

specific rotatory power, indicated by $[\alpha]$, is calculated by the formula $\frac{100a}{cl}$, in which a is the angular deviation observed; c the number of grams of the substance in 100 c.c. of solution; and l the length, in decimetres, of column of liquid examined. As the rotation differs somewhat with light of different colors, the specific rotatory power is now usually given for yellow light corresponding to the D line of the solar spectrum (see *Spectroscope*), and the symbol is written $[\alpha]_D$. In practice certain weights, termed "normal weights," of material are employed. At the International Commission for Uniform Methods of Sugar Analysis held at Paris, 1900, it was agreed that the normal weight "shall be 26 gm. of pure sugar weighed in air with brass weights," and dissolved in 100 true cubic centimetres. Though the principle of the operation of these instruments is simple, yet accurate results are obtained only by much care and experience.

The expense of the standard form of polarimeter has led to efforts to construct cheaper forms for clinical use. The instrument of von Fleischl has met with most favor. It employs white light and is so constructed that two spectra are shown at once with a dark band in each, the two being coincident when there is no rotating body; but one of the bands is displaced when a rotating body is introduced, and the analyzer can be revolved until the coincidence is restored. The instrument is graduated so that the percentage of rotating body can be read off directly. It is constructed for estimation of sugar.

Clinical Applications.—Polarimeters are of but limited application in clinical diagnosis. Apart from the expense, the conditions interfering with accuracy are numerous. Practically, the estimation of sugar in diabetic urine is the only medical use made of them. Albuminous substances rotate polarized light; but the fact has no diagnostic value. Diabetic urine is apt to contain several optically active bodies, not all of which are dextrorotatory; hence the observed reading will be a resultant of all the actions. The polarimeter may be of use in making routine tests in a given case to determine the effects of treatment; but even then it will be necessary to check occasionally by the chemical tests which can now be performed with ease and celerity, and with sufficient accuracy for clinical purposes.

Urine, as a rule, will require clarification and decolorization for examination in the polarimeter. A solution of lead subacetate is commonly employed; 50 c.c. of the sample are added to 5 c.c. of the official solution, the liquids well mixed and filtered through a dry filter. The first 10 c.c. are rejected and the examination is made on the next portions. The dilution must of course be allowed for by increasing the reading ten per cent.

Henry Leffmann.

POLYCHROMATOPHILIA.—(*Polychromasia*.) The term applied by Ehrlich to that condition of the red cells in which they take, not only the diffuse stain, but also the nuclear, so that they exhibit a bluish-red or violet tinge, or may even take a deep blue stain when stained with hæmatoxylin and eosin, or methylene-blue and eosin. By Ehrlich and others this phenomenon is regarded as essentially degenerative, a progressive "coagulation necrosis," whereby the cell loses its affinity for acid stains. They are supported in this view by the presence of such cells shortly after hemorrhage and in starving animals, and by the polychromatophilic character of megakaryoblasts. Further, cells showing this characteristic are usually ragged in contour or show vacuoles. On the other hand, Askanazy and others hold that the polychromatophilic cells are the *youngest* cells of the blood, and are not degenerating forms. This view is based chiefly upon the fact that a large portion of the red cells of the fœtus are polychromatophilic. According to Sherrington, the brownish color frequently seen in red cells is to be regarded as due to an incomplete oxidation of hæmoglobin. Ewing would regard this as a form of polychromatophilia and would limit the term polychromasia to this diffuse brownish color of the cell, which

occurs in anæmias and is also seen in the normal marrow. On the other hand, he would class the bluish-staining granules and areas in red cells, originally designated as polychromatophilia, with Grawitz's *granular degeneration* of red cells. Even though the phenomenon be proved to be identical in significance with the last-named, it would appear best to use the term polychromatophilia in its original application by Ehrlich, and not to transfer it, according to Ewing's suggestion, to an entirely different process.

Aldred Scott Warthin.

POLYCYTHÆMIA.—The increase in number of the red blood cells, due either to an absolute increase in the number of the red cells or to a decrease in the volume of the plasma. An absolute increase in the number of red cells above the normal has not yet been demonstrated to occur. Theoretically, such an increase could be brought about by an increased formation of red cells, or through a longer life of the individual cells. A relative polycythæmia is of frequent occurrence. It occurs in the newborn, and is usually highest before nursing begins, and gradually disappears during the first few weeks. Its cause is doubtless to be found in the temporary concentration of the blood due to various factors. Ewing finds that the polycythæmia bears a rather close relation to the degree of cyanosis exhibited by the expressed drop, and believes that the concentration of blood is principally referable to a state of relative stasis which is established in the peripheral capillaries in the first hours after birth. The average count of red cells in the new-born ranges from 5,368,000 to 6,500,000. Too early ligation of the cord may cause a reduction of 500,000 to 1,000,000 (Hayem and Helot). After nursing begins, the red cells fall about 250,000 a week, until the usual average is reached.

According to many observers there occurs a polycythæmia in individuals residing at high altitudes. The change may take place within twenty-four hours, the increase amounting to a million or more, reaching the limit in two weeks and then remaining permanently high. On return to low altitudes the polycythæmia disappears very rapidly. The percentage of hæmoglobin is less affected, and the volume of the red cells not at all. The phenomenon has been variously explained: by some writers as a compensatory increased production of red cells, by others as due to concentration of the blood, by still others as an error in estimation, due to the fact that the results obtained by the blood-counter are dependent upon temperature and barometric pressure.

Polycythæmia occurs also in the diarrhoeal diseases, particularly in cholera, as a result of the concentration of the blood. In chronic dysentery it may be offset by the anæmia produced. Similarly, in typhoid fever the progress of the anæmia may be obscured by the concentration of the blood. A relative polycythæmia occurs also in chronic valvular disease of the heart with passive congestion, in endocarditis, in excessive sweating, in phosphorus poisoning, after cold baths or the application of drugs causing contraction of the vessels (alcohol, etc.), and in cases of poisoning with illuminating gas. In phosphorus poisoning an increase to over 8,000,000 has been observed; it is probably due to the depletion of the blood from vomiting. An increase of 2,000,000 to 3,000,000 may be observed after large doses of salts.

Aldred Scott Warthin.

POLYDACTYLISM.—See *Hands and Fingers, etc.*

POLYFORMIN, INSOLUBLE, is prepared by dissolving resorcin in an aqueous solution of formaldehyde, and adding an excess of ammonia. It is an odorless, tasteless, yellowish-brown, amorphous powder, insoluble in all ordinary solvents and rich in formaldehyde. It is used as an antiseptic.

W. A. Bastedo.

POLYFORMIN, SOLUBLE—di-resorcin-hexa-methyl-ene-tetramine—occurs in white crystals which are very soluble in water or alcohol, but insoluble in ether or oils.

It is decomposed by heating in solution, setting free formaldehyde. Externally, it is employed in parasitic skin diseases, and internally has been used as an antiseptic in the alimentary and urinary tracts and as a diuretic. It is said to appear as formaldehyde in the urine.

W. A. Bastedo.

POLYSOLVOL—Solvin, sodium sulphurinate—is prepared by acting on castor oil with strong sulphuric acid, adding a solution of sodium chloride, then neutralizing the free acid with soda. It is a thick, clear, light-yellowish oily liquid, insoluble in water, but forming with it a good emulsion. Polysolvol possesses the property of dissolving thirty per cent. of phenol, twenty-five per cent. of menthol, ten per cent. of salicylic acid, and other substances in like proportion.

W. A. Bastedo.

POLYURIA.—(Synonyms: Hyperuresis, Diabetes Insipidus, Diuresis, Essential Polyuria.)

Polyuria means an excessive flow of urine. There are numerous cases in which this occurs temporarily, and is due to dietetic or nervous changes, and a few in which it occurs persistently. The latter are best named *essential polyuria* or *diabetes insipidus*. I shall at the present time describe the latter cases. Instances of persistent or chronic hyperuresis were recognized and described at an early period of medical history, but no attempt was made to classify them. In 1670, however, Thomas Willis discovered the existence of sugar in the urine of some of them, and nearly a century later Sauvages described anew the excretion of sweet urine, as a distinct form of disease, under the name of *diabetes anglicus*. But it was not until near the end of the eighteenth century that Cullen and P. Frank placed all cases of persistent polyuria in two classes, the one having sugar in the urine and the other none, the first being called *diabetes mellitus* and the second *diabetes insipidus*. This distinction has been maintained by all subsequent observers. *Diabetes mellitus* is now classed with the morbid conditions of assimilation and nutrition. Therefore only the non-saccharine cases, or those of *diabetes insipidus*, are still thought of as essentially polyurias.

ETIOLOGY.—Cases of temporary polyuria are due to a variety of conditions such as the drinking of large quantities of fluid or the eating of excessively large amounts of sugar. It is also caused by such nervous diseases as hysteria and epilepsy. Chronic polyuria has been ascribed to exposure to cold, and to a residence constantly in damp and dark rooms. However, the causative influence of these conditions has not been proved. Injuries affecting the brain and spinal cord, more especially penetrating wounds in the region of the fourth ventricle and medulla oblongata; violent mental emotions and persistent functional diseases of the nervous system are known causes in certain instances. But many cases are on record which can be traced to no special cause. Age evidently exerts a predisposing influence, as shown by the following statistics: Of 242 recorded cases 18 were under five years, 32 between five and ten years, 50 between ten and twenty years, 59 between twenty and thirty years, 42 between thirty and forty years, 20 between forty and fifty years, 13 between fifty and sixty years, and 8 between sixty and seventy years, which is equivalent to 75 per cent. between the ages of five and forty years. Observations in regard to sex show more than twice as many cases in the male as in the female.

There are not a sufficient number of reliable observations on record to justify the conclusion that the disease is hereditary. It seems probable that either a functional or structural disease of the centre in the medulla which controls the blood supply to the kidneys and excretion by them exists in all cases of *diabetes insipidus*.

SYMPTOMS AND CLINICAL HISTORY.—When not the result of direct injuries to the central portions of the nervous system, or of sudden mental emotions, the symptoms of polyuria generally develop slowly and without

marked changes, except the gradually increasing quantity of urine which is voided and the correspondingly increased thirst.

When the urine is greatly in excess, the skin appears dry and somewhat shrunken, but much less than in *diabetes mellitus*. There are some paleness of the features, mental despondency, disturbed sleep, unusual weariness from moderate exercise, excessive appetite for food as well as constant thirst, and frequent eructations and flatulence, with constipation of the bowels. As much as twenty-five to fifty pints of urine may be voided daily. In most cases the specific gravity of the urine is diminished in proportion to the increase of its quantity, varying from 1.001 to 1.008. The fluid is nearly colorless. Its reaction is often neutral or feebly alkaline. Therefore it readily undergoes decomposition. Although the amount of solids in the urine is small, the proportion of urea is often great. A considerable thirst is felt and the mouth and lips rapidly become parched. Appetite is variable. A moderate loss of flesh is the rule, but such patients do not become emaciated. In spite of an appearance of average plumpness these patients lack endurance and ambition. When the disease is not caused by, or associated with, injuries or structural diseases of the brain or spinal cord, it may continue many years, and rarely proves fatal unless from the nature and extent of complications. Some cases have been observed to present great variations in their progress, the quantity of urine sometimes diminishing to the normal, with corresponding improvement in other symptoms, and then increasing again. In some cases exacerbations are traceable to unusual mental or nervous excitement, in others to exposure to cold and damp air, and in still others to excesses in eating and drinking.

During the active progress of essential polyuria the increased quantity of urine consists entirely of water, while the quantity of the other natural constituents voided in the twenty-four hours remains nearly the same as in health.

This explains why the waste of tissues and impairment of health is so much less in this form of disease than in *diabetes mellitus*, even when the actual quantity of urine discharged in the twenty-four hours is greater in the former than in the latter. The condition of the digestive organs varies much; sometimes food is imperfectly digested, causing acid and gaseous eructations, flatulency, and constipation, alternating with diarrhoea. These symptoms, however, appear to depend more directly on the morbid conditions that have caused the polyuria or have existed as complications, than upon the excessive flow of urine.

PROGNOSIS.—The duration of the disease depends almost entirely upon the nature of the causes and complications. Those cases which are associated with diseases or injuries of the cerebral and spinal centres usually either recover or prove fatal at an early period, while those which are dependent upon chronic functional disorders may continue for many years. R. Willis has left on record a case that continued for fifty years, and Neuffer one that ended fatally in four months. It is generally conceded that permanent recovery from this disease is rare, but it does occur sometimes spontaneously. Complications or intercurrent diseases cause death in much the larger number of instances.

DIAGNOSIS.—The most reliable and characteristic symptoms of *diabetes insipidus*, or essential polyuria, are persistent daily excretion of quantities of urine above the ordinary maximum of health, or of low specific gravity (between 1.001 and 1.008), and destitute of sugar and albumin: unnatural thirst, increased in direct ratio to the increase in the quantity of urine voided; and a loss of endurance. At first, cases in which polyuria is caused by habitually drinking very large quantities of fluids, may be mistaken, for example, for cases of *diabetes insipidus*. In the early stage chronic interstitial nephritis may be mistaken for it. This can happen only when albumin does not occur in the urine or occurs only occasionally. In this stage of interstitial nephritis the in-

creased flow of urine is moderate rather than excessive, and the specific gravity is almost uniformly above 1.008. A careful study of the circulatory disturbances, which are a part of interstitial nephritis and do not exist in essential polyuria, makes a diagnosis easy.

PATHOLOGICAL ANATOMY.—An essential polyuria generally continues for many years, and rarely terminates fatally except through the intervention of other diseases; few opportunities, therefore, are afforded for careful post-mortem examination. However, in some cases the kidneys have been found slightly enlarged and more vascular than natural, but often they appeared unaltered.

Much the most numerous and important changes have been found in the brain and cord. These consist of inflammatory and degenerative changes in the region of the fourth ventricle, and less frequently in the meninges; of gummata and exostoses; and of tumors. Such changes within the cranium are evidently the results of prior constitutional disorders, and are in no sense dependent on the polyuria. Chemical analyses of the blood have shown a moderate increase of the solid constituents in proportion to the water. It may be safely assumed that uncomplicated polyuria does not involve uniform structural changes either in the kidneys or in other parts of the body, but rather such a modification of the renal vaso-motor nervous mechanism as to induce and maintain an increased blood pressure, and consequent increased elimination of urine.

TREATMENT.—In the treatment of this affection, it is of the highest importance to ascertain from the history of the patient what accidents, injuries, coincident diseases, or constitutional morbid conditions, hereditary or acquired, may have been influential in developing or perpetuating the disease. In all cases in which such causative conditions can be found, the removal when possible, or alleviation when removal cannot be accomplished, should demand careful and persistent attention.

For permanently controlling the diuresis no remedies have been found to be reliable or uniformly successful. Those who suffer from this disease should live in well-ventilated, well-lighted, warm and dry rooms; should wear warm flannel underclothes, take a warm-water bath, followed by rapid light friction with dry flannel, daily or at least two or three times a week; and take as much exercise in the open air daily as is possible without fatigue. Such quantity and quality of food may be eaten as the digestive organs of the patient will tolerate without developing gastric distress or much flatulency; but sugar should be eaten sparingly, for an excess of the latter in the blood will aggravate the polyuria. Very cold beverages should be avoided, and especially such as are diuretic, like beer, cider, and milk. Melons and grapes among fruit increase diuresis and must be eschewed.

Rest and sleep should be had at regular intervals and in sufficient amounts. Emotional excitement and fatigue must be avoided. To promote vicarious elimination by skin and lungs, the hot baths and friction of the skin, already advised, are important. Breathing exercise, slow climbing of hills, and a residence in a high altitude and dry climates are useful.

Among the numerous drugs which have been employed are pilocarpine and cathartics as means of provoking elimination by other channels than the kidneys. Their utility is transitory and slight.

For their effect upon the tone of the renal blood-vessels such drugs as strychnine, ergot, and astringents have been tried. They all tend to increase blood pressure, which we would expect to aggravate, not to relieve, the important symptoms of the disease. Although in individual cases they have seemed useful, they cannot be said to have a specific action.

Valerian, castor, musk, asafoetida, camphor, belladonna, opium, and potassium bromide are other drugs which have occasionally seemed beneficial.

Drugs, however, are not to be relied upon. They may be used to meet indications in individual patients, and hygienic and dietetic treatment is important.

N. S. Davis, Jr.

POMEGRANATE.—*Granatum*, *Granati Cortex*, or *Cortex Granati*. *Grenadier*. "The dried bark of the stem and root of *Punica Granatum* L. (fam. *Punicaceae*)." U. S. P.

This is a very beautiful shrub or small tree, producing a dense crown of glossy dark-green foliage, handsome deep-scarlet or crimson (in one form white) flowers, and

the delicious fruit well known under this name. It is a native of Southwestern Asia and is now everywhere cultivated in tropical and subtropical countries. Some pharmacopœias require the root bark only, a judicious restriction (see *Constituents*). The French Codex recognizes also the flowers and fruit, and the rind of the latter, but all these are very inferior.

The bark occurs in quills several inches in length, and 0.5 to 2 cm. ($\frac{1}{2}$ to $\frac{3}{4}$ in.) in diameter, or in broken pieces of the same, the bark 1 to 3 mm. ($\frac{1}{8}$ to $\frac{1}{4}$ in.) thick; outer surface consisting of broad, shallow, rough, commonly short and reticulated, yellow fissures, alternating with less roughened, gray or slightly purplish-gray bands having sharp, lightly elevated margins, and usually more or less marked with small blackish spots of lichen; root bark, especially the thicker pieces, browner, less fissured, and more or less scaly and roughened; inner surface finely striate, with some longitudinally elongated, blister-like elevations, and varying in color from pale greenish-yellow to cinnamon-brown; fracture short, granular, greenish-yellow, and showing a somewhat laminated structure; taste astringent, very slightly bitter.

Constituents.—The important constituents of pomegranate bark are four alkaloids, together aggregating from one per cent. to three per cent. of the weight of the drug. Although evidence on this point is contradictory, it appears pretty well established that the root bark contains about a half more alkaloid than the stem bark and that the barks of the white-flowered variety are richer than those of the red-flowered. There is a large amount of tannin (twenty per cent. or more), some mannin ("punicin" or "granatin"), much yellow coloring matter, and a very large amount (ten to fifteen per cent. or more) of ash. The tannic acid is interesting, being partly gallo-tannic and partly a form peculiar to this drug. The alkaloids exist for the most part as tannates. The most important is *pelletierine* or "punicine" ($C_8H_{12}NO$), which is a volatile liquid, soluble in water, alcohol, ether, and chloroform, and rapidly oxidizing, upon exposure, into a resin-like body. Its salts are crystalline. *Methyl-pelletierine* ($C_9H_{17}NO$) is similar, but somewhat less soluble in water. This alkaloid is more abundant in the root bark, the former more in the stem bark. The other alkaloids are *iso-pelletierine* and *pseudo-pelletierine* or "granatonine" ($C_9H_{15}NO \cdot 2H_2O$), the latter occurring in prismatic crystals, soluble in water, alcohol, and chloroform, and in nine parts of ether.

Pomegranate bark deteriorates rapidly on keeping. The alkaloids undergo a change, rendering them less soluble, soon after which they become decomposed. It is to be particularly noted that the commercial substances passing as pelletierine and its salts are in reality mixtures of all the alkaloids named above.

ACTION AND USES.—The important use of pomegranate bark is as a tannic, its alkaloids being active. Opinions differ as to whether the parasite is killed or merely paralyzed by the drug. In any case, a brisk

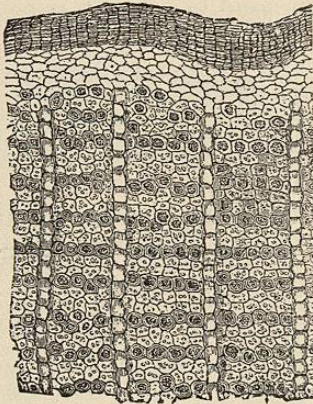


FIG. 3875.—Pomegranate Bark.

cathartic is required after its administration, owing to the strongly astringent effect of its tannin. Its astringent properties are often utilized for gargling and similar purposes and have been used internally, though the large doses thus used have frequently been followed by unpleasant emetic, and to some extent narcotic, effects. There is no official preparation, though an unofficial fluid extract is often employed, in doses of 2 to 6 c.c. (fl 3 ss.-iss.), and the powdered bark is given in corresponding doses. A very good method is to suspend the latter in mucilage. The ten-per-cent. decoction is the form probably most used, in wineglass doses. The tannate of the alkaloids (so-called "pelletierine-tannate") is now very largely employed in doses of 0.2 to 0.4 gm. (gr. iij. to vi.). This is after all the best form of administration, since the inhibiting action of the free tannin of the bark is thus avoided.

The rind of the fruit (*Granati Fructus Cortex*; *Cortex Malicorii*) is largely utilized for its astringent properties. It contains rather more tannin than the bark, together with a still larger amount of gum, and is free from the alkaloids which, as stated above, often render the use of the bark as an astringent undesirable. This rind occurs in irregular, curved, chip-like fragments, about 2 mm. ($\frac{1}{8}$ in.) thick, externally brown, with a yellowish or sometimes reddish tint, finely tuberculate roughened, internally of a lighter or whitish color, marked with conchoidal depression indicating the position of the masses of seeds. The terminal pieces bear the thick, tubular, cup-shaped remains of the calyx tube. The fracture is short, sharp, and granular. The drug is nearly odorless and strongly astringent.

Henry H. Rusby.

POMPHOLYX.—(Synonyms: Cheiro-Pompholyx; Fr., *Dysidrosis*; *Dysidrose*.)

DEFINITION.—An acute exudative eruption characterized by the formation of vesicles and blebs, usually of moderate size, and occurring for the most part on the hands and feet; in some instances it may be limited to the palms and soles. It is a disease seldom encountered, and is liable to be confounded with other eruptions of the bullous type.

SYMPTOMS.—The clinical features of pompholyx are well-defined and distinctive, and in most works on dermatology the disease is recognized as a distinct affection. It was first described by Jonathan Hutchinson and Tilberry Fox, of London. The former gave it the name of cheiro-pompholyx, while the latter in reporting the same case gave it the name of dysidrosis. During a period of twenty years the present writer, in encountering many thousand cases of skin diseases, has seen but one or two instances of this affection; nor could these be regarded as typical examples of the disease, for the eruption during its whole course was not confined to the regions most frequently involved—namely, the hands and feet—but extended to the forearms as well. While a student in the Black Friars Skin Hospital in London I had the opportunity of studying several cases that were regarded by Mr. Hutchinson as typical examples of the affection. In some of these, if I remember correctly, the disease likewise extended to the forearms, and frequently the feet were exempted. The disease usually begins in the summer, especially during excessively hot weather. The first symptoms complained of are burning and tingling, with the development of deeply seated vesicles which are single and later become grouped by the development of new lesions; the most characteristic position at first being the sides of the fingers, and the eruption gradually extending to the palms. When the lesions are confined to the thick skin of the palms of the hands and the soles of the feet they have been very aptly compared to boiled sago grains embedded in the skin. This appearance is due to the thickened epidermis, as pointed out by Crocker, rather than to any special variation in the lesions themselves. The eruption is usually symmetrically distributed. As the lesions develop the groups of vesicles not infrequently coalesce, forming large, irregularly outlined bullæ filled with a serous fluid, and pro-

jecting above the level of the skin. At first the contents are translucent, but later they become opaque. In reaction the fluid is neutral or slightly alkaline. At no time is there much inflammation in the surrounding skin, in which respect the disease differs from certain affections with which it may be confounded. In the course of two or three weeks the lesions begin to subside, although new ones appear from time to time. The contents become absorbed and finally the outer epidermic wall exfoliates, exposing a reddish area of delicate new skin, which marks the site of the former lesion. The disease often runs its course in a few weeks, or at most in one or two months, although it is liable to recur the following year. At times, in debilitated subjects, the lesions may assume a red color and the surrounding derma become slightly edematous. The epidermis not infrequently becomes undermined and then soon ruptures, exposing to view a red, exudative surface. Gradually, however, this process subsides, and recovery may take place as before stated. The subjective symptoms are usually slight. Aside from the burning and tingling previously mentioned, there may be marked impairment of the general health, in which case excessive sweating is sometimes complained of. Itching is never a prominent symptom.

PATHOLOGY.—As the name given to the disease by Tilberry Fox¹ indicates, this writer regarded the affection as in some way associated with the sudoriparous glands. Later investigators, and especially Robinson,² have demonstrated that the lesions show no especial connection with these structures. On the other hand, it has been shown that the pathological condition is one of inflammation which takes its origin in the rete, gives rise to a serous exudate from the capillary blood-vessels, and then, collecting between the rete cells, forms variously sized vesicles or bullæ. As this effusion takes place there follows a gradual degeneration of the cells of the rete mucosum. While some of the vesicles, especially those situated on the outer surface, may rupture when the inflammatory process is more extensive, there may be a general extension of the fluid at the periphery, thus causing the undermining previously mentioned. Later, the entrance of pus corpuscles changes the translucent fluid to one of an opaque or even yellow color.

ETIOLOGY.—The disease is nearly always associated with general debility, or it occurs in those whose nerve tone is below par. It is especially liable to occur in women who have been subjected to excessive mental strain or worry; and yet, while it is more frequently met with in women, men are by no means exempted. Middle age seems to be the period of life in which the disease is most frequently encountered; only a few cases have been reported in children and the disease is extremely rare in old age. Crocker has not seen it under twelve years, and the oldest patient was thirty-eight, while Hyde³ records a case at sixty. The disease is supposed to be due to some abnormality in the innervation of the skin, although its exact nature has not been determined. On the other hand, Unna has found a bacillus resembling the tubercle bacillus, although slightly thicker, and he is disposed to regard it as an essential pathological factor in the disease.

DIAGNOSIS.—The limitation of the disease to the palms of the hands and the soles of the feet—a characteristic which is considered by some authorities to be essential—renders the affection less liable to be confounded with other affections to which it bears some similarity; namely, with eczema, pemphigus, and dermatitis herpetiformis. In my own experience the line of demarcation is not so sharply drawn, and the affection gradually merges in type with other well-recognized diseases. When limited to the palms and plantar surfaces the only condition to which it bears a close resemblance would be blisters from slight traumatism, eczema, and an accumulation of sweat under the thickened epidermis. Eczema is seldom limited to these surfaces, and is always accompanied by inflammation and marked itching; while inflammation and itching are usually insignificant features in pompholyx. The persistence of the eruption, together with the formation of new lesions extending over a period of a week or more,

would enable one to exclude blisters arising from slight injuries. More difficulty, however, would be encountered in differentiating the affection when seen on the lateral surfaces of the fingers and on the backs of the hands. Here the affection bears a close resemblance to eczema; but in eczema there are more extensive inflammation and less tendency to the formation of bullæ, and in eczema the outer wall of the lesions easily ruptures, giving rise to excoriated itching surfaces of irregular outline. In pompholyx, on the other hand, the epidermic wall seldom ruptures and the lesions remain circumscribed, or coalesce in such a manner as to form bullæ. Furthermore, it should be borne in mind that pompholyx is most liable to occur in adults, and especially in women who are debilitated or who have been overwrought, and that the disease tends to a spontaneous recovery, and at the same time is likely to recur upon the recurrence of conditions favorable to its development. Ivy poisoning must likewise be excluded in making a diagnosis, but the acute inflammatory character of this disease and the tendency of the eruption to appear on other parts, render it, as a rule, easy to distinguish it from pompholyx. The last doubts, however, would be removed if the history of an exposure to the poisonous plant could be obtained in addition.

PROGNOSIS.—The prognosis in pompholyx is good so far as the individual attack is concerned, although there is a tendency for the disease to return with successive years. In some instances the irritation to which pompholyx gives rise has engendered an eczema which may persist indefinitely. On the other hand, the disease may not return for several years, although, upon the return of ill health, it will be very likely to appear again.

TREATMENT.—The treatment should be partly constitutional or general and partly local. The former seems to be of the more importance, as the individual attack is self-limited. First, all debilitating influences should be removed, and as far as possible the patient should be urged to avoid worry, over-excitement, or intense mental labor. General hygienic measures should be advocated, namely, exercise in the open air, cold bathing with vigorous friction immediately thereafter, and diversions of a relaxing nature. Change of location from inland to the seashore, or from the seashore to the mountains, is in some cases highly beneficial. In addition to this the patient should be given a generous diet and in some instances tonics, and the room which he occupies should have a sunny exposure and should be well ventilated. Aside from these general measures individual cases should be treated according to the indications present. Strychnine is a drug which must frequently be called into requisition. Iron, especially in its more assimilable forms, quinine, cod-liver oil, and in some instances arsenic, are valuable drugs.

The local treatment consists partly in soothing applications and partly in such as protect the surface from the air and from the irritation of clothing and other extraneous substances. It is best forcibly to rupture the lesions, especially when large, and flush out the cavity with a saturated solution of boric acid and water. In some cases, when the lesions rupture, black wash may be used. I can also recommend the following application: Salicylic acid 2 per cent., and diachylon ointment q. s. 100 per cent. This should be spread on some firm white cloth and kept constantly applied to the diseased area. Every twenty-four hours the surface of the skin should be cleansed with a saturated solution of boric acid, or with water to which a small quantity of carbolic acid has been added, and a fresh application of the ointment should be made. This ointment is especially valuable when the soles of the feet are involved. Stelwagon⁴ recommends the following: Menthol, gr. ij.; acidi salicylici, gr. x.; emplastri plumbi, emplastri saponis, ãã $\frac{2}{3}$ iss.; petrolati, $\frac{2}{3}$ v. M. The prevention of local infection is one of the main objects in treatment, and, to accomplish this, we may with benefit apply a solution of corrosive sublimate (1 to 2,000) or white precipitate oint-

ment (five per cent.), the latter serving as a parasiticide as well as a protective agent.

William Thomas Corlett.

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PONCE DE LEON SPRINGS.—Crawford County, Pennsylvania. POST-OFFICE—Meadville. ACCESS.—Via Erie Railroad or by Pittsburg, She-nango and Lake Erie Railroad to Meadville (separate depots), thence about two miles to springs.

The Ponce de Leon Springs may be said to be in a process of development. An electric line of railway from Meadville is now being constructed, and a modern first-class hotel will soon be built. The location is very favorable for a pleasant summer resort, being twelve hundred feet above the sea-level and surrounded by picturesque hills. There are six mineral springs, only one of which has been submitted to a qualitative examination. An analysis by Prof. Henry Leffmann, of Philadelphia, resulted as follows: One United States gallon contains: * Sodium sulphate, gr. 0.17; sodium chloride, gr. 0.90; calcium bicarbonate, gr. 1.89; magnesium bicarbonate, gr. 0.47; sodium bicarbonate, gr. 16.73; silica, gr. 0.70. Total, 20.86 grains.

A second analysis by J. Singley, Ph.D., professor of chemistry in the Western Pennsylvania Medical College of Pittsburg, resulted substantially as above. The following gases were also found: Carbonic acid, 1.33 cubic inches per gallon; oxygen and nitrogen, 7.23 cubic inches per gallon; hydrogen sulphide, abundant traces.

The water is a bland antacid and diuretic. It will be found of value in certain stages of Bright's disease, especially when the urine is scanty, high-colored, and irritating. It is also useful in assisting the diminution of calcareous deposits and of uric acid in gout and gravel. The water will speedily relieve acidity of the stomach and heartburn. It is used commercially, and also for the manufacture of a number of temperance beverages.

James K. Crook.

PONS AND MEDULLA. See various articles under Brain.

PONTRESINA. See Engadine.

POPLAR. See Willow.

POPPY.—The principal products of the poppy plant will be found described under the titles of opium and its more important alkaloids. Some minor products are here considered.

Poppy Capsules (Papaveris capsula; Fructus or Capita Papaveris immatura) are more or less employed in medicine for the opium which they contain. Their botanical origin has been fully stated under Opium. For the purposes here considered, they are gathered when nearly ripe and are dried in the sun. They are more or less spheroidal, but vary in the different varieties, from strongly oblate to strongly prolate, and they range from one and one-half to three inches in diameter. The larger ones, and those of prolate form, known as the "black" variety, are generally regarded as superior. The color is pale brown, and the surface nearly smooth. At the summit there are from eight to sixteen, or occasionally twenty short, nearly sessile, recurved stigmas, indicating an equal number of placenta, the latter projecting as sharp ridges upon the inside of the capsule. Partly concealed under the stigmas are a circle of small pores through which the mature seeds escape. The seeds are not a part of the capsule considered as a drug. Numerous constituents have been reported as occurring in these capsules, but from a medicinal point of view they may be regarded as identical with those of opium. The morphine content

* Reduced from grains per imperial gallon.

rarely exceeds a fourth of one per cent., notwithstanding that claims for a much larger yield have been made. The younger the pods the less morphine do they contain.

Poppy capsules were official in the United States Pharmacopœia of 1870, and are still so in the British Pharmacopœia, but their use in the United States has almost entirely given place to that of other and more definite forms and preparations of opium. In Great Britain the syrup is probably the most largely used preparation, and is mostly administered to children, though the extract is also considerably employed. The dose of any preparation should represent from one to two drachms of the capsule.

Poppy seeds possess no narcotic properties whatever, though it is said that traces of morphine can be found in them. They are used purely for their fixed oil, which is an important article of commerce. The oil is quite bland and possesses only the nutritive and demulcent properties of vegetable fixed oils in general.

Poppy Petals, or Red Poppy Petals (Rheadas Petala) are the petals of *Papaver Rheas* L., the common red or field poppy of Europe. They resemble rose petals, but are larger. The color of the fresh petals is a brilliant scarlet red, with a large black spot at the base, but the color becomes pale and dull in drying. They are used entirely for their coloring matter, for the tinting of pharmaceutical preparations, and hence are greatly preferred in the fresh condition. The coloring matter is divisible into two portions: *rheadinic acid*, which is dark red, soluble in both water and alcohol; and *papaveric acid*, which is of a brilliant red, soluble in water but not in alcohol. An alkaloid (*rheadine*) exists in very small amount, but is unimportant. It is said that a trace of morphine has been extracted, but the article can scarcely be regarded as medicinal.

Henry H. Rusby.

POROKERATOSIS.—(Synonyms: Hyperkeratosis eccentrica, Keratoderma eccentrica, Hyperkeratosis figurata centrifuga atrophicans, Porokeratose.)

DEFINITION.—A unique form of hyperkeratosis, beginning as a small papule. This papule having slowly enlarged becomes depressed at the centre, and its margin usually develops into a ridge involving a rift and defining an area of varying extent.

In 1887 Maiocchi reported a case, marked by a singular appearance of the skin, which he diagnosed as a form of ichthyosis hystrix. After a lapse of six years the same case was brought to the notice of Mibelli, who pronounced the lesion exceptional and peculiar, claimed that the pathological process was distinctive, and finally characterized the affection by the name of porokeratosis. Simultaneously with the observation by Mibelli, an article was published by Respighi describing a number of similar cases under the name of hyperkeratosis eccentrica. The disease has been especially observed in Italy, particularly in the district of Parma. Cases occurring in the United States have been reported by Hutchins, Gilchrist, and Wende. A few cases have been noted in Germany, France and, very recently, in England.

SYMPTOMS.—The disease is of slow development, first

appearing as a papule of varying size, dirty brown, dry, and invariably surrounded at the base by a collarette of scales. As the papule increases it takes on a decided change. The lesion, the periphery of which is subject to a gradual development, extends centrifugally; the central portion becomes slightly depressed, and the margin resolves itself into a unique border which represents a non-inflammatory hypertrophy, sharply defined against the outlying sound skin, and forming a continuous or broken ridge. In the middle of this ridge is found a rift somewhat irregularly dividing the same into two lateral halves, all of which constitutes a lesion unlike any other known, and which has been characterized as a "seam," "dike," or "wall." It is dirty gray or blackish in color and usually quite pronounced, though in ill-defined cases it may appear simply as a loose rim of epidermis. The

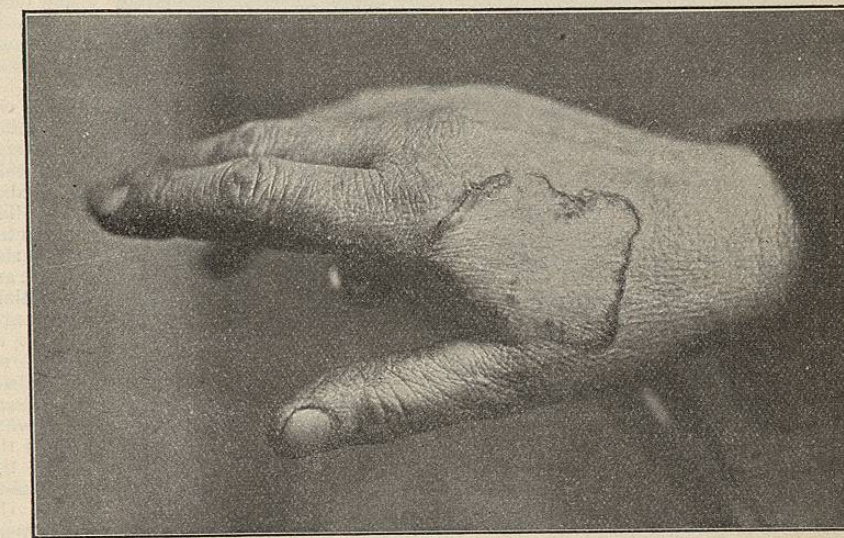


FIG. 3876.—Case of Porokeratosis of Five Years' Standing. The affected area is bounded by the characteristic rifted ridge. The lesion shown here was the only one present in this case. (From Grover W. Wende's collection of photographs of skin diseases.)

centre, so long as the lesion is small, consists of a horny, thickened, epidermic patch. After the lesion has attained a certain size the centre may become normal in appearance. Sometimes the natural furrows of the skin are erased; again, there is clear evidence of atrophy. The functions of the sweat and sebaceous glands are interrupted. In some areas absence of hair is observed. Epidermic concretions, the size of a millet-seed, are sometimes present, now divided by the furrow, again attached to the inner side of the seam; or they may appear at any point within the affected area.

The areas affected by hyperkeratosis vary in size—many do not measure over one-eighth of an inch in diameter, while some become much larger and may even cover the greater portion of an extremity. As a rule, they do not exceed an inch in diameter, and in the majority of cases they are much smaller.

The lesion is always slow in development; at times the condition remains stationary. The shapes assumed are round, oval, or elliptic; they may become polycyclic by confluence or may all run together, especially when their dimensions are greatly increased.

The lesions often affect the mucous membranes lining the mouth. All or any part of the skin may be attacked. The favorite regions, however, are the face—especially the nose, forehead, and cheeks—the ears and neck, the dorsal surfaces of the hands and feet, and the extensor surface of the forearms.

The lesions of the mouth are generally not very numerous, although present in a large number of cases. They consist of small asymmetrical spots varying from