and bones. According to Osler metastases occur in primary stomach carcinoma in 86.6 per cent. of cases, according to Welch in 63.4 per cent., according to Ewald in 75 per cent. of cases. Retrograde metastasis may lead to multiple carcinomatous constrictions of the intestines. The metastases of intestinal carcinoma are usually hæmatogenous, through the portal vein into the liver. This is explained by the numerous large and thin-walled vessels in the intestinal coats.

Primary carcinoma of the uterus gives rise to metastases first in the iliac, sacral, and lumbar retroperitoneal glands, later in the liver, more rarely in distant organs. Primary sarcoma of the uterus does not often give rise to secondaries; they are usually found, when they do occur, in the lungs, liver, vagina, and ovaries. Primary carcinoma of the ovary gives rise to secondaries in the retroperitoneal glands and the liver, and more rarely in distant organs. Implantation metastases over the peritoneum are very common; they are more rare in the mucosa of the tubes and uterus.

Both primary carcinoma and sarcoma of the kidneys break into the renal veins and produce metastases in the lungs. The neighboring lymph glands, particularly those near the hilum, are usually quickly involved. In the case of cancer of the left kidney retrograde metastasis into the spermatic vein may occur. In carcinoma and sarcoma of the testis the regional lymph glands are usually affected; hæmatogenous metastasis into distant organs is not infrequent. Retrograde metastasis into the kidney through the renal vein may take place. In the case of the cystocarcinoma of this organ implantation metastases over the peritoneum are very common. They may form the chief clinical feature, the primary being of insignificant size. Likewise primary carcinoma of the prostate very often gives rise to metastases of great clinical importance, while the primary may be but a small nodule. The secondaries are often found in the bones, usually in the large ones. The metastasis is usually through the veins; statical and traumatic influences are potent in the location of the metastasis. In all cases in which carcinomatous growths are found in the bones without evident primary disease the prostate and thyroid should be carefully examined for the existence of a primary.

The secondaries of primary cancer of gall-bladder and pancreas are usually found first in the regional lymphatics and liver, later in the lungs and other organs. Primary carcinoma of the liver rarely gives rise to secondaries, but when they do occur these are hæmatogenous. The metastases of malignant hypernephroma arising either in the adrenals or in the kidneys are usually found in the lungs. Primary carcinoma of the thyroid very frequently gives rise to metastases in the bones, the skull, sternum, and ribs being most frequently involved. In primary sarcoma of the thyroid, bone metastases are less commonly found.

In the case of other organs of the body the general rule of lymphogenous metastasis for carcinoma, hæmatogenous for sarcoma will hold good. There are, however, all possible forms of combinations, the metastases in many cases being determined by various factors: relation of tumor cells to blood and lymph vessels, location of primary, etc.

Besides the metastasis of malignant tumors cases of metastases from apparently benign tumors have been reported. Thyroid adenoma and chondroma of the testis are the benign growths which most frequently give rise to secondaries. The very fact of such metastasis should, however, exclude such growths from the benign category. In the case of the chondroma of the testis the primary growth is probably to be regarded as of the nature of a malignant teratoma. The so-called benign adenoma of the thyroid gives rise to bone metastases which resemble the original tumor. They may be multiple. As the secondary foci are not malignant in character they should be removed by local operation; amputation is not indicated. (See also *Embolism*, *Carcinoma*, *Sarcoma*, etc.)

Aldred Scott Warthin.

METHACETIN (Para-oxymethy-acetanilid). — This compound is a derivative of acetanilid, introduced in 1888 by F. Mahnert as a substitute for phenacetin, to which it is closely allied. Its formula is $C_6H_4OCH_3NHC_6H_5O$, which differs from acetanilid, $C_6H_5NHC_2H_3O$, by substituting, for one atom of H, one atom of the oxymethyl group OCH_3. In phenacetin, $C_6H_4OC_2H_5NHC_2H_3O$, the H atom is replaced by the ethyl group OC_2H_5.

It forms in white, glistening, scaly crystals, without color or faintly reddish; odorless; melting at 127° C.; it has a slightly bitter saline taste; is soluble in water at 60° F., 1 part in 530; in boiling water it dissolves in 12 parts; is freely soluble in alcohol, chloroform, glycerin, and fatty oils. Methacetin possesses antipyretic, antiseptic, and analgesic properties similar to those possessed by phenacetin, which it resembles therapeutically, as well as chemically. It may be administered in all conditions in which phenacetin is employed. The dose for an adult is from five to seven grains.

Methacetin has not been very generally adopted and is not employed to any extent. It was recommended as being particularly serviceable for children and enfeebled persons as it was said to be devoid of toxic action. Experience, however, has shown that its use may be followed by profuse perspiration and signs of collapse.

Physiological experiments have proved that forty-six grains will cause death in a rabbit, producing spasms in the posterior, and later in the anterior, half of the body. After death there is found hyperæmia of all the organs, and the heart is flaccid and filled with blood clots. No hæmoglobin is found in the urine. *Beaumont Small.*

METHENYL-ANISIDINE is a local anæsthetic obtained by prolonged heating of ortho-anisidine with ortho-formic acid ester. *W. A. Bastedo.*

METHENYL DI-PARA-PHENETIDIN is a crystalline compound prepared from para-phenetidin and ortho-formic ester. It is used as a local anæsthetic and in seasickness. *W. A. Bastedo.*

METHONAL, di-methyl-sulfone-di-methyl-methane $[(CH_3)_2C(SO_2CH_3)_2]$ is a hypnotic resembling sulfonal, the di-ethyl-sulfone compound. It is, however, less sedative and of less value than sulfonal. Dose 0.7 to 2 gm. (gr. x.–xxx.). *W. A. Bastedo.*

METHOXY-CAFFEINE, $C_8H_9(OCH_3)N_4O_2$, is a derivative of caffeine, occurring as white acicular crystals or as an amorphous powder. It is given in neuralgia, migraine, etc., and may be used hypodermatically. Dose 0.06 to 0.25 gm. (gr. i.–iv.). *W. A. Bastedo.*

METHYL ALCOHOL.—Methyl alcohol, $CH_3(OH)$, known to the chemist also as *carbinol* and *methol*, is more popularly known under the several names of *pyroligneous spirit*, *pyroxylic spirit*, *wood spirit*, *wood alcohol*, and *wood naphtha*—names taking origin from the fact that methyl alcohol occurs as one of the ingredients of crude wood vinegar, the fluid product of the destructive distillation of wood. Methyl alcohol, when pure, is a thin, colorless fluid, much resembling common (ethyl) alcohol in taste and smell, but, obtained from wood vinegar and unpurified, has both a rank and an offensive flavor and odor. Methyl alcohol resembles ethyl alcohol also in being volatile, inflammable, and miscible in all proportions with water and ether. The two alcohols also mix freely with each other. *Physiologically*, the effects of methyl alcohol are probably very similar to those of common alcohol, but exact experimental researches are wanting. Recent experience, however, seems to show that its effects are more harmful than those of ordinary alcohol. *Therapeutically*, this alcohol has been given, with no very obvious purpose, in a number of diseases; but it is now little used, and it is not official in the United States Pharmacopœia. It has been administered in doses of from five to forty drops, taken in water. Methyl alcohol is useful in the arts as a solvent. *Edward Curtis.*

METHYL ALCOHOL, POISONING BY.—Commercial methyl alcohol (wood spirit, wood naphtha) is very impure and on account of its offensive odor and taste cannot be used for the preparation of drugs or beverages. Recently, however, a purified article has been largely sold under the name of Columbian spirit. This has a faint, not unpleasant odor and a pungent taste. As it is somewhat cheaper than common (ethyl) alcohol, it has been extensively used as a substitute for this. Very little information is available as to the physiological action of absolutely pure methyl alcohol. Dr. Benjamin Ward Richardson stated that it was a light and transient stimulant. It has been shown, however, by recent experience that the continued exposure to the vapors of the commercial purified methyl alcohol, or the repeated drinking of it, produces blindness. In the reported cases, which have occurred principally among varnishers who were using materials prepared with Columbian spirit, or among those using medicines containing the same substance, as a substitution for common alcohol, the blindness has been the prominent symptom. The ophthalmoscope shows optic neuritis with exudations into the retina and subsequent atrophy. The calibre of the retinal vessels is much diminished and the veins are tortuous. In the early stages an absolute scotoma and color blindness are found. The condition is very serious. Recovery, if it occurs at all, is slow. The action is, therefore, more of the type of slow poisoning, similar to that commonly caused by lead compounds. Acute poisoning by methyl alcohol would probably resemble acute poisoning by common alcohol, but this phase has as yet no practical importance.

The only treatment possible for the blindness is removal of the cause. It is not impossible that the Columbian spirit still contains some empyreumatic product which is the cause of the poisonous action.

Henry Leffmann.

METHYL CHLORIDE (Monochlormethane) $CH_3.Cl$.—Obtained by the action of hydrochloric acid upon methyl alcohol, in the presence of zinc chloride. A colorless gas with a sweetish taste and an ethereal odor. It is soluble in one-fourth its volume of water, much more so in ethyl and methyl alcohol, and freely in ether and chloroform. The gas is not very inflammable; when ignited it burns with a greenish flame. At a temperature of −11.4° F., or under a pressure of five atmospheres, it is converted into a liquid, with a specific gravity of .9915, neutral to test paper. This liquid boils and becomes a gas at a temperature of −5.8° F., the change of condition being accompanied by the absorption of a great amount of heat. On account of the rapidity of this change an intense degree of cold is produced, amounting to a fall of 40° or 50° F. or more.

The use of this refrigerant action was applied by Débove, in 1884, as a local anæsthetic for neuralgia and other painful affections. It has been used in sciatica, pruritus, spinal pains after railway accidents, and in the painful joints of rheumatism, and in pleurisy. For this purpose it may be applied directly to the part with a camel-hair pencil, or cotton saturated with it is applied to the skin; the spray may also be used. The most important application of this compound was as a freezing mixture for the performance of minor surgical operations. It was used with decided success in circumcision for phimosis, evulsion of toe-nails, excision of cancer of the lip, opening of mammary abscess, incision for empyema, and many similar painful procedures. This use, however, has been superseded by ethyl chloride, which is a much milder but equally effective anæsthetic. Methyl chloride is much more intense in its action on account of the greater degree of cold that is produced, and its effect is controlled with much greater difficulty. The part is sprayed for two or three seconds only; if the spraying is continued beyond five seconds, the tissues are liable to be blistered and necrosis may follow.

Methyl and ethyl chloride are combined in various proportions and brought to the notice of the profession under various trade names; none, however, is superior to the ethyl chloride.

It has also been suggested as an anæsthetic, and a mixture of ether and chloroform, saturated with the gas, was suggested by Richardson, but no advantage was apparent, and it has failed to receive recognition.

Beaumont Small.

METHYL-CHLOROFORM, CCH_3Cl_3, is similar in anæsthetic power to chloroform, but very rapid and fleeting in its action. It is claimed to be less dangerous. It is recommended as an anæsthetic in short operations.

W. A. Bastedo.

METHYL-GLYCOLLIC ACID PHENETIDID. See *Kryofine*.

METHYL-GLYOXALIDIN. See *Lysidin*.

METHYL IODIDE, *Moniodomethane*, CH_3I. Methylic iodide is a colorless, heavy, ethereal fluid, of specific gravity 2.199 at 0° C. (32° F.), and boiling point 43.8° C. (111° F.). When pure its vapor is anæsthetic after the manner of that of chloroform, but this iodide is easily decomposed, and so is apt to incite the irritant effects due to free iodine. In consequence of this disadvantage methyl iodide has never been given a place among accepted anæsthetics. It was originally proposed by Dr. Richardson in 1868. *Edward Curtis.*

METHYL-LORETIN, para-methyl-meta-iodo-ortho-oxyquinolin-ana-sulfonic acid, $CH_3I.OH.C_9H_3N.SO_3H.H_2O$, is a deep yellow compound occurring in scales or needles, slightly soluble in alcohol and water and insoluble in ether. Its action and uses are those of loretin, which see.

W. A. Bastedo.

METHYL OXIDE.—Methyl oxide $(CH_3)_2O$, commonly called *methylic ether*, is the same compound of the radical *methyl* that common ether is of the radical *ethyl*. Methylic ether is a gaseous body at all ordinary temperatures (condensing only at a temperature of −21° C. [−5.8° F.]); is colorless, and of a not unpleasant ethereal odor. Methylic ether is a powerful and rapid anæsthetic, and was experimented with by Dr. B. W. Richardson, in 1867, with a view to its possible employment as an anæsthetic in surgery. Dr. Richardson used a saturated solution of methylic ether in absolute ethylic (common) ether, the solution being effected at the temperature of 0° C. (32° F.). The preparation, however, has never come into general use. *Edward Curtis.*

METHYL-PARA-AMIDO-META-OXYBENZOATE. See *Orthoform*.

METHYL-PHENACETIN, $(C_2H_4.OC_2H_5N.CH_2.CH_3.CO)$, is phenacetin with a methyl group replacing the imide hydrogen atom. It is prepared by acting on phenacetin sodium with methyl iodide, and occurs in colorless crystals which are slightly soluble in water and readily soluble in alcohol. It resembles phenacetin in its antipyretic and sedative properties, but is said to be more hypnotic. Dose 0.12 to 0.7 gm. (gr. ij.–x.).

W. A. Bastedo.

METHYL-PHOSPHIN and *di-methyl-phosphin* have been used in malaria by Mannaberg with good results in dose of 1.2 gm. (gr. xx.) a day, but they have been found by Fürbringer to be powerful convulsant poisons which kill by paralysis of respiration. One-half gram per kilogram was fatal to rabbits. *W. A. Bastedo.*

METHYL-PYRIDIN SULFOCYANATE is a crystalline compound of chinolin and thiocyanic acid, which in one-per-cent. solution serves as a powerful non-caustic antiseptic. *W. A. Bastedo.*

METHYL-SALOL, para-cresotonic-phenyl ester, $C_6H_3.CH_3.OH.CH_3.CO_2$, occurs in colorless needle-like crystals,

insoluble in water and soluble in ether, chloroform, and hot alcohol. It is used as an antirheumatic in dose of 0.3 to 1 gm. (gr. v.–xv.). *W. A. Bastedo.*

METHYL-URETHANE, urethylane, $CONH_2OCH_3$, is prepared by acting on methyl alcohol with cyanogen chloride, and occurs in colorless crystals which are soluble in water and alcohol. It is used like urethane (ethyl urethane) as a hypnotic, which is not depressing to the heart. Dose 1 to 4 gm. (gr. xv.– ʒ i.). *W. A. Bastedo.*

METHYLENE BICHLORIDE.—*Methylenic Chloride, Di-chloromethane,* CH_2Cl_2. This body is closely related to chloroform chemically, and, accordingly, much resembles that body in physical characteristics and in physiological properties. Methylene bichloride is a heavy, colorless, ethereal fluid, of specific gravity 1.344, and boiling point 40° C. (104° F.), and of neutral reaction. Its odor resembles that of chloroform. It mixes freely with chloroform, ether, and alcohol. The medicinal importance of methylene bichloride lies in the anæsthetic powers of the vapor of the drug, which closely resemble those of chloroform both in kind and in degree. This anæsthetic is one of Dr. B. W. Richardson's numerous proposed substitutes for chloroform, and has been quite extensively used by many surgeons, notably by Mr. Spencer Wells. The only possible advantage of this substance over chloroform would lie in greater safety; but since several deaths have unquestionably been caused by methylene bichloride, the anæsthetic must rank among the dangerous group. Dose and method of administration are substantially the same as those of chloroform, the only difference between the two bodies—so far as the mode of administration is concerned—being a lower boiling point, and therefore a higher volatility, in the case of methylene bichloride.

The name "methylene chloride" has been given also to certain anæsthetic mixtures—to a mixture of the present body and ordinary ether, and to one of chloroform and methyl chloride, or chloroform and methyl alcohol.
Edward Curtis.

METHYLENE BLUE (Tetramethylthionine Chloride).—An aniline derivative, its formula being $(C_6H_2N[CH_3]_2Cl)_2NS$. Chemically pure methylene blue occurs in small indigo-colored scaly crystals, with a bronze-like tinge and dark green in transverse fracture. It is slightly soluble in water, forming a deep blue solution, which is changed by sulphuric acid to a dark green, and from which a strong potash solution throws down a dark violet precipitate. The methylene blue of commerce (ethylene blue O) is a double chloride of zinc and tetramethylthionine.

This aniline product was introduced into medicine in 1890, by Drs. Ehrlich and Lippmann (*Deut. med. Woch.*, June, 1890), as an analgesic of some value. Professor Ehrlich had investigated the action of the drug on nervous tissue as a staining reagent, and had demonstrated that it had a peculiar selective action on the axis cylinders of motor and sensory nerves. Further experiments showed that when taken into the stomach, or introduced subcutaneously, it rapidly spread throughout the system and gave relief to all neurotic pains, and the pain in rheumatism of the muscles, joints, and tendons. A two-per-cent. solution was used, by means of which one grain was given hypodermically. It was also used in capsules, the powder being given in doses of gr. iss.–iv.; as much as gr. xv. were given in one day. No ill effects accompanied its administration, and there was no change in appetite, digestion, pulse, or any of the normal functions. The drug was absorbed very quickly, and a quarter of an hour after the smallest dose the urine became a bright green, after two hours a dark green, and after four hours a dark blue. In the saliva a bluish tinge was detected, but there was no discoloration of the mucous membranes or conjunctiva. Those observers found that the anodyne effect began in about two hours, and was gradually produced; it had no effect on any fever or inflammatory condition. Other observers have reported it of value in nervous headaches, herpes zoster, alcoholic depression, migraine, and in the pleuritic pains of tuberculous patients. Further use has failed to confirm this analgesic property and the drug is now rarely employed for this purpose; other compounds have proved more effective, and the discoloration which it produces renders its use objectionable.

In the following year (1891) Ehrlich and Guttman announced that the drug was also a remedy for malarial troubles. They were led to experiment upon this disease from the fact that the plasmodia of malarial disease were readily stained by this body, not only in prepared specimens but also in fresh blood. They used the remedy in two cases of malarial fever—one quotidian, the other tertiary. They found that it had a decided curative power over the disease; the periodical attacks ceased within a few days, and at the end of eight days all plasmodia had disappeared from the blood. A dose of gr. iss. was given ten or twelve hours before the expected attack, and repeated every two hours until five doses had been taken. The treatment, they say, should be continued for seven or eight days after all malarial symptoms have subsided. Other European observers have reported the results of a trial of this remedy, with more or less beneficial results. Laveran experimented with it without obtaining any success. He injected it into the blood of pigeons affected with the hæmatozoon, and although the color was seen in the blood no effect was exercised upon the parasites.

Dr. W. S. Thayer, in *Johns Hopkins Hospital Bulletin,* May, 1892, gives a detailed report of seven cases treated by this method. He concludes that: 1. Methylene blue has a definite action against malarial fever, accomplishing its end by destroying the specific organism; but it is materially less efficacious than quinine, failing to accomplish its purpose in many cases in which quinine acts satisfactorily. 2. Reaction appears to be rapid, the chills disappearing and the temperature, in remittent cases, falling to normal during the first four or five days; later, however, if a sufficient number of organisms have resisted the drug, they appear to develop again directly under its influence, causing a return of the symptoms. 3. Methylene blue seems to have no advantages over quinine which would warrant its further use. It is now recognized as a valuable remedy in the treatment of all forms of malaria, not replacing quinine, but of service in many cases in which this drug has failed, and the two together often succeeding when both have failed when given separately. The monograph of Dr. Cardamatis, of Greece, published in 1897 (*Deut. med. Woch.*, xxiv., 9) shows the remedy to be of decided value when given in doses of gr. x.–xij., commencing ten hours before the onset of the paroxysms.

A case of chyluria due to *Filaria sanguinis hominis* was reported by Austin Flint as cured by this treatment (*New York Medical Journal,* June 15th, 1895).

Methylene blue has also been given in tuberculous conditions. In pulmonary phthisis a dose of gr. iss. was given the first day, increased on the second day to gr. iij., on the third day to gr. ivss., and so on until gr. xxiv. were given in the twenty-four hours. The usual improvement of symptoms is said to follow its use. In tuberculous pharyngitis the powder may be applied to the affected part, and in scrofulous glands of the neck, and for irrigating empyemic cavities, a ten-per-cent. solution has been used. A solution of the same strength has also been recommended in diphtheria. It is reported that the drug has been employed with advantage as an injection in severe forms of dysentery.

The latest use of methylene blue has been in the treatment of diseases of the genito-urinary organs, both by internal administration and locally as an injection. It has been shown that as much as sixty-eight per cent. of the amount given is excreted by the kidneys, and during its passage it is mildly diuretic and exerts an anodyne and germicidal action. Numerous cases of kidney disease

have been reported in which it has proved beneficial, but it has been of most practical value in cystitis and urethritis, particularly when gonorrhœal in character. The dose is gr. i. three times a day, and oil of santalwood, copaiba, etc., may be combined. The bladder and urethra may also be irrigated freely with a solution of the strength of from half a grain to one grain to the pint.
Beaumont Small.

METHYLENE DI-TANNIN. See *Tannoform.*

METHYLENE DI-COTOIN. See *Fortoin.*

METHYL VIOLET. See *Pyoktanin.*

METRITIS.—Definition.—Metritis is defined as an inflammation of the uterus, or, in other words, of the uterine wall. This definition, so far as it goes, is satisfactory, and if all of the conditions which are grouped under this head were inflammatory in their nature and always involved the whole of the uterine wall, there would be but little difficulty in giving a systematic account of the disease. As it is, however, many observers describe as a distinct entity diseases of the endometrium. This division necessitates another name when the muscular and connective-tissue portion of the uterine wall, or the mesometrium of Schultze, is involved, and it is to inflammatory or other changes of this portion of the uterus that the name metritis is often applied to distinguish it from endometritis. From the close relationship, however, which exists between these tissues and from the fact that recent observations show an almost constant involvement of some of the mesometrial tissue following primary inflammation in the endometrium, it is no longer proper to describe endometritis as a distinct disease. Therefore it is best to use the term metritis as meaning an inflammation of the uterus as a whole, while if special stress is to be laid on changes in one or the other part of the wall we may speak of an endometritis, or of a parenchymatous metritis, or of a mesometritis.

Further, we find grouped under the one head of metritis several conditions which are not in their nature inflammatory, but are the results of congestive or degenerative changes; and though these should properly not be classed under a term meaning in its derivation inflammatory, for the present, at least, until our understanding of the exact etiological factors is clearer, they must be grouped here, especially as it is difficult sharply to differentiate between the inflammatory and the congestive changes, and it is even more difficult to differentiate between the results of these two conditions in the later stages.

Varieties.—As in the definition of the term, so also in grouping the varieties do we find much confusion, and it is only necessary to review briefly some of the proposed methods of grouping to realize how difficult a matter it is to obtain a satisfactory conception of the whole. Thus we may divide the varieties, as does Winckel, according to their etiology. This is cumbersome, however, and leads to much obscurity. We may divide them according to clinical symptoms, and speak of endometritis hæmorrhagica, endometritis dysmenorrhœica, and endometritis catarrhalis. Or we may follow Ruge's classification, describing endometritis glandularis, endometritis interstitialis, and endometritis diffusa, to which Ruge adds three special forms, endometritis decidua, endometritis post abortum, and endometritis exfoliativa. This last is the classification most frequently used in this country and the one, with some modifications, which is employed here.

Acute Forms Involving both Endometrium and Mesometrium.

1. Acute puerperal metritis.
2. Acute septic metritis (non-puerperal).
3. "Metritis desiccans" Garrigues, or "gangræna uteri partialis post partum," Grammatikati.

Chronic Forms Involving Chiefly the Endometrium.

4. Endometritis glandularis.
5. Endometritis interstitialis.
6. Endometritis diffusa.
7. Endometritis exfoliativa.
8. Endometritis deciduæ.
9. Endometritis senilis.

Chronic Forms Involving Chiefly the Mesometrium.

10. Parenchymatous or interstitial metritis.

Conditions classed as metritides, in which there is no distinct pathological change.

11. "Metritis hysterica," Vedeler.

Etiology.—As etiological factors two main causes are found—bacterial infection and circulatory disturbances; although besides these two there are other influences which must be borne in mind, as, for instance, in cases of glandular metritis the clinical picture is of a hyperplastic change in the epithelium, and in this form we must search for some form of irritation. Again, for instance in the hysterical metritis, we must consider the cause as a local hyperæsthesia of the nerve terminals, and in fact in a number of cases of metritis we are forced to concede the fact that as yet but little is known of the etiology.

In studying more in detail the bacterial infections we find in the acute forms that the condition is a result of the attack of the pyogenic cocci. Thus, the most frequent variety of bacteria in cases of acute puerperal metritis is the streptococcus pyogenes, either alone or as one member of a mixed infection. This organism gains entrance to the uterine cavity through the widely opened cervix, and generally as a result of its introduction from outside through the medium of an unclean finger, speculum, forceps, or other instrument.

Acute septic metritis, not puerperal in origin, is less frequently recognized and is a rarer condition. As in the puerperal form, however, it is the result of the presence of one of the pyogenic cocci, probably most frequently the gonococcus, though various other forms have been isolated from the uterine cavity in these cases. The method of invasion varies. Most frequently, perhaps, the acute inflammation follows the introduction of a dirty sound or other instrument. The introduction of dirty instruments, or of an infected finger, into the vagina is also a means of infection, the micro-organisms reaching the cervix and gaining entrance to the uterine cavity through the cervical canal. In the same way a dirty pessary may be the means of spreading the infection. An acute gonorrhœal infection of the uterine wall usually begins some time during the menstrual period when the cervical canal is more widely open than usual, and when the organisms which have already attacked the cervix may be more easily carried into the uterine cavity by a back flow of the fluid blood.

Metritis desiccans is but one of the later stages in puerperal metritis, and is characterized by the destruction and sloughing off of large portions of the uterine wall.

As regards the more chronic forms, we must conceive in many cases a different course of events. A certain number of cases of chronic endometritis, especially the interstitial form, follow as a later result after the acute inflammation has subsided, there being in these cases a round-cell infiltration and a proliferation of the connective tissue with a possible change in the character of the epithelial cells which in places are found flattened or cuboidal and lying several layers in depth in place of the one layer of cylindrical cells. In many of the chronic cases the condition does not follow a bacterial infection at all, but is due to circulatory changes or to interference with uterine involution after delivery, and we may find the chief trouble either in the glandular tissue, in which case there are proliferative or degenerative changes in the glands, or it may be in the interstitial tissues in which it gives rise in the same way to active proliferation or degeneration; or, finally, we may find the chief effects of the circulatory disturbance in the mesometrial tissues,