

- <sup>26</sup> Gersuny: Centralblatt für Chirurgie, 1893, p. 921.  
<sup>27</sup> Bacon: Atlantic Medical Weekly, August 10th, 1895.  
<sup>28</sup> Dauriac: Thèse de Paris, 1896.  
<sup>29</sup> Lucas Championnière, Congrès Français de Chirurgie, 1894, p. 203.  
<sup>30</sup> Noble: American Medico-Surgical Bulletin, June 20th, 1896.  
<sup>31</sup> Diakonoff and Starkoff: Traité de Chirurgie, tome iii., p. 498.  
<sup>32</sup> Heinrich: Centralblatt für Gynäkol., January, 1900.  
<sup>33</sup> Hagen: Archiv für klin. Chir., Bd. lxi., Heft 1., 1900.  
<sup>34</sup> Ferguson: Philadelphia Med. Journ., October 20th, 1900.  
<sup>35</sup> Mayo: Annals of Surgery, August, 1901.  
<sup>36</sup> Picoli: Centralblatt für Chirurgie, 1900, p. 36.  
<sup>37</sup> Sapiejo: Revue de Chirurgie, 1900, p. 240.  
<sup>38</sup> Blake: Medical Record, May 25th, 1901.  
<sup>39</sup> Phelps: Medical Record, September 22d, 1900.  
<sup>40</sup> Cheesman: Medical Record, June 22d, 1901.  
<sup>41</sup> Tacke: Beiträge z. klin. Chir., vol. xxix., No. 1.

**HEROIN**, diacetyl-morphine  $[C_{17}H_{17}(CH_3CO)_2NO_2]$ , is one of the group of morphine compounds to which belong codeine, dionin, and peronin. It occurs as an odorless and slightly bitter, white, crystalline powder, insoluble in water, and soluble in dilute acids. The hydrochloride, the salt generally used, is freely soluble in water and alcohol, insoluble in ether, and incompatible with alkalies.

Experiments show that heroin is not absorbed by the unbroken skin, and has but slight effect on mucous membranes. It tends to cause dryness of the throat and slight irritation of the gastro-intestinal tract as manifested by nausea, vomiting, and diarrhoea. These effects are, however, uncommon. In therapeutic doses the circulation is unaffected, though heart failure may follow a large dose. The main action of the drug is upon the respiratory organs, as it tends to diminish bronchial secretion, while it slows and increases the depth and strength of respiration. Dreser demonstrated that a smaller amount of oxygen was used by the system and less carbon dioxide eliminated; in other words, that metabolic processes were retarded. On account of this diminished tissue-activity there is a slight temporary lowering of body-temperature. In very few cases has any hypnotic or analgesic effect been noted. Heroin is a very powerful remedy, the maximum dose being one-twentieth that of codeine. Observers agree that the dose of 0.01 gm. (gr.  $\frac{1}{8}$ ) should not be exceeded. Though not very common, cases with unpleasant sequelæ are met with by every user of the drug. Therapeutic doses have been followed by dryness and irritation of the pharynx, nausea, vomiting, constipation, diarrhoea, languor, and, rarely, excitement or delirium. A case of the writer's always became greatly excited after a dose of morphine or heroin, but never after codeine. Some writers advise adding potassium iodide to prevent dryness of the throat, and cascara or calomel for the constipation. A dose of 0.015 gm. (gr.  $\frac{1}{16}$ ) given by mistake to an asthmatic patient was followed by prostration, cyanosis, amaurosis, restlessness, pulse of 40, feeble heart action, spasm of the legs, persistent nausea, subnormal temperature, and a semi-comatose condition.

Among the large number of published reports most authorities agree that heroin is valuable in the treatment of bronchitis, bronchial asthma, pulmonary tuberculosis, and whooping-cough, while opinions differ as to its efficacy in neuralgia, angina pectoris, cardiac dyspnoea, etc. The writer used it in over one hundred cases of tuberculosis, and found it of distinct use, but inferior to codeine in allaying the cough, irritability, and pain, and in promoting sleep. Heroin had little, if any, effect on the pain, dyspnoea, or night sweats. Loewenthal employs it in infantile diarrhoea and colic, the maximum dose for a child of one month being 0.0002 gm. (gr.  $\frac{1}{5000}$ ), of six months 0.00027 gm. (gr.  $\frac{1}{3570}$ ), and of five years 0.0024 gm. (gr.  $\frac{1}{41}$ ). Heroin has not proven of any special value in diabetes, and so far as known does not create a drug habit. Indeed it is recommended as a substitute for morphine on the withdrawal of the latter drug for morphinism. W. A. Bastedo.

**HERPES**.—The term herpes (from ἔρπειν, to creep), formerly employed to designate a large number of diseases of the skin of varying etiology, is restricted at the present time to a class of affections whose distinguishing

clinical feature is a grouped vesicular eruption seated upon an inflamed and slightly swollen base. If the term is used in this restricted sense there are practically but two varieties of the disease, viz., simple herpes, of which there are a number of regional forms which differ but little from one another in their clinical characters; and herpes zoster, which clinically and etiologically is quite distinct from the first-named variety. The herpes iris of some authors properly belongs to erythema multiforme; herpes gestationis is one of the forms of the dermatitis herpetiformis of Duhring; while the herpes circinatus and herpes tonsurans of some continental authors are parasitic affections, much more frequently characterized by erythematous and squamous eruptions than by vesicular lesions.

The appearance of the herpetic eruption is preceded for a variable period, usually short, by a sensation of burning, pricking, or slight itching; after a few hours an erythematous, slightly swollen patch appears upon which small papules arise which are speedily transformed into a group of vesicles with clear serous contents, each group containing from three or four to a dozen or more lesions. The vesicles, at first discrete, later become more or less confluent through increase in size, often forming small blebs. After from twenty-four to forty-eight hours the contents of the vesicles become cloudy, then purulent, and yellow or brown crusts form, which after a week or ten days fall off, leaving a slightly reddened patch which lasts but a few days and disappears without leaving any trace of its existence.

**Herpes Simplex**.—In the great majority of cases the eruption of simple herpes is situated upon the face, usually the lower half; hence it is also spoken of as facial herpes. The parts of the face most frequently attacked are, in the order of frequency, the lips, the lower oftener than the upper lip, the cheeks, and the ala of the nose. It sometimes occurs upon the external ear and still less frequently upon other parts of the cutaneous surface. It usually begins quite abruptly with a sensation of heat or itching; the skin over a limited area becomes red and slightly swollen, and upon this area a group of small papules appear which in a short time become clear vesicles. The vesicles, discrete in the beginning, enlarge slightly for a short time after their appearance and frequently coalesce, forming blebs that vary in size from that of a pea to that of a dime; but when the lesions are very small and few in number, they usually remain discrete. At the end of a day or two the contents of the vesicles become purulent; they then dry up, forming yellow or brown crusts, which fall off in a few days more, leaving slightly red, or occasionally transiently pigmented stains, the entire attack lasting from four or five days to two weeks.

The eruption is not always limited to the skin, but may appear upon the adjoining mucous membranes, even the larynx in rare instances being invaded. When the eruption occurs upon mucous surfaces it presents marked differences from that upon the skin. Owing to the moisture with which the affected parts are constantly bathed, the vesicles appear as white opaque elevations which are soon transformed into shallow erosions through spontaneous rupture. Herpes of the mucous membranes is, in the great majority of cases, associated with similar lesions upon the skin, although pharyngeal herpes may occur alone; the mucous membranes attacked being usually those of the lips, the cheeks, and the pharynx.

In a considerable proportion of cases the appearance of the eruption is preceded or accompanied by sensations of chilliness and some elevation of temperature; hence the popular terms "cold sore," "fever blister," applied to these eruptions.

In many individuals there is a marked tendency to recurrences, and this continues for years, the eruption appearing with the slightest derangement of the general health, or following slight irritations of the skin.

Although, as a rule, there are usually but two or three groups of vesicles, and often but one, each containing a moderate number of lesions, it happens in rare instances

that the eruption is much more extensive, covering, it may be, almost the entire cutaneous surface. Such extensive cases have been most frequently reported by French observers, Rendu having only recently described a case of generalized herpes produced by the ingestion of uncooked shell-fish. It seems to me, however, that such eruptions are very closely allied to, if not actually examples of, bullous erythema multiforme, rather than true herpes.

Facial herpes frequently occurs in febrile diseases of various kinds, such as pneumonia, in which it is quite common, in typhoid fever, in the malarial fevers, and in cerebro-spinal meningitis, a favorable prognostic significance being attributed to it. In the malarial fevers it may occur with each febrile paroxysm, or in exceptional cases it may replace it, as has been noted by several writers.

Under the name herpetic fever, various authors have from time to time described an endemic affection in which, after marked constitutional disturbances, such as chills and elevation of temperature, an herpetic eruption appears upon the face or other parts of the cutaneous surface. A remarkable endemic of this kind has been reported by Savage in which, in an institution for boys, thirty-nine cases of herpes occurred. In this outbreak the eruption was preceded by chills, nausea, and elevation of temperature varying from 102° to 104.5° F., and was accompanied by sore throat and swollen glands, the attack lasting four days.

**Herpes Genitalis**.—The genital organs of both sexes are frequently the seat of herpes, the eruption occurring, in men, upon the margin of the prepuce or upon its inner mucous surface (herpes preputialis, herpes progenerialis), upon the glans, and, much less frequently, upon the skin of the shaft of the penis; in women the parts affected are the vulva, the mucous surfaces of the labia majora, the labia minora, the clitoris and the prepuce, and the mucous membrane about the meatus urinarius. The appearance of the eruption is preceded by more or less burning or stinging, which is shortly followed by redness, œdema, and the formation of groups of vesicles which are usually quite small. When the skin surfaces are attacked the vesicles after a day or two dry up into brownish crusts which fall at the end of a week, leaving a slightly reddened, or, it may be, pigmented patch. When the eruption occurs upon the mucous surfaces, as the inner side of the prepuce, the glans, or the labia minora, the vesicles rupture almost immediately, forming shallow erosions, the bottoms of which are often covered with a whitish or gray membrane. Occasionally the eruption appears in successive crops separated by intervals of some hours or a day or two, thus prolonging the attack greatly. Fournier has observed a case in which the disease was thus prolonged for five weeks; but this is altogether exceptional. When the affected parts are irritated by violence or by the application of caustics, as not infrequently happens, the inflammation may be considerable and may be attended by marked induration of the base of the vesicles; this induration being especially apt to occur upon the glans in the region of the sulcus. In such cases the glands in the groin may be noticeably swollen. In rare cases the eruption occurs upon the urethral mucous membrane, giving rise to ardor urinæ and, in the male, to a serous discharge. Although, as a rule, subjective symptoms are limited to slight burning or itching, it occasionally happens that the pain is severe, even neuralgic in character.

In women the eruption is sometimes quite extensive, covering the cutaneous surface of the vulva, and the labia majora and minora with numerous groups of vesicles and erosions, and at times extending down upon the inner surface of the thighs. The pain and burning in such cases are severe, and with the marked swelling which is commonly present walking is difficult and at times impossible. Superficial ulceration may occur with the formation of vegetations, producing an appearance much like that of a syphilitic mucous patch; indeed, according to Fournier, it is sometimes impossible to make a positive differ-

ential diagnosis until after the lapse of a considerable period of time.

Of all the forms of herpes the genital is most apt to recur, the interval between the attacks varying from a few weeks to several months. In a considerable proportion of cases each coitus in the male and each menstrual period in the female is followed by an attack, the recurrences continuing for years. On the other hand there may be but a single attack.

Simple herpes is in many cases, no doubt, a local manifestation of a general toxæmia. Its frequent association with such general diseases as pneumonia, typhoid and the malarial fevers, epidemic cerebro-spinal meningitis, and other maladies of an infectious nature, lends strong support to such a view of its etiology. In a considerable proportion of cases, however, it must be regarded as due to local conditions associated with a special predisposition. In genital herpes excessive irritations and congestions, physiological or pathological, such as coitus and the menstrual period, play important rôles in the production of the affection. Uncleanliness and previous venereal disease are potent etiological factors. As Unna and Fournier have pointed out, prostitutes are especially liable to suffer from herpes of the genitalia.

The herpetic eruption is the result of a peripheral neuritis of an acute transitory character, the consequence of a direct or reflex irritation of the terminal nerve branches distributed to the skin. Unna, who had the opportunity to examine lesions from three cases of genital herpes, found a fibrinous inflammation of the epidermis, the primary changes affecting the more superficial prickle cells. The entire epidermis was lifted from the papillary layer of the corium, forming a blister whose walls and contents had undergone coagulation necrosis. Beneath the vesicle the entire cutis was œdematous and the blood and lymph vessels were markedly dilated. A striking histopathological difference between the vesicle of simple herpes and that of herpes zoster is the absence of the so-called "ballooning" of the epithelial cells in the former.

The diagnosis of simple herpes is usually made without the slightest difficulty. The purely vesicular character of the lesions, the grouped arrangement of the eruption, its localization upon the face, in most cases about the mouth, or upon the genitalia, and the acute course of the disease are features so characteristic that there is little chance for error. When, however, the eruption is seated upon the mucous membranes, particularly those of the genitalia, the erosions which follow the vesicles may be mistaken for venereal ulcers or the initial lesion of syphilis. The herpetic lesion is superficial and does not tend to extend like the chancre; it exudes an abundance of serum instead of pus, which, as Leloir has pointed out, may be much increased by squeezing the lesion between the thumb and finger; its borders are apt to present a festooned or polycyclic outline; and lastly, there are often groups of well-defined vesicles in the neighborhood. It is to be distinguished from the initial lesion of syphilis by its brief duration and the absence of the peculiar induration characteristic of the chancre. It should not be forgotten, however, that the herpetic lesion, under the influence of irritants, may present an indurated base much like that seen in the chancre, and that in such cases there may be swelling of the inguinal glands. Fournier has called attention to the fact that the chancre may be preceded by herpes; and it is always wise, in view of the very serious results which may follow an error in diagnosis, to be very guarded in expressing an opinion in doubtful cases until sufficient time has elapsed to make the diagnosis certain.

In the treatment of simple herpes all irritant applications should be avoided. Frequent applications of ninety-five-per-cent. alcohol in the early stages of the eruption will sometimes partially abort it. If there is marked burning, a saturated aqueous solution of boric acid will be found very useful in relieving this symptom; or a solution of resorcin, from eight to ten grains to the ounce of water, may be even more effective. A lotion



containing twenty grains each of sulphate of zinc and sulphide of potassium, as recommended by Duhring, is also a useful remedy.

In genital herpes the parts should be kept scrupulously clean, and nothing better for this purpose can be used than a saturated solution of boric acid, which should be freely and frequently mopped upon the affected parts. When the mucous surfaces are the seat of the eruption, they should be kept apart by pieces of gauze wet with the boric acid solution; or, after careful cleansing, they may be covered with a dusting powder of talc and oxide of zinc, to which, if there is annoying pain, from ten to twenty per cent. of acetanilid may be added, or the acetanilid may be used alone. The resorcin lotion above referred to will often be found a very soothing and cleansing application. Lotion nigra may be employed in many cases with good results. If suppuration occurs, weak solutions of bichloride of mercury should be applied several times a day, but this remedy must be used cautiously as it sometimes proves irritating. As a preventive measure, circumcision has been recommended in recurrent herpes genitalis; it is, however, an uncertain remedy. Arsenic given internally for a considerable period exercises a decided influence in preventing recurrences in many cases, and should always be tried when other remedies have failed.

Milton B. Hartzell.

**HERPES ZOSTER.**—Herpes zoster, also known as zoster, shingles,—this last probably being a corruption of the Latin *cingulum*,—names all having reference to the girdle-like arrangement which the eruption often exhibits, usually begins with pain, commonly of a neuralgic character, varying in degree from mere discomfort and soreness to the severest neuralgia, and situated in the regions presently to be the seat of the herpetic eruption. Exceptionally in the beginning of the attack there is some elevation of temperature with slight malaise. After a prodromal period, varying from a few hours to several days, groups of papules seated upon a reddened and slightly swollen base appear in the painful areas, and in the course of a few hours they become vesicles with transparent contents. With the appearance of the eruption the pain may diminish, but there are frequent exceptions to this rule. The vesicles, for the most part discrete, tense, and showing no tendency to spontaneous rupture, vary in size from a hemp seed to a large pea, and are arranged in variously-sized groups from one or two to a dozen or more in number, separated by areas of normal skin, and situated over the distribution of some nerve usually at points where branches are given off to the skin. The several groups of vesicles do not appear simultaneously, but new ones continue to form for some days, the last-formed groups often containing many papules which do not develop into vesicles, and imperfectly developed vesicles. After a day or two the vesicular contents become turbid, then purulent, and later brown or black crusts form which fall off at the end of from ten days to two weeks, leaving transiently hyperæmic patches, or slight pigmentation, and frequently permanent scars. The duration of the entire attack is from ten days to three weeks; but when the inflammation is unusually severe, or when complications, such as suppuration and gangrene, occur, it may last much longer.

The amount of pain present varies within wide limits. In children and young adults it is often entirely absent, or so slight as to cause little or no complaint; but in elderly subjects it is commonly severe, often demanding large doses of powerful narcotics for its relief, and sometimes continuing for weeks or even months and years.

In an overwhelming majority of the cases the eruption is limited to one side of the body, although it is not at all uncommon to see a group of vesicles extend some distance beyond the middle line. While it may occur over the course of any peripheral nerve, it is much more frequently situated upon the trunk than upon the extremities. In one hundred cases in which the location of the eruption was specially noted by Crocker, it was observed to occur upon the trunk fifty-four times.

Variations from the ordinary type of zoster occur in a small proportion of cases. The vesicles may be filled with blood instead of serum, giving the eruption a blue or black appearance. In this variety, known as *zoster hæmorrhagicus*, the pain is as a rule extremely severe, and ulceration more or less deep is prone to occur.

In cases of unusual severity suppuration may take place, and in rare instances gangrene of the skin occurs, either after the appearance of the vesicles or before these have had time to develop. As the result of the severe and at times deep-seated inflammation, extensive and indelible scarring follows, which later may become the seat of keloid.

As *zoster gangrenosus hystericus* Kaposi has described an atypical form of zoster that occurs in hysterical women. This variety of the malady is characterized by repeated attacks separated by intervals of a few weeks or some months, the eruption being unilateral or bilateral. Gangrene of the skin at the base of the vesicles occurs, and keloid-like cicatrices follow. This disease is certainly closely related to, if not identical with, the multiple hysterical gangrene of the skin of other authors; and while it is mentioned here, I think it is doubtful if it properly belongs to herpes zoster.

While almost invariably limited to one side of the body, the eruption may be bilateral. According to Hyde, bilateral zoster is most apt to be seen in those suffering from syphilis or in those taking arsenic.

Colombini has reported a case in which the eruption was universal, groups of vesicles occurring over the branches of all the cutaneous nerves. The disease in this instance was most likely of malarial origin, as the patient had had repeated attacks of malarial fever, and the eruption appeared shortly after one of them.

Second attacks of zoster are rare, although not so infrequent as formerly supposed. In recurrent zoster the same region may be affected several times, or new regions may be invaded with each new attack. Recurrences are most likely to be observed in those cases in which the disease is of traumatic origin; as in one under my observation some years ago in which the sciatic nerve was injured by a fracture of the femur. In this case there were many attacks preceded and accompanied by severe pain, most of them in the region of the distribution of the sciatic nerve and its branches. While the pain usually diminishes with the appearance of the eruption and ceases entirely with its complete involution, it may persist for a considerable period, especially in elderly subjects, after all other evidences of the disease have disappeared. Other sequelæ are local paralyses, and various disturbances of sensation, either alone or associated with trophic changes.

The principal local varieties of herpes zoster, named according to the region in which the eruption is situated, are *Z. capillitii*, *Z. frontalis*, *Z. facialis*, *Z. ophthalmicus*, *Z. colli*, *Z. brachialis*, *Z. pectoralis*, *Z. abdominalis*, *Z. femoralis*. In these several local varieties the disease presents practically the same clinical features, particularly so far as the eruption is concerned, but it may vary considerably as to extent and the severity of the inflammation and pain which accompany it.

In *Z. frontalis* the eruption follows the distribution of the supraorbital branch of the fifth pair, extending over the lid, one-half the forehead, and up into the scalp. This form is sometimes followed by marked scarring resembling the pits produced by variola.

In *Z. ophthalmicus*, in which the branches of the fifth pair distributed to the eye are affected, the pain is often of the severest character, and the various structures of the eye may be inflamed, the inflammation being in rare cases so severe as to cause destruction of this organ. Fatal meningitis has been known to result in this variety of zoster.

In *Z. facialis* the second branch of the fifth pair is concerned, the eruption occurring on the cheek, the side of the nose, and one-half of the upper lip. In exceptional cases it also occurs upon the mucous membranes of the

cheek and pharynx. Loss of the teeth and necrosis of the jaw have been noted as rare complications.

The supraspinous portion of the scapula and the upper arm are the regions affected in *Z. brachialis*. The forearm and the fingers are not often involved. This is usually a mild form of the malady.

*Z. pectoralis* is the variety oftenest seen, and the one from which the disease gets its various names signifying a girdle. Groups of vesicles extend from the spine forward to the sternum. In many cases the eruption consists of but two or three groups, one close to the spine, a second in the axillary line, and a third, often composed of imperfectly developed lesions, near the anterior middle line. In severe cases the groups of vesicles may coalesce, forming a continuous half-girdle. In this variety of zoster the pain which sometimes precedes the appearance of the eruption may be mistaken for a pleurisy.

In *Z. femoralis* the eruption is situated upon the anterior surface of the thighs, the external genitalia, and upon the buttocks. The legs and feet are only rarely attacked.

**Etiology.**—Zoster occurs much more frequently in the young than in the old, but old age is by no means exempt. In three-fourths of the cases observed by Crocker the patients were under twenty years of age. Although infrequent in infancy cases have been reported in infants from four days to several months old. The sexes appear to be equally liable. Cold, damp, and other climatic influences seem to play some part in its production since it occurs most frequently in winter and spring.

It sometimes occurs in connection with such diseases as influenza, malaria, and tuberculosis. Winfield has reported a number of cases in which the presence of the plasmodium malariae was demonstrated; and it has been observed often enough in the subjects of tuberculosis to suggest the possibility of a causal relationship between the two maladies.

As was first pointed out by Hutchinson, and afterward confirmed by other observers, arsenic when given in large quantities for a prolonged period may produce zoster by setting up a neuritis. Other toxic substances, such as carbonic oxide gas, have also produced the disease. In a considerable number of instances the eruption has been observed to follow injuries to nerves. Occasional-

the presence of tapeworm. Lastly, it is very probable that in a considerable proportion of cases it is the result of a specific infection, although the infectious agent is as yet unknown. Its occurrence in epidemics, its undoubted



FIG. 2644.—Epithelial Degeneration: Large Protozoon-like Cell. (From author's own case of herpes zoster.)

occasional contagiousness, its self-limited course, and the rarity of second attacks are features of the malady which are strongly in favor of such a view. From the foregoing brief summary it is evident that there is no one cause of herpes zoster, but that it may be produced by any agent capable of setting up a neuritis.

**Pathology and Pathological Anatomy.**—Proof of the neuritic character of the disease was first furnished by Baerensprung, who found that there was inflammation of the ganglia and the nerves distributed to the area occupied by the eruption. The ganglia do not always share in the inflammatory process, as Baerensprung supposed, but the inflammation is sometimes limited to the peripheral parts of the nerve. The pathological alteration of the nerve is not always of an inflammatory character, but may be the result of hemorrhage, the pressure of new growths, or traumatism.

The zoster vesicle lies deeply within the epidermis, the bottom being formed by the papillary layer of the corium upon which lie masses of altered epithelium. The most striking feature is the peculiar alteration which many of the epithelial cells have undergone, by which they have been transformed into bodies resembling more or less closely protozoa. These bodies were regarded by Pfeiffer, who was one of the first to describe them, as parasites, and were believed by him to be the cause of the disease; but the later investigations of Unna, Torok, myself, and others have clearly demonstrated their epithelial character. These altered cells are often enormous in size, round, oval, or balloon-shaped, with a double-contoured wall or capsule within which are from two to a dozen or more large round and oval nuclei which often present a peculiar beaded limiting membrane. The cavity of the vesicle contains a few free epithelial cells, a small number of leucocytes, and fibrin. The papillæ and that part of the corium immediately beneath the papillary layer are abundantly infiltrated with leucocytes, and there is dilatation of the blood-vessels.

**Diagnosis.**—The clinical features of zoster are, in the great majority of cases, so well defined that the diagnosis is usually easily made. The two diseases with which it is most likely to be confounded are vesicular eczema and simple herpes.

It may be distinguished from eczema by the grouping of the vesicles over the course of known nerves, by the

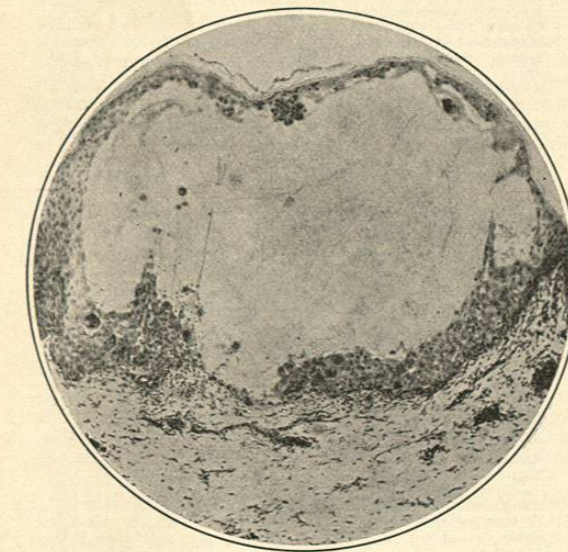


FIG. 2643.—Vesicle of Zoster. Upon the bottom of the vesicle are numerous cells which have undergone alteration like that shown in Fig. 2644. (Author's own case.)

ly it seems to be of reflex origin, as is shown by a case reported by Jewel in which a crural zoster resulted from disease of the uterus; and in other cases it has seemed to be due to irritation in the alimentary canal caused by



accompanying neuralgia, by the absence of itching and discharge, and by the vesicles, unlike those of eczema, showing no tendency to spontaneous rupture.

It differs from simple herpes by its unilateral distribution, by the pain which precedes and accompanies the eruption, and by the infrequency of second attacks. Simple herpes is most apt to occur about the mouth and upon the genitalia, regions seldom invaded by zoster.

**Prognosis.**—The prognosis is in most cases favorable, the disease usually terminating in from ten days to three weeks. In severe attacks, however, or when ulceration, deep-seated inflammation, or gangrene occurs, the duration may be greatly prolonged beyond the usual period. In elderly subjects, less frequently in the young, persistent neuralgia of a severe type may follow, lasting for months or years. In exceptionally severe cases of ophthalmic zoster disfiguring, scarring, loss of an eye, and even death may result.

**Treatment.**—In mild cases of herpes zoster only the simplest treatment is required. The vesicles should be protected from the friction of the clothing by covering them with two or three thicknesses of gauze or a thin layer of absorbent cotton, having first freely applied a simple dusting powder, such as equal parts of starch and oxide of zinc, to which, if there is burning or pain, camphor or morphine may be added. Internal remedies administered with the view of aborting or controlling the eruption are of more than doubtful efficacy. Phosphide of zinc, in doses of from one-sixth to one-third of a grain given every three hours, is recommended by Thompson and Bulkley for the relief of the pain and the control of the eruption, but other observers have not found it reliable. In cases in which the pain is severe, antipyrin, phenacetin, or acetanilid may be given in doses of from five to eight grains every three or four hours; when these fail to afford relief morphine, given hypodermatically, may be employed. Locally frequent application of ninety-five-per-cent. alcohol is often very useful; or, instead of simple alcohol, alcoholic solutions of resorcin fifteen grains to the ounce, or a solution of carbolic acid five to ten grains to the ounce, or of menthol ten grains to the ounce, may be used. Such lotions should be mopped on gently every three or four hours with a soft cloth, care being taken not to rupture the vesicles. Dühring specially recommends a lotion containing from twenty to sixty grains each of sulphate of zinc and sulphide of potassium to the ounce of water; he finds it very useful in relieving pain and drying up the eruption. Colodion, either alone or with one or two grains of morphine to the ounce added, may be painted over the eruption for the purpose of favoring its absorption and alleviating the pain. For the relief of persistent neuralgia, galvanism is perhaps the most useful remedy, mild currents being more useful than strong ones. Crocker finds repeated blistering over the root of the affected nerve very efficacious in some cases. An abundance of easily digested, nutritious food, and cod-liver oil are also indicated.

Milton B. Hartzell.

**HESPERIDIN.** See *Citrus*.

**HETOCRESOL; HETOFORM; HETOL.**—*Hetocresol* or cinnamyl-meta-cresol, *Hetoform* or bismuth cinnamate, and *Hetol* or sodium cinnamate are remedies introduced for the treatment of tuberculosis. W. A. Bastedo.

**HEXAMETHYLENE-TETRAMINE.** See *Urotropin*.

**HIGHLAND SPRINGS.**—Lake County, California.  
**Post-Office.**—Highland Springs. Hotel and cottages. These excellent springs are found within the edge of the mountains, about four miles from Kelseyville and seven miles from Lakeport. They are reached by the Southern Pacific Railroad, on the south to Calistoga, and thence by stage; also by the Northern Pacific road on the southwest to Cloverdale, and thence by stage. The drive from Calistoga or Cloverdale is exceedingly picturesque. The road leads through a romantic mountain region until an

elevation of 3,200 feet is gained. Here a grand panorama is revealed. As far as the eye can reach in every direction are mountains and valleys, peaks upon peaks, mountain streams and brooks, forest and shrubbery. The most picturesque of all is the view northward over Clear Lake and Lake County. This is a magnificent sheet of water twenty-five miles long and six to eight miles wide. It has an elevation of 1,200 feet above the Pacific Ocean, and lies peacefully smiling in the embrace of the mountains on every side, with the towering head of "Uncle Sam" above them all. The bright, cultivated fields appear like a checker-board in the valley below. The gigantic oaks, the largest in the State, are scattered here and there to lend variety to the enchanting picture. The descent to the springs is made in much less than half the time it takes to make the ascent, and the resort is soon seen lying in a level sequestered spot surrounded by hills and by trees of many years' growth. At Highland we find a commodious hotel and many elegant cottages built with a view to health and pleasure combined. A large, pure mountain stream which is well supplied with fish runs past the hotel. The usual mild, genial climate of Lake County prevails here. The altitude is about 1,700 feet, and it is claimed to be an excellent place for consumptives. There are about twenty springs at Highland, five of the most important having been examined by Anderson in 1888. These analyses show results practically identical with those of Professor Rising in 1882, except in the case of the "Neptune" spring, which seems to have lost greatly, especially in calcium salt, in the course of six years. The principal springs are the "Magic," the "Neptune," the "Seltzer," the "Dutch" or "Ems," and the "Diana" spring. The waters are chiefly of the alkaline-saline type, most of them containing a well-marked proportion of iron. Following are the analyses of two of the representative springs:

**THE SELTZER SPRING.**

ONE UNITED STATES GALLON CONTAINS:

Solids.	Grains.
Sodium chloride	0.67
Sodium carbonate	2.06
Sodium bicarbonate	12.72
Potassium bicarbonate	.50
Magnesium bicarbonate	33.35
Calcium bicarbonate	32.25
Manganese bicarbonate	Trace.
Ferrous carbonate	1.43
Silica	5.13
Alumina	1.75
Organic matter	Trace.
Total	110.46
Free carbonic acid gas, 98.41 grains.	
Temperature of water, 60.4° F.	

The water is antacid, laxative, and diuretic, and has been used with much satisfaction in dyspepsia, neuralgia, kidney and bladder troubles, calculi, etc., and in rheumatism, gout, and skin diseases.

**THE "DUTCH" OR "EMS" SPRINGS.**

ONE UNITED STATES GALLON CONTAINS:

Solids.	Grains.
Sodium chloride	1.76
Sodium bicarbonate	17.50
Sodium carbonate	2.45
Potassium bicarbonate	.78
Magnesium bicarbonate	66.55
Magnesium carbonate	1.63
Calcium bicarbonate	57.32
Manganese bicarbonate	Trace.
Ferrous carbonate	1.33
Silica	7.22
Alumina	.12
Organic matter	Trace.
Total	156.86
Free carbonic acid gas, 58.90 grains.	
Temperature of water 77° F.	

This water is more diuretic and laxative than the Seltzer. The Highland bathing water is artificially heated.

It is also an alkaline-saline fluid with considerable carbonic acid gas and some iron. The baths are used for rheumatism and joint affections. James K. Crook.

**HIGHLAND SPRINGS.**—Androscoggin County, Maine.  
**Post-Office.**—Lewiston. Cottages.

Highland Spring is located in Highland Park, comprising over sixty acres of elevated and wooded land, about two miles from Lewiston station. The spot offers exceptional advantages to persons wishing to camp during the summer. The waters of this spring have enjoyed a considerable reputation for a long time past. They are bottled and sold extensively for table purposes. The following analysis was made by Richard C. Stanley, Ph.D., State assayer of Maine:

ONE UNITED STATES GALLON CONTAINS:

Solids.	Grains.
Iron carbonate	1.10
Iron oxide	.31
Potassium and sodium carbonate	.83
Magnesium carbonate	1.23
Potassium and sodium sulphate	.31
Sodium chloride	1.00
Total	4.78

This is an excellent, palatable water and possesses the properties of a mild ferruginous tonic.

James K. Crook.

**HIP-JOINT.**—The development of the pelvic limbs into organs for support and propulsion has given to the joints by which they are articulated with the trunk a peculiar character of strength and solidity. While movement is free in every direction, and the femur can be circumducted as well as rotated, yet these movements are much less extensive than at the shoulder. The head of the distal bone is more completely enclosed, and the capsular ligament is stronger and narrower at its distal insertion, so as to offer a resistance to luxations. Besides this, certain modifications have been caused by the strain and pressure occasioned by the erect position. It would naturally be supposed that in a ball-and-socket joint the surfaces of contact would be perfectly spherical, and, indeed, the head of the femur is usually described as presenting from two-thirds to three-fourths of the surface of a sphere fitting closely the acetabular cavity. Aeby<sup>1</sup> and Schmid<sup>2</sup> have, however, shown that this is not quite correct, as there is a slight flattening of the surfaces and a thickening of their encrusting cartilages where they are subjected to the greatest pressure. This is more marked in the adult.

The liability of the articulation to disease and injury is considerable, both on account of its size and of the pressure upon the surfaces. It is therefore important to determine its precise position and relations—and this is by no means easy, as it lies buried under thick masses of muscle. In front is the reflected tendon of the ilio-*psaos*, a bursa (*B. subiliaca*), which sometimes communicates with the joint cavity, intervening. Above, the reflected tendon of the rectus femoris and the gluteus minimus are firmly united with the capsule (see Fig. 2645). Internally lies the pectineus above, also united with the capsule, and the obturator externus below. The tendon of this latter muscle also lies posteriorly, together with the obturator internus, the gemelli, the pyriformis, and the quadratus femoris.

All these form an immediate investment for the joint, and are themselves partially covered by a second mass composed of the tensor vaginae femoris, the gluteus maximus and medius behind and externally, the biceps group behind, and the adductor group internally.

Over these muscles there stretches the fascia belonging to the different groups, and in several situations this notably strengthens the joint capsule, especially where the iliac fascia comes down from the ilio-*psaos*, where the pectineal fascia passes outward upon the capsule from the pectineus, and, externally, where a strong process

passes inward between the tensor vaginae femoris and the rectus femoris.

The depth at which the articulation lies makes it difficult to obtain any positive knowledge as to the condition of the joint by direct manipulation, but a fairly accurate notion of its situation may be had by noting the surface

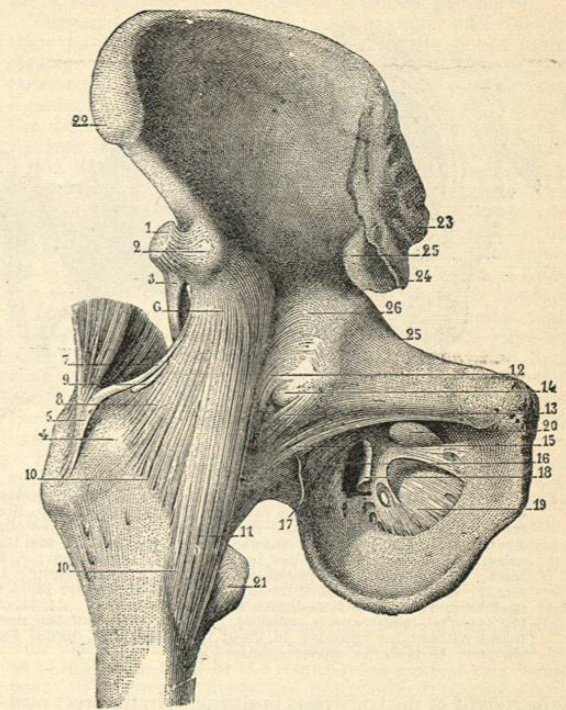


FIG. 2645.—Front View of the Hip-Joint. (From Sappey.) 1, Tendon of rectus femoris, cut; 2, its attachment to the antero-inferior iliac spine; 3, reflected portion of the tendon; 4, tubercle of the trochanter major; 5, tendon of the gluteus minimus; 6, the attachment of the ilio-femoral ligaments to the antero-inferior iliac spine; 7, fibrous union of the capsule with the tendon of the gluteus minimus; 8, superior ilio-femoral ligament; 9, section of a very thin fibrous lamella which covers over and crosses the ligament obliquely; 10, thinner portion of the capsule between the two ilio-femoral bands; 11, anterior ilio-femoral ligament; 12, 13, thin portion of the capsule arising from the ilio-pectineal eminence, and from the horizontal ramus; 14, orifice in the capsule communicating with the bursa beneath the tendon of the ilio-*psaos*; 15, ilio-femoral ligament; 16, 17, 18, 19, fibrous bands relating to the obturator membrane; 20, the obturator foramen or subpubic canal; 21, lesser trochanter; 22, antero-superior iliac spine; 23, postero-superior iliac spine; 24, postero-inferior iliac spine; 25, ilio-pectineal line; 26, ilio-pectineal eminence.

forms and bony points of the region. As to the bones, note first the anterior superior spine of the ilium, always marked even in the fattest subjects; then the spine of the pubis, which can easily be found by abducting the thigh and then running the finger along the strong tendon of the adductor longus which starts up. Joining these two points is Poupart's ligament, which may easily be felt. The muscular prominence on the outer side of the leg is caused by the tensor vaginae femoris, on the inner by the abductor muscles, and the triangular interval between, which reminds one distantly of the axillary space, is the *fossa subinguinalis*, or Scarpa's triangle. It is through the middle of this that the great vessels pass down the thigh, and the beating of the femoral artery, which lies nearest the joint, may be felt by pressing just below Poupart's ligament. The joint is about half an inch external to this, and in a very lean person (easier in cadaver) the head of the femur may be felt rolling under the fingers by pressing deeply here while an assistant extends and rotates the limb. This is impossible, however, when the subject is even moderately fat. A fulness and tenderness here are noted in the early stages of hip dis-