The regular outline of the round or oval patches may be lost and a number coalesce, thus involving a considerable extent of surface, which may be superficially ulcerated, and in cachectic subjects is often partially covered by an extremely adherent false membrane of a pale brown color. The patches frequently become hypertrophied and resemble condylomata lata.

In the early course of hereditary syphilis very many distinct mucous patches may be counted; at a later period they are less numerous, but they show a decided tendency to relapse, having been seen by me as late as the sixth year.

The most common situations of this lesion are the angles of the mouth, the mucous membrane lining the cheeks, the pillars of the fauces and the tonsils, the sides and frequently the dorsum of the tongue, and also very often the portions of the gums adjacent to the teeth. On account of the difficulty of pharyngeal examination in young infants, we cannot state positively the frequency of the invasion of this region. There is certainly less tendency to extensive ulceration of the pharynx and tonsils in infants than in adults. At the angles of the mouth the ulceration is often extensive and painful.

The serous secretion of mucous patches is rather free, and quite as infectious as that of the initial lesion. Hence the necessity of their early recognition, and of measures to prevent contagion. Nursing at the breast of any one but the mother, kissing and fondling must be prohibited, and great care and cleanliness must be observed in the use of bottles, cups, etc. The infection of the nurse by a child having mucous patches of the mouth is particularly liable to occur in hospitals and in lying-in asylums. An instance of this mode of contagion has been reported by me in a paper,[1] in which this question is fully considered.

Only when ulceration exists, or when the mucous patches are complicated with diphtheritic membrane, is their diagnosis from stomatitis, simple or parasitic, attended by difficulty. In the absence of distinctive features in the history and on the body of the child, our decision must be based on the local appearances. In simple stomatitis the inflammation is generally more diffuse, the whole tongue, in particular, being intensely affected and often covered with vesicles, which are not seen in the specific disease. The tendency of mucous patches to development at the angles of the mouth is a valuable point in diagnosis. In parasitic stomatitis the inflammation is less localized than in the specific, the general hyperæmia is greater, and the false membrane has a whiter color and a more patchy appearance. In both forms of non-specific stomatitis, the sulci between the gums and cheeks, and the gums themselves, are often involved, rarely in the specific.

The history of the case, therefore, and the comparatively circumscribed character and limited distribution of mucous patches, will enable us to make a diagnosis.

[1] The Dangers of the Transmission of Syphilis between Nursing Children and Nurses in Infant Asylums and in Private Practice. Am. J. Obs., N. Y., Nov., 1875.

Gummatous Infiltrations.

These lesions, consisting of cellular infiltration of the mucous membrane, are usually developed upon the hard palate, or upon the posterior pharyngeal wall, when they may be mistaken for retro-pharyngeal abscess. They are rarely seen before the third year of life, and generally occur from the sixth to the twelfth. The first indication of their formation is a reddish elevation of the mucous membrane, forming a round or oval patch, from half an inch to an inch and a half in diameter, which increases in size and in prominence until a well-defined tumor results. Necrotic changes almost invariably occur in the tumor, leaving an ulcer with sharply cut, undermined edges and tenacious greenish secretion, involving the mucous membrane even to the subjacent bone.

Their course is chronic, with slight tendency to invade surrounding parts. Upon the hard palate they give little trouble, but upon the wall of the pharynx they are the source of much suffering and inconvenience in swallowing. The health may be further impaired by the copious secretions and the noxious gases developed. Repair of the ulceration is followed by cicatricial contractions, which, on the hard palate, may affect phonation, and, on the wall of the pharynx, may interfere with deglutition. The diagnosis is generally easy.

In strumous ulceration of the hard palate, the process is more active and less sharply limited, while other evidences of struma exist. Retropharyngeal abscess is much more acute in its invasion and progress than a gummy tumor, and, in the latter case, signs of pre-existing syphilitic lesions may be found. In all cases the previous history of the patient must be learned.

Affections of the Larynx.

In the early periods of hereditary syphilis, the larynx and upper air-passages may be the seat of simple hyperæmia, of mucous patches, or of ulceration involving the mucous membrane, or even the cartilages, to such an extent as to result in stenosis.

Fränke[1] reports the case of an infant, in whose larynx there was deep ulceration and perichondritis.

Coincident with, or following gummatous infiltrations into the pharynx, similar lesions may attack the larynx. In six cases, as yet not published, observed by my friend, Dr. George M. Lefferts, destruction of this organ in varying extent was found. In three cases the disease was limited to the epiglottis, which in two was totally destroyed, and in one there was loss of half of its free border. In

[1] Syph. Geschwüre u. Verengerung der Larynx. Wien. med. Wchnschr., No. xviii., 1868.

one of the two cases of total destruction, the ulceration had extended to the right arytenoid epiglottic fold. In the remaining three cases, there was general destruction of the superior laryngeal tissues with resulting stenosis.

In all of these cases there was greater or less destruction of the pharynx, and the laryngeal affection was probably an extension of the morbid process from that region. Our knowledge being as yet so limited, we cannot, of course, state that the laryngeal affections are always secondary to those of the pharynx, though the histories of these cases warrant that view. It remains for future observation to determine whether, in the course of hereditary syphilis, the larynx is primarily attacked, with or without attendant lesions of the pharynx. The ages of the affected children varied between ten and eighteen years, and the histories of all of them gave evidence of inherited syphilis.

Like gummatous affections of the pharynx, those of the larynx belong to the late manifestations of the disease. Like them, also, their course is quite rapid, and unless promptly checked they produce great deformity. Their symptoms are a varying degree of hoarseness and even total loss of voice, with difficulty of respiration in the more severe cases. Iodide of potassium in full doses should be given. These affections are quite rare, and their existence is not even mentioned in most text-books.

Since the publication of the last edition of this work, an excellent article has appeared on this subject,[1] written by Dr. J. H. Mackenzie, of Baltimore. This observer, from a personal study of one hundred and fifty cases, and from those in literature, thinks that these lesions are not rare, and may be observed at any period of the disease, but that the most common period of invasion is in the first six months after birth. In the throat, the most frequent seat of invasion is the palate, more especially the hard palate. Then, in order of frequency, are the fauces, naso-pharynx, the posterior pharyngeal wall, the nasal fossæ, the septum narium, the tongue, and, last, the gums. These ulcers show a tendency to centrality of position, and are prone to be followed by caries and necrosis. The prognosis, according to Mackenzie, is largely dependent upon the age of the child, being most grave in the very young. While deep ulceration of the larynx is at all periods serious, those of the pharyngo-laryngeal region are especially so, and are usually followed by death when they appear within the first year of life. Later in life, these lesions are much more amenable. Mackenzie recommends for acute laryngeal syphilis mercurial inunctions over the thyroid body, the inhalation of calomel and iodate of zinc in the form of vapor, and the heroic use of iodide of potassium. In very urgent cases tracheotomy must be resorted to. In chronic cases the mixed treatment may be used with benefit. This author speaks highly of the beneficial results obtained in the use of iodoform locally, and of the iodate of zinc in vapor form.

[1] Congenital Syphilis of the Throat, Am. Journal Med. Sciences, October, 1880.

Affections of the Lungs.

In 1851, Depaul called the attention of the profession to peculiar indurated masses, found in the lungs of infants affected with hereditary syphilis. He furnished specimens of this lesion to the Anatomical Society of Paris, who submitted them to Lebert for examination, whose report was as follows: "There is no trace of pus in the indurated masses. The tissue presents a peculiar yellow color, and is elastic and resistant. In the midst of a network of normal pulmonary tissue is found, mingled with fibro-plastic elements, a soft, pulpy and diffused substance, containing small cells, which differ from those of cancer and tubercle, and which resemble in every respect those seen in syphilitic gummata. These specimens may, therefore, be regarded as an early stage of pulmonary gummata, which first appear as indurated masses, afterwards assume a yellow and pulpy appearance, and finally soften, so as to resemble purulent infiltration or an abscess."[1] In his treatise on *Pathological Anatomy*, Lebert gives a plate of one of these masses, which he compares with certain pneumonic products.[2]

Within the past ten years much has been contributed by various observers to our knowledge of pulmonary changes. Interstitial cell proliferation, sometimes complicated with gummatous infiltration, seems to be the principal change.

When the lesions are extensive and fully developed, the lung is reduced in size, increased in consistency, and, when cut, is found to be firmer and less vascular than normal. Scattered upon the surface of the lung, and through its substance, on the smaller vessels and bronchi, which are much thickened and look like yellow cords, are numerous nodules of various sizes. The more recent are small and of a grayish-pink color; the older ones may be the size of a filbert, are light yellow, and, when excised, exude a thin milky fluid, while serum escapes from the lung substance. The former appear to be homogeneous, while the latter are granular, and may contain pus. The pulmonary pleura, especially in the vicinity of the nodules, is thickened and opaque.

The entire lung is usually more or less involved in the morbid processes, though, in some cases, the nodules may be few, and confined to a portion of a single lobe.

The first step in the process is evidently active congestion, followed by cell proliferation around the bronchioles, and, in a less degree, in the walls of the capillaries, resulting in partial or complete obstruction of their lumen, and consequent destruction of the function of the lung.

The nodules, which represent one or more plugged and distended alveoli, consist of a mass of connective tissue cells, fibrous tissue, granular debris, and perhaps some gummatous tissue. Like all new

[1] Bull. Soc. anat. de Paris, 1852, p. 23.
[2] Traité d'Anatomie pathol., Pl. viii., figs. 3 and 4.

growths, they are liable to degeneration, fatty or caseous, and may contain pus in their centres. The pleural changes are due to hyperæmia and increase of fibrous tissue. True gummatous nodules have been found by some observers. While two forms of nodules, the gummatous and the connective tissue, may exist, their gross and microscopical appearances are, in some cases, so very similar, that it is impossible to distinguish them. The gray hepatization of pneumonia resembles syphilitic induration, but may be recognized by the greater succulence and less resistance of the lining tissue, and by the escape of true pus on pressure. Owing to the nature and extent of these pulmonary lesions, life is, in most cases, destroyed. They may, however, exist in a moderate and localized form without such a result.

A child, five months old, who had passed through the earlier period of its disease, having had a papular and pustular eruption, developed broncho-pneumonia, with dulness on percussion, imperfect expansion, and harsh respiratory sounds, with slight crepitation at the right apex and over the lower lobe of the left lung. Although there was excessive cough, the increase in pulse rate and in temperature was very slight, and no acute symptoms of any kind were exhibited. This condition lasted fully six weeks, and finally yielded to the mixed treatment in gradually increasing doses. I examined this infant six months later, and there were no perceptible traces of the lesion in either lung. I have seen two cases, essentially similar both in course and in method of cure, in which lesions of the bones, joints, eyes, and integument were also present.

While these changes usually take place in intra-uterine life, we may find them at any time when the syphilitic diathesis is active, but most frequently within the first eighteen months of life. They are not attended by much systemic reaction, and may be developed in any portion of the lung either symmetrically or unilaterally.

Affections of the Peritoneum.

Primary morbid changes are rarely, if ever, seen in the peritoneum. Thirty-one cases, in which general or partial uncomplicated inflammation of this membrane was distinguished, have, indeed, been reported by Simpson,[1] who claims the existence of true peritonitis.

The syphilitic origin of many of these cases was, however, doubtful, and in some the exact condition of the viscera was not observed. Chronic adhesive peritonitis, more or less localized, and unattended by marked symptoms, often occurs, originating in some syphilitic visceral change, particularly of the liver.

Affections of the Alimentary Canal.

The mild chronic diarrhœa observed in syphilitic children, other causes being eliminated, seems to indicate the presence in the gastro-

[1] Edinb. M. and S. J., No. 37.

intestinal tract of erythematous affections similar to those seen in the mouth and pharynx. Structural changes have been found by various observers.

Förster[1] has described a fibroid degeneration of Peyer's patches in a syphilitic infant who died six days after birth with lobular pneumonia and purulent bronchitis. The glandular structure of the patches had been replaced by elevated grayish-red masses, with smooth surface and yellowish centre, composed of nuclei, cells, and fibres of connective tissue. Similar observations have been made by Eberth,[2] Roth,[3] and Oser,[4] who have described an affection consisting of multiple circumscribed indurations, varying in size, and generally circular, situated on a level with Peyer's patches and the solitary glands, the surrounding mucous membrane being smooth and slate-colored, or more or less ulcerated. The latter condition resembles that of a dry eschar, but leaves an ulcer with a bright lardaceous base. This lesion, consisting of an infiltration of cells similar to those of lymphatic glands and of connective tissue, is usually limited to the submucous stratum.

Affections of the Liver.

The functional activity of the liver in infancy renders it subject to profound structural changes, which consist chiefly of connective tissue infiltration. The credit of first calling attention to this important lesion belongs to Gubler,[5] from whose writings, mainly, Diday was enabled to give the following clear and complete description, of which we avail ourselves:

"When the lesion has reached its maximum, the liver is sensibly hypertrophied, globular, and hard. It is resistant to pressure, and even when torn by the fingers its surface receives no indentation from them. The elasticity of the organ is such, that if a wedge-shaped piece taken from its thin edge be pressed, it escapes like a cherry-stone, and rebounds from the ground. When cut into, it creaks slightly under the scalpel. The distinct nature of its two substances has completely vanished. On a uniform yellowish ground, a more or less close layer of small, white, opaque grains is seen, having the appearance of grains of semola, with delicate arborescences, formed of empty bloodvessels. On pressure no blood is forced out, but only a slightly yellow serum, which is derived from the albumen. Gubler has only three times seen the change carried to this extent. It is most frequently much less marked. Thus, the tissue of the organ is firm, without having that extreme hardness

[1] Würzb. Med. Ztschr., Band iv, part 1, 1863.
[2] Ueber syph. Enteritis. Arch. f. path Anat., etc, Berlin, Band xl., page 326, 1867. Quoted by Lancereaux.
[3] Enteritis syphilitica. Ibid., Band xliii., p. 298.
[4] Fälle von Enteritis syphilitica. Arch. f. Dermat. u. Syph., Prag., Band iii., 1870.
[5] Mémoire sur une nouvelle affection du foie, liée à la syphilis héréditaire chez les enfants du premier âge. Gaz. méd. de Paris, 1852.

and yellow color, which might admit of comparison to some kinds of flint. The interior of the organ presents rather an indefinite color, shaded with yellow or brownish-red, more or less diluted; but in no part is the parenchyma quite healthy in appearance.

"Again, the change may be found in circumscribed parts only. Gubler has seen it confined to the left lobe, to the thin edge of the right lobe, and to the *lobulus Spigelii*. He ascertained by injections that, in the indurated tissue, the vascular network is almost impermeable; that the capillary vessels are obliterated, and that even the calibre of the larger vessels is considerably diminished. Microscopical examination enabled him to discover the cause of this disposition by revealing in the altered tissue of the organ, in every degree of change, the presence of fibro-plastic matter, sometimes in considerable, sometimes in enormous, quantity. In the portions intervening between the diseased parts, the cells of the hepatic parenchyma maintain all the characteristics of their normal condition. The physical consequences of the deposit of these elements are an increase in the volume of the liver, the compression of the cells of the *acini*, the obliteration of the vessels, and the consequent cessation of the secretion of bile. In all the subjects examined after death by Gubler, he always found the bile in the gall-bladder of a pale yellow color and very sticky; that is to say, very rich in mucus and very poor in coloring-matter."

Later observations confirm the results obtained by Gubler, and add much to our knowledge of the microscopic changes found in the liver. The primary changes are vascular. The walls of the vessels are much thickened, and around the tunica adventitia numerous nuclei and cells, with an abundance of fine fibrillar connective tissue, are found. The calibre of some of the vessels is diminished, and that of others is entirely obliterated. Moreover, various stages of fatty degeneration of the hepatic cells are found. Increase of connective tissue is observed in the parenchymatous network of the organ and in the capsule, which may be thickened either in its entire extent or especially on its upper surface. Adhesions may form between the convex surface and the diaphragm or the peritoneum of the anterior abdominal wall. Certain changes in the veins have been described by Schüppel, under the title "peripyle phlebitis syphilitica," which will be spoken of in the section on affections of the circulatory organs.

Gummous hepatitis in hereditary syphilis is admitted by several authors. There are two forms, one consisting of numerous minute tumors scattered through the liver, called by Wagner miliary syphilome; and the other consisting of one or more large circumscribed tumors, such as are found in the adult. Either of these lesions may be accompanied by the fibro-plastic infiltration of Gubler.

The clinical history and microscopic anatomy of this affection have been carefully studied by Rochebonne, a former student of Professor Gubler. This observer thinks that a diagnosis may be made from the following symptoms: A deep wine-colored venous stasis and

œdema of the lower extremities, often accompanied by pemphigus; ascites, due to mechanical obstruction of the circulation, as in cirrhosis; a more or less pronounced chloro-anæmic appearance of the face; and the presence in the urine of albumen and hæmato-globulin. Vomiting may occur, and constipation, alternating with diarrhœa, has been observed. Icterus, symptomatic of this affection, has not been noticed. A fatal result commonly ensues in the early weeks of the child's existence.

Affections of the Spleen.

In cachectic children and in those in whom the disease assumes a severe form, more or less hypertrophy of the spleen is sometimes observed, usually during the early stages of syphilis. The enlargement is rapid, the size of the organ often being quadrupled in two or three weeks. This condition may persist, according to Barlow, even for a year, while on the other hand, mercurial treatment induces its rapid subsidence.

Although we are ignorant of the pathology of this affection, the acuteness of its invasion and its rapid involution suggest hyperæmia rather than permanent cell-growth. Still it is quite possible that cellular hyperplasia may take place in the spleen, as it does in the liver. Lancereaux says that the hypertrophied spleen is firm and smooth, that it sometimes becomes adherent to other organs, that the condition is often a simple multiplication of cell-elements, and that affections of the liver and perhaps of the lymphatic glands generally coexist.

Gee, who first described the affection in 1867, stated that it occurs in at least one-half the cases of hereditary syphilis, and in one-fourth hypertrophy is excessive and accompanied by a similar condition of the liver and the lymphatics. In two post-mortem examinations he found enlargement and induration, without evidence of gummatous infiltration or of amyloid degeneration.

In view of its gradual diminution as the general condition of the child improves, splenic hypertrophy is regarded by Gee and Barlow as an evidence of the severity of the syphilitic cachexia.

According to Parrot[1] there are two forms of splenic lesion caused by hereditary syphilis. The first is an hypertrophy, in which the organ may become three times its natural size, which, he thinks, is a secondary result of portal obstruction, caused by diffuse infiltration of the liver, the spleen then being compelled to serve as a reservoir of the blood.

The second form is an inflammation resulting in the formation of false membranes around the capsule of the organ. Parrot is not positive regarding the future course of these lesions, but is inclined to attribute to them certain lardaceous degenerations found later in

[1] Mouvement méd., Paris, 23 Nov., 1872.

the life of children who suffered from hereditary syphilis at their birth. He thinks that these lesions were the cause of rupture of the spleen in the case of a new-born child with hereditary syphilis, the details of which were reported by Charcot in 1865.

Affections of the spleen have been studied also by Birch Hirschfeld[1] in thirty-two cases of hereditary syphilis. He found the organ much enlarged, but was unable with the microscope to discover any abnormality. The spleen of a fœtus, born in a macerated condition, was soft and of a dirty-violet color. In case of still-birth or of death soon after birth, the density of the organ was increased and its color was dark-brown. Two forms of lesion of the spleen are therefore recognized by Hirschfeld; in one the organ is indurated and of a dark-brown color; in the other it is soft and pale.

Lesions of the Pancreas.

The changes in the pancreas caused by hereditary syphilis have been recently studied by Osterloh,[2] Oedmansson,[3] Wegner,[4] and most extensively by Birch Hirschfeld.[5] The last-mentioned observer found in thirteen syphilitic children, who died during or soon after birth, varying degrees of morbid change. In the most marked cases the organ was much enlarged, its weight was doubled, its tissue firm, and, on section, it presented a glistening white appearance, somewhat like that of scirrhus, the grandular substance being very indistinct. Under the microscope, the interstitial connective tissue, especially between the larger lobules, was found greatly increased. Portions of lobules were compressed, and their epithelium was atrophied and in a state of fatty degeneration. The vessels of the interstitial tissue were few, and their walls were thickened. This extreme degree of the process was observed in seven cases; in six the changes were less perceptible, and the lobules could be distinctly seen, although the organ was enlarged and rather denser than normal. The head of the organ was more altered than the tail.

Hirschfeld thinks that this marked change begins late in intrauterine life, since it is rarely found in macerated fœtuses prematurely born. The most marked case was that of a child who died five months after birth.

It is improbable that this degeneration of the pancreas is one of the chief causes of gastro-intestinal disturbances in hereditary syphilis.

[1] Zur pathologischen Anatomie der hered. Syphilis. Arch. d. Heilk., Leipz., Feb., 1875.
[2] Mitth. a. d. Kgl. Sächs. Entbindungsinst. zu Dresden. Quoted by Birch Hirschfeld.
[3] Jahresb. ü. d. Leistung. u. Fortschr. 1869, 2 Abth., 561.
[4] Arch. f. path. Anat. etc., Berl. Band 50, Heft 2, 1870.
[5] Beitr. zur path. Anat. der. hered. Syph. Neugebornen. Arch. d. Heilk., Leipz., Feb., 1875.

Affections of the Kidney.

Our knowledge of the condition of the kidney in hereditary syphilis is very limited. Lancereaux[1] states that he has found connective tissue proliferation with fatty degeneration of the epithelium lining the tubuli uriniferi. The organs were firm and of a yellow color. Bradley[2] reports the case of a syphilitic child four months old, with dropsy and albuminuria, who was cured by mercurial treatment.

The most recent studies of the pathological anatomy of the kidney affected by syphilis are by Parrot. On section, he found these organs studded with numerous small tumors, varying in size from a pin's head to a cherry-stone. The smallest were white, and the larger were yellow at their periphery and reddish in their centre. In some spots there was partial destruction of the renal tissue, and there were also infarctions. The lesion consists of a circumscribed or diffuse infiltration of round embryonic cells, with others of fusiform shape, into the connective tissue framework, followed by compression or destruction of the tubules and colloid degeneration of their epithelium. In the early stages of this affection, the organs become much enlarged, and Mollière reports a case in which they were found to be twice their normal size. Gradual atrophy follows degeneration of the new cells, and the organs may finally become much reduced in size.

Affections of the Suprarenal Capsules.

Lancereaux has noted enlargement of these organs in a large number of cases. Virchow has also observed it, and speaks of a case in which complete fatty degeneration was found, a condition met with also by Hulke. According to Lancereaux, proliferation of young connective tissue cells in the cortical substance has been found by Baerensprung. In a case in which the left suprarenal capsule was enlarged and adherent to the diaphragm, Hennig found its contents gelatinous.

Affections of the Testicles.

Observation has convinced us that Zeissl, Hill and other authors are incorrect in their opinion that the testicles are not affected in hereditary syphilis. In a recent paper, I gave the histories of five cases of disease of the testis in young children, with marked lesions of hereditary syphilis. The details of seven cases have been given by Henoch,[3] and others have been reported by North,[4] Bryant,[5] and Obédenciere.[6]

The disease consists of a chronic, painless enlargement of one or both testicles, usually accompanied by hyperæmia of the scrotum and

[1] Op. cit., page 420.
[2] Syphilitic Dropsy of the Kidneys, Brit. M. J., Lond., Feb. 4, 1871.
[3] Ueber syphilis der Hoden bei Kleineren Kindern. Deutsche Ztschr. f. prakt. Med, Leipz., No. 11, 1877.
[4] Med. Times and Gaz., Lond., 1862, vol. i., p. 403. [5] Ibid., Dec., 1863.
[6] Bull. Soc. de chir. de Paris, 1875, p. 140.