It was first described as occurring only in Cauca, one of the United States of Columbia. A few cases have been reported in Germany and one in this country. It is characterized by the appearance of from one to ten small, dark-colored, very hard and gritty nodes along a hair. When the hair affected by the disease is combed or shaken, the nodes rattle together like stones. This gave the disease its name, which in the Spanish language means stone. The hair itself is unaffected, the nodes being simply attached to it. Women are most commonly affected, men only exceptionally so, and then it is their beards.

ETIOLOGY.—It occurs in warm countries and is a fungous growth. Microscopical examination shows that the nodes are composed of a mass of pigmented spore-like bodies arising from one cell that sends out columns radially in all directions.

DIAGNOSIS.—It differs from the other diseases of the hair in which nodes form, such as trichorrhexis nodosa, in that the hair itself is unaffected. Its nodes differ from the nits of pediculi in their dark color, and in their not being placed on one side of the hair.

TREATMENT.—The nodes can be readily removed by soaking them with a hot solution of bichloride of mercury 1 to 1,000. They can be combed off or pulled off when softened. *George T. Jackson.*

PIGMENT. (PATHOLOGICAL.)—The pigments found in the human body, either under normal or under pathological conditions, are formed either by the body cells themselves (*intrinsic or autochthonous pigment*), or are derived from the bile (*hepatogenous pigment*) or the blood (*hæmatogenous pigment*), or are foreign pigments which are deposited within the body from without (*extrinsic pigment*). The last named may enter the body through the respiratory or the gastro-intestinal tract, or through wounds; or, as in the case of malarial pigment, they may be formed inside the body by the activity of the cells of parasites.

Pigment.	1. Autochthonous..	Melanin.
		Lipochrome.
		Hæmofuscin.
	2. Hepatogenous ..	Bilirubin.
	3. Hæmatogenous .	Hæmatoidin.
		Hæmosiderin.
	4. Extrinsic	1. Carbon.
		2. Silver.
		3. Lead.
		4. Tattoo.
		5. Malarial pigment.
		6. Various dusts.

1. AUTOCHTHONOUS PIGMENTS.—*Melanin* is found normally in the cells of the rete and in the choroid. It is believed by the majority of writers to be a product of specialized connective-tissue cells (chromatophores), which in the skin lie just beneath the cells of the rete, in the upper layers of the tissue of the dermis. These cells contain fine yellow or brownish granules of melanin, or their protoplasm may be diffusely stained with the pigment. Protoplasmic processes containing the pigment extend from the chromatophores into the epidermis, between the epithelial cells of the rete, and it is believed that the pigment is transferred to the epithelium by means of these processes. The chromatophores are most numerous normally in the skin of the flexor surfaces, about the nipples, external genitals, and anus. They are more abundant in dark-skinned individuals than in those having a light skin. The chemical nature of melanin is not known; it is a nitrogenous body rich in sulphur, and is believed to be a product of the combination of certain split products of albumin that contain sulphur. It does not give a reaction for iron. It is not a derivative of hæmoglobin, but is either built up by cell activity from the end products of albumins circulating in the blood or is formed by the cell from its own albumin.

A physiological increase of melanin occurs during pregnancy, particularly about the nipples, external genitals, and in the median line of the abdomen (linea fusca, chloasma uterinum). This pigmentation is especially pronounced in brunettes. In freckles, tan, lentigines, pigmented moles and warts, etc., the pigmentation is due to an increased formation of melanin by the chromatophores. In various cachexias, but particularly in Addison's disease, there is a greatly increased production of melanin, to such an extent that the individual may become very dark. Melanin may also be formed in excess in or about scars of the skin caused by various skin lesions or eruptions. From an abnormal proliferation of the chromatophores a pigmented sarcoma (melanotic sarcoma) may arise. The cells of these growths produce melanin in great excess, so that their color is usually brown or black. Their metastases, wherever produced, likewise form melanin. Such metastases occur most frequently in the liver; and they often overshadow the primary tumor, which may be of insignificant size, often originating in a small pigmented mole. The excessive production of melanin by sarcoma cells is of the nature of a degeneration; with the formation of the melanin the cells die.

Lipochrome is the coloring matter of fat tissue, corpora lutea, ganglion cells, epithelium of the seminal vesicles, and of the greenish-colored sarcomata known as chloromata. Its chemical nature is not known. It does not contain iron, and is colored black by osmic acid.

Hæmofuscin is the yellow or brownish granular pigment found in heart muscle, striped muscle, and in the unstriped muscle of the gastro-intestinal tract, vas deferens, seminal vesicles, etc. The pigment found in the cells of the glands of the stomach and intestine, as well as in the cells of the lachrymal, mucous, and sweat glands, is by some writers regarded as identical with hæmofuscin, by others as belonging to the melanin group. Its sulphur content favors the latter theory. Hæmofuscin does not give the iron reaction. In atrophic conditions of muscle, particularly when following hypertrophy, the amount of hæmofuscin is either relatively or absolutely increased. The color of such muscle may become a deep brown. This is not infrequently seen in the case of atrophy of heart muscle in failure of compensation for valvular disease (brown atrophy of the heart). Microscopically, the pigment is found to consist of fine yellow granules arranged at the poles of the nuclei, in the form of a cone, the base of the cone toward the nucleus. In all cases the presence of a notable amount of hæmofuscin in muscle cells is to be taken as an evidence of degeneration (pigment atrophy).

HEPATOGENOUS PIGMENT.—*Bilirubin* is found as a pathological pigment in the tissues in icterus. As a result of the appearance of bile pigment in the blood, the skin, conjunctivæ, the internal organs, serous membranes, subcutaneous tissue, blood plasma, urine, etc., are stained yellow in mild or recent cases; but in jaundice of long standing the color may be an olive-green or a deep bronze. The bile pigment gains entrance to the circulation as a result of obstruction to the outflow of bile through the biliary vessels, or through changed conditions of the liver cells brought about by intoxication, infection, or through nerve influences, whereby the secretion of the liver cell, instead of passing into the bile capillaries, passes into the blood. Carried through the body by the circulating blood, the bilirubin gives to all of the tissues a diffuse yellow color. After a time granules of bilirubin collect in the lymph spaces and in the tissue cells themselves, and particularly in the lymph glands, spleen, and bone marrow. In the cells of the connective tissue, liver, and kidney, rhombic plates and needles of bilirubin may sometimes be found. In the kidneys the cells of the convoluted tubules are stained with bile pigment, and in the collecting tubules yellow, brown, or greenish casts are found. The presence of the casts is due to the degenerative processes set up in the cells secreting the bile pigment. In icterus there constantly occurs a deposit of hæmosiderin in connection with the bilirubin, as a result of the destruction of red blood cells by the bile acids.

HÆMATOGENOUS PIGMENTS.—The pigments arising from the destruction of the red blood cells may be classed in two groups: one containing iron, *hæmosiderin*, and one not giving the iron reaction, *hæmatoidin*. The exact chemical nature of these pigments is not known, and the terms *hæmatoidin* and *hæmosiderin* represent groups of related pigments rather than individual pigments. The deposit of derivatives of blood pigment is known as *hæmachromatosis*, that of *hæmosiderin* alone, as *hæmosiderosis*. Hæmatoidin and hæmosiderin in all cases are derived from the destruction of hæmoglobin, either in extravasates or in the circulating blood. *Hæmatoidin* is regarded as identical with bilirubin. It is a ruby-red or reddish-yellow granular or crystalline pigment, soluble in absolute ether, chloroform and carbon disulphide, and insoluble in water and alcohol. With potassium ferrocyanide and hydrochloric acid it gives no reaction for iron. Hæmosiderin occurs in yellowish or brownish granules, which when treated with potassium ferrocyanide and hydrochloric acid give the Prussian blue reaction. With ammonium sulphide it forms a black sulphide of iron. After a time hæmosiderin may lose its iron reaction and become changed to hæmatoidin.

Hæmatoidin is formed when the blood pigment is but little exposed to the action of living cells, as in the central portions of thrombi, or in large extravasates in the tissues, or in extravasates lying in the body cavities. It may be produced artificially by enclosing blood clots in capsules which admit the tissue juices but not the wandering cells, and by introducing such capsules into the peritoneal cavity or beneath the skin.

Hæmosiderin is formed in extravasates, in those portions exposed to the action of living cells, and is usually found around the periphery of thrombi and extravasates, in the area of organization. The pigment may lie free in the tissue, or may be contained within cells. The free pigment and that contained within phagocytes give rise to a pigmentation of the tissue about the extravasate, varying from a light yellow to a deep brown. After hemorrhage into the lung alveoli both hæmatoidin and hæmosiderin granules may be found in the sputum, either free or in phagocytes (pigment cells).

Both *hæmatoidin* and *hæmosiderin* may be carried from the seat of extravasation to the lymph glands and there deposited. Soluble blood pigment in the circulation is deposited partly as hæmatoidin and partly as hæmosiderin, in the spleen, bone marrow, lymph glands, liver cells, and kidney cells; and under certain conditions in the parenchymatous cells of various organs. The greater part of the pigment thus deposited gives the iron reaction, and therefore is to be classed with hæmosiderin. Such deposits of iron-containing pigment occur in pernicious anæmia and pernicious malaria, in poisoning with arsenic, toluylendiamin, potassium chlorate, mushrooms, etc., in overheating of the body, etc. As a result of the destruction of the red cells there occurs a hæmoglobinæmia; an increased amount of bile is formed, and there is an increased excretion of urinary pigment. In the kidneys the hæmosiderin is found chiefly in the cells of the convoluted tubules. In pernicious anæmia the hæmosiderin is found in greatest abundance in the liver cells of the peripheral portion of the liver lobules. Around the central vein the liver cells may contain hæmatoidin. The endothelial cells of the liver capillaries also contain the pigment; in the early stages of the process the pigment may be found only in these, later it is transferred to the liver cells.

If hæmosiderin comes into contact with hydrogen sulphide it becomes changed into a black hæmosiderin hydrogen sulphide. This condition is known as *pseudomelanosis*. It is usually seen after death in the intestinal canal, peritoneum, and suppurating wounds, but its production is dependent upon a formation of hæmosiderin in the tissues before death. It may take place in the living body as the result of hydrogen sulphide produced by bacteria. The green color seen in the early stages of the decomposition of the cadaver is due to a sulphur compound of methæmoglobin, produced by the action of H_2S on oxyhæmoglobin.

A peculiar brown or black pigmentation of cartilage, tendons, and the capsules of the joints occurs in old people, and occasionally in younger individuals. The condition is known as *ochronosis*. By some the pigment is regarded as allied to melanin, by others as a derivative of blood pigment. Neither its chemical nature nor its mode of formation is known. A similar pigmentation of cartilage may be produced by formalin.

EXTRINSIC PIGMENTS.—*Silver* taken into the body as a soluble salt (silver nitrate) is reduced by the cells of the blood-vessels and deposited as free silver or a low oxide in the connective tissue of the kidneys, intestine, skin, intima of large arteries, adventitia of the smaller ones, choroid plexus, etc. The epithelial structures and nervous tissue are alone spared. The pigment appears in the tissues in the form of fine black granules, lying in or between the connective-tissue cells. The condition is known as *argyria*. (See *Argyria*.) *Lead* may be deposited as a grayish-black discoloration of the gums, consisting of granules of sulphide of lead. *Iron* may be taken into the body in excess and deposited in the bone marrow, spleen, and lymph glands (*siderosis*), but this is rarely of a noticeable extent. In iron workers the lungs may acquire a reddish tinge from the deposit of iron-oxide dust. *Carbon* is the most common of the extrinsic pigments. It is usually taken into the body through the respiratory tract and deposited in the connective tissue of the lungs and in the peribronchial lymph glands (*anthracosis*). Under certain conditions, such as softening or tuberculous cascation of the bronchial glands, the carbon pigment gets into the general circulation and is deposited in the spleen, bone marrow, lymph glands, liver, etc. It occurs in the tissues as a deep grayish-black, coarsely granular pigment. *Colored dusts* from pottery clays, pigments, etc., may be found in the respiratory tract of individuals following certain trades. Various *pigments* may be introduced into the body in tattooing. Cinnabar and India ink are most commonly used. The pigment occurs in the connective tissue of the dermis as coarse black granules. The greater part of the pigment introduced into the wound of the skin is carried to the lymph glands, the remaining portion lies in the spaces of the scar tissue formed. As the pigment is constantly removed by wandering cells the outlines of tattoo marks slowly become indistinct. Carbon may enter the body through wounds of the skin: powder marks, cinders rubbed into cuts, etc. Silver particles may also enter the body through the skin or respiratory tract. *Malarial pigment* is a brownish-black pigment formed by the cell activity of the malarial plasmodium. It does not give an iron reaction. By some writers it is incorrectly called melanin. Its chemical nature is wholly unknown. It collects in the small capillaries of the body and is taken out of the circulation by the endothelium and also by wandering cells, and transferred to the tissue cells, chiefly in the spleen and bone marrow.

PATHOLOGICAL ABSENCE OF PIGMENT.—A failure of melanin production leads to the conditions known as *albinism* or *vitiligo*. The absence of pigment may be congenital or acquired. A lack of pigment throughout the skin of the entire body is known as *albinismus universalis*; in certain regions only as *albinismus partialis*. The hair may also be destitute of pigment (*leucotrichia*); and in universal albinism the pigment of the choroid and iris is also wanting. Acquired *vitiligo* is a condition characterized by a loss of pigment over certain portions of the skin, following scarlet fever, typhoid, or recurrent fever; or occurring as an epidemic disease without known cause. Idiopathic cases also occur. With the loss of the skin pigment may be associated a *leucotrichia acquisita*. Vitiligo appears to depend upon an atrophy of the chromatophores; its exact nature is unknown. It may depend upon a disturbance of adrenal function, or of the sympathetic system. A third form of absence of pigment follows infectious inflammations of the skin, leprosy, syphilis, etc.; and is known as *leucoderma*. The

skin covering the scars produced by these diseases loses the power to produce pigment. This may be explained by a disappearance of the chromatophores, or by the inability of the epithelium to take up the pigment. The non-pigmented portions are not infrequently surrounded by a heavy pigmented border. (See *Coloring Matter, Argyria, Vitiligo, etc.*) *Aldred Scott Warthin.*

PILOCARPUS. See *Jaborandi.*

PINEHURST AND SOUTHERN PINES, N. C.—Pinehurst, six hundred and thirty feet above sea level, is situated in the "Pine Belt" of North Carolina, not far from the centre of the State, about seventy-five miles southwest of Raleigh. It is a comparatively recent creation, an attempt by one person to establish a model health resort in a favorable climate.

It embraces about five thousand acres, privately owned, and under the absolute control of the owner. Much labor and expense have been bestowed upon this enterprise; the grounds have been carefully laid out by landscape architects, and every attention has been paid to the sanitary conditions, sewerage, water supply, plumbing, etc., so that one is assured of finding here most wholesome hygienic surroundings and excellent accommodations. Consumptives, however, are not received, the desire evidently being to provide a winter resort for the large number of persons who, though not ill, desire to spend the winter in a comparatively mild and equable climate where they can remain for the greater part of the time out of doors.

Invalids are also received here, according to the writer's understanding, suffering from diseases other than tuberculosis. The soil of all this upland region is sandy, quite resembling the dry sand on the edge of the seashore, in which soil the long-leafed pine flourishes. Pines and sand comprise the scenery, but this lack of variety has its compensation in the abundant sunshine and bracing air. Moreover, the peacefulness of such surroundings must be restful to tired nerves.

The average winter temperature ranges from about 44° to 65° or 70° F., said to be about that of Southern France. In January, 1902, the maximum temperature was 72° and the minimum 20°, while in Philadelphia it was 54° and 15° respectively, and in Boston 54° and 4° F.

There is a large amount of sunshine, and one can generally spend most of the time out of doors. In the Piedmont Plateau which embraces this region, the annual average rainfall is 49.85 inches, and for the winter 12.28 inches. Snow is said to appear about once in two years, but remains only for a few hours. January is the coldest month; there may then be frosts at night and thin ice may coat the ponds. Spring begins by the middle of February. Protection is afforded from the cold northwest winds by the Apalachian range and by the pine forests. Naturally there is little to attract the visitor in this monotony of sand and silent, dark pines, but art has done much to make life attractive here. There are extensive golf links and a club house; shooting preserves for quail; horseback riding, tennis, croquet, etc. There are several hotels of varying prices, and furnished cottages for rent. The water is obtained from artesian wells and is pure and good. All the conditions of modern living are found here, and every attention seems to have been given to the maintenance of a high standard of sanitary excellence. Pinehurst has electric railroad connection with Southern Pines, six miles distant, which is on the Seaboard Air Line Railroad. It is a journey of eighteen hours from New York to Pinehurst.

Southern Pines, about six hundred feet above sea-level, is six miles distant from Pinehurst, and possesses similar conditions of climate, soil, and vegetation. It is situated upon a large sand bank, and is surrounded by the characteristic pine.

It is a comparatively new town of about one thousand inhabitants, and is essentially a winter health resort largely made up of Northern inhabitants or visitors. It has more of the features of a town than Pinehurst, there being several churches, shops, a graded school, library, electric lights, a trolley line, good water supply, and a sewerage system. There are several hotels of varying accommodations and prices, furnished cottages, apartments, and boarding-houses. Tuberculous patients are generally received here, although at the largest and most pretentious hotel, the "Piney Woods Inn," the statement is made that "confirmed consumptives will not be cared for."

Opportunities are afforded for various outdoor diversions, such as golf, tennis, driving, bicycling, and small-game shooting.

It is said that several thousand visitors frequent this resort during the winter season, and it can be recommended, especially for those of moderate means and requirements who desire to live with their families in one of the many small cottages which can be obtained at a moderate rental.

Several miles south of Southern Pines is Pinebluff, which is being developed as a health resort.

The air in all this pine-belt region is pure and dry, and impregnated with the balsamic emanations of the pines. It affords favorable conditions for many cases of tuberculosis and bronchitis, for convalescents from acute diseases, and for those suffering from chronic nephritis. This region is also a convenient halting place for those going to or returning from the lower South.

The season is from November to April.

Edward O. Otis.

PINE LAWN SPRING.—Bergen County, New Jersey.—Post-Office.—Hohokus.

The Pine Lawn Spring water, recently introduced into the markets, is obtained from an artesian spring at Hohokus, twenty-three miles from New York City. The place is not used as a resort, but we are informed that residents of the neighborhood attach considerable medicinal value to the water and use it in large quantities. The following analysis was made in 1897 by Messrs. Smith and De Roode, chemists of New York:

One United States gallon contains: Potassium sulphate, gr. 0.06; sodium chloride, gr. 0.43; sodium sulphate, gr. 0.32; calcium sulphate, gr. 0.49; calcium nitrate, gr. 0.66; calcium carbonate, gr. 2.04; magnesium carbonate, gr. 0.72; alumina, a trace; silica, gr. 0.57. Total, 5.29 grains.

The water is exceptionally free from organic matter, and presents no evidence of surface pollution. It is clear, palatable, and sparkling, and well adapted for the table. *James K. Crook.*

PINGUECULA. See *Conjunctiva, etc.*

PINKROOT.—*Spigelia* (U. S. P.). The dried rhizome and roots of *Spigelia marilandica* L. (fam. *Loganiaceæ*).

This is a perennial herb, with a horizontal, twisted rhizome, and several erect, simple, somewhat quadrangular stems. Leaves opposite, sessile, ovate-lanceolate, smooth. Inflorescence terminal in a one-sided (scorpioid) spike, of half a dozen or more showy flowers. Calyx small, five-parted; corolla tubular, trumpet-shaped, with five acute, spreading lobes; bright scarlet outside, bright yellow within. Stamens five, inserted on the corolla; pistil single; ovary two-celled, several-seeded, superior. Pinkroot is a native of the Middle and Southern States, where large quantities are annually collected. Its medicinal properties have been known for upward of a century.

The description of the drug is as follows:

The rhizome is of oblique and sharply tortuous growth, somewhat branched, mostly 2.5–5 cm. (1–2 in.) long and 2–4 mm. ($\frac{1}{12}$–$\frac{1}{6}$ in.) thick, knotty from the approximate stem bases of the upper surface, which bear cup-shaped scars, dark brown or blackish, thickly clothed underneath and at the sides with long, rather coarse, finely branched, lighter brown roots, which are usually broken shortly, not leaving a long, bare, woody central portion; brittle, showing a whitish wood and a dark or decayed

pith; somewhat aromatic; taste sweetish, bitter, and somewhat pungent.

The larger, lighter-colored rhizome of *Ruellia*, sp., with fewer coarse roots, from which the bark readily separates, is frequently substituted or admixed.

But little is known of the constituents of this drug. Starch, resin, gum, tannin, fat, volatile oil, and other ordinary plant substances exist, together with a small

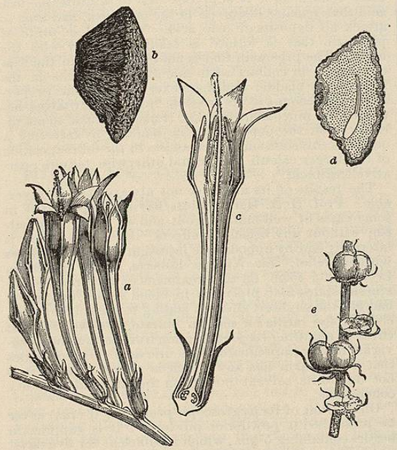

Fig. 3808.—Pinkroot. *a*, Twig with blossom; *b*, grain centre; *c*, section of flower; *d*, section of grain; *e*, fruit. (Baillon.)

amount of the volatile alkaloid *spigeline*, which is soluble in alcohol and water, and is probably the active constituent.

Action and Use.—In overdoses spigelia is a narcotic poison. Quickening of the pulse, dryness of the throat, flushing and heat of the skin, uneasiness and delirium have followed its use. There is little doubt that in the cases in which it is most employed,—cases of *lumbrici* or round worms,—it is of considerable value. A fluid extract (*Extractum Spigeliæ Fluidum*, U. S. P.) is a good preparation, and the one generally prescribed. It is frequently combined with senna or some other cathartic. Dose of the fluid extract, for an adult, 2–8 c.c. (fl. ʒ ss.–ij.); for small children, from 1 to 4 c.c. (fl. ʒ ¼ to i.).

Allied Plants.—Another Spigelia, *S. anthelmia* L., growing in South America and the West Indies, has, as its name implies, similar properties and uses. Although used chiefly in its home, it has also been introduced into Europe. It is regarded, probably correctly, as more active than our own. *Henry H. Rusby.*

PINTA.—(Synonyms: Carat, Carate, Carathe, *Mal de los pintos.*)

Pinta is a parasitic disease characterized by the appearance on the skin of spots and patches of various sizes and colors.

Until recent times the disease had been observed only in Central America, Mexico, and South America, but lately reports have been published of its occurrence in Africa. It is said to be most common in the Mexican States of Tabasco and Chiapas, but it is also quite prevalent in Peru, Bolivia, and Brazil. In Venezuela and Colombia, along the low-lying banks of the rivers Zulia and Magdalena, the affection is quite in evidence. The half-breeds, mulattoes, and mestizos that make up the bulk of the laborers and crews of vessels plying these waters seem to have a peculiar susceptibility to the disease, or perhaps their skins offer less resistance to its inroads than the skins of the pure whites or pure negroes. I have often seen on these river boats as many as a half-dozen cases on a single vessel. So common is the trouble that it soon ceases to awaken interest in the average passenger.

The dorsal surfaces of the hands and feet, the anterior aspect of the legs, and the surface of the chest are the parts most often affected. The disease attacks both sexes and all ages, although it is seldom seen in children under six years of age. Like other diseases of a similar nature, it seems to have a preference for people of unclean habits, filth apparently having a direct bearing not only on the persistence but perhaps on the very existence of the affection. For this reason it is rare in the better class of mestizos and native whites.

The color of the patches may be red, blue, black, or white; hence the Spanish names rojo, azul, negro, blanca, etc. The size of the individual patches is quite variable. The disease first appears in one or two small spots which tend to increase along their periphery and merge into one another; it also extends by auto-inoculation in the act of scratching.

Some observers claim that the victims of this disease emit an offensive odor. One compares it to the odor exhaled by a mangy dog, another compares it to that of dirty linen. Personally I have never been able to detect this peculiar smell apart and distinct from the naturally offensive emanations from a body and clothes that have never been subjected to the action of soap and water.

Symptoms.—The general health is not affected in this disease. Dr. Freites, of Venezuela, states that he has observed as prodromal symptoms chills, headache, anorexia, etc., but, so far as I know, no other observer has had a similar experience. The eruption appears suddenly as one or two small spots, at first slightly elevated above the surrounding surface. It progresses slowly and may even remain stationary for a variable period—the quiescent stage. This may be followed by a period of activity when the patches extend peripherally or appear on other parts of the surface, being the result of auto-inoculation, in the act of scratching. Pruritus may be excessive, even to the point of interference with sleep, or it may cause little or no annoyance. Desquamation is as a rule of a furfuraceous character, varying in quantity from almost *nil* in the white to a relative abundance in the red and black forms of the disease; in some cases of the latter variety it occurs in thick crusts. Suppuration and bleeding are due to the injuries inflicted by scratching. After a period of variable duration some of the spots merge into one another, giving the patient the characteristic piebald appearance.

The above symptoms are common to all forms of the disease. A few additional words regarding each variety of the disease would perhaps make the matter clearer.

White Form.—This looks very much like an ordinary leucodermic patch. The color is like that of yellowish-white wax, and the surface of the patch is smooth and shiny. When this form attacks the hairy portions of the body the hairs become thin, like lanugo, and lose their pigment.

Red Form.—This at first looks as if the surface had been scalded; later the affected portions become bright red and smooth. As the pruritus in this form is usually more intense, it is the one most liable to suppuration and other accidents due to traumatism.

Blue Form.—The eruption appears first as a group of small blue spots, like those made in tattooing; sooner or later these spots extend and merge into one another, the whole patch then having a peculiar blue color, which I would compare to the blue shell of a duck's egg. These patches are covered by a thin layer of dust-like grayish-blue scales.

Black Form.—In this form the spots are at first of a dirty gray color, which gradually becomes darker as the spots themselves grow older and larger. Eventually, the area affected resembles nothing so much as a surface

spread with a layer of blue ointment. Another division that has been made recognizes a superficial form, including the blue and the black forms, and a deep form, embracing the white and the red varieties, in which there is destruction of the deeper underlying tissues. Several of these forms may and do occur together in the same individual.

PATHOLOGY.—"The scales contain a white, highly refracting mycelium, and black spores which are round or oval in shape. The spores contain a yellow fluid in which abundant pigment is found. The mycelial filaments are short, non-branching, and taper from a broad base to a blunt point, by which each filament is attached to a single spore" (Manson).

DIAGNOSIS.—Pinta may be distinguished from anæsthetic leprosy by the facts that the sensibility of the patches is not impaired, and that the mucous membranes are not attacked; from acquired leucodermia or vitiligo by the fact that in the latter there are no changes of structure or of sensibility in the affected skin. From chromophytosis, ringworm, and erythrasma pinta may be distinguished by the history of the disease and the color and localization of the lesions.

PROGNOSIS.—As to life the prognosis is very good, but the disease is very rebellious to treatment; and in spite of all treatment it usually lasts a long time.

TREATMENT.—Absolute cleanliness and the local applications of chrysophanic acid, sulphur, iodine, the salts of mercury; in fact, all the stronger parasiticides are indicated. *N. J. Ponce de Léon.*

PIPERAZIN (*Diethylene-Diamin. Ethlenimin*). — A synthetical compound primarily intended to replace spermin, but found to be a different body, both in chemical and in physiological characters. It is now utilized only as a solvent for uric-acid deposits in the place of lithia salts.

It is formed from the action of ammonia on ethylene bromide, which produces a mixture of compounds from which diethylene-diamin is separated by fractional distillation at a temperature between 130° and 180° C. When separated by a patented process it is supplied to the profession under the name of piperazin. It is a solid which melts at 104° to 107° C., and boils at 145°. It forms in bright, lustrous tables. When exposed to the air it absorbs water and carbonic acid gas, and becomes liquefied. It is very soluble in water, and forms a tasteless, alkaline solution without being in the least corrosive.

Experiments with solution of piperazin upon uric acid and upon calculi formed either of uric acid or of uric acid with phosphate of lime, prove that it exerts a powerful solvent action. When placed in a one-per-cent. solution at a temperature of 90° F., the stones are rapidly acted upon, the sharp edges are removed, and the surface becomes smooth and slippery; within twenty-four hours the mineral portion is dissolved and a soft mucoid skeleton only remains. All forms of urinary deposits are said to be more or less acted upon. Compared with carbonate of lithium it dissolves twelve times as much uric acid. Tests have been made of the relative solubility of fragments of a stone in one-per-cent. solutions of piperazin, lithia carbonate, borax, and sodium carbonate. In the piperazin solution the fragment was dissolved in six hours, the lithia solution did not dissolve the fragment until after forty-eight hours, the borax dissolved only a very small portion in forty-eight hours, and the sodium solution had no effect whatever after the lapse of the same period of time. In each case the residue was placed in the piperazin solution, when it entirely disappeared.

The action of the drug when administered to a person in health is perfectly harmless. It does not disturb the digestive, circulatory, or respiratory organs. After its administration and absorption it is not decomposed or acted upon, but passes through the system and is excreted by the kidneys unchanged. Piperazin may be detected in the urine two hours after its administration, and it continues to be excreted for a prolonged period. The urine is not rendered alkaline, nor in any way altered by its prolonged use.

Piperazin is theoretically a very valuable drug for the treatment of all conditions in which uric acid is formed in excess. Numerous cases are reported in which it has been used with very marked success—in gout in all its forms, in lithiasis, renal calculi, and vesical calculi, and in many forms of rheumatism of a gouty character. In these conditions it is supposed first to saturate the uric acid that remains dissolved in the organism, and then to attack all deposits of uric acid. The soluble urate of piperazin that is formed is readily excreted with the urine. The piperazin that is not neutralized in the system comes in contact with calculi and deposits in the kidney and bladder and there exerts its specific properties. On account of its freedom from any irritating action on the mucous membrane, it may be made to act directly upon the deposits in the bladder, by injecting a one-per-cent. solution, which assists in the decomposition of the larger calculi that would otherwise require operative treatment.

The results of its use have not always been so favorable. Prof. H. A. Hare reports having employed it in some cases of well-marked gout and in gouty rheumatism without any beneficial effects. He administered it internally and by hypodermic injection in the usual doses without relief. Sir William Roberts, in the "Croonian Lectures for 1892," on the treatment of the uric-acid diathesis, states that piperazin in blood serum or synovia had not the slightest effect in adding to the solvent powers of these media on sodium biurate, nor the slightest effect in retarding its precipitation from serum and synovia artificially impregnated with uric acid. He concludes that if piperazin has any beneficial action in gout it is not due to its solvent powers on the material of gouty concretions.

On account of its hygroscopic properties it must never be prescribed in powder or pill form. It is supplied in bottles containing 5 gm., which is sufficient for five days' use. This is to be dissolved in a definite quantity of water, and one-fifth given each day in divided doses. The quantity employed by all observers has been 1 gm. daily, in solution, well diluted. The effects of the drug are rapidly manifested. After the subsidence of the attacks a smaller dose of eight to fifteen grains may be given every third day, and continued for months. When administered hypodermically, fifteen minims of a ten-per-cent. solution may be used. The injections are to be made in the neighborhood of the affected joints. The drug is to be given internally at the same time. The effects of this method are reported to be very gratifying; the swelling and pain subside and the deposits are absorbed and greatly reduced in size. In some cases it is reported that deposits of gouty material in the pinnæ of the ears and in the eyelids were removed by two or three injections. The following solution is also prepared for local application to the affected joints: Piperazin, gr. xv.–xxx.; alcohol, ʒ v.; water, ʒ iiss.

Beaumont Small.

PIPERONAL—heliotropin, methylene ether, protocatechuic aldehyde, $C_6H_3.COOH.O.CH_2$—occurs in small white crystals with a strong odor of heliotrope, and is soluble in alcohol and ether and insoluble in water. In dose of 0.5–1 gm. (gr. viij.–xv.) it is antiseptic and antipyretic. It is also used in perfumery.

W. A. Bastedo.

PIPSISSEWA. *Chimaphila. Bitter* or *False Wintergreen, Prince's Pine.* "The dried leaves of *Chimaphila umbellata* (L.) Nutt. (*Pyrola u.* L.; *C. corymbosa* Pursh. —fam. *Pyrolaceæ*)."

This very pretty little plant, native of dry woods throughout the cooler regions of almost the entire North Temperate Zone, is an herb-like undershrub, having an erect stem a few inches in height, arising from a short, prostrate portion. The leaves are crowded near the ground and the scape bears several very pretty, five-

merous, wax-like, white, subpendulous flowers, about a half an inch broad. The leaves are from 2.5 to 5 cm. (1 to 2 in.) long and 1 to 1.5 cm. (⅜ to ⅝ in.) broad, oblanceolate, the lower half cuneate and entire, the upper coarsely and sharply serrate, acute or obtusish, thick and rigid, brittle, above dark-green or brownish-green, and slightly shining, the veins strongly impressed, underneath paler, the veins very prominent; odor very slight, tea-like; taste astringent and bitterish.

Their constituents are almost identical (as are the properties and uses) with those of *Uva Ursi*. There is between four and five per cent. of tannin, arbutin, sugar, gum, etc., and a small amount of the yellow, crystalline, neutral substance, *Chimaphilin*, which is inodorous and tasteless, soluble in alcohol, ether, and chloroform, but only slightly soluble in water. For its mildly astringent and diuretic properties and uses, see *Uva Ursi*. The Pharmacopœia provides a fluid extract, the dose of which is 2 to 4 c.c. (fl. ʒ ss. to i.). *Henry H. Rusby.*

PITCH, BLACK.—Common pitch. See *Turpentine.*

PITCH, BURGUNDY.—*Pix Burgundica* (U. S. P., B. P.); *Poix de Bourgogne, Poix des Vosges, Poix jaune* (*Codex Med.*). This opaque resin is nominally, and properly, obtained in Europe from the Norway spruce, *Abies Abies* (L.) Rusby (*Pinus* A., L.; *P. Picea* Du Roi—fam. *Pinaceæ*), a magnificent evergreen with a pyramidal head reaching 40 metres or more in height, and having branches even down to the very ground. Its cones are large and pendent, its foliage is close, and of a brilliant green color. It is an abundant forest tree of Northern Europe and Asia, and a frequent ornamental one here.

Burgundy pitch is not an empyreumatic product like common black pitch, but a turpentine which has been exposed to hot water or steam, and has in consequence taken up enough of it to become opaque. It is collected by making rather deep incisions in the trunks of the trees, scraping off the resinous sap that flows out, boiling it in water, and straining it through cloths. The collection is carried on in Austria and Switzerland, but not to a very great extent, and is diminishing. In the place of this genuine article, the turpentine of other European Pinaceæ, prepared in the same way, is frequently substituted, and is sanctioned in most countries; and besides this, an entirely spurious preparation of common American rosin, mixed with oil or fat and water, is the common (false) Burgundy pitch of the market. That sold in this country is said to be almost never genuine. The following is the official description:

Hard, yet gradually taking the form of the vessel in which it is kept; brittle, with a shining, conchoidal fracture, opaque or translucent, reddish-brown or yellowish-brown; odor agreeably terebinthinate; taste aromatic, sweetish, not bitter.

It is almost entirely soluble in glacial acetic acid, or in boiling alcohol, and partly soluble in cold alcohol.

The principal portion of this substance—eighty per cent. or more—is *resin*, amorphous and opaque until the water is evaporated off, then clear; from three to five per cent. of *essential oils* is also present, and from five to ten of *water*.

It is a mildly stimulating substance when applied to the skin; taken internally it has the properties of common rosin, or, in a mild degree, those of turpentine; stimulating in small doses, irritating in large ones; but it is milder in its taste and action than common turpentine. Its very limited medicinal use is almost entirely confined to its presence in a few plasters, of which the following are official here: Burgundy pitch plaster (*Emplastrum Picis Burgundicæ*, U. S. P.). Burgundy pitch, 80 parts; yellow wax, 15 parts; olive oil, 5 parts, melted together. It may be used as it is, or as the basis for other more active medicaments. The pitch plaster with cantharides is more stimulating; it consists of: Burgundy pitch, 92 parts; cerate of cantharides (thirty-two per cent.), 8 parts, melted together after straining the cantharidal cerate through a very fine strainer. *W. P. Bolles.*

PITCH, HEMLOCK.—*Pix Canadensis* (U. S.), *Canada Pitch.* This is a product of the *Hemlock Spruce, Tsuga Canadensis* (L.) Carr. (*Pinus C.* L.; *Abies C.* Mx.—fam. *Pinaceæ*), collected and prepared in much the same way as the preceding. It appears often to have been boiled for a greater length of time, and is frequently very dark, almost black in consequence. It is described as follows: "Hard, yet gradually taking the form of the vessel in which it is kept; brittle, with a shining conchoidal fracture, opaque or translucent; dark reddish-brown; having a weak, somewhat terebinthinate odor." Canada pitch has essentially the same composition and properties as the preceding, and is used for the same purposes. A plaster is made of it in exactly the same way as the Burgundy pitch plaster (see above). *W. P. Bolles.*

PITUITARY GLAND.—(*Hypophysis Cerebri*; Ger., *Hypophyse*; Fr., *Gland* or *Corps Pituitaire*; Ital., *Glandula Pituitaria*; Span., *Ghiandola Pituitaria.*) Vesalius was the first to describe this organ, and in his "De Corporis Humani Fabrica" (1553) he calls it the "glans pituitam excipiens," due to the mistaken idea that this organ secreted the nasal mucus (pituita). Soemmering (1778) described it more fully and called it "hypophysis cerebri." Both thought that the pituitary was a gland, but as they could not find any duct, they considered it a part of the nervous system. Rathka (1838) pointed out the significant fact that the organ is developed from two *Anlagen*, one arising from that part of the fore-gut which later forms the pharynx, the other arising from the base of the third ventricle. These views were disputed for some time, but Mihalkovichs (1874) agreed with Rathka, and his proofs were so conclusive that but few have disputed them since that time. Pathological changes were noticed by many of the early observers. Wepfer, Bonnet (1679), and Morgagni found colloid cysts; Greding (1771) and Melcarne (cited by Mechel) found "enlargements of the pituitary gland"; and Wenzel claimed that diseases of the pituitary caused epilepsy. The physiology of this organ has been neglected much, and it is only recently that its physiological action has been given much attention.

ANATOMY.—The pituitary body is an oval, glandular organ, consisting of two lobes and a connecting part. It rests in the sella turcica, and is enveloped by a layer of dense connective tissue, which is a prolongation of the basal dura. The average weight of the pituitary is 0.5 gm. In a series of one hundred cases Schönemann found that the average weight was 0.63 gm. between the ages of twenty and thirty, but that the weight diminished after that time until the average at fifty was 0.6 gm. Boyce and Beadles examined the pituitary glands from fifty female insane and found that the weight varied from 0.384 to 0.896 gm., the average being 0.6 gm. In fifty male insane the weight varied from 0.712 to 1.302, with an average of 0.453 gm. The ages of these cases varied from twenty-two to seventy-eight, none having presented symptoms referable to the pituitary. According to these authors the weight of the pituitary has no definite relation to that of the brain or to the age of the patient. The organ measures about 14 mm. in its lateral diameter, 7 mm. in its antero-posterior, and 6 to 7 mm. in thickness. The color of the pituitary is a dark brown or a bluish-red. The consistency of the organ is about that of the normal liver.

HISTOLOGY.—The microscopical structures of the two lobes differ markedly, the anterior being made up of glandular elements, and the posterior of a tissue resembling, with ordinary stains, a modified glia. From the connective tissue surrounding the gland, fine trabeculæ carrying the blood-vessels run into the interior and separate the cords of epithelial cells. These epithelial cells are rather hexagonal in shape and are of two kinds. One contains a round or oval, deeply staining nucleus embedded in a large amount of granular protoplasm which stains deeply with eosin ("eosinophilic cells"). The other cells are somewhat smaller, more granular, and they do not stain with the acid dyes ("cyanophilic cells").