

tic; almost invariably there will be found a symmetrical hyperkeratosis of the hands and feet, with a horny layer which has an almost uniform thickness and is supple and without fissures.

PROGNOSIS.—Congenital keratoderma is an ailment of a most uncomfortable nature on account of its incurability. Sometimes it is so severe as to interfere with all manual labor which requires delicacy of touch. All the types of this disease that constitute a secondary manifestation are curable, although, in the most favorable circumstances, they are exceedingly obstinate to treatment, and require long periods for their permanent correction.

TREATMENT.—For the hereditary type of keratoderma, arsenic in large doses has been recommended, particularly the arsenite of sodium as suggested by Brocq. There are, however, many misgivings among physicians as to its virtue. The only practical treatment is local—the attempt should first be made to cure the rhagades by proper applications and by the removal of the horny masses. Afterward such measures should be adopted as will tend to arrest the persistent tendency, on the part of the epidermis, to reproduce layer after layer of a horny character. Hyperkeratosis due to arsenic is of course cured by discontinuing the use of the drug. When it is due to eczema the treatment consists in suppressing the local or general influence which has produced that disease. When it is the result of occupation or of contact with irritating substances, the occupation must be abandoned and the substances avoided. In fact, the internal treatment indicated for lichen planus and for pityriasis rubra pilaris should be carried out when keratoderma is associated with either of these affections. The local treatment in all types is about the same—prolonged maceration of the parts, followed by shampooing with green soap, supplemented by strong plasters of salicylic acid or resorcin. Mercurial plasters may also be used to advantage. A very good treatment is recommended by Unna; it consists in dressing the affected part with compresses immersed in a two-per-cent. solution of resorcin, and then enveloping these with rubber tissue. These dressings are to be worn at night, removed in the morning, and followed by an application of salicylic-acid ointment.

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KERATOHYALIN. See *Cornification.*

KERATOSIS FOLLICULARIS.—(Synonyms: Psorospermosis, *Psorospermose Folliculaire Végétante*, Ichthyosis follicularis, *Acne sebæcæ cornée*, Darier's Disease).

DEFINITION.—Keratosis follicularis is a hypertrophic affection of the general integument, characterized by pinhead- to pea-sized horny plugs, embedded in funnel-shaped dilatations of the pilo-sebaceous follicles. This rare affection of the skin was almost simultaneously described by White, Bowen, and Darier. It had, however, previously been recognized under other names, although positive histological proof was lacking. The interesting

observations of Darier relative to the striking cell forms that resemble coccidia and that are found in the skin lesions, and his first conjecture that these cells are parasites, resulted in very careful examinations on the part of many investigators, as well as the reporting of numerous cases. It has turned out, however, that White and Bowen were correct as to the nature of this disease and that Darier's protozoan interpretation was wrong.

SYMPTOMS.—The primary efflorescences appear in the form of pinhead-sized papules, more or less raised and covered with greasy scales that vary in color from a dirty yellow to a black brown. These scales cling together with considerable tenacity, and, when removed, frequently show on their lower surface a dingy, conical projection which may, although with some difficulty, be rubbed away, and which sometimes corresponds with the orifices of the sebaceous follicles and always with the funnel-shaped depressions of the upper skin which are independent of the follicles. The periphery of these primary lesions becomes expanded by the deposit of new, dirty-gray to black-brown foci the size of a lentil, which run together into large, irregular plaques, bordered at their edges by disseminated primary efflorescences, whose surfaces soon appear more or less glandular and warty. These efflorescences soon become flatter and rise above the level of the skin in the same manner; the plaques growing out of them may also attain considerable size. In one case reported by Darier, these hill-shaped efflorescences, devoid of epidermis, ran together on the pubes into large tumors, which were separated by deep furrows. They were bright red in color and showed numerous crater-like orifices containing secreted pus which emitted a decided odor. Besides these peculiar changes there were present, in almost all the recorded cases relating to the scalp, fatty yellow to brown, and often slightly warty, masses of scales penetrated by hair. Sometimes these were reddened, moist, and excoriated, at other times they were not essentially changed. The dorsal surfaces of the hands, feet, and fingers appeared at times to participate in the disease process. The nails were like almost habitually involved whether there were like changes in the fingers or not, being generally striated longitudinally and rent or fragmented at their free edges. In some instances the palms and the soles showed a considerable callous formation. In the course of the affection there were manifestations exhibiting distinct exacerbations and remissions. This condition at times almost disappeared, but no instance of actual recovery has yet been reported.

ETIOLOGY.—Its inception, in regard to the time of life, is very variable; generally it appears late in childhood, or early in youth, but in some cases it is deferred to a period between the ages of twenty and thirty-five years. In a case of Hallopeau's, the disease first appeared in the sixty-first year. It has been known to manifest itself in both father and daughter, which fact would suggest heredity.

The bacteriological examinations have been constantly negative. The theory advanced by Darier, and later elaborated by Wickham, that this variety of keratosis was due to the presence of psorosperms, or coccidia, has been abandoned even by those authorities themselves; consequently, the precise nature of the disease still remains wholly in the dark.

PATHOLOGICAL ANATOMY.—Upon this point all authorities have reported similar results. The changes chiefly occur within, or in close proximity to, the mouths of the pilo-sebaceous excretory ducts. These are dilated so as to form funnel-shaped openings, which are filled with a mass of horny cells continuous with the scales that cover the follicular opening. The wall of the follicle is composed of thick, horny layers limited to the rete cells. The epidermis generally appears more or less thickened. The rete Malpighii appears as if hypertrophied; the interpapillary prolongations are lengthened and press firmly against the corium. The epidermis and the horny masses constituting the summit seem partly to consist of horny lamellæ of normal appearance, but piled up one

upon another in great strands, partly composed of abnormally horny cells in which the nuclei are well preserved. A defective formation in the lower layers of the rete Malpighii, in association with degenerated cells, lymphoid cells and fibrin, and connected with the degenerated processes of the rete cells, is described as typical of the affection. There also appear in the epidermis numerous peculiar elements which Darier has designated as psorosperma. These round bodies, according to the same authority, are represented by corpuscles which show a more or less clearly defined cell and a granulated protoplasm, and are surrounded by a refractive membrane. Almost all authorities at the present time believe that the psorosperma of Darier are only degenerative forms of the rete cells, a conclusion which he himself has recently adopted, and are not an exclusive phenomenon of keratosis follicularis, but also occur in lichen ruber and lupus erythematosus circumula. Darier, however, firmly contends that their abundance constitutes a characteristic element of the disease. Besides these changes, there is an increased amount of pigment in the contents of the basal cell layer at the periphery of the efflorescence, while the horny layer contains but little or no coloring matter. This layer, however, shows more or less granular pigment. In the region of the elongated papillæ of the corium there is generally found a moderate infiltration, which has been described as consisting of plasma, connective-tissue or mast cells, and leucocytes.

DIAGNOSIS.—The diagnosis of a well-developed case presents few or no difficulties. One of the diseases it early resembles is lichen planus, although the horny plugs occupy the mouth of the dilated follicles. Large verrucous lesions in the inguinal regions are characteristic. It differs from molluscum epitheliale in not being so generalized, and invariably exhibits an enucleable mass containing the so-called molluscum bodies. The disease bears close resemblance to some types of ichthyosis, but careful study enables us to differentiate it. The lesions in the one undergo a definite and characteristic development not observed in the other.

PROGNOSIS.—The prognosis is unfavorable in nearly all the cases heretofore reported. The disease has lasted for years without undergoing spontaneous involution. The general health of the patient is unaffected, other than in the way of subjective sensations. Treatment has very little influence upon the disease.

TREATMENT.—The therapeutics of keratosis follicularis have hitherto been of little benefit. A heightened irritability of the skin limits the use of the common remedies employed in hyperkeratosis, such as salicylic acid, resorcin, pyrogallic acid, and chrysarobin. Sulphur, especially that form known as Vlemineck's solution, is applied to the affected places, after which they are to be scrubbed with soap and water, carefully dried, and then covered with some soothing application. In general, the remedies for eczema seborrhœicum should be tried, as there are striking analogies between the two diseases.

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KERATOSIS FOLLICULARIS CONTAGIOSA.—This type is the same as that which was formerly characterized by the name of acne sebæcæ cornæa, an appellation originally bestowed upon it by Dr. Prince A. Morrow, the term contagiosa having been added by Dr. H. G. Brooks, who was the first to observe this particular association.

The type begins with small, black points, usually seated on the elbows and knees, afterward extending up the arms and thighs and finally invading the greater part of the surface of the body. The face may also be affected,

while the scalp remains free; the distribution is symmetrical. The black points soon become prominent. Coupled with these are large, sharp-pointed comedones around which papules are finally developed, some of which become inflamed. The lesions mostly, although not exclusively, occupy the pilo-sebaceous follicles, and consist essentially of a hyperplastic proliferation of the epithelial cells, combined with modification of the process of keratinization which allows them to preserve their vitality during a longer period than that pertaining to inflammatory exudations. The lower layers of the stratum granulosum are primarily attacked, not only at the level of the sebaceous follicles, but also in the excretory duct of the sudoriparous glands, and in the interpapillary prolongations of the epidermis. No micro-organisms were found in the cases quoted by Brooks. The contagious nature of the disease was simply conjectured on account of its distribution and for the reason that it affected the entire family at the same moment.

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KERATOSIS PILARIS.—(Synonyms: Lichen pilaris, pityriasis pilaris, ichthyosis follicularis, *xerodermie pilaire*, *ichthyosis anérine des scrofuleux*, *cacotrophia folliculorum*.)

DEFINITION.—Keratosis pilaris is a hypertrophic affection, chiefly of young persons, characterized by the formation of small, horny elevations developed around the orifices of the hair, under the influence of a process tending to atrophy.

This form of hyperkeratosis, as now accepted, was originally described as a separate disease, first by Hyde, then by Brocq. It had previously been regarded as one of the manifestations of ichthyosis, with which it often coincides, but from which it differs in localization, histopathology, and evolution.

SYMPTOMS.—In its most common form, keratosis pilaris is characterized by pointed pinhead-sized elevations, developed around hairs, and consisting of an accumulation of horny epithelia around the lanugo hairs on the extensor surfaces of the extremities and trunk. In a more advanced stage, rounded papules appear with an acuminate summit, usually normal in color, hard to the touch and varying in size from a millet seed to a grain of hemp. Sometimes, however, the aspect of the part affected is more or less red, the condition being accompanied by congestion. The hair assailed is more or less atrophied, is seen to pierce each papule, and may be twisted; its calibre is often unequal and, when removed with the finger nail, its locality is marked by a depression. Brocq points out, at the side of these papules, incomplete elements, aborted, in the way of retrograde evolution. These are single spots, perifollicular, erythematous, or, in the last cases, representing cicatrices. The affection is sometimes pruriginous.

The middle portion of the back of the arms, as well as the forearm, the buttock, and the front of the leg above the knees, may be involved. The flexor surfaces, and the middle of the trunk alone remain free. On the face, the eruption presents peculiar characteristics; the prominences are very small and confluent, their presence asserting congestion. According to Brocq, the favorite seats of this dermatosis are the face and the forehead, where it forms two red plaques above the internal third of the eyebrow, occupies either the internal or external front of the ear, or is disposed in a vertical plaque reaching from the temple to the angle of the jaw. The space between the eyebrows, or the middle of the chin, in very pronounced cases, may be involved. The scalp presents desquamation like that of seborrhœa. Brocq has observed, in connection with keratosis, the formation of circumpolar papules and cicatricial atrophy, both of which he connects with moniliform aplasia of the hairs of the head and body. This condition corresponds to the ulerythema

ophryogenes of Taenzer and Unna and the xeroderma of Besnier.

ETIOLOGY.—This disease is shared in greater or less degree by a majority of people. It is usually attributed to lack of bathing, but may occur in persons who scrupulously observe hygienic rules. It may appear before puberty, although, as a rule, it does not. It is wanting where the hairs are atrophied, and it becomes attenuated and finally disappears with advancing age, the pilar system having become more atrophied. The disease is seen most frequently in persons having a thick, coarse, dark-colored skin.

PATHOLOGY.—Keratosis pilaris is essentially characterized by a hypergenesis of the epidermic cells in the hair follicle. The cells of the Malpighian layer in the hair follicle are found to undergo rapid cornification and to be arranged loosely around the hair shaft, so as to form a plug which projects above the surface. The hair shafts may be included. These are often twisted and deformed and the papillae of the root are reduced in size, or entirely wanting. Patches of necrosis are found here and there at the point of insertion of the arrectores pilorum. On the other hand, actual infiltration may occur, usually affecting the superficial rather than the deeper portions of the follicles. Giovanni found in many cases that the sebaceous glands were entirely wanting, while, in the rest, they were reduced in size. As a rule, the sweat glands were unaffected.

DIAGNOSIS.—Keratosis pilaris differs from goose-flesh (cutis anserina) in its permanency and in the fact that it is uninfluenced by temperature. Pityriasis pilaris rubra is the only dermatosis which is able to simulate the affection. There is this difference, however: the latter is characterized by peripolar and squamous prominences, exhibiting a peculiarly dark and smirched appearance, on the back of the fingers; by the affection of the nails; and, finally, by palmar and plantar desquamation. Keratosis pilaris is distinguished from the papular syphilides by its persistently unchanging character and the absence of specific concomitants.

PROGNOSIS.—The general health is in no wise affected by the disease, even when most pronounced. The disease is curable, but, without proper treatment, may last indefinitely.

TREATMENT.—Frequent baths with the use of a proper toilet soap, or, better still, *sapo viridis*, will usually be found curative. Alkaline, Turkish, and vapor baths will also be useful, although, in very obstinate cases, Brocq considers that the surest treatment is the destruction of the hair follicles by electrolysis. *Grover W. Wende.*

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KERION. See *Trichophytosis*.

KEYSTONE MINERAL SPRING.—Androscoggin County, Maine.

POST-OFFICE.—East Portland.

LOCATION.—This spring is located in the town of Poland, about one mile from the Empire Road Station, on the Grand Trunk Railway, and about two miles from the Portland and Rumford Falls Railway. It is thirty miles from Portland and six miles from each of the two cities of Lewiston and Auburn. The spring is situated on an elevated ridge of land, and the water itself issues from a bed of rock barely distinguishable from granite, which can be seen in and about the spring. The water flows through a glass pipe direct from the spring into bottles, jugs, etc., which are being filled, and is not taken from storage tanks. According to Prof. Richard C. Stanley, of Bates College, the water contains about three grains of solid matter to the United States gallon, composed as follows:

ONE UNITED STATES GALLON CONTAINS:	
Solids.	Grains.
Iron carbonate.....	0.45
Iron oxide.....	.25
Magnesium carbonate.....	.65
Potassium and sodium carbonate.....	.30
Potassium and sodium sulphate.....	.25
Sodium chloride.....	.25
Silica and alumina.....	.85
Organic matter.....	Traces.
Total.....	3.00

The water is remarkably pure, soft, and wholesome, and well adapted for the table. It is also recommended for dyspepsia and as a mild stimulating beverage in inflammatory, renal, bladder, and genito-urinary complaints. *James K. Crook.*

KEY WEST, FLA. See *Florida*.

KICKAPOO MAGNETIC SPRINGS.—Warren County, Indiana.

POST-OFFICE.—Kickapoo. Private inn.

LOCATION.—These springs are located on the line of the Chicago and Eastern Illinois Railroad, four miles northeast of Attica. The scenery about the springs is delightful, and abounds in historic interest. They are situated in a valley, on either side of which mounds rise to the height of fifty or sixty feet. Between the mounds run picturesque ravines, whose precipitous walls, composed in some places of soapstone, in others of gray or brown sandstone, show by their transverse marking the course of the ancient river as it flowed in torrents down the hillsides from the stranded and rapidly melting icebergs during the glacial period of our world's history. Among the objects of interest in the neighborhood may be mentioned Pine Creek, a romantic stream flowing through a deep valley, which is walled by towering cliffs of sand-rock, crowned by evergreen pines, cedars, and junipers, combining scenery at once grand, wild, and beautiful. This creek was used as a strong line of defence by the confederated Indian tribes prior to the battle of Tippecanoe in 1811. A number of picturesque cascades, from thirty to one hundred feet in height, are to be seen in the immediate neighborhood.

It is said that the principal spring was discovered by the Kickapoo Indians as early as June, 1750. The water was analyzed in 1885 by H. A. Huston, of Purdue University, assistant State chemist, with the following result:

ONE UNITED STATES GALLON CONTAINS:	
Solids.	Grains.
Calcium carbonate.....	12.35
Magnesium carbonate.....	5.38
Ferrous carbonate.....	.05
Silica.....	.68
Sodium sulphate.....	.39
Sodium carbonate.....	.30
Organic and volatile matter.....	4.61
Total solids.....	24.42

The flow of water from this spring is about fifteen hundred gallons per hour, having a temperature of 50° F. The water is a very good antacid and diuretic. In large quantities it is said also to have a mild cathartic action. It is useful in flatulent dyspepsia with acid eructations, in irritability of the bladder and prostatitis, and in rheumatism. A peculiar black mud deposited near the springs is also used for bathing purposes. *James K. Crook.*

KIDNEYS, ANATOMY AND PHYSIOLOGY OF.—**I. ANATOMY.**—The kidneys are bean-shaped organs situated on either side of the spinal column. They are usually said to lie in the lumbar region but are really intersected by the horizontal and vertical planes which separate the hypochondriac, lumbar, epigastric, and umbilical regions from each other and may therefore be said to lie in all these segments of the abdominal space. They lie on the fascia of the *M. quadratus lumborum* and on the verte-

bral portion of the diaphragm and extend from the first or the third lumbar vertebra to the eleventh rib or even higher. The left kidney is usually somewhat higher than the right.

The kidney presents two surfaces, two borders, and two extremities. The surfaces are ventral and dorsal, the ventral surface being more convex than the dorsal. The external border is convex, while the internal border is fissured by the hilum. The upper extremity is usually larger than the lower and is usually somewhat nearer to the median line.

The kidneys are usually of a flattened oval shape with the long diameter nearly parallel to the vertebral column. The form is, however, very variable. The kidneys may be slender, the length being three times the breadth and the convex and concave borders almost concentrically curved, or they may be short and broad, the vertical diameter being only a little greater than the transverse. More rarely the kidney may appear as an almost elliptical disc. In this case the place of entrance of the vessels is crowded toward the posterior surface. The sagittal diameter (thickness) is generally in inverse ratio to the transverse. The left kidney is usually higher, narrower, and thicker than the right. The vertical diameter of the kidney averages 13 cm., the transverse 6 cm., and the sagittal 3.5 cm. The volume is from 100 to 175 c.c., averaging 135 c.c. (Krause). The weight of a normal kidney varies between 90 and 180 gm., the left being 5 to 7 gm. heavier than the right. The kidneys of males are ordinarily heavier than those of females. The weight of the two kidneys is to the weight of the body as 1 to 240.

The hilus renalis is a longitudinal cleft with anterior and posterior lips, the posterior usually projecting nearer to the median line than the anterior. Between the two lips pass the renal vessels and nerves, the duct, and a quantity of fat-bearing connective tissue. The sinus renalis is flattened in the sagittal diameter, bounded by an anterior and a posterior wall, having circular or elliptical sharp borders. It extends mesially to the hilus and repeats the external contour of the kidney. The sinus contains a mass of adipose tissue in which are embedded the branches of the blood-vessels and excretory duct. It gives attachment to the primary branches (calices) of the duct.

The kidneys are covered on the anterior surface by the peritoneum. The entire organ is enveloped and supported by a capsule of connective tissue containing a larger or smaller amount of adipose tissue. This is known as the *capsula adiposa*. The fat in this capsule may be so poorly developed that the sheath may be mistaken in operations for peritoneum or fascia, or it may be excessively developed. The organ with its fatty capsule may normally be easily stripped off from the posterior wall, the adipose tissue being but loosely attached. In some cases the attachment becomes impaired, as a result of injury or strain, the kidney is loosened from the abdominal wall, being held in position only by the renal vessels. This gives rise to the phenomenon known as movable kidney, palpable kidney, or floating kidney. This condition is most common in women and can be determined by bimanual palpation. The left hand is placed in the lumbar region behind the eleventh and twelfth ribs, the right hand in the hypochondriac region just under the edge of the liver. In rare cases, the kidney may be surrounded by peritoneum and be held in position by a mesonephron.

The lower edge of the left kidney is usually nearly 5 cm. from the iliac crest, a little below the level of the second lumbar spine; that of the right is generally from 1.25 to 2 cm. lower. The right kidney is covered in front by the descending duodenum and flexura coli dextra, while the liver with its *impressio renalis* often covers a considerable portion of the upper part. In front of the left kidney is a part of the posterior portion of the stomach, and the flexura coli sinistra. The external margin of the left kidney is partially covered by the spleen. The adrenals cover the upper extremities of both kidneys,

projecting a little over the anterior surface and mesial border.

The kidney is surrounded by three sheaths, an outer fatty sheath, a middle fibrous sheath and an inner muscular layer. The outer sheath, or *capsula adiposa* consists of loose connective tissue, containing an amount of fat which varies with the nutritive conditions of the body. It is loosely connected to the middle sheath, which consists of a thin but firm layer of fibrous tissue, which can be easily peeled off from the healthy kidney, leaving a smooth surface and causing but little hemorrhage when undertaken during a renal operation. This capsule consists of two layers which are easily separated, the outer 0.1 to 0.2 mm. in thickness which fuses in the sinus renalis with the connective-tissue sheaths of the blood-vessels. The inner and thinner layer continues to the point of attachment of the calices. Under this inner layer is a thin layer of smooth muscle fibres, which form a network, whose meshes are about equal in size to the diameter of the larger superficial veins. From this plexus fine processes enter the substance of the kidney.

After the removal of the capsules, the outer surface of the kidney usually appears smooth, reddish-brown in color, and of firm consistency. The color and consistency, however, vary with the blood content. Exceptionally the outer surface is traversed by shallow furrows, the remains of the lobulation of the foetal kidney, which is distinctly marked in the kidneys of the new-born infant. The inner surface bordering on the sinus renalis is also smooth in the neighborhood of the entrance of the sinus, but presents some transverse furrows on the anterior lip, the impressions of the arteria renalis. The hilum is merely an orifice opening into the cavity of the sinus renalis. This sinus is from 10 to 12 mm. in diameter and from 30 to 35 mm. deep. In the deeper portion of the sinus the surface is uneven, presenting low, pyramidal projections with flat or rounded summits. These are the papillae renales, of which there are from four to thirteen, generally seven or eight quite uniformly distributed over the anterior and posterior walls. The papillae may be simple, or several may be fused into a single papilla having a larger base and furrowed sides. The simple papillae are about 8 mm. in height, the bases having a diameter of 6 to 10 mm. Near the base of each papilla is fused the circular edge of an end branch of the ureter, a so-called renal calyx, so that the papilla forms the base of the calyx, its apex projecting into it. Numerous blood-vessels penetrate the inner surface of the kidney above the neck of the papillae and thus outside of the calices; these are often arranged concentrically about the base of the papilla.

On section of the kidney through the hilum, the parenchyma is seen to be composed of two essentially different structures, the medulla and the cortex. The medulla consists of a variable number (eight to eighteen) of conical segments called pyramids of Malpighi, the apices of which project into the sinus and are surrounded by the calices, while the bases of the pyramids are turned toward the surface of the kidney and are surrounded by the cortex. The pyramids are smooth and glistening and present, even to the unaided eye, a longitudinal striation, indicating the course of the collecting tubules. The apex or papilla when viewed with a low-power lens presents numerous apertures, the foramina papillaria, through which the secretion escapes into the duct. The cortex may be divided into two portions: a peripheral layer, the cortex proper, which extends in a layer 5-7 mm. in thickness over the entire surface of the kidney between the bases of the Malpighian pyramids and the fibrous capsule, and an interpapillary portion, the *columnae Bertini*, dipping down between the Malpighian pyramids to the bottom of the sinus, where they are covered by the fibrous capsule and more or less adipose tissue. The cortical substance is granular, grayish in color, varying however with the blood content, and characterized especially by the occurrence at quite regular intervals of red points visible with the unaided eye; these are the so-called glo-