Cysts	Retention cysts. Hydatids.
Myoma	Adeno-myoma.
Adenoma	
Sarcoma	Round cell. Spindle cell.
Carcinoma	Lympho-. Scirrhus. Colloid.

Retention cysts formed from dilated gland acini occur in many old prostates. They are always small, and give rise to no inconvenience. Their contents are sometimes inspissated, forming little concretions.

Hydatid cysts of the prostate are so rare that Thompson could, in 1883, learn of but one; and even in that case it is doubtful whether the cyst started in the prostate or near it. When discovered they should be at once emptied.

Pure myoma is very rare; adenoma is somewhat less so, but adenomyoma is the most common of prostatic growths. Paul thinks ordinary hypertrophy should be ranked under this head.

The universal, symmetrical enlargement can hardly, as it seems, be classified as a tumor, and yet the pathological process is the same in it and in the circumscribed masses which we recognize as new growths. These may project into the urethra, the bladder, and in other directions, or they may be buried in the midst of the gland tissue, from which they can be easily shelled out.

These tumors have sometimes been removed during section of the gland in lithotomy or other operations, and the removal of projections into the urethra has been considered above.

Sarcoma is occasionally observed in the prostate, where it may start primarily, or to which it may transplant itself from the testicle or elsewhere. It usually appears early, but may develop late in life.

Carcinoma is more common than sarcoma, and appears ordinarily after middle life. It may assume a scirrhus or a colloid type.

In either of these last two malignant forms of growth there may be a good deal of pain and considerable hemorrhages, especially after instrumentation.

In carcinoma the neighboring lymphatic glands are likely to be early involved.

Any cyst or tumor of the prostate may give rise to symptoms of obstruction. The difficulty of micturition may reach a point at which some operation for its relief will be required. In opening the bladder for drainage under these circumstances, either the perineal or the suprapubic incision may be used, and the selection would depend somewhat upon the size of the tumor.

If this is large and of a malignant character, which makes its removal evidently impossible, suprapubic drainage would be preferable.

On the other hand, in the case of a smaller or non-malignant tumor the perineal incision should be used, as by it the exact condition of things can be ascertained and possibly benefited. Harrison reports a case in which he removed a cancerous growth as large as the last phalanx of the thumb from the prostatic urethra. The operation was followed by great relief from distress in micturition, and the patient lived for fourteen months.

Tuberculosis of the Prostate occurs often secondarily to tuberculous conditions in other parts of the genito-urinary tract. It probably also sometimes appears primarily in the prostate.

As patients with genito-urinary tuberculosis usually die when the disease is far advanced, it is rarely possible to decide at autopsy where the disease originated; and as the organs are many of them deep-seated and beyond the reach of physical examination, it is likewise impossible during life to be sure that the prostate was primarily affected.

On the other hand, this gland is situated at the junction of the genital and urinary passages, is as it were at the crossroads through which any tuberculous material from the kidneys or testicles must go in its passage from the body. This situation makes it peculiarly liable to secondary infection, and, as a fact, it is almost always sooner or later involved.

The tubercles may appear as little isolated gray granules, scattered throughout the tissue of the organ, or they may be agglomerated into masses which, if they reach a moderate size, ordinarily become cheesy in the centre and finally break down into abscesses.

Sometimes almost the whole prostate is thus destroyed, and its place is occupied by an abscess which usually communicates with the urethra and bladder. It may break through into the rectum, forming a recto-vesical or a urethral fistula directly through the prostate.

The *symptoms* are those of a chronic prostatitis (see above) with a special tendency to hemorrhage. They may be associated with evidences of tuberculosis elsewhere.

Physical examination by the rectum may reveal little or no alteration in the gland. Ordinarily, however, inequalities are felt which may give it a distinctly nodular character. This may be associated with enlargement, or the prostate may preserve almost its normal size.

The ejaculatory ducts and the vesiculæ seminales should be felt for, and if the disease has affected them, they may be found as thickened, resistant, cord-like bodies. This is especially to be observed when the disease started in the testicle and worked its way up to the prostate.

Not infrequently a little shot-like mass is felt between the rectum and the prostate, or it may be a little behind and to one side of the gland. It is not attached to the prostate, rectal wall, or seminal vesicles, but is loose in the tissues between them.

Dr. Bryson, of St. Louis, thought that in one case, in which he had an autopsy, he made it out to be a cheesy mass within a vein. Possibly it is sometimes an infected lymphatic gland.

The testicles, epididymides, and vasa deferentia should also be examined, and the urine should be investigated for evidences of kidney complication and for tubercle bacilli.

These last are very difficult of detection in the urine, and their apparent absence does not argue against tuberculosis. When unmistakably present they are conclusive confirmatory evidence. In all cases of doubt the urinary sediment should be inoculated into a guinea-pig.

The physical investigation should also include the examination of the lungs, which may share in the tuberculous process.

Diagnosis.—The disease may be confounded with chronic prostatitis or cystitis, with stone or tumor in the bladder, or with pyelitis when accompanied by frequent micturition.

While a careful consideration of the symptoms and inherited tendencies of the patient may enable us to form a probably correct idea of the condition, it is only by a careful physical examination that we can reach a positive diagnosis.

Besides the examination described above, an exploration of the bladder, under ether if necessary, will be needed for the detection or elimination of stone and of tumor of the bladder.

There will be a certain number of cases in which a diagnosis is at first impossible, and in which the true interpretation of the condition can be reached only when time has developed characteristic symptoms.

Treatment.—Most important is the constitutional treatment with cod-liver oil, hypophosphites, and iodides. A healthy out-of-door life, with moderate exercise and good food, is to be enjoined.

Thompson advises against local treatment, and it is certainly important to avoid rough manipulation.

In the early stages of the disease, however, gentle local measures may serve rather to allay than to excite irritation, and should be tried.

Irrigation of the prostate and bladder and the introduction of iodoform pencils may be of service. Occasionally the passage of a sound is useful by removing the contraction of the constrictor muscle. The pain and frequency of micturition may sometimes be much relieved by these means.

While the prognosis is necessarily grave, and the permanence of improvement is always doubtful, still these cases are not always hopeless if seen early.

Prostatic Calculi.—In the ducts and dilated tubules of the prostatic glands are found not infrequently little yellowish or brownish bodies, composed of an organic substance allied to protein.

These, if they increase beyond a moderate size, begin to have earthy salts deposited in and around them, and finally become prostatic calculi, which may reach the size of a walnut or even of a larger object.

These calculi are usually multiple, and are facetted from mutual attrition. They are hard, take a high polish like porcelain, and are white or light brown in color.

Chemically, they are composed almost wholly of phosphate, with a slight admixture of carbonate of lime, and are to be distinguished from urinary calculi by the fact that they do not contain any of the triple phosphate of magnesia and lime, which is so large a constituent of vesical calculi.

When prostatic calculi are made out they may be removed by a median or lateral perineal incision. The operation is usually one of no serious danger, as the bladder is not opened.

Arthur T. Cabot.
Hugh Cabot.

PROSTITUTION, REGULATION OF. See *Camp Diseases.*

PROTAN is a tannin nucleo-proteid employed in dose of 1–2 gm. (gr. xv.–xxx.) as an intestinal astringent in diarrhœa.

W. A. Bastedo.

PROTEINOCHROMOGEN, PROTEINOCHROME. See *Tryptophan.*

PROTHROMBIN. See *Coagulation.*

PROTOGEN. See *Formaldehyde.*

PROTOPLASM. See *Cell.*

PROTOZOA, PARASITIC. See The Appendix.

PRUNE.—*Prunum*, U. S., Br. The partially dried ripe fruit of *Prunus domestica* L., or, according to the British and some other pharmacopœias, *P. domestica Juliana* De C. (fam. *Rosaceæ*). The fresh fruit of the latter variety is oblong, that of others subspherical.

The prune, coming originally from southwestern Asia, is now everywhere cultivated in temperate regions. Probably the best prunes for medicinal uses are those grown in southern Europe, since they are more acid. The prune requires no description. It should not be over-dried, should possess a very slight odor and a pleasantly sweet and acid taste. It owes its slightly laxative properties to the presence of acids, chiefly malic, free, and combined with potassium and other bases. There is present also sugar, to the extent of about one-third of the weight. The seed contains amygdalin and yields prussic acid, and should, of course, be removed.

Prunes have no other medicinal value than that of a very mild laxative, similar to many other fruits, but the concentrated juice is useful for administration to small children, because of its pleasant taste. The only official preparation is the confection of senna (see *Senna*). Prunes are very largely consumed upon the table for their laxative effects, as well as for their food properties. As served upon ocean steamers, they usually have some senna boiled with them.

Henry H. Rusby.

PRURIGO.—Prurigo is a malady *sui generis*. The condition usually appears about the end of the first year, but may appear as late as the thirtieth year. The affection usually starts as a lichen urticatus, the characteristic lesions of prurigo appearing later. There are two forms: prurigo ferox or Hebra's prurigo, and prurigo mitis, but a distinct line cannot be drawn between the two. In prurigo ferox there are repeated eruptions of pale red or skin-colored miliary papules, which itch violently. This eruption is generalized, but it is thickest on the extensor surfaces of the lower extremities. The papules are so small and project so slightly that they often cannot be seen, although they can be felt. Scratching produces excoriated tips, and these become covered with blood crusts. Other lesions appear as the result of scratching, such as excoriations, pustules, crusts, pigmented areas, and a dry, scaly, and thickened skin.

During the first few years wheals are frequently found, but they disappear as the papules increase. A secondary eczema in all forms may also be seen. In nearly all cases there is enlargement of the superficial lymphatic glands, the femoral being most marked. The flexures are usually free from eruption. As a rule, the eruption diminishes upon the advent of summer. This form is incurable, but the patient can be relieved to such an extent as to be free from the eruption at times. In prurigo mitis the papules are fewer and the itching is less; consequently the secondary lesions are much milder. Most of the cases met with in this country are of this type. In some of these cases a perfect cure may be obtained by careful and persistent treatment. When untreated, prurigo has a marked effect on the patient both mentally and physically.

Etiology.—In discussing the causation of this affection we can do no more than mention certain conditions with which it frequently occurs. It is usually found in poorly nourished and scrofulous children. Occasionally there seems to be an hereditary predisposition, several children in one family being affected. It is possible that there is some congenital anatomical malformation of the skin as is seen in ichthyosis.

Pathology.—The affection probably starts as a vaso-motor neurosis. Microscopically the papules are composed of a round-cell infiltration, with œdema of the papillæ. Swelling of rete cells occurs and later there is a hyperkeratosis.

Diagnosis.—The diagnosis is difficult at first, as in the beginning the eruption consists mostly of wheals. The condition is also misleading when large eczematous areas cover the lesions of prurigo. The following points are characteristic, and when they are present the disease cannot be mistaken for any other condition: A constantly recurring eruption of miliary papules, resembling in color the normal skin, appearing in early childhood, and most marked on the extensor surfaces; the enlarged glands; and secondary lesions from scratching.

Treatment.—Very little can be expected from internal medication, unless the patients are scrofulous or poorly nourished; in which case cod-liver oil and general hygienic measures will be beneficial.

Crocker speaks highly of cannabis indica as an effective remedy for controlling the itching, as in pruritus. The dose should be gradually increased to thirty minims of the tincture, well diluted, after each meal. Phenacetin and antipyrin are among the most valuable remedies for the itching. Rest, an even temperature, and alkaline or sulphur baths will make the patient more comfortable. For the local treatment, naphtol, sulphur, and tar are the remedies most likely to relieve the itching and decrease the papular eruption. The usual way of using sulphur is by the application of the official ointment or Wilkinson's ointment. Tar can be used pure or diluted with oil or lanolin. Naphtol should be used as an ointment in the strength of two to five per cent. Whatever local treatment is used, it should be vigorously continued until there are no fresh papules and the skin is smooth and flexible. Occasionally it will be found necessary to use first some bland ointment to cure the secondary eczema which so frequently accompanies this condition.

Howard Morrow.

PRURITUS.—Pruritus is an affection of the skin characterized by itching without any external cause. It is an independent disease, and must be distinguished from

the symptomatic itching common in such pruritic conditions as eczema, scabies, etc. It is a sensory neurosis due to a functional disorder of the nerves independent of any source of irritation on the skin. The symptoms may be so mild as to produce but temporary discomfort, or so severe as to cause profound misery or even such a degree of nervous depression as may result in insanity. Scratching is the patient's method of relief, and the excoriations produced are often preferable to the itching. Although scratching frequently relieves the itching in a certain place, it usually excites it in other parts. From the scratching we may get excoriations, pustules, wheals, and pigmented areas. A rare result of such chronic scratching is the condition called lichenification, in which the skin is thickened and the natural lines are deepened, leading to the formation of irregularly shiny papules. This condition is usually found in the flexures, and is often mistaken for eczema and lichen planus.

Pruritus is either general or confined to certain areas. The former is frequently spoken of as pruritus universalis, and although the itching is general, it is seldom felt all over at the same moment, and there are frequent remissions from any itching. The most frequent causes of this affection are disorders of the alimentary tract, functional derangement of the liver, cancer of the stomach or liver, uterine disorders, malaria, gout, rheumatism, and Bright's disease. Pruritus is always worse when the sufferer is in bed, and is excited by exercise, forced rest, and sudden changes of temperature.

The itching which accompanies jaundice is not a true pruritus, for it is produced by the mechanical pressure of the biliary coloring matter which is deposited in the skin. Senile pruritus is an accompaniment of senile degeneration of the skin. Although it is general, it is usually most marked on the lower extremities. It is very persistent.

Pruritus hiemalis and pruritus æstivalis are terms given to varieties of generalized pruritus which occur during the cold and hot seasons respectively. Some authors consider these forms distinct affections. Pruritus hiemalis is due to the dryness and brittleness of the epidermis which is caused by the cold of winter. Pruritus æstivalis is occasionally found during the warm weather of summer.

In the *local forms*, although we can have itching in any part of the body, the following varieties are most common: pruritus ani, pruritus vulvæ, pruritus scroti, pruritus palmæ et plantæ. Pruritus ani may be due to fissures, hemorrhoids, ascarides, or pelvic tumors producing local congestion. Pruritus of the vulva may be caused by ovarian or uterine disease, diabetes, or urethritis. Pruritus of the scrotum is usually associated with eczema. Pruritus of the hands and feet is mostly found in the gouty, and frequently is associated with hyperidrosis.

In the different forms of local pruritus it is occasionally impossible to discover the cause. The prognosis of senile pruritus is unfavorable. In the other forms the pruritus will usually cease if the cause is found and removed.

Diagnosis.—All chronic diseases which are associated with itching, such as prurigo, urticaria, scabies, and the irritation from fleas, bedbugs, and lice must first be excluded. It is often impossible to differentiate chronic urticaria, as these two affections frequently occur under the same etiological conditions. Careful investigation must be made as to the presence of any renal, hepatic, or digestive disorders.

The diagnosis of senile pruritus must be made by exclusion. In cases of persistent itching around the anus and vulva, careful examination may show a definite point from which the patient says the itching starts. The skin at this point may appear to be perfectly normal, but it must be treated before the itching will cease.

Treatment.—A great deal depends upon the cause, and the sooner this is found out the sooner the patient may be put on appropriate treatment. The internal treatment is dietetic as well as medicinal. The food should be easily digestible and all stimulating liquids should be avoided. The bowels must be carefully regulated. Calomel followed by saline aperients is often necessary at the start. From now on, the internal treatment must be in accordance with the general principles of medicine, and the condition of each internal organ should be investigated. Of the various internal remedies which are used as nerve sedatives, cannabis indica is the best. Ten to twenty minims of the tincture should be given, well diluted, after each meal. Carbolic acid, gr. ij. in each pill, one after each meal, is recommended by Brocq. Antipyrin acts well at times.

External treatment is necessary even if it is not curative, because it enables the patient to abstain from scratching, and this temporarily relieves the irritated nerves. In the mean time other remedies can be directed to the origin of the trouble.

For general pruritus lotions are preferable to ointments. One of the best is composed of liquor carbonis detergens, ʒ iij.; liquor plumbi subacetatis, ʒ iv.; glycerin., ʒ iv.; distilled water, q.s. ad ℥ viij. Another is carbolic acid, two per cent., in camphor water. Bichloride of mercury, gr. ij. to an ounce of fifty-per-cent. alcohol, is a good odorless lotion. A mixture of aromatic spirit of ammonia and water, equal parts, is frequently used.

Five or six ounces of bicarbonate of sodium to an ordinary bathtubful of hot water may be used with advantage. Bran baths are soothing. They should be made by adding from four to six pounds of bran to a tubful of water. After a bath the surface should not be rubbed dry, but should be patted gently with a soft cloth and dusted with some soothing powder.

For pruritus hiemalis alkaline baths and emollient preparations have proved most serviceable. A two-per-cent. solution of salicylic acid in almond oil is an excellent remedy. Similar applications are indicated in senile pruritus.

For local pruritus, dozens of remedies have been recommended, but until the cause is ascertained most of them will give but temporary results. If the patient can locate a definite point from which the itching starts, the destruction of this point by the actual cautery gives immediate relief. Simpler methods, as a matter of course, should be used at first.

For pruritus ani, mercurial applications give the most satisfaction; such are: ammoniated mercury, gr. xx., in zinc ointment, ʒ i.; calomel, ʒ i., in lard, ʒ i. These two are frequently combined. Hot compresses are very agreeable. Carbolic acid in two-per-cent. solution can be used in a compress or in an ointment. A suppository of extract of belladonna, gr. ss. at bedtime, often gives relief; morphine may be added to this. Cocaine, gr. ss. in a suppository, gives temporary relief. On the surface cocaine is frequently used in a boric-acid ointment, or in combination with menthol, two per cent. of each. Camphor-chloral is commonly used. Hydrocyanic acid, naphtol, and ichthyol are useful at times.

For pruritus vulvæ, hot compresses of a saturated solution of boric acid sometimes give relief. Tincture of benzoin painted on the parts daily with a camel's hair brush is also an excellent remedy. *Howard Morrow.*

PSAMMOMA. See *Sarcoma.*

PSEUDOLEUKÆMIA. See *Hodgkin's Disease.*

PSEUDOLEUKÆMIA INFANTUM.—(Synonyms: Anæmia infantum pseudoleukæmica; Anæmia splenica infettiva dei bambini; Anæmia splenica [Splénomegalie primitive]; von Jaksch's anæmia.)

Definition.—A disease occurring in infants, usually in the first two years of life, characterized by great pallor, considerable enlargement of the spleen, moderate enlargement of the liver, a low erythrocyte count, a moderate leucocytosis, consisting chiefly of an increase of the lymphocytes, numerous erythroblasts, low hæmoglobin, the absence of especial enlargement of the lymph nodes, and at times accompanied by hemorrhages (hæmatemesis, hæmaturia, purpura) without any known cause. The course of the disease is usually subacute or chronic.

Historical Notice.—The term "anæmia infantum pseudoleukæmica"* was originally adopted on the ground that the disease was one form of pseudoleukæmia (Hodgkin's disease). Of late years it has been so clearly shown to be different from Hodgkin's disease, in that the condition of the spleen is not the same, that the name "pseudoleukæmia" is evidently a misnomer and, strictly speaking, should not be used in connection with the class of cases under consideration. On the other hand, there are as yet so much dispute and such varying opinions among those who have carefully studied the group of symptoms which are supposed to represent the disease, that there is no other name which at present had better be applied to it, since the evidence is very strong that no such disease exists apart from severe cases of secondary anæmia with enlarged spleen. It is supposed at present to correspond to the so-called cases of splenic anæmia in adults. The same difference of opinion exists as to the recognition of a splenic anæmia in adults as separate from severe cases of secondary anæmia with enlarged spleen. It is thought better, therefore, to describe the symptoms of what has been supposed to be a separate disease by the name under which it was first spoken of, always wishing it to be fully understood that this description merely represents what is known about the subject up to the present time, and does not intend to give the impression that the author necessarily believes that it is a separate disease because he describes a set of symptoms under the term "anæmia infantum pseudoleukæmica." The subject is still *sub judice*, and much further investigation must be carried out before a final decision can be made to give up the idea that there is such a disease separate from severe cases of secondary anæmia.

We wish, however, to have it understood that it is the so-called "splenic anæmia" of adults with which the disease, if such disease exists, is associated rather than with pseudoleukæmia.

Formerly, anæmia infantum pseudoleukæmica was considered a primary disease of the blood, but it was soon differentiated from the different forms of leukæmia, and later from pseudoleukæmia (Hodgkin's disease). It is, however, still believed by some writers to be a primary disease of the spleen.

As far back as 1866 a case of a child suffering from a severe form of anæmia accompanied by an enlarged spleen was reported by Gretsel. Cases have since been described, but in a somewhat indefinite manner, and the next important work which appeared on the subject was that of Banti in 1883. Banti, however, although believing that anæmia splenica was a primary disease of the spleen, considers it also a splenic form of pseudoleukæmia, and it is from Banti's description that the characteristic symptoms of the disease are taken as well as the pathology. Following Banti a number of writers have recorded cases which they considered to represent the disease splenic anæmia; but their cases, in the light of more modern investigation, are so closely allied in their description to those of pseudoleukæmia that they would at the present time scarcely be accepted.

In 1891 Bruhl published an article on splenic anæmia, and suggested the name "splénomegalie primitive." Bruhl's work, however, was very much in the same line as Banti's, and therefore need not be further referred to. Williamson in 1893 reported a case of a boy nine years old who died, and a description of the lesions found in this case will be given under pathology. Later writers, such as Hawthorne in 1895, in the case of a child eleven years old who recovered, and Taylor in 1896, in the case of a girl thirteen years old in whom the symptoms were very similar to those of pseudoleukæmia, have added nothing new to our knowledge of the subject. In like manner Goepel reported the case of a boy eleven years old on whom splenectomy had been performed with recovery, but no histological report was made as to the condition of the spleen, and although he stated that the operation was performed for pseudoleukæmia, no enlargement of the superficial lymphatics was present at the time the operation was performed, and the blood was stated to have been normal.

In 1900 Osler reported fifteen cases which he considered to be cases of "primitive splenomegalie," but his cases occurred in adults. He also reported some additional cases of splenic anæmia at the annual meeting of the Association of American Physicians in Washington, April 29th and 30th, 1902. The opinion of those who discussed Osler's paper gives the impression that splenic anæmia as a primary disease is not universally accepted, and, in fact, most authors consider it to be a form of secondary anæmia.

In 1884 Somma, under the title of "anæmia splenica infantilis," reported thirteen cases in infants and young children. Fedde in 1889 and in 1890 spoke of this disease under the title of "anæmia splenica infettiva," believing it to be an infectious disease of infants. No details of his cases, however, were given.

In 1890 at the Pediatric Congress in Rome, Somma and Fedde presented papers on "Anæmia Splenica Infettiva dei Bambini." Somma's conclusions are that "anæmia splenica infantilis" is a disease which occurs in infancy as a rule, but that adults are not exempt.

It is significant that a number of the cases, reported by various authors, of the disease in early life show a condition of rhachitis.

Cases have also been reported by Senator, Luzet, Baginski, Alt, Weiss, Hock, Schlesinger, Koplik, Monti, Berggrun, Audioud, Glockner, and others, but in all these cases rhachitis or some other condition of malnutrition was present which could produce changes in the blood identical with those which occur in the secondary anæmias of early life.

Pathology.—The pathology of splenic anæmia has mostly rested on the findings in the autopsies described by Banti previous to 1883. The pathological lesions in these cases were not those of leukæmia or pseudoleukæmia, and on this fact Banti laid much stress in his argument that the condition is due to a primary disease of the spleen. In Williamson's case, that of a boy nine years of age, the patient was under observation for four months, and finally died. The pathological lesions as described by Banti were marked fibrous changes in the trabeculæ and the follicles of the spleen, and a great diminution of the cells. There were many large phagocytic cells containing red corpuscles, the bone marrow was red and showed a lymphoid condition, but the lymph nodes were not enlarged. The spleen weighed two pounds seven ounces, the liver weighed two pounds twelve and one-half ounces. The blood showed a diminution of leucocytes, and the red corpuscles were between 2,000,000 and 3,000,000 per cubic millimetre. The temperature varied for four months, sometimes as much as four degrees between morning and evening. There was no history of rhachitis, syphilis, or malaria.

In the reports of the autopsies of Somma's cases of anæmia splenica infettiva dei bambini nothing very definite is added to our knowledge of the disease, nor are the reports satisfactory or conclusive. The spleen is firm and large, sometimes congested, sometimes with a thickened capsule. Various conditions, such as anæmia of the organs, pulmonary congestion, serum in the ventricles of the brain, and enterocolitis, and in one case pneumonia of both lungs, are recorded. Lorenzo reports the autopsy of one case in which there was an increase of the connective tissue of the spleen and sclerosis of the follicles.

Fedde states that the only characteristic lesions are found in the spleen, liver, and blood, that the glands are normal or slightly enlarged, the liver often enlarged from congestion and from a slight increase of the connective tissue, with fatty degeneration and atrophy of the liver

*The title which is placed at the head of this paper was chosen merely for reasons of convenience, *i.e.*, simply because the time had gone by when the article might have been placed under the title which I consider to be preferable.

cells; the spleen large and firm, with hypertrophy of the connective tissue, and the pulp rich in lymph cells and with the follicles hyperplastic.

Gianturco and Pianese report the pathological findings in a case of Fedde's as a spleen showing no increase in interstitial tissue and with the follicles little developed.

Mya and Trambusti reviewed the lesions found in the spleen and liver, and came to the conclusion that they were more or less diverse. In one of their cases the lesions in the spleen were similar to those found by Banti in cases of adult splenic anæmia, there being marked increase in the fibrous tissue, together with atrophied follicles and thickened trabeculæ.

Von Jaksch, in his description of anæmia infantum pseudoleukæmica, gives very few and very unsatisfactory reports as to the pathological appearances of the disease; he considers them to be a chronic hyperplasia of the spleen affecting in different degrees parts of the organ, with the liver showing slight increase in the connective tissue.

Hayem and Luzet report in their examination of the blood in anæmia infantum pseudoleukæmica large numbers of nucleated red corpuscles, in some of which there was evidence of karyokinesis of some of the nuclei, and they consider this to be of great diagnostic value. Fowler also lays great stress upon the presence of large numbers of nucleated red cells out of proportion to the diminution of the erythrocytes.

It is very evident that there does not seem to be satisfactory post-mortem evidence to warrant a definite pathological condition representing the splenic anæmia of infants. There seems to be present in most cases a chronic hyperplasia of the spleen, while in other doubtful cases the spleen is not altered.

Etiology.—In regard to the etiology of anæmia infantum pseudoleukæmica nothing definite has been proved. Although pathological micro-organisms, finding conditions favorable for their growth in the spleen, may, according to Somma, find their way into the circulation and thus produce changes which are represented by certain clinical symptoms, yet there is no doubt that the true nature of the disease, if such exists, has not yet been discovered. Nothing has ever been found bacteriologically to show a direct relation between the micro-organisms present and the production of the disease.

Symptoms.—It is difficult to describe the symptomatology of a disease which is so closely identified with cases of secondary anæmia with enlarged spleen, and in which the group of symptoms that are supposed to represent anæmia infantum pseudoleukæmica, are somewhat diverse. Both sexes are equally liable to present these symptoms, and the patients are usually between the ages of ten and eighteen months; one has been reported of seven and one-half months, and one at three and one-half years. The onset of the disease is gradual, the nutrition is poor; there are considerable emaciation, a waxy tint of the skin, at times hemorrhages from the mucous membranes and the skin, a spleen much enlarged, and the liver moderately enlarged. There is no tenderness over the bones, and there are often a venous bruit in the neck and functional cardiac murmurs. The blood shows the characteristics of a secondary anæmia of varying intensity, that is, a diminished number of erythrocytes, low hæmoglobin, variations in the size and shape of the erythrocytes and in the number of erythroblasts present. The leucocytes are not characteristic, being markedly increased in some cases and in normal proportion in others. The lymphocytosis, reported by many writers, may occur under any condition, giving rise to an increased number of white cells.

Diagnosis.—There seems to be no doubt that anæmia infantum pseudoleukæmica and anæmia splenica infettiva are the same condition, and, as there does not seem to be reason for believing that the spleen is primarily affected in either of them, they need not be differentiated one from the other. The differential diagnosis should first be made from leukæmia and pseudoleukæmia. The proportionately low leucocytosis and the absence of either a general lymphatic enlargement or an excess of myelocytes in the blood would differentiate it from the former, while the absence of enlarged lymph nodes would exclude pseudoleukæmia. As there are so few cases in which a thorough and reliable examination of the organs has been made in which rhachitis was not present, the diagnosis between rhachitis with enlarged spleen and secondary anæmia, and this supposed especial group of symptoms, would be very difficult and seemingly impossible.

We know that in infants the same blood changes which have been mentioned above often occur in connection with an enlarged spleen in the course of or following any disease of nutrition. We are therefore in the position of attempting to make a diagnosis between two conditions which may in the future be proved to be practically the same. In making a diagnosis we should limit the term anæmia infantum pseudoleukæmica to those cases in which no cause for secondary anæmia can be found, and in which the clinical symptoms and changes in the blood already described are present.

Prognosis.—The prognosis varies according to the extent and serious nature of the cause which produces the condition. The symptoms run an essentially subacute or chronic course; the large size of the spleen does not necessarily imply a fatal ending. When, however, secondary changes in the blood have occurred to such an extent as to warrant the diagnosis of a severe form of anæmia, and when a spleen of considerable size is detected in connection with these blood changes, the prognosis is very bad, as the infants usually die.

Treatment.—What has just been said of the prognosis in this class of cases may also be said of the treatment, which is, in fact, that of a case of secondary anæmia, and depends upon what is most reasonably supposed to be causing the condition that is present. This may be malaria, rhachitis, gastro-enteric disease, or some unknown cause which, simply representing the conditions of anæmia, calls for the usual treatment of arsenic, iron, proper food, and hygiene.

An extensive bibliography of the subject will be found in an article by Dr. A. H. Wentworth in the "Medical Communications of the Massachusetts Medical Society," vol. xviii., No. 3, 1901. *Thomas Morgan Rotch.*

PSEUDOMYXOMA PERITONEI.—The occurrence of free mucoid or colloid-like material within the peritoneal cavity, as the result of the rupture of an ovarian cyst or cystadenoma, or of the direct secretion of a neoplasm into the cavity, gives rise to a reactive proliferation of the peritoneal surfaces covered by such substance and the more or less complete organization of the latter. As a result of such partial organization the peritoneal surface is found to be covered with a jelly-like layer containing blood-vessels and strands of connective tissue, closely resembling myxomatous tissue. To this condition the term pseudomyxoma peritonei is applied.

The gross appearances vary with the amount of colloid or mucoid material lying on the peritoneal surfaces, and with the degree of organization. In the very early stages the surfaces of the peritoneum are covered with a jelly-like substance of varying thickness, which is easily scraped off, or may even be scooped out of the peritoneal cavity owing to the fact that it lies free therein. If organization has begun, the portion of the colloid material lying next to the peritoneum is not so easily scraped away, appears more opaque, and contains minute vessels, as shown by the fine red lines running through it. The peritoneal surface has therefore a reddish, roughened appearance, and is covered with fine whitish or reddish strands enclosing jelly-like colloid substance. As organization progresses there is developed above the peritoneal surface a zone of fibroblastic tissue which in time becomes changed into fibrous connective tissue, so that the peritoneum becomes greatly thickened, the condition resembling that of a chronic fibroid peritonitis. If the amount of colloid material scattered over the peritoneum is small, it may be completely organized and the peritoneum become more or

less thickened. On the other hand, a thick layer of colloid (several inches) is but slowly absorbed and organized, and may remain in the abdomen for a long time with but little change except where it comes into contact with the peritoneal surfaces. The reaction on the part of the peritoneum appears to vary greatly; in some cases it occurs immediately, in others it may be delayed for a long time.

Microscopically, sections cut through the peritoneum and the overlying mass of colloid show a fibroblastic proliferation of the subendothelial layer of the peritoneum, a wandering of fibroblasts into the colloid, and the formation of new blood-vessels which run out into the colloid substance. As organization progresses interlacing strands of connective tissue supporting blood-vessels are formed throughout the colloid substance, enclosing between them masses of the jelly material which have not yet been absorbed. These give the tissue an appearance resembling myxomatous tissue, even under the microscope. It is easily seen, however, that the structure is not that of a true myxomatous tissue, but represents an organization of a jelly-like foreign substance. All stages of organization may sometimes be seen in the same case. The writer has seen a number of cases representing different stages; in one of two years' duration the organization of the colloid was almost complete, the peritoneum being converted into a thick hyaline layer of connective tissue, enclosing here and there bits of unabsorbed colloid. Contraction of the mesentery and matting of the intestinal coils occur in this stage, and the appearance resembles very much the condition of the peritoneum in diffuse scirrhous carcinoma. The surfaces of the liver and spleen are similarly involved, and in the late stages present a picture of marked perihepatitis and perisplenitis.

Localized pseudomyxoma occurs when, from the rupture of a small ovarian cyst or cystoma, a small mass of mucoid substance is distributed in small portions over the peritoneal surface. These show the same stages of organization, hyaline change, etc., and finally come to represent localized thickenings of the peritoneum. This condition occurs most frequently in the pelvis.

If portions of living epithelium or of papillæ are set free into the peritoneal cavity with the mucoid material, after the rupture of an ovarian cystoma, these may proliferate and set up implantation metastases. These may become malignant; if the primary tumor has already undergone carcinomatous change, these implantations are likewise carcinomatous. In the case of the ordinary cystoma the implanted epithelium forms small cysts which become stationary after a while and do not form large growths. When the primary is a papilliferous cystadenoma the implantation metastases are much more likely to develop into larger tumors. It is conceivable that the implantation metastases of epithelium arising from a benign growth may later become malignant.

Small cysts lined with hypertrophic endothelium may also be found in the pseudomyxomatous tissue of the peritoneal covering. These are probably derived from the remains of the surface endothelium. It is also within the range of possibility that these may form centres for the formation of a new growth of malignant character.

Pseudomyxoma of the peritoneum is not in all cases formed by the rupture and discharge into the peritoneal cavity of an ovarian tumor containing mucoid or colloid material. Surface papillomata of the ovary may secrete such material directly into the peritoneal cavity; further, cystic carcinomata of the stomach, intestines, or testicles may give rise to the presence of mucoid or colloid substance in the peritoneal cavity, either from rupture of the primary or from secondaries located in the peritoneum.

In the great majority of cases, however, the mucoid or colloid substance comes from the rupture of a large ovarian multilocular cystoma, in which one chamber has been developed at the expense of the others; or from a primary unilocular cystoma. If the cyst contents are of a thin serous character they may be absorbed by the peritoneum without the production of peritoneal proliferation. The more jelly-like or colloid the contents the more likely the occurrence of pseudomyxoma. In order to excite peritoneal proliferation the substance must be of a fairly firm consistency and not easily absorbed. Pseudomucin may or may not be present in the cyst contents, but in the majority of cases it is a pseudomucin cyst that ruptures. The jelly-like material of the pseudomyxomatous tissue may give both mucin and pseudomucin reactions. Pseudomucin is, however, not necessary to the production of pseudomyxoma. This term should be taken as signifying the formation of a tissue resembling myxomatous tissue. Though spoken of as colloid, the cyst contents in all cases are mucoid, but when firm and jelly-like they may be appropriately designated as colloid or colloid-like.

The cyst contents when poured over the peritoneum act as a foreign body and set up a reactive proliferation which is of the nature of an inflammatory process. The presence of fibrin throughout the pseudomyxomatous tissue may often be shown by Weigert's fibrin stain. Localized collections of leucocytes may also occur throughout the organizing zone. In case of an infected cyst, or following infection as a result of operation, the picture of pseudomyxoma and that of a fibrinous peritonitis may be combined. The writer has seen one case of pseudomyxoma in which the cyst contents were scattered over a peritoneum showing a marked subacute fibrinous peritonitis. The colloid material was deposited on top of a thick fibrinous exudate which was undergoing organization. Organization of the colloid from the new fibroblastic tissue had begun in some areas.

To recapitulate, the writer holds that pseudomyxoma peritonei is a condition of the peritoneum due to a partial organization of a mucoid or colloid material, which has been deposited over the peritoneum as the result of the rupture of an ovarian cystoma or of other cystic tumor containing such material, or from the secretion of certain tumors directly into the peritoneal cavity. This view, however, is not held by all authors. Netzel, Wendeler, and others regard the condition as due, at least in part, to a chronic productive inflammation of the peritoneum associated with myxomatous degeneration. This view may be explained by the presence of pseudomucin in the lymph spaces of the peritoneum, following an absorption from the peritoneal cavity. Westermark and Annell regard the jelly masses on the peritoneum as the product of a specific form of peritoneal disease. Alshauser, Strassmann, Pfannenstiel, and others regard the process as due essentially to an implantation metastasis of tumor cells over the peritoneum. On the other hand, Werth (to whom we owe the designation *pseudomyxoma*), Veit, Kretschmar, and others hold practically the same view as the writer, namely, that the colloid masses are not metastases but are to be explained as the non-absorbable mucoid contents of a ruptured cyst, which, scattered over the peritoneum, act upon it as a foreign body, become enclosed in inflammatory adhesions, and undergo organization after the manner of a thrombus, finally being replaced by hyaline connective tissue.

The prognosis in pseudomyxoma is not necessarily bad. Large masses of colloid material may be kept within the peritoneal cavity for a long time without especial symptoms. Small amounts may be completely absorbed and organized, and the resulting condition of the peritoneum may give rise to the same sequelæ as those which follow chronic adhesive peritonitis. In operations for the relief of pseudomyxoma after the rupture of ovarian cysts, it should be borne in mind that the peritoneum, after the removal of the overlying colloid material, represents a more or less denuded, hyperæmic surface, through which infection may easily take place, giving rise to a fibrinopurulent peritonitis. The general resistance of the peritoneum appears to be lowered as the result of the presence of the foreign substance in the cavity. The danger that a malignant growth will arise from the implantation metastases is not very great in the case of a simple multilocular cystoma, but in the case of a papilliferous cystoma the danger of such an occurrence is much greater.