blade, which increased very slowly in an upward direction until he was four years old, when another spot the size of a pin's head made its appearance near the first one, which gradually grew larger, and since then other spots have continually appeared and grown larger. When the patient was first seen, the affection formed a band three inches wide, which extended from the anterior edge of the right scapula about six inches forward toward the nipple, and was composed of about twenty-four different lesions, which varied in size from a pin's head to circular patches more than two inches in diameter. Minute elevated points, of a bright red color, first made their appearance, which increased slowly in size until they were from one-eighth to one-twelfth of an inch in diameter. They were of firm consistence, and only partially disappeared under long pressure. Involution in the centre then began, while the growth spread peripherally, so that circles were produced, until by confluence with other lesions near by this shape was lost. The skin in the centre of the lesions appeared normal except for the presence of a distinct pigmentation. New lesions were continually appearing at a little distance from the older areas, and in one or two instances small foci were apparent in the old central portions. The anterior group of lesions, some seven or eight in number, were at one time destroyed by the Paquelin cautery. Pale cicatricial tissue was formed at the side of the cauterization, and it looked as if the operation was successful, but after a time the lesions appeared on the borders of these scars, and the original condition was produced. In this case there was the greatest sensitiveness to slight pressure upon the affected region, but it is not improbable that this was due to the extreme nervousness and fear of the patient. There was also some itching complained of.

The only careful histological examination that has been made of this remarkable disorder was that of White's case. A typical lesion was excised and one-half was studied by Darier of the St. Louis Hospital, Paris, and the other half by Councilman and the writer. Microscopically, the epidermis and the epithelial appendages of the skin, such as the hair follicles and sweat glands, were unaltered. The lesion was characterized by groups of cells throughout the corium, which were fairly well circumscribed, and ran in their general arrangement parallel to the surface of the skin. They were sometimes round, but more often elongated in shape, and sometimes extended out in long ribbon-like masses, which seemed to be formed by a coalescence of neighboring groups. The papillary layer of the corium was only here and there invaded by the process. Under a high power the nuclei were seen to be oval in form with a general direction parallel to the course of the mass. They were surrounded by a small amount of protoplasm, and the boundaries of the individual cells could not always be distinctly made out. The cells of all the groups were arranged in smaller groups or clumps, concentric in form, and in the centre a lumen could sometimes be seen, showing their connection with the vessels of the skin. There were also various changes in the vessels, consisting in a swelling and proliferation of both endothelial and perithelial cells. A striking feature was the presence of small granular masses here and there in the cell groups, which showed no definite structure, and which were evidently produced by a degeneration of the cells, as there was every gradation from slightly granular, poorly staining cells to a total necrosis. In some places the cell groups were situated about spaces and fissures which evidently corresponded to lymphatics. Taken as a whole, the process is evidently one connected with the vessels of the skin, affecting certain groups of vessels, notably the blood-vessels. It seems to begin by a proliferation of the endothelium of the vessels accompanied also by a proliferation of the perithelium, which is followed later by a degeneration and necrosis of the central cells. There is apparently no complete new formation of blood-vessels. Histologically, the growth is to be compared to an angiosarcoma, and its cause is possibly that underlying tumor formation in general, and due to some congenital condition of the vessels. Darier, from his investigations of the case in question, proposes the name Sarcome Angioplastique Réticulé. He considers that we have to do with a peculiar form of sarcoma which is not massed to form a single tumor, but has a reticulated structure following the vessels of the skin, and that there is a tendency to form clusters of capillaries, approaching in this way the characteristics of a true angioma. He refers to the fact that in some of the soft nævi cell forms are found very similar to those of this case.

The number of reported cases of this disease is too small to warrant any general conclusions as to its course. In Hutchinson's case there was a recurrence of the growth after cauterization. In White's case the nodular infiltration made its appearance in the normal skin beyond the scar left from cauterization. This patient was seen six years later, when he had reached the age of eighteen. There had been some treatment by cauterization in the mean time, and again the appearance of lesions jumping over the part treated, to reappear beyond the cicatrix in the sound tissue, was seen. There had been no breaking down in any part, and on the whole it seemed as if the process was gradually becoming less active.

Treatment of this affection has thus far proved most unsatisfactory. Caustics or excision may convert the territory occupied by the lesions into a cicatrix, but hitherto they have failed to stop the peripheral spread of the disorder, and sometimes new lesions have recurred in the scar tissue itself. Electrolysis applied along the edges that are progressing has been advocated, but no successful results from this or any other method of destruction have been reported. *John T. Bowen.*

ANGIONEUROTIC ŒDEMA.—Definition.—A vasomotor neurosis or an angioneurosis, characterized by the appearance of circumscribed swellings on various portions of the surface of the body and the mucous membranes, by preference the face, throat, and extremities, without apparent cause or premonition, and non-inflammatory in character.

Synonyms.—Acute circumscribed œdema; acute idiopathic œdema; periodic swelling; urticaria tuberosa, or giant swelling; acute non-inflammatory œdema; Australian blight.

History.—Although references to this affection may be found here and there in medical literature since 1827, it is only during the present generation that it has been recognized as a disease possessing sufficient individual characteristics to have a history and special designation of its own. It is to Quincke, and his pupil, Dinkelacker, that we are indebted for calling the attention of the profession to this disease in such a lucid manner that it was soon generally recognized.

Etiology.—*Age.*—The period of early life furnishes the greatest number of cases, the average age in a series of ninety-three cases examined by the author being twenty-four. It rarely occurs for the first time in individuals upward of sixty years of age. Childhood, however, is by no means exempt; a case is reported by Dinkelacker, in which a child, whose father suffered from the disease, had an attack for the first time when it was three months old.

Sex.—It occurs oftener in males than in females. The disorder is seen as often in women as in men when the former are exposed to conditions that produce bodily and mental exhaustion.

Heredity.—This is one of the most important and interesting elements in the genesis of the disease. Angioneurotic œdema has been seen to occur in families one generation after another. In a remarkable series, reported by Osler, the disease was demonstrated to be present in five generations, including in that time twenty individuals. Its occurrence in several members of one family has recently been reported by Meige.

Previous and Present Condition of Bodily Health.—No relationship can be traced to previous, immediate, or remote disease, and the majority of cases presenting themselves with this disease are in fairly good health. It

occurs in neuropathic individuals and occasionally in those who suffer from hysteria, neurasthenia, and Graves' disease.

Exciting Causes.—Of the directly exciting causes, cold, traumatism, and psychical disturbances are the most obvious. Fright, grief, anxiety, worry, and the ingestion of certain kinds of food, such as apples and fish, have all been found to be exciting causes in some patients. The relationship of an attack to the use of alcoholic liquors and tobacco can sometimes be made out. An attack is often precipitated by cold, as in passing from a warm into a cold atmosphere, although it does result after severe muscular exercise with consequent sweating and then becoming cool very rapidly. In women attacks are more liable to occur during or near the menstrual period. The period in the twenty-four hours when attacks are most likely to show themselves is during the time between 1 and 5 A.M., when the tide of life is at its lowest ebb and the parts are least resistant.

Area of Distribution and Primary Point of Manifestation.—In a total of 83 cases studied by the writer the swelling showed itself for the first time: in the face in 33 cases; on the extremities in 24; in the pharynx, uvula, and larynx in 6; on the genitals, penis, and scrotum in 6; on the body in 6; on the gums and palate in 2; in the stomach in 4; on the neck in 1; and behind the ears in 1. Of the cases in which the swelling showed itself upon the face, in 5 it was restricted to the forehead; in 3 it occurred first on the eyelids, in 9 on the lips, and in the remainder it was distributed over various portions of the face. Of the extremities, the hands were by far the most often attacked, and after these the forearms were the next most frequent seat. The occasional occurrence of this variety of œdema in the gastro-intestinal mucous membrane seems to be sufficiently attested by characteristic symptoms.

The occurrence of the swelling in one spot seems to predispose the part for future attacks, and it is the exception for it to be once seen in a place which thereafter remains free. Parts of the body which have received injury or have been the seat of protracted pain seem occasionally to be favorite places for the development of the swellings. Occasionally there seems to be a periodicity in the appearance of the swelling. It has been contended that the pia, and even the brain substance itself, may be the seat of this variety of œdema. No proof of such occurrence has been given, and the only testimony is inferential from certain rather obscure clinical data.

Symptomatology and Clinical Course.—The manifestations of the disease generally present themselves without warning, and the suddenness of their appearance and departure is rather characteristic. Possibly the patient may complain, for a short time before the appearance of the swelling, of vague feelings of malaise, general disinclination to do anything, and a feeling of depression associated with ill-defined gastro-intestinal symptoms. The œdema comes on quickly, generally reaching its full development in a few hours, and gives the patient very little trouble, except by its mere presence; there is a feeling of stiffness and unwieldiness and a sensation as if the parts were on the stretch, but this sensation is not attended with pain or distressing throbbing, or any of the subjective symptoms of inflammatory swelling. The swelling is distinctly circumscribed and plainly differentiated from the surrounding surface, and of varying color. In some cases, but probably not in the majority of them, the skin is of a dark-red, dull roseate hue, while in others the marked contrast between the pale, almost waxy color of the swollen surface and the skin around it is very striking. The œdematous part does not pit on pressure, or if it does, only in a few cases, and in these not to any marked extent, so that the indentation produced by the forcible pressure of the finger is quickly effaced.

The subjective symptom of which the patients complain most is a sensation of scalding or burning during the occurrence of the swelling, this being probably due to the marked tension under which the skin is suddenly placed; and after this, there is generally a feeling of itchiness. Outside of these, if the swelling does not encroach on any organ, such as the eye, the stomach, the penis, and the testicles, or does not block up the conductivity of a passage, such as the pharynx or larynx, as it sometimes does, and so produce trouble, it is not likely that the patient will complain of any other subjective symptoms. Frequently the surface temperature of the swollen part has been found to be slightly elevated, while, on the other hand, carefully made observations have demonstrated that the specific heat of these parts is considerably lowered. It is probable that at the beginning of an attack the surface temperature of the part is somewhat elevated, while later, or just before the swelling begins to wane, the temperature falls.

The swelling generally reaches its height in any one part in a few hours after its appearance, in some cases in a few minutes, while in others from six to eight hours will elapse. After remaining for a period varying from a few hours to days, it will begin to disappear, ordinarily with a rapidity corresponding to that with which it showed itself. Frequently its disappearance from one part is the signal for its appearance in another, which may have no anatomical or physiological relation to the part previously affected. As a rule it does not show itself in more than two or three localities at one visitation, and frequently only in one. The disease recurs, and in the analysis of the cases spoken of above, the time between the attacks averaged twenty-one days. Occasionally a patient will have three or four attacks in a month, while others go for three and four months, and even longer, before they have a recurrence. Just before and during an attack the patient is often depressed, anxious, possessed of forebodings of evil or calamity similar to those of neurasthenia. I have noted these psychical or emotional symptoms peculiarly in those in whom excessive use of tobacco and alcohol seemed to have something to do with causing the condition.

The symptoms of the disease when some of the mucous membranes are attacked are well marked and suggestive. As has already been said, the mucous surfaces most often attacked are those of the stomach and of the larynx. In about one-third of the cases gastro-intestinal symptoms are prominent. These symptoms are at first a feeling of uneasiness and tension, as if something indigestible had been taken and had remained in the stomach. With this there is loss of appetite generally associated with constipation, which is soon followed by a distended appearance of the epigastrium; and then follows a sharp colicky pain, often attended with profuse vomiting and great thirst. The pain may be so severe as to demand the administration of morphine. The character of the material vomited consists at first of the contents of the stomach, but later it becomes watery and somewhat stringy from the mucus which it contains, and it is frequently profuse in quantity. When this continues for any length of time the thirst becomes greater, and large quantities of urine are frequently passed, which, however, contain nothing abnormal with the exception of increased amounts of earthy phosphates. Transient hæmoglobinuria has been noted in two or three cases. After this exacerbation in the symptoms has ceased, the reaction sets in, and there is frequently diarrhœa of a colliquative nature, with apparent retraction of the abdomen and a general feeling of lassitude and prostration, and the characteristic symptom of the disease shows itself in another part of the body, or, if it has already done so, it now begins to disappear.

When the swelling appears in the larynx, it of course produces symptoms in proportion to the amount of encroachment that it makes. This is often so great as to cause distressing symptoms of suffocation, and, indeed, in some instances death has taken place in consequence of the œdema. In others the symptoms are so severe as to demand liberal scarification, or, more rarely, tracheotomy. As a rule the swelling does not pass by continuity from the pharynx to the larynx, but when the latter region is affected by the disease the swelling develops there with the same degree of abruptness and vigor as in other

parts of the body, and in consequence the horrible sensation of choking to death is added to the patient's misery. Difficulty in swallowing, when the seat of swelling is in the pharynx, is not so common as the corresponding symptom of difficulty in breathing, which occurs when the larynx is the seat of the disease, nor does it ever become so distressing. If it be granted that the œdema in question may manifest itself in the lungs, as many good observers would have us believe, the symptoms resulting will not differ materially from those of acute pulmonary œdema, except in the suddenness of onset, the urgency of the symptoms, and the abrupt mode of departure.

Of the general health between the attacks but little need be said. Generally there is nothing noticeably wrong, although for a day or two after an attack there may be a feeling of prostration, especially if the gastric or intestinal mucous membrane has been attacked; but this soon passes away, and the patient's physical condition and his morale are excellent until the next attack shows itself. Frequently there is not even this feeling of lassitude.

Diagnosis.—The diagnosis of a case of angioneurotic œdema will be attended with little or no difficulty if arrived at by the process of exclusion. The spontaneous appearance of the œdema, its recurrence at certain intervals, the absence of the concomitant symptoms of inflammation, either local or constitutional, and the abruptness of the disappearance of the œdema, are generally sufficient to enable us to recognize the disease at once.

It may be confounded with the blue œdema of hysteria, as described by Sydenham, or with the white œdematous swellings that sometimes occur with the same disease, as described by Charcot. Such confusion is of no moment, however, as the pathogenesis of the swelling is probably the same in both cases. Moreover, the treatment for the one is appropriate for the other. In hysteria, however, and especially if the hysterical attack is sufficiently profound to have œdema as one of its attendants, there will always be found the well-known stigmata which will be sufficient to make the diagnosis. Other factors, such as the abruptness of onset and the mode of departure, as well as the distribution of swelling in angioneurotic œdema, will corroborate the diagnosis.

There are a certain number of affections described under other names which are in all probability modified forms of this disease. They are urticaria tuberosa, Australian blight, malarial œdema, acute essential œdema, creeping œdema, ephemeral congestive cutaneous tremors. As was seen at the beginning of this article, these terms are considered as synonyms of the disease in question, and therefore require no further description.

Duration and Prognosis.—The duration of the disease varies from a period sufficient for one attack to a lifetime; the duration of the attack, from one hour to a week. The statistics bearing on prognosis do not allow us to draw conclusions that are of any great value, on account of the fact that the patients do not often remain under the physician's care sufficiently long to enable him to study the natural course and termination of the disease. I am inclined to believe that in about half the instances the disease disappears after lasting a variable length of time, say from two to three years. In the other half it may remain dormant for prolonged periods, but one can never prognosticate when or where it is next going to manifest itself. In this respect it resembles all other manifestations of the neuropathic state, as well as the neuroses, hysteria, and neurasthenia which it sometimes accompanies. In still other cases it continues to recur with varying intervals during the patient's entire life, which may not, however, be perceptibly shortened by the exhibition of these attacks. Not infrequently the manifestations cease to present themselves when the exciting cause is obviated. The disease rarely causes death, and then only when laryngeal involvement is so profound as to cause suffocation. Whether or not the possession of this infirmity tends to shorten life by predisposing to other conditions which jeopardize the life of the patient, nothing definite has been observed, and there must necessarily be many observations before any justifiable conclusions can be drawn in regard to this point.

Pathology.—The pathology of the disease is still rather obscure. The nature of the lesion is unquestionably that of a non-inflammatory œdema circumscribed in form. The fact that the epidermis is not involved is decidedly opposed to the view that the lesion is an inflammatory one, even though it is not so evident clinically that the œdema is in no way connected with an inflammatory condition. The seat of the œdema is usually in the connective tissue of the derma, beneath the papillæ, and in the subdermal tissue; very rarely the œdema confines itself to the more superficial parts. It is probable that although the lesions or the irritants on which the disease is dependent may attack the other parts of the system, yet the result directly appears through the sympathetic system of nerves. Furthermore, the nerves affected are undoubtedly the vasomotor nerves. The pathogenesis of the disease has a close relation to other vasomotor neuroses, such as morbid blushing and flushing, exophthalmic goitre, the so-called pulsating variety of neurasthenia, and intermittent swelling of the knee, and to some of the arthropathies as yet not well understood. An œdema very similar to it is occasionally associated with tic douloureux, migraine, and nerve-stretching, and in hypnotizable subjects it is apt to follow a séance.

Treatment.—Therapeutic measures are of little avail, either in mitigating the length or the severity of the attack or in increasing the intervals between their occurrence. A fact that the practitioner will do well to bear in mind when called upon to treat any neurosis which is apparently dependent upon perversion of function of the sympathetic nervous system, is that disease thus originating is far less amenable to therapeutic agencies than when it is dependent upon some lesion of the cerebro-spinal system. The greatest success will be obtained by adopting such hydriatric, hygienic, dietetic, disciplinary, and medicinal measures as give tone and stability to the nervous system. As an all-round vasomotor and general tonic to the nervous systems of the body strychnine most nearly reaches the mark. It should be given in large doses and until its full physiological effects are manifest, particularly on the spinal cord; for although the affection is one indicating defect in the sympathetic nervous system, we must not forget that the origin of that system is in close relation genetically with the spinal cord. Physostigmine salicylate, in from gr. $\frac{1}{10}$ to gr. $\frac{1}{50}$ doses, is often beneficial. The next most important drug in the treatment is atropine; it should be likewise given in moderately large doses, and its administration should be continued during the intervals between the attacks. Tonics, invigorating baths, exercise, massage, and the prevention of trauma are the most important factors in the treatment of this disease. It is unnecessary to enter into details concerning the treatment for symptoms as they arise. If there be an excess of uric acid in the blood, manifest by a disproportionate relation to the urea in the urine, this condition demands regulating. The same may be said of constipation, menstrual irregularities, and the like. The treatment at the time of an attack will depend somewhat on the part of the body in which the disease is manifest. If the dermal surface of the body be involved, the most satisfactory plan of treatment is to keep the patient quiet, in an equable temperature, and to apply dry heat to the swelling; and if there be much uneasiness or restlessness, a mild anodyne should be administered. Compression by means of a bandage or a Gamgee dressing is occasionally of benefit. When the disease manifests itself in the mucous membranes the treatment is entirely symptomatic. As I have already stated, when the gastro-intestinal symptoms are prominent, morphine fulfils two conditions: it relieves the severe pain and distention, and checks the vomiting for the time being. When the disease shows itself in the throat and larynx, this drug should not be given unless the pain is so severe as urgently to demand its employment. It will occasionally be necessary to scarify and sometimes, but rarely, to perform the operation of laryngotomy. It need scarcely be emphasized that when either of these procedures is indicated it should be done at once. In every case it will be wise to begin treatment with the administration of calomel followed by a saline. Oftentimes this, with a judicious regulation of the diet and the administration of a suitable mineral water to counteract any diathetic tendency, will be all that is required. The use of electricity, although recommended, has not been attended with sufficient success to warrant more than mere mention. *Joseph Collins.*

ANGIOSARCOMA. See *Sarcoma.*

ANGUILLULA INTESTINALIS. See *Nematoda.*

ANGUILLULA STERCORALIS. See *Nematoda.*

ANGUSTURA.—Cusparia. The bark of *Galipea Cusparia* A. St. Hil. (fam. *Rutaceæ*). This is a shrub or small tree of the Orinoco River valley, exported from Bolivar. The river at this place runs in a narrow channel, called "*Angustura*" (equivalent to "The Narrows"), and this has given its name to the bark. The bark was formerly shaved off in long strips, often with wood adhering to the inner surface. More care is now taken to obtain it in quills, which, however, arrive much broken up into curved or quilled pieces. Its outer surface presents a peculiar and very characteristic appearance, being of a yellow-clay color and densely covered with small and very slightly elevated scale-like warts, which can be readily scraped off with the finger nail. It rarely reaches a fourth of an inch in thickness. The inner surface is usually marked by a transversely wavy appearance. It has a short and sharp, but by no means weak, fracture, which discloses a zone of stone cells between the periderm and inner bark and darker volatile-oil cells. It is very bitter and aromatic. Its composition indicates properties of greater importance than have yet been attributed to it. Volatile oil, to the extent of from 0.5 to 1.5 per cent., gives its aromatic, and a considerable amount of the amaroid *angusturin* its bitter properties. With these, a peculiar resin and a little gum, occur the alkaloids *galipine*, *galipinine*, *cusparine*, and *cusparidine*, all crystallizable. The chief consumption of angustura is in South America and the West Indies, where it is highly valued as an antiperiodic and intestinal stimulant. Its use in the United States, outside of patent medicines, has been as an aromatic bitter. The dose is 0.6 to 3 gm. (gr. x.–xlv.). Large doses have a purgative effect. *H. H. Rusby.*

ANHALONIUM. See *Muscale Buttons.*

ANHYDROTICS. See *Antisudorifics.*

ANIDROSIS.—Anidrosis in the usual meaning of the term denotes a disturbance of the function of the perspiratory glands in which their secretion is either absent or materially diminished. Under these circumstances the skin is dry and harsh, more or less pruritic, and inclined to crack or fissure. Cold lessens the amount of perspiration and heat increases it, and this increase or diminution in the amount of sweat is also influenced by certain drugs which may be readily called to mind. The close connection between the several functions of the kidneys, bowels, and skin may also be mentioned. Certain persons normally sweat but little, even under conditions that ordinarily provoke the secretion, as, for example, in the Turkish bath.

Anidrosis is usually symptomatic, and is accordingly observed in connection with some general or local pathological condition. A general diminution of sweat is frequently seen in diabetes mellitus and insipidus, and in the states of malnutrition dependent upon tuberculosis and the cancerous cachexia. Sweating is apparently absent in the patches of anæsthetic leprosy and in localized areas in scleroderma, psoriasis, and eczema. The ichthyotic notably suffer in this way. Aubert has made an extended study of the secretion of sweat in various diseases of the skin, to which the curious reader may be referred (*Ann. de derm. et de syph.*, tome ix., 1877–78). The association of anidrosis with various disorders of the nervous system, and as following direct nerve injury, etc., may also be referred to in this place. Lastly, deficient perspiration may be due to simple mechanical plugging of the sweat ducts, the result of uncleanliness. Kaposi declares that there is no absolute anidrosis, the insensible perspiration never becoming abolished. This, he states, becomes noticeable as a fluid secretion whenever the skin, however dry it may feel, or even if affected with one of the dry dermatoses (psoriasis, ichthyosis, prurigo), is covered with some material that prevents evaporation. It is certainly true, however, that under certain circumstances, and in limited areas, the sweat glands may be entirely destroyed or undergo atrophy from a variety of causes, or that paralytic conditions arise in consequence of nerve lesions due to the presence of new formations (Geber).

The prognosis and treatment must be based upon the character of the primary cause. In a general way it may be said that the skin should be stimulated by warm alkaline baths and massage. Pilocarpine gives only temporary relief. Cod-liver oil and glycerin are often prescribed in considerable doses. Unna recommends arsenic and ichthyol separately or together. Free lubrication with fats gives much comfort in ichthyosis.

William A. Hardaway.

ANILINE.—(*Amidobenzene, Phenylamine*, C_6H_7N.) Aniline is an aromatic amine presenting itself as a thin, oily, colorless fluid of a vinous odor and hot, aromatic taste. It is very volatile and inflammable, dissolves only very slightly in cold water, but freely in alcohol, ether, fixed and volatile oils, etc. It is remarkable for the great number of colored crystallizable compounds that it forms with acids. Physiologically, aniline is a powerful neurotic of more interest toxicologically than therapeutically. Experiments upon animals show serious derangement of the functions of the spinal cord as the essential element of the aniline action. The aniline dye stuffs are certainly, in the great majority of instances, not themselves poisonous, but in the form in which they are in some cases practically used they may poison, because of the presence in them either of uncombined aniline or of arsenic. Many of the cases of eczema following the wearing of aniline-dyed shirts or stockings have doubtless their cause in such contamination of the dye.

Therapeutically aniline has been experimented with, to a small extent, in some nerve diseases, notably chorea and epilepsy, and in scarlatinal dropsy. Aniline has been given in doses of a grain or two, and aniline sulphate in doses of five grains or more. *Edward Curtis.*

ANILIPYRINE is a combination of one equivalent of acetanilid with two equivalents of antipyrine, and it appears as a crystalline white powder which is fairly soluble in water. It combines the antipyretic and analgesic properties of its components, and is claimed to be less toxic than either. Its dose is gr. v. to x.

W. A. Bastedo.

ANISE, ANISUM.—*Anise Fruit.* "The fruit of *Pimpinella Anisum* L. (fam. *Umbelliferæ*)" (U. S. P.). The anise plant is a small annual, from 30 to 50 cm. high (twelve to twenty inches), a native of the Orient, but so long under cultivation that its wild form and original home are scarcely known. It is a long-known drug, mentioned by the earliest writers on medicine, and referred to as a medicine or spice in nearly every period since then. It has been cultivated in the warmer parts of Europe, Asia Minor, Egypt, Russia, and Africa for centuries; more recently also in India and South America. The principal supply comes from Southern Europe.

The mericarps are rather loosely attached together. In many such fruits these fall apart upon ripening, but not in anise, where they are always adherent. The whole

fruit, so formed, is small, hard, ovoid, seed-like, and finely bristly pubescent. It has a grayish-green color and strong, agreeable odor. A transverse section is nearly circular in general outline, with ten projecting ribs. The *Vittæ* are numerous, two or three times as many as the ribs, and are rather small. The seed on section is somewhat crescentic. Anise is apt to be pretty dusty, and is mixed with stems and various coarse impurities, requiring frequently to be winnowed or sifted, but it is not often adulterated. In one instance, many years ago, serious trouble was caused on account of its being mixed with conium.

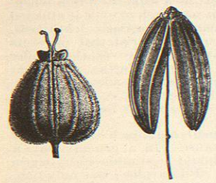

FIG. 208.—Anise, Enlarged About Six Times.

The properties and uses of anise are wholly those of anethol, which constitutes about ninety per cent. of its one and one-half to three per cent. of volatile oil. It contains also a rather larger amount of fixed oil and a little gum and sugar. The dose is 0.5 to 2 gm. (gr. viij.–xxx.). Excepting the oil, there is no official preparation.

Oil of Anise.—A volatile oil distilled from anise. It is colorless or pale yellow, of characteristic odor and taste, has a specific gravity of 0.980 to 0.990 at 17° C., and rotates very slightly to the left. At a temperature of from 14° to 19° C. it congeals. More than ninety per cent. of it is anethol, which gives its properties, and which may the more advantageously be employed, as uniformity is thus secured. It belongs to the more carminative class of volatile oils, and shares the diffusive stimulant properties of volatile oils in general. It is, at the same time, of an unusually pleasant flavor and much used for purely flavoring purposes, especially as an addition to liquors. Its pleasant flavor also makes it of special use in treating the flatulent colic of infants, and in adding to medicines which have a tendency to gripe. The dose is ♏ iij. to xv. The official preparations are the Aqua, of one-fifth of one per cent. strength, and the Spiritus, of ten-per-cent. strength. The Sp. Aurant. Comp. contains one-half of one per cent., and the Tincture Op. Camph. two-fifths of one per cent. It also flavors several other preparations.

Anethol ($C_{10}H_{12}O$).—The active constituent of oil of anise, of which it constitutes about ninety per cent., of oil of star anise, which contains somewhat less of it, and of oil of fennel, which contains about sixty per cent. of it. It occurs both as a solid and as a liquid, the former in colorless crystalline plates. Its specific gravity at 25° C. is 0.985, and it melts at 21° to 22° C. It is freely soluble in alcohol and slowly in water. Its odor and taste are purely those of anise, and it may be used with advantage in doses of one to ten grains as a substitute for the above-named oils. *H. H. Rusby.*

ANISE, STAR.—*Illicium.* "The fruit of *Illicium verum* Hook. (fam. *Magnoliaceæ*)" (U. S. P.). The species here named is the Chinese, or sweet star anise, besides which there is a poisonous Japanese species. When Linné applied the name *I. anisatum*, supposing that he had the former, he really had the latter, as his description and figure clearly show. As a result of this mistake, the poisonous species must always bear the inappropriate name *I. anisatum* L. (Syn.: *I. religiosum* Zucc.), and Hooker's later name, *I. verum*, must pertain to the useful species.

The plant is a handsome small tree.

The fruit consists of the eight carpels, united to a carpophore, from which they can be easily separated, but distinct from one another. Each carpel is short, laterally compressed, "boat-shaped," pointed at the upper and outer extremity, and dehiscent at the upper and inner border. The pericarp is deep brown, rather woody, brittle, fragrant, and spicy. The seeds, which can be seen through the split in the carpel, although this is not usually wide enough to let them fall out, are also brown, but very smooth and shining. They are less fragrant than the carpels, but contain considerable fixed oil in their kernels. Both testa and pericarp show, under the microscope, numerous oil cells, and the parenchyma of the seeds reveals drops of fat.

COMPOSITION.—Besides sugar, gum, and oil, which, although abundant, have no practical value, star anise is remarkable for containing a large percentage (from three to five) of an essential oil, so similar in odor, taste, properties, and composition to that of anise, that no means can be relied upon to distinguish them from each other, except by the greater percentage of anethol in the latter, on account of which it congeals at a higher temperature.

FIG. 209.

FIG. 210.

FIG. 211.

FIG. 212.

FIG. 213.

FIG. 209.—Illicium verum, Flower. FIGS. 210 and 211.—Gynæcum and fruit. FIGS. 212 AND 213.—Seed, entire and in longitudinal section. (After Baillon.)

Illicium is never prescribed, and is recognized only as a commercial source of "oil of anise." This oil, owing to its weaker action, should not be indiscriminately substituted for oil of anise. *H. H. Rusby.*

ANKLE JOINT.—As this joint supports the weight of the body, considerable stability is required of it. This is secured mainly by the shape of the articular surfaces, which interlock like a mortise and tenon. The tibia and

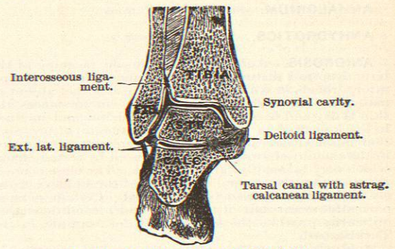

FIG. 214.—Frontal Section of Right Ankle.

fibula, strongly united by ligaments (interosseous and inferior tibio-fibular, Figs. 214, 215, and 218), form the mortise by embracing with their extremities (malleoli) the tenon-like astragalus. The joint is a hinge, its movement angular, and in a single oblique plane (corresponding to the outward pointing of the toes) through an arc of some eighty degrees. In the fœtus of six weeks (Henke and Reyher) the joint is arranged like that of

some marsupials, so as to admit of rotation, the astragalus sending a process up between the tibia and fibula. A trace of this movement remains in the adult. To

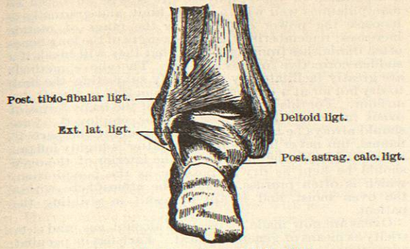

FIG. 215.—Rear View of Left Ankle.

guard against the thrust of the tibia and fibula when alighting on the extended toes (the commonest form of

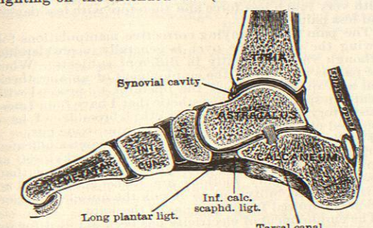

FIG. 216.—Sagittal Section of Right Ankle.

dislocation arises thus), the astragalus is narrower behind than in front, averaging 35 mm. behind and 40 mm. in front. And a slight lateral movement is therefore possible when the malleoli are thrown back in complete extension. The malleoli are held against the articular surfaces in all positions by the elasticity of the shaft of the fibula, which bends inward when the wedge pushes the malleoli apart, springing back during extension. The axis of rotation of the curved superior surface of the astragalus (Fig. 216)

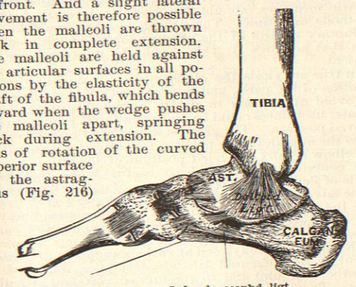

FIG. 217.—Inner Side of Right Ankle.

passes through the most fixed part of the bone, viz., the tarsal canal, touching the outer malleolus but passing below the inner, which does not descend so low (Figs. 214 and 215). The original capsular ligament (see *Arthrology*) remains in front and behind as a thin layer of fibres connected with the synovial membrane and strengthened by the extensor tendons in front and the tendon of the flexor longus hallucis behind. Effusion into the joint usually shows first in front. On the sides strong bands are developed. The internal lateral ligament (Figs. 214, 215, and 217), also called the deltoid, from its triangular form, is the strongest of these; in dislocations usually tearing the bone apart. It is a thick bundle, ensheathing the internal malleolus and passing to the calcaneum, the scaphoid, and the calcaneo-scaphoid ligament. The tendon of the tibialis posticus strengthens it. Deeper fibres pass to the astragalus. In amputating at the ankle the joint is opened on the inner side, because of the shortness of the malleolus, and the existence of this deep band

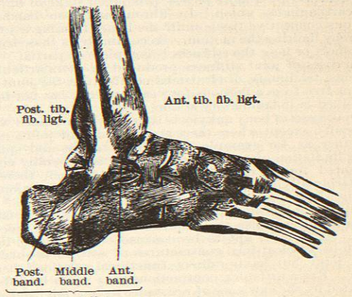

FIG. 218.—Outer Side of Right Ankle.

should be remembered. The external lateral ligament (Figs. 214, 215, and 218) is composed of three bands which radiate from the lower part of the malleolus, the anterior and posterior bands passing to the astragalus, the middle one to the calcaneum. The synovial cavity is quite extensive, communicating above with the inferior tibio-fibular articulation. It is said to contain more synovia than that of any other joint (Morris). Its capacity is not affected by the position of the foot, and no change of posture takes place during inflammation of its membrane.

Sensations of pain are sometimes felt in the ankle without lesion of the joint, caused by some injury to the long nervous trunks which supply it, viz., the long saphenous, connected with the lumbar plexus, and the anterior tibial with the sacral plexus. The vascular supply arising from twigs from the anterior and posterior tibial arteries, and discharging by both saphenous veins, may be interfered with by tight boot laces and occasion a dull pain. *Frank Baker.*

ANKYLOSIS (sometimes spelled anchylosis).—"(ἀγκύλος, a stiff joint). Union of the bones forming a joint, resulting in a stiff joint. Ankylosis, false or spurious, is due to the rigidity of surrounding parts. Ankylosis, true or bony, is the proper term to employ when the connecting material is bone; and ankylosis ligamentous, when the medium is fibrous" (Gould's Medical Dictionary, 1897).

SYNONYMS.—English: Stiff joint, fixed joint; French: Roideur articulaire, Anchylose; German: Gelenkverwachsung, Gelenksteifigkeit; Italian: Anchilosi; Latin: Ankylosis cartilaginea, Ankylosis fibrosa intercartilaginea, Ankylosis fibrosa interossea, Ankylosis ossea.

A strictly correct definition would designate a fixed angular position of a joint, but this restriction no longer obtains, the word now being used to describe joints, in whatever position, that have become more or less stiff.