lyons, employs the milk diet in rheumatism. According to him, this regime alleviates the pain and lowers the thermic curve. This effect is largely due to the activity given to the renal functions. (*b*)

(*a*) Woillez, Du rhumatisme cérébral et de son traitement par les bains froids (Bul. gén de Thér., p. 334 et 397, October et November, 1880). Report concerning hyperpyrexia in acute rheumatism, by a Commission of the Clinical Society of London (Med. Times and Gaz., June 3, 1882).

(*b*) Biòt, On Milk Treatment of Acute Rheumatism. Revue Mens. de Mèd. et Chir. Mars, Avril, Mai, 1879

ON THE TREATMENT OF CHRONIC RHEUMATISM AND GOUT.

SUMMARY:—Chronic Rheumatism—Origin of Gout and Chronic Rheumatism—Arthritism—Arthritis Deformans—Treatment of Arthritis Deformans—Internal Medication—Arsenic—Iodine and Iodides—Salicylate of Soda—External Treatment—Electricity and Massage—Thermal Treatment—Dietetic Treatment—Action of Cold—Gout—Pathogeny of Gout—The Uric Acid Diethesis—Etiology of the Uric Diathesis—Therapeutics of Gout—Treatment of the Fit of Gout—The Fit of Gout—Ought We to Treat the Fit of Gout—Visceral Complications of Gout—The Gouty Kidney—Bloodletting—Sudorifics—Guaiacum—Purgatives—Specific Treatment of Gout—Sulphate of Quinine—Colchicum—Preparations of Colchicum—Vegetal Treatment of Gout—Alkalies—Salicylate of Soda—External Treatment of the Fit of Gout—Resumé of the Treatment of the Fit of Gout—Treatment During the Interval—Alkalies—Lithia—Bitters and Tonics—Thermal Treatment—Hygienic Treatment.

GENTLEMEN:—I propose in this lecture to consider the treatment of chronic rheumatism and gout. By these words, chronic rheumatism, I do not mean all chronic forms of rheumatism, but rather that variety which affects the bones, and which is characterized by those deformities of the small joints which have given to this affection the name of *nodular rheumatism* or *arthritis deformans*.[1]

Confounded from remote antiquity under the name of arthritism, gout and chronic rheumatism have been now grouped in the same description, now constituted as distinct entities, according as writers have taken for their basis the etiology, the symptomatology, or the pathological anatomy of these two affections. To-day this question, after many vicissitudes, seems to have reverted to the point from which it started, and if we observe between gout and rheumatism differences radical and complete, we recognize also that they may derive their origin from one common hereditary source.

[1] Charcot has referred chronic articular rheumatism to three principal types: 1. Chronic, primitive, articular rheumatism, generalized or progressive; this is the nodose or deforming rheumatism of authors, a rheumatism remarkable especially for its tendency to become general, by beginning in the little joints and particularly those of the hands, by the deformities and disorders which it occasions.

2. Chronic, primitive articular rheumatism, fixed and partial. This is the dry arthritis of surgeons; it generally affects only one joint, preferably that of the hip (*morbus coxæ senilis*).

3. Heberden's nodosities (*digitorum nodi*) which occupy the joints of the phalanges and palangettes, while sparing the matacarpo phalangeal articulations. Besnier has divided the forms of chronic articular rheumatism into three groups:

Simple chronic rheumatism, chronic fibrous rheumatism, chronic bony rheumatism. The latter is subdivided into three groups: Chronic multi-articular bony rheumatism; chronic partial bony rheumatism; chronic rheumatism of the phalanges. (*a*)

(*a*) Charcot, Lecons sur le rhumatisme chronique, recueillies par Ball. Besnier, Art. Rhumatisme, in Dictionn. encyc. des sciences méd.

To this hereditary cause of these two diseases we give the name of arthritism, and if gout and rheumatism have at their origin many points of contact, they soon separate in two divergent directions, of which the two extremes are chronic arthritis deformans, on the one hand, and acute gout on the other. This opinion, which I defended at the time of the discussion which arose in the Society of Hydrology, between the partisans of arthritism and those who, like Durand Fardel, persist in seeing in gout, chronic rheumatism, and acute rheumatism, distinct morbid entities, I maintain to-day, for when you carefully trace back the genealogy of arthritic patients, you almost always find rheumatism in all its forms, or gout in all its modalities. At the same time, take note that quite recently our colleague Lancereaux has withdrawn arthritis deformans and dry arthritis from the category of arthritism to place this affection in the gronp of herpetic disorders. But this is a new view which needs to be discussed before being adopted.

Scarcely recognized at the beginning of this century,[1] chronic rheumatism with articular deformity, which is described under the name of *nodular rheumatism*, has not been well understood till within a few years, and it is especially to the School of Salpêtrière and its eminent master, Prof. Charcot, that we are indebted for the exposition, both from the standpoint of symptomatology and pathological anatomy, of the palpable and striking differences between gout and arthritis deformans, to the latter of which even now some authorities persist in giving the name of *gouty rheumatism*.

Even if we well understood the lesions of chronic rheumatism (arthritis deformans), the pathogeny and the course of the affection,[2] it must be confessed that the therapeutics of this disease has made little progress, and our efforts remain well-nigh impotent to arrest the progressive and invading march of those

[1] The description of chronic deforming rheumatism is of recent date, and the first writing respecting it goes back to the beginning of this century. It was Landré-Bauvais, interne under Pinel, who, in his inaugural thesis in 1800, was the first to call attention to this form of rheumatism under the name of *primitive asthenic gout*. Heberden in 1804 discribed the nodosities of the joints in rheumatism; Haygarth in 1805 reviewed and completed this description. Lobstein, in 1833, described in his treatise of pathological anatomy the eburnated state of the bones; Deville, in 1845, called the attention of the Anatomical Society to the alterations of chronic rheumatism; finally, Charcot, in 1853, completed this description and established the anatomical and clinical distinction which separates gout from rheumatism. (*a*)

[2] The patho-anatomical lesions of chronic rheumatism affect the constituent parts of the joint: synovial membrane, diarthrodial cartilages, bones, and ligaments.

The synovial membrane at first slightly injected, and of pinkish color, soon becomes thickened, intensely red, and is traversed by numerous blood-vessels, varicose, more or less dilated, and surrounding the borders of the diarthrodial cartilages like a collar; it presents a roughened appearance and is covered with little prominences of variable size, from a millet-seed to a bean; these little bodies constituted by young connective tissue cells, and sometimes also by cartilage corpuscles, are pale or rosy in hue, and resistant to the finger;

(*a*) Vidal, Considérations sur la rhumatisme articulaire chronique primitif (Thèse de Paris, 1853). Charcot, Leçons de la Salpétrière, recueillies par Ball. Lobstéin, Traité d'anatomie pathologique, t. 11, p. 207. Landré-Bauvais, Doit on admittre une nouvelle espèce de goutte sous le nom de goutte asthénique primitive? (Thèse de Paris, 1800.)

lesions which eventually constitute incurable infirmities, and condemn the unhappy patient to a life of invalidism.

The treatment of chronic rheumatism comprises external and internal means. The internal treatment comprehends but few medicaments; those most in use are arsenic and arsenical preparations, iodine and the iodides, and salicylate of soda. Arsenic is given internally, as Charcot recommends, or employed in the form of arsenical baths (which have been especially vaunted by Noel Gueneau de Mussy); this treatment, whether it consists in the internal administration of arsenic or in the use of the baths, often provokes a return of the painful crises; hence this medicament should not be resorted to when there are any acute symptoms.[3]

the vascularization of the synovial fringes may give to the membrane a fleecy and fungous aspect.

The foreign bodies which are met with in the joint are sometimes free, sometimes pedunclated, sometimes sessile; they are constituted either of masses of fatty or connective tissue or of cartilaginous or bony substance; according to their age they are more or less large, more or less soft; when the transformation into bone takes place they become hard, resistant and opaque.

The synovial liquid is wanting or exists in very small amount and contains blood globules, epithelial or cartilage cells.

The cartilages lose their bright, smooth, lustrous appearance. Their surface is irregular, with velvety aspect and presents here and there ulcerations of greater or less depth. Here there are erosions, superficial, elliptical, or ovoid, as if lightly scooped out; in other places there are veritable losses of substance with complete disappearance of the cartilage to a greater or less extent, and this especially in places where the articulating surfaces are subject to much friction. On the margin of the articular cartilage you observe, on the other hand, a multiplication of the cellular elements contained in the cartilaginous capsules; numerous enchondroses are formed which unite in the form of crowns and by their ultimate transformation give place to a zone of osseous tissue over the entire circumference of the diarthrodial cartilage.

The extremities of the bones entering with the composition of the joint are swollen and covered at the margin with osteophyte productions, disseminated, or united and forming a sort of crown at the surface of articulation.

In the points where the cartilage has disappeared, the bone is more compact, it is an eburnated substance, formed of a layer of osseous lamellæ in which one fails to find Haversian canals; the surface is white and smooth, sometimes furrowed with grooves, due to friction of the two articulating surfaces.

Below the eburnated layer, the medullary spaces are, according to Vergely, filled with a great number of medulloceles and blood-vessels, while still deeper the spaces are enlarged, deprived of medulloceles, and filled with fat, and the osseous trabeculæ are diminished or reduced to the state of tenuous filaments, whence results the friability of the tissue of the epiphyses, which may be perforated by the scalpel or broken down under the finger.

The ligaments undergo variable modifications; sometimes there is nothing appreciable to the sight, at other times they are indurated or shortened, thinned, atrophied, and even occasionally encrusted with calcareous salts.

The tendons may undergo the same modifications; greater thickness, less resistance, atrophy or even disappearance.

The muscles which are in the vicinity of the articulation often present atrophy, thinning and decolorization, they are infiltrated with fat, and even at times undergo fibrous degeneration, with or without the bony transformation.

[3] Gueneau de Mussy has recommended two kinds of arsenical baths; the arsenical

However different these two modes of exhibiting arsenic may be, their principle of action is essentially the same, namely, by absorption of the medicament and its penetration into the economy, the rate of whose nutrition is raised. It must be confessed, however, that cutaneous absorption from baths is infinitesimal or nil.

Iodine has been employed in chronic rheumatism by Lasègue. He made use of the tincture, of which he was in the habit of giving large doses, as much as a drachm and a half a day (six grammes). It is given diluted in water, or, what is better still, in a little old Spanish wine, which constitutes a mixture which is but slightly disagreeable and is easily taken with the meals. Instead of iodine, iodide of potassium may be given. Besnier proposes to give the iodide in syrup of coffee, which he thinks is the best adjuvant, and from one to three grammes a day (15 to 45 grains) may be given in this way. Iodine and the iodides in these cases act especially by stimulating the organism and energizing nutrition. These are the most important indications to fulfil in the treatment of chronic rheumatism, and Garrod has justly insisted on this point in showing us that the dominant fact of the treatment ought to be to fortify the system and to excite the nutritive activity, which is considerably lessened; consequently, he recommended ferruginous preparations, cinchona bark, and, above all, cod-liver oil.

These indications are quite different from those which are applicable to the treatment of simple gout, and which should make us altogether discard in the treatment of chronic rheumatism the alkalies, which are heroic medicines in the gouty diathesis. This proscription of alkaline preparations ought not to include salicylate of soda. Whatever Sée may have said, who has affirmed that salicylate of soda may cure chronic rheumatism, I have never obtained the same effects from it. Nevertheless, while recognizing that if it is impotent in combating chronic rheumatism with joint deformities, the salicylate may be employed to advantage in the acute exacerbations which attend this disease; it diminishes then both the acuteness of the pain and the intensity of the febrile manifestations.

The internal treatment, then, of chronic rheumatism, may be summed up in a few words: arsenic in appropriate cases, iodide in others, and salicylate of soda in the periods of exacerbation.

The external treatment is much more complex. It comprises, first, all the local means which I enumerated *à propos* of acute rheumatism, as well as most

bath pure, which contains from fifteen grains to two drachms of arseniate of soda per bath, and the compound arsenical bath, which with the same quantity of arseniate of soda has from three to five ounces of carbonate of soda. *Apropos* of the application of these baths, Gueneau de Mussy distinguishes two forms of rheumatism: chronic rheumatism with little pain, and rheumatism with subacute attacks. In the first kind he would employ the compound arsenical bath, in the second the bath containing only the arsenical salt. The temperature of the bath varies from 86° to 95° F. (30° to 35° C.); as for its duration that depends on the degree of excitability of the patient. (*a*)

(*a*) Gueneau de Mussy. Clin. Med., t. i. p. 271, Paris, 1874.

of the artificial baths which I have described; but to these means we must join others which have a very marked action in chronic rheumatism, in the first rank of which we place electricity. Whether the rheumatism has exerted its action primitively on the muscular tendons, or whether it has affected first the bony or fibrous parts of the articulation, it seems to be demonstrated that the deformities of chronic rheumatism, which are so numerous, depend on the retraction of certain muscular groups. There are even cases in which rheumatism very speedily causes atrophy of the muscles, producing in this way considerable loss of power in the limbs, and without any apparent deformity.

It is easy to understand the utility of electro-therapeutics in such cases. If you employ this agent, you must use galvanic currents, which have an influence on nutrition in general, and that of the muscles in particular. Erb, Remak, Onimus, Jules Cheron, etc., have long insisted on the remarkable action of these currents in causing the articular deformities gradually to disappear, and, for my part, I have obtained successful results of this kind which are really marvellous.[1] You should then always have recourse to constant currents when the phenomena of muscular irritation have disappeared. If you resort to this powerful therapeutic agent in time, you will be able to restore movement, and the use of the affected joints, and to attain this you should, as Dally has recommended, associate massage with the employment of electricity. To these powerful means of treatment in chronic rheumatism, the methodical employ of mineral waters should be added.[2]

[1] These are the conclusions of Remak, respecting the applications of constant currents to the treatment of chronic rheumatism.

Electrotherapeutics has for its object:

1st. To provoke catalysis in the interior of the tendinous part of the joint which is affected with inflammation, exudation, or sclerosis.

2d. To excite or accelerate a flux of liquid by impressions made on the blood-vessels distributed to the joint.

3d. To remove the muscular inflammation which often complicates the arthritis.

4th. To relieve the secondary contractures of the muscles, contractures which are kept up by the pain and inflammatory irritation.

5th. To remedy the paralytic and atrophic states which affect all the muscles as a result of inflammation, inactive or impeded circulation.

Onimus maintains that in the joint pains, galvanism is of indisputable utility, and ought to be tried even when the disease seems to be incurable. (*a*)

[2] [Walton (Mineral Springs of the United States and Canada) very properly divides rheumatics into two classes, those of the lymphatic temperament, and those of the nervous. In the former, waters rich in the sulphurets have seemed to produce the best results, and baths of a high temperature are indicated; in the nervous temperament, however, waters containing but a small proportion of these constituents and of moderate heat, like the Virginia Hot Springs, are preferable. The hot sulphur springs have been much recommended in the treatment of chronic deforming rheumatism; these benefit more by their elevated temperature than by any saline or sulphurous constituents. We have a great variety of such springs in this country. We may instance the so-called Hot Springs, in Garland County, Arkansas, whose waters resemble those of Gastein, in Austria, and Pfäffers, in

(*a*) Remak, Galvanothérapie, trad. de Morpain, 1860.—Onimus et Legros Traité d'electricité médicale, Paris, 1872, p. 45.

Mineral waters play a considerable part in the treatment of rheumatism, and Aix in Savoy, and Plombières, Naris, Luxeuil, Dax, Chattauneuf, Chaudes-Aigues, Bains dans les Vosgés, Bourbonne-les-Bains, and Bourbon-l'Archambault, and many others not to mention any out of France, have been counselled in rheumatism. There is a great variety of these mineral waters. It may in fact be said in a general way that all the thermal waters of high temperature are useful in the chronic forms of rheumatism. Three stations have especially been recommended: Plombières, Aix in Savoy, and Dax.

To Plombières you should direct your lymphatic and anæmic rheumatics, and those who are affected with visceral troubles of arthritic nature. To Aix-le-Bains where massage is practiced in a marvellous manner, you should recommend patients of a plethoric and congestive type. Lastly to Dax, where mineral mud baths are employed, you should send your chronic rheumatic patients; moreover, these spas present the great advantage that they constitute rather a winter than a summer station.

To these waters you should join the ferruginous springs, as Garrod recommends; such are those of Spa, of Schwalbach, of Mauritz, etc., the tonic action of which gives good results in rheumatism.

The necessity of tonic treatment should influence you in advising the dietary of these rheumatic patients, and all your efforts should be directed towards augmenting their nutrition. You should order a substantial nourishment such as red meats, generous wines, for, contrary to what takes place in gout, the uric acid diathesis does not exist in chronic deforming rheumatism. Urge the need of out-door air and exercise, to combat the muscular atrophy of the members. You should especially insist upon the necessity of avoiding damp cold. The impression of cold is one of the most active causes in the production of rheumatism, whether it acts directly on the nervous system, as Heyman[3] thinks, or in modifying the functions of the skin, permitting, as Hueter and Klebs believe, the introduction of organized phlogistic agents in the blood. This effect of cold is admitted by all observers, and is especially seen at periods of life when the body is most likely to be exposed to sudden changes of temperature; you must

Switzerland; the Calistoga Hot Springs in Napa County, California; the California Geysers; the Santa Barbara Hot Sulphur Springs in California; the Middle Park Hot Sulphur Springs in Colorado; the "Warm Springs," in Madison County, North Carolina; springs of the same name in Meriwether County, Georgia; the Lebanon Springs in Columbia County, New York; the Hot Springs of Bath County, Virginia; and, lastly, the Salt Lake Hot Springs in Utah. The hot springs of Virginia and Arkansas are very fashionable places of resort; to the treatment by baths are conjoined massage and douches.]

[3] Heyman has studied the influence of cold in the production of rheumatism. He maintains that it is by the medium of the nervous system that cold causes rheumatism. According to his view, the action of dry or damp cold on the skin impresses the nervous centres, and these, by reflex irritation of the trophic nerves, determine various troubles at the point where the cold acts, or in other parts of the economy. (*a*)

(*a*) Heyman, Ein, beitrage zur rhumatische lehre (Arch. fur path. anat. and phys., t. vi, 3e livraison).

then avoid these variations of temperature,[1] and their results, which often depend on the rapid evaporation of perspiration, by making your patients wear flannel and shun exposure to the winds, and particular to the west wind.[2]

You should have a surveillance also of the dwellings of your patients, providing as far as possible that the conditions of the habitation shall be of a sanitary kind, with apartments airy and free from moisture and the moulds which moisture generates,—cryptogamic productions which Moses in Leviticus characterizes as the plague in the walls of the houses[3] (Leviticus, 14, 36, etc.). Therefore, whenever your patients are well enough off to afford it, you should insist upon their avoiding the autumn rains, by going early to the winter stations. In a word, do not forget, gentlemen, that rheumatic arthritis, which has been called "poor man's gout," affects only those individuals whose nutrition is impoverished and enfeebled, and that all your efforts should be directed toward restoring the forces of the organism and stimulating the nutritive exchanges. This it is that explains how the treatment by arsenic and the iodide of potassium, the tonic medication under all its forms, is of use in these cases without being able always absolutely to oppose the invading march of the disease, which is generally fatal in the end.

Gout presents quite different indications of treatment, and the adage that to contrary affections contrary remedies are indicated, is especially applicable to these two diseases, gout and chronic rheumatism, which, born of a common parent, are distinct diseases from a clinical as well as from a therapeutical standpoint. While we can observe at our hospital chronic rheumatism under all its forms (and grave cases are not wanting), we seldom or never meet with gout; or at least but one kind of gout is common in our wards,

[1] In making a summary of the statistics of the hospitals of Paris during the years 1868, 1869, 1872, and 1873, Besnier has shown that acute articular rheumatism, with respect to the frequency of its occurrence, is not influenced by the regular order of the seasons except in a very limited proportion; it is, nevertheless, in the spring that more cases are observed in Paris. (*a*)

[2] Peters has studied the influence of climates on the production of rheumatism. According to this writer, in chronic rheumatism the aggravations coincide with a considerable fall in the mean temperature from one day to another, with a very moist atmosphere, a prevalence of west winds, and a large proportion of ozone in the atmosphere. (*b*)

[3] Charcot has dwelt at great length on the action of damp tenements in the production of rheumatism: "A dwelling on the ground floor, dark, damp rooms, wet garments, paper peeling from the walls—this is the condition in which we find the homes of most of those who are attacked with chronic rheumatism, and besides the patients have lived a long time in these sorry surroundings—for four, six, eight and ten years."

Gueneau de-Mussy also has pointed out the unwholesomeness of the walls of tenements, characterized as they often are, by the presence of cryptogamic growths or moulds which Moses has described in Leviticus under the name of the "plague of the houses." These cryptogamic growths may possibly have an influence on the development of rheumatism. (*c*)

(*a*) Besnier, Art. Rhumatisme, in Dict. Encyc. des. Sc. Med.

(*b*) Peters, in Berlin, Klin. Wochens. nos. 1 and 3, p. 15 and 33. Jan'y. 13 and 20, 1879.

(*c*) Charcot on "The Diseases of Old Age." Wood's Library Series, 1881, p. 151. Gueneau de-Mussy, Clinique Medicale, Paris, 1874, t. 1, p. 305.

that from lead-poisoning,[1] and I have already shown you, in my service, curious examples of this affection, whose description we owe to Charcot, Garrod, Ollivier and Lancereaux. But in your private practice it will not be so, and you will there meet with a considerable number of gouty patients, although their number tends to become less every day. This diminution results chiefly from the fact that the number of idle men tends also to decrease and that the struggle for existence demands of almost everybody a certain amount of daily labor.

Without entering here into the details of the different theories that have been put forth as to the pathogeny of gout, it may be said that the humoral theory of the disease has always counted the most adherents. According to Sydenham, gout is the result of a peccant humor, a morbific matter, which nature endeavors to get rid of. Substitute for these words *peccant humor*, *morbific matter*, uric acid and urate of soda, and you will have the theory to-day admitted by physicians generally; and notwithstanding the reserves recently formulated by Bouchard, it seems to be proved that every attack of gout is due to excess of urate of soda.[2] But is is not sufficient to know that this excess

[1] Falconer in a work on the waters of Bath says that the *colica pictonum* is often accompanied with gout. Hillier-Parry in his medical work has a long chapter entitled "Gout from Lead." Garrod affirms with great positiveness the existence of this form of gout. Charcot, Ollivier, and Lancereaux also point out the frequency of saturnine gout.

Lead gout is accompanied, like ordinary gout, by the uric acid diathesis, and this diathesis results from the interstitial nephritis which is common to persons suffering from lead poisoning, and which hinders the elimination of uric acid. (*a*)

[2] The nature of gout has given rise to several theories which may be ranged in two groups: in the one has been considered the action of the solids as the starting point of the disease, in the other an alteration of the humors has been invoked in explanation.

The "solidists" have enumerated three orders of primordial causes of gout: stomach troubles, disturbances of the nervous system and of the joint elements.

Boerhaave and Van Swieten located the cause of gout in the stomach; whence the celebrated aphorism of Boerhaave "Ejus vitii origo proxima in indigestione viscerum."

Cullen is the principal defender of the nervous doctrine, according to which gout is a disease of the entire economy, but in particular of the nervous system. Like Boerhaave, he assigns an important part to the stomach. This doctrine has been revived by Braun who maintains that the fit of gout consists in a primitive and idiopathic alteration of the peripheral nerves, and that we ought to range it in the group of neuroses.

As for the writers who have assigned to joint troubles the origin of gout, we must mention in the first place, Hoffmann and Musgrave; the first has attributed the gouty paroxysm to violent spasm lacerating the fibrous ligaments of the joint. This spasm is produced by a depraved and acrid serosity, furnished by the little arterioles and glands of the ligaments. Musgrave makes gout consist in a disease of the minute follicles situated around the articulation and in the articulation itself. According to him gout, like scrofula is an alteration of the glands.

Alard and Ficinus refer the cause of gout to alterations of the joint lymphatics.

(*a*) Falconer, *Essai sur les eaux de Bath*, 1872.—Musgrave, *De arthritide symptomatica* (Genovæ, 1752, cap. x, art. 5, p. 65).—Hillier-Parry, *Collections of the unpublished medical writings of the late C. Parry*, London, 1855, p. 243.—Garrod, *Medico-Chirurg. Trans.*, vol. XXXVII., 1854.—Charcot, *Soc. de biol.*, 1871.—Ollivier, Thèse de Paris, 1863, et *Arch. Gén. de méd.*, t. II, p. 430 et 709.—Lancereaux, *Soc. de biol.*, 1870; *Union méd.*, 15 Décembre, 1863, p. 513.

of uric acid is the first cause of gout, we need chiefly to know the reason of this accumulation.

Since the time when, in 1793, ninety years ago, Forbes Murray affirmed the starting-point of gouty symptoms to be the presence of uric acid in the humors of the economy, many hypotheses have been advanced to explain the first cause of this uric diathesis. Residuum of the imperfect combustion[3] of albuminous matters, cinders, as it were, of the economy, uric acid is the result of the incomplete nutritive operations of the human system. Urea, which is a more perfect product of organic combustion, has an origin which varies according to the ideas advanced as to its production; thus it is that Provost and Dumas regard this substance as the result of an oxidizing process

The group of humorists is far the more numerous. Sydenham was one of the most illustrious representatives of this doctrine; in his estimation gout depends on a morbific matter produced by imperfect coctions, and the symptoms of gout are an expression of the efforts of nature to expel this peccant matter.

In 1797, Wollaston and Tenon proved that the concretions of gout are composed of urate of soda, and for the peccant matter of Sydenham was substituted the uric acid diathesis, and it is Garrod who has given this theory its greatest completeness. According to him, uric acid in gout, under the form of urate of soda, exists always in abnormal proportion in the blood, and this is a necessary condition to the production of the paroxysms which are characterized by the presence in the interior of the joint of crystalline deposits of the urate.

This doctrine, supported by Charcot, has been combatted by Bouchard who affirms that there is not always in gouty persons an excess of uric acid in the blood. He believes gout to be a disease characterized essentially by retardation of nutrition. (*a*)

[3] Uric acid ($C^5H^4N^4O^3$) is a product of the oxidation of urea. Submitted to the action of oxidizing agents it furnishes three series of bodies, alloxane ($C^4H^2N^2O^4$), parabanic acid ($C^3H^2N^2O^3$), and allantoid, ($C^4H^6NO^3$).

Uric acid by oxidation and hydration breaks up into urea and alloxane.

Urea is the ultimate term of the azotized matters of the economy. Bechamp and Ritter have obtained urea directly by oxidizing albuminoid matters with permanganate of potash.

There has long been earnest discussion concerning the origin in the organism of urea and uric acid; some authorities have maintained that urea is formed in the kidneys. This opinion has been combated by Prevost, Dumas, and Grehant, who have disproved it by showing the accumulation of urea and uric acid in the blood of animals in which the kidneys had been extirpated. Dumas has maintained that it is in the ultimate capillaries that the oxygen of the arterial blood destroys the tissues which have become unfitted for life, and Hirtz calls urea the ashes of animal combustion.

Bouchardat and Robin think that urea and uric acid result from the process of dis-

(*a*) Sydenham, *De podagra et hydrope*, London, 1683.—Musgrave, *De arthritide symptomaticâ dissertatio*, 1707.—Hoffmann, *De doloro podagrico*, 1701.—Garrod, *the Nature and treatment of gout, and rhumatic gout*, London, trad. par Ollivier et annoté par Charcot, Paris, 1869.—Charcot, *Etudes pour servir a l'histoire de l'affection décrite sous le nom de goutte asthénique primitive, nodosité des jointures* (thèse inaugurale, Paris, 1853.—*Sur les concrétions tophacées de l'oreille externe chez les gouteux* (*Gaz. hebd.*, 1860). *L'intoxicat ion saturnine exerce-t-elle une influence sua le dévelopement de la goutte* (*Gaz. heb.*, 1863).—*Leçons sur la goutte* (*Gaz. des hôp.*, 1866).—*Leçons sur la goutte* (*Gaz. des hôp.*, 1867; *Bull. de thérap.*, 1867).—*Leçons sur les maladies des viellards el des maladies chroniques, recuellies par B. Ball*, 1867.—Braun, *Deutsche Klinik*, 1854, p. 22; *Beitrage qu einer monographe de Gicht*, Wiesbaden, 1860, trad. par Méder, Paris, 1862.—Bouchard, *Maladies par ralentissement de la nutrition*, Paris, 1882, p. 264.—Paul Pouzet, *Contribution à l étude de la goutte* (thèse de Paris, 1878).

in the capillaries, while Robin and Bouchardat consider it as a product of disassimilation, and, on the other hand, Brouardel, Charcot, and Murchison, think that the liver chiefly is concerned in its elaboration.

Whatever theory one may adopt, the main fact that you should bear in mind, is that there will be increase or diminution in the production of uric acid according as nutrition is perfect or imperfect. As for the accumulation of urea and uric acid, it may result from two causes which shed light on the pathogeny of gout. In the one case the uric diathesis has for its origin excess of production; in the other, the production remains the same, but there are troubles in the function of the kidneys which prevent the elimination of uric acid, and it is these two great factors which we shall have to study when we examine the prophylactic treatment of gout.

The medicines recommended for gout are very numerous; their number was considerable in the time of Lucian, if we may judge by his dialogue on gout.[4]

similation in the economy. Finally within a short time, Brouardel has claimed that the production of urea or uric acid is limited to a single organ, the liver, and Murchison and Charcot have adopted this view, a view on which Murchison has even based a new theory of gout.

The congestion of the liver is the central point of gout; this congestion occasions an augmentation of the secretion of uric acid which is the point of departure of a condition of uricæmia; the latter inducing, by the passage of urine too much charged with uric acid a granular nephritis which in its turn opposes the elimination of uric acid. (*a*)

[4] "What mortal knows not me, unconquered gout,
Great queen of pain, whom not the reeking blood
Of many victims on the altars slain,
Nor richest incense, nor the votive gifts,
O'er the proud temples hung can e'er assuage,
Nor mighty Pæan's self, with all his herbs
Medicinal, nor Phœbus's skillful son,
Great Æsculapius, can subdue: since man
Was first created, hath he rashly strove,
But strove in vain, with every fruitless art
To check my conquests and elude my power.
Whilst some their plantane and their smallage bring,
Lettuce or purslane, hore-hound, nettles sharp,
Fen-gathered lentiles, or the Persian weed,
Leeks, scallions, poppies, henbane or the rind
Of ripe pomgranate, frankincense and fleawort,
The root of potent hellebore or nitre;
Some steeped in wine, the husks of beans prescribe,
Or spawn of frogs, a sovereign cataplasm,
Carrot, or pimpernel, or barley flour,
Or gall of cypress tree, the healing dung
Of mountain goat or still more fetid man,

(*a*) Béchamp et Ritter, compt. rend. de l'Acad. des Sc., 2 novembre 1872.
Bouchardat, De l'urée (thèse d'Agreg., 1869).—Hirtz, art Fièvre (Dict. de méd., t. iv, p. 707). Murchisson, Diseases of the Liver, p. 72.—Brouardel, Arch. de physiol., 1876.—Charcot, Leçons sur les maladies du foie.

In order to give system to the exposition of this subject, I shall consider it under several heads, and examine successively the treatment of gouty paroxysms, the treatment of gout apart from the paroxysms, and finally the hygienic and thermal treatment which occupies the first place among the prophylactic means.

Gout, as you know, manifests itself in paroxysms,[5] and without giving you here a symptomatic description of these attacks, which have never been more

Colewort, or gypsum, or the well-ground sand
Of Asia's powerful stone, with bean-flour mixed,
Others, sagacious tribe, call in the aid
Of weasels, toads, hyenas, ruddocks, stags,
And foxes; every metal, and the teas
Distilled of every tree; bones, nerves, and skins
Of every beast, milk, urine, marrow, blood.
A portion some of four ingredients, some
Of seven or eight prefer, some oft repeat
The sacred bitter; some to the pure spring
Medicinal, whilst others trust to charms
And incantations, which the wand'ring Jew
Hath ever ready for his gaping throng.
Meantime I laugh and bid the fools go weep,
Who mock me thus, and but incense my rage,
Whilst to the humble, who oppose me not,
I'm ever mild and gentle." (*a*)

[5] Gout may be divided into acute and chronic, normal and abnormal, simple or complicated. Acute gout manifests itself by energetic attacks, separated by variable intervals. Gout is normal, that is to say, regular when it affects only the joints; abnormal when it appears only under the form of metastatic visceral accidents; complicated, when to the joint symptoms are added visceral affections. The first fit of gout comes on ordinarily between the ages of 30 and 35, but it may be for a long time preceded by certain morbid phenomena which are under the influence of the gouty diathesis, such as gravel, neuralgic pains, migraine, gastralgia with pyrosis, certain dermatoses, such as acne, eczema, psoriasis, etc. These phenomena constitute what has been sometimes described under the head of larvated gout.

The first paroxysm may be ushered in by certain prodromes consisting especially in dyspeptic symptoms, but the invasion is generally abrupt. The patient goes to bed the evening before in good health and falls asleep, then at the end of several hours he is awakened by a pain of greater or less severity, seated in the metatarso-phalangeal articulation of one of the great toes, ordinarily the left; he has at the same time a slight chill, the pain soon increases in violence, and becomes atrocious, with sensations of burning, throbbing, stinging, tearing, etc., then little by little it becomes subdued, perspiration breaks out, and the patient goes to sleep. On awaking, the toe is found inflamed, the skin is red, swollen, of shiny aspect, sometimes livid and furrowed with vessels distended with blood; the whole joint is painful to pressure and to movement. The fit is over. During the day the morbid symptoms are absent, and the patient thinks himself well, but the following night the pain returns, at first dull, then with the same acuteness as the night before. For several days the attacks may thus burst forth every evening and cease in the morning. When the paroxysms are nearly over, the fits are less violent and shorter, the great toe takes on a bluish hue, the tumefaction, the œdema, the redness cease, and there is a desquamation of the epidermis. In the interval of the fits of one attack, if during the day the pain is com-

(*a*) From Lucian's Gout-Tragedy, Francklin's translation.