of kin from hysteria, some of the most useful remedies are caffeine and guarana.

The newer analgesics of the coal-tar series, such as antipyrin, phenacetin, antifebrin, ammonol, antikamnia, etc., are of some service, though there is reason to fear that as "domestic remedies" they are employed to an extent which is not devoid of danger.

Charles F. Withington.

ANTISUDORIFICS; ANHYDROTICS.—These are a group of remedies employed to check excessive secretion from the sudoriferous glands. It includes belladonna and allied plants, agaricin, picrotoxin, sulphuric and phosphoric acids, sulphate of copper, oxide of zinc, and many other drugs which possess astringent properties. What may be termed indirect antisudorifics are strychnine, iron, and tonics generally, which act by improving the tone of the system and overcoming any debility which is often the predisposing cause.

A too free secretion from the skin is often an accompaniment of general debility, and is readily checked by appropriate treatment. That form which is of importance to the practitioner is the very profuse sweating met with in phthisis and in all forms of septic absorption. In these conditions the loss of fluid is at times enormous, and as there is also present a large amount of solids, it becomes a very exhaustive drain upon the system. This secretion is not an ordinary transudation of water in the form of serum. It is a special secretion controlled by special nerves, and any depression or paralysis of these nerves at once lessens the secretion. This is well seen in the effect of poisonous doses of belladonna, when the vaso-motors are paralyzed and the flow of blood in the skin is increased, but notwithstanding this the skin remains dry on account of the sudoriferous glands being also paralyzed.

The most valuable of antisudorific drugs is belladonna and its alkaloid. One of its earliest effects is to paralyze the secreting glands of the skin and mucous membranes, and, aside from its interfering to a slight extent with the digestion, its action is wholly favorable. The local application of the liniment or ointment will produce the same effect, and this treatment is often adopted in sweating hands and feet. If applied freely, absorption takes place, and its constitutional effects are produced. The local application to the chest has been employed, with benefit, in the "night sweat" of lung disease. The effect of belladonna is now almost entirely secured by the administration of atropine by the mouth, or preferably by hypodermic injection. It may be commenced in moderate doses of gr. $\frac{1}{120}$, but it will generally be found necessary to inject gr. $\frac{1}{75}$ or $\frac{1}{50}$ to obtain its proper action. Too frequently the dose employed is insufficient. Children require a larger dose, gr. $\frac{1}{50}$ or even larger quantities being given. The rapidity of its action varies; sometimes the system responds almost immediately, at other times its effect is not evident for three or four hours. Usually the effect of a full dose will last for two or three days.

When necessary to give opium, belladonna will prove a valuable combination to prevent the sweating which often arises during the use of that drug.

Hyoscymus and its alkaloids have also the same action. Agaricin has been used with much success in doses of gr. $\frac{1}{30}$ to $\frac{1}{4}$. Picrotoxin has also been recommended in doses of gr. $\frac{1}{100}$ to $\frac{1}{50}$. Zinc oxide, gr. ij. to iv. at bedtime, and sulphate of copper, gr. $\frac{1}{2}$, are very old remedies. One of the oldest remedies, and, next to belladonna, one that is the most generally employed, is the aromatic sulphuric acid. This requires to be given more continuously until it produces its astringent action. At first, ♏ xx. three or four times a day, should be given for two or three days, after which a single dose at bedtime will continue the effects of the day. The dilute phosphoric acid is also of service when administered in the same way. These acid astringents have not the same specific action as belladonna, but are probably excreted in part by the sweat glands, and during the excretion exercise their astringent action. Sulphate of copper and oxide of zinc probably, in addition, exert some effect upon the centres controlling secretion.

In septic diseases it has been recommended to employ antiseptic drugs, which by counteracting and removing the poison allay the unfavorable symptoms, among them the profuse perspirations. Creosote, sulphocarbolates, and other similar remedies have been employed for this purpose.

Bathing the surface of the body with weak acid solutions assists in allaying perspiration and preventing the "night sweats," for it is known that all acid solutions will lessen the secretion of acid-secreting glands. Dilute sulphuric, or acetic acid, or vinegar, applied at bedtime, and in severe cases repeated a short time before the expected "sweat," will allay the trouble and at the same time prove most refreshing. Hot solutions are said to be more effective, and it has been recommended to employ cayenne pepper in hot vinegar in rebellious cases.

Beaumont Small.

ANTITHERMIN. — Phenyl-hydrazine-levulinic acid, $CH_3C\ C_6H_5N_2H,C_2H_4COOH$. This is prepared by acting on a solution of phenylhydrazine in acetic acid, with levulinic acid. The resulting crystals are colorless, without taste, and are practically insoluble in water. They are slightly soluble in alcohol and readily so in ether. Their melting point is 108° C. (226° F.). This drug was introduced in 1887 by Nicot as a new antipyretic, and was afterward recommended by Drobner in the high temperature of pulmonary tuberculosis. He gave it in doses of gr. viiss. to x., but on account of occasional untoward symptoms, such as pallor, sweating, headache, and general depression, gr. iij. is advised as the maximum safe beginning dose. Antithermin has been used to a slight extent in other cases of fever, but has not found favor with the medical profession.

W. A. Bastedo.

ANTITOXINS; ANTITOXIC SERA.—The word antitoxin is at present usually restricted to substances found in the blood of animals which neutralize the toxins produced by bacterial or other cells. Other substances exist which are slightly antitoxic. These are found in old cultures, and Bolton developed them from toxins by means of electricity. An antitoxin is, to a large degree at least, specific in its effects on poisons; that is, it acts only, or at least chiefly, upon the toxins produced by one species of organisms.

Thus, a given quantity of antitoxic serum from a horse made immune to diphtheria will absolutely neutralize a number of fatal doses of diphtheria toxin, so that the mixture injected into an animal will prove harmless.

The same antitoxic serum mixed with the toxin from tetanus bacilli will have no appreciable neutralizing effect. In a few instances some have reported an antitoxin to have an effect on more than one toxin, but even here this effect is always much greater upon some one than upon the others.

Antitoxins are present to some extent in the blood of animals which have not passed through an infectious disease or been injected with bacterial or other cell poisons. For instance, horses usually have more or less of a substance antitoxic to the diphtheria toxin. Thus it will require 5 c.c. of the blood of one horse to protect a 250 gm. guinea-pig from ten fatal doses of diphtheria toxin, while in another $\frac{1}{30}$ c.c. will suffice. The blood of these same horses may have no neutralizing effect upon tetanus toxin.

Whether these antitoxic substances present in small amounts in normal blood are the same as those present in larger amount in the blood of immunized animals, we as yet do not know. Neither in their chemical nor in their physiological properties can we detect any difference.

THE NATURE OF ANTITOXINS.—Up to the present time we know only that they seem to have the properties of globulins. If it were not for the fact that we have them present in normal blood, we might, in order to account for their specific qualities, consider them as partly satisfied combinations of globulins and specific toxins, but as they occur without the presence of toxins this theory seems to be excluded.

Blood from either normal or immunized animals contains a number of globulins, and these all, when the blood is antitoxic, prove antitoxic also. By no known method can we separate the antitoxin from the globulin, so that if antitoxin be not a globulin it is at least a substance very closely allied to it. Exactly how the antitoxins are produced we do not know, but we believe them to be cell products. Different antitoxins may be produced by different cells.

A relation which exists between the amount of antitoxin in the blood of an immunized animal and the amount of globulins has been noted, in the tests of the different horses under the care of the Department of Health, by Atkinson. He found that the globulin increased and decreased roughly as the antitoxin increased and decreased.

Antitoxins are only fairly stable substances. In sera antitoxins either slowly or quickly deteriorate, largely according to the conditions under which they are kept, but partly also in proportion to the abundance of certain blood ferments. In sterile serum, kept cold and free from access of air, antitoxins deteriorate very slowly, diminishing from ten to fifty per cent. in a year. Exposed to light, air, and slightly elevated temperature, they quickly become altered, and especially so if exposed to heat above 50° C. Exposed to 70° C. for ten minutes, a large portion of the antitoxin in a solution is destroyed.

As the antitoxins of diphtheria and tetanus have been the most studied and are by far the most important of the known antitoxins, they will be considered in detail as types of the others.

Both of these antitoxins have the power of neutralizing their corresponding toxins, so that when a certain amount is injected into an animal before or together with the toxin the poisonous effect of the toxin is removed. There is still a great difference of opinion as to whether antitoxin acts by direct chemical neutralization of the toxin or indirectly on the cells. The facts in favor of a direct action of antitoxins upon their corresponding toxins have recently been briefly summarized by Cobbett as follows.

1. Certain reactions have been observed to take place between these substances outside the animal body (venom, ricin, crotin, tetanus toxin, diphtheria toxin, and their corresponding antitoxins).

2. Various attempts by filtration, chemical means, and heat to separate the toxins and antitoxins from neutral mixtures have been failures. Partial successes have, at least in some instances, been shown to depend upon the fact that insufficient time for the complete union of toxins and antitoxins was allowed, separation being no longer possible if this were granted.

3. The accuracy of the titration of toxins and antitoxins to within one per cent. of error.

4. The fact that to save an animal from one thousand fatal doses of toxin requires little more than a hundred times as much antitoxin as is required to fully protect for ten fatal doses, the resistance of the animal itself accounting for the difference.

5. The fact that the potency of antitoxin is greatly increased if it is allowed to remain for a sufficient time in contact with the toxin at a suitable temperature.

On the other hand, the conclusions which Buchner and Roux drew from their experiments have been shown to have been based, partly at least, on a misconception, for they ignored the capacity of an animal to deal with a certain minimal quantity of poison, and consequently made no distinction between what seemed to be a physiologically neutral and a completely neutral mixture.

The facts now known, therefore, indicate rather strongly that the antitoxins of tetanus, diphtheria, the plague, and cholera, of snake poison, of ricin, etc., enter into direct chemical combination with their respective toxins—a combination which is, perhaps, not exactly comparable to that of an acid with an alkali; for, as we have seen, it is a much slower one, but one which possibly—as Ehrlich has suggested—more closely resembles the formation of a double salt. Some facts seem to indicate that the antitoxin has a stronger affinity for toxin than the toxin has for the cells. Many points, however, are still far from clear as to the manner in which both toxins and antitoxins act.

THE PERSISTENCE OF ANTITOXIN IN THE BLOOD.—About five days after the absorption of toxin has ceased, either after a natural disease or after an artificial infection, the production of antitoxin in the body stops, except that which may be normally produced, and the amount in the blood gradually lessens, partly from its elimination by the urine, milk, etc., and partly, perhaps, by its destruction in the blood.

According to the amount of antitoxin present will be the length of time required for the elimination of the antitoxin. The blood of an animal highly immunized may retain appreciable amounts of antitoxin for from three to six months.

When animals are immunized with the antitoxic sera of animals of other species, the antitoxin is more quickly eliminated than when sera from the same species are employed. For this reason the immunizing effect of sera in man against diphtheria, tetanus, and the few other infections for which we have antitoxins, is of short duration, less than if antitoxins had been developed from toxins injected. Thus, immunization of a child with 300 units of antitoxic horse serum insures immediate safety, but only ten days of certain protection from diphtheria.

The diphtheria and tetanus antitoxins are the only two used extensively in treatment. All the other protective sera are largely bactericidal in their action and owe what little or doubtful value they have to this characteristic. The most important of them will be touched upon in the article on immunity, under the bactericidal properties of the blood.

The use of antitoxins in the prevention and treatment of diphtheria and tetanus is so important that some details as to how to choose and administer the sera may be of value. All antitoxic sera must be injected subcutaneously, or intravenously, for they are only very slightly absorbed by the stomach or intestines. The sera should be clear and have no odor except in cases in which an antiseptic has been added, such as trikresol or carbolic acid. In the Department of Health laboratory in New York we add no antiseptic whatever. Let us now consider in detail the diphtheria antitoxic serum. The dosage is regulated by units of effect and not by weight, for we have not as yet absolutely isolated antitoxin. A unit is the amount of antitoxin which protects a 250-gm. guinea-pig from one hundred fatal doses of diphtheria toxin.

Diphtheria antitoxic serum is put up in different "grades," the lower grades having 100 to 300 units in each cubic centimetre of serum, the higher grades having 400 to 600 units. Other things being equal, the higher grades are better and more convenient than the lower ones. In the laboratories of the Department of Health of New York City we have until recently striven for a serum which had the greatest possible amount of antitoxin in each cubic centimetre. The better way, however, is to get the highest grades of serum which will produce few or no rashes, for, without regard to the amount of antitoxin present, some serums produce deleterious results, while others produce almost none. Samples of all bleedings should be used first, if possible, in a few mild cases of diphtheria, and then only those serums which pass this test without producing marked rashes should be further used.

THE AMOUNT OF DIPHTHERIA ANTITOXIN TO BE ADMINISTERED AND THE NUMBER OF INJECTIONS IN A SINGLE CASE. — There is still some difference of opinion among competent observers as to the answer to these questions. For immunization, 200 units in infants and 500 in adults will suffice. In treatment, our practice is the following: Cases seen early, in which the onset is mild, 1,000 units. Cases seen early, in which the onset is severe, shown either by local signs, such as swelling, hyperæmia, or the extent of the exudate, or by constitutional symptoms, 2,000 to 4,000 units, according to severity. Cases seen after the disease has progressed so far that its probable local extent can be guessed, mild cases, 1,000 to 2,000 units, according to the size of the patient; moderate cases, 2,000 to 3,000 units; severe cases, showing necrotic membrane, swollen glands, or laryngeal stenosis, 3,000 to 4,000 units.

The effects to be expected from the antitoxin are, that the local disease should not extend, that the swelling and hyperæmia should lessen and the constitutional symptoms abate. If twelve hours after the injection these changes have not begun clearly to manifest themselves, the injection of antitoxin should be repeated. If in twelve hours more no decided improvement occurs (which rarely happens, excepting in cases already very severe when first injected, and in some of the laryngeal cases complicated by bronchial or lung involvement), still a third dose should be given; some even advise a fourth. The extent of the disease, rather than the size of the patient, guides the dose; still size should be considered somewhat, and I should not advise, in a child under one year, more than 3,000 units in a single injection, and in one under six months not over 2,000 units. If the cases are severe, injections should be repeated just as in larger children. In adults attacked with malignant diphtheria the largest doses mentioned should be used and fearlessly repeated. With the serums as now used, these large doses have produced in a small percentage very disagreeable results, namely, rashes, fever, and in a few joint inflammation.

Whether some samples of serum may or may not cause, along with their beneficial effects, really serious deleterious effects, is still undetermined; but we do know that many samples of serum produce practically not even disagreeable effects. Thus, I have seen sixty cases treated, with only one rash. I have also seen, with serum obtained from another bleeding, twenty treated, with ten rashes. To select good serum only and throw away the most irritating, is only a matter of testing in trial cases. At present I see no other way of eliminating from sera the substances which produce rashes and other deleterious effects. The precipitate of antitoxin and globulin thrown down by magnesium sulphate is just as liable to produce rashes as the entire serum, and at present we know of no way to separate antitoxins from globulins.

The Production of Diphtheria Antitoxin for Therapeutic Purposes.—As a result of the work of years in the laboratories of the Health Department of New York City the following may be laid down as a practical method:

The strongest diphtheria toxin possible should be obtained by taking a very virulent culture and growing it in slightly alkaline two-per-cent. peptone bouillon. The culture, after a week's growth, is to be removed, and, after it has been tested for purity by microscopical and culture tests, is then to be rendered sterile by the addition of ten per cent. of a five-per-cent. solution of carbolic acid. On the following day the sterile culture is filtered through ordinary sterile filter paper and stored in full bottles in a cold place until needed. Its strength is then tested by giving a series of guinea-pigs carefully measured amounts.

The horses used should be young, vigorous, of fair size, and absolutely healthy. A number of such horses are severally injected with an amount of toxin sufficient to kill ten thousand guinea-pigs of 250 gm. weight. After from three to five days, so soon as the fever reaction has subsided, a second subcutaneous injection of a slightly larger dose is given. With the first three injections of toxin about 10,000 units of antitoxin are given. If antitoxin is not mixed with the first doses of toxin, only one-tenth of the doses advised is to be given. At intervals of from five to eight days increasing injections of pure toxin are made, until, at the end of two months, from ten to twenty times the original amount is given. There is absolutely no way of judging which horses will produce the highest grades of antitoxin. Upon a very rough estimate I may say that those horses which are extremely sensitive and those which react hardly at all are the poorest, but even here there are exceptions. The only way, therefore, is at the end of six weeks or two months to bleed the horses and test their serum. If only high-grade serum is wanted, all horses that give less than 150 units per cubic centimetre are discarded. If moderate grades only are desired, all that yield 100 units may be retained. The retained horses receive steadily increasing doses, the rapidity of the increase and the interval of time between the doses (three days to one week) depending somewhat on the reaction following the injection, an elevation of temperature of more than 3° F. being undesirable. At the end of three months the antitoxic serum of all the horses should contain over 200 units, and, in about ten per cent., as much as 600 units, in each cubic centimetre. Very few horses ever give above 1,000 units, and none so far has given as much as 2,000 units per cubic centimetre. The very best horses continue to furnish blood containing a large amount of antitoxin for several months, and then, in spite of increasing doses of toxin, the amount of antitoxin gradually decreases. If every nine months an interval of three months' freedom from inoculations is given, the best horses furnish high-grade serum for from two to four years.

The Production of Tetanus Antitoxin.—The tetanus antitoxin is developed in the same manner as the diphtheria antitoxin—by inoculating the tetanus toxin in increasing doses into horses. The toxin is produced in bouillon cultures grown anaërobically. After ten or fifteen days the culture fluid is filtered through porcelain, and the germ-free filtrate is used for the inoculations The horses receive 0.5 c.c. as the initial dose of a toxin of which 1 c.c. kills 250,000 gm. of guinea-pigs, and along with this a sufficient amount of antitoxin to neutralize it. The antitoxin is added to the first few doses. In five days this dose is doubled, and then every five to seven days larger amounts are given. The dose is increased as rapidly as the horses can stand it, until they support 700 to 800 c.c. or more at a single injection. After some months of this treatment the blood of the horse contains the antitoxin in sufficient amount for therapeutic use. When the animals' temperatures are normal and they have recovered from the dose of toxin last given, they are bled into sterile flasks and the serum collected.

Technique of Testing Tetanus Antitoxic Serum for Value in Antitoxin.—Tetanus antitoxin is tested exactly in the same manner as diphtheria antitoxin, except that the unit of measure is different. A unit in the German standard is the amount of antitoxin needed to neutralize 4,500,000 fatal doses of toxin for 1 gm. of white mouse. In the French method the amount of antitoxin which is required to protect a mouse from a dose of toxin sufficient to kill in four days is determined, and the strength of the antitoxin is stated by determining the amount of serum required to protect 1 gm. of animal. If 0.001 c.c. protected a 10-gm. mouse, the strength of that serum would be 1 to 10,000. Guinea-pigs are frequently used in place of mice. Knorr's method of preserving toxin is by precipitating it with saturated ammonium sulphate and drying and preserving the precipitate in sealed tubes. As required, it is dissolved in ten-per-cent. salt solution, as above stated. For small testing stations the best way is to obtain some freshly standardized antitoxin and compare serums with this.

The Dosage of Tetanus Antitoxin.—For immunization, one dose of from 5 to 10 c.c. of a serum of a good strength, such as 1 to 100,000,000, will suffice unless the danger seems great, when the injection is repeated at the end of a week. For treatment, it is well to begin with from 30 to 50 c.c., and then, according to the severity of the case, give from 20 to 50 c.c. every six to twenty-four hours until the symptoms abate. In the gravest cases no curative effect will be noticed from the use of the serum. It is sometimes injected into the lateral ventricles or even into the brain substance. Both the theoretical reasons for, and the actual results obtained from, this method of treatment, are open to criticism. The first dose, in severe cases, may be given intravenously. *William H. Park.*

ANTITUSSIN.—Difluor diphenyl $(C_6H_4F)_2$. This is a white crystalline powder with a pleasant aromatic odor suggestive of dill seed. It is insoluble in water and soluble in alcohol, ether, chloroform, and fixed and volatile oils.

Originally introduced as an antispasmodic and sedative in whooping-cough, it was reported by the early observers to be of little value in that condition. Recently, however, Max Heim has published observations on sixteen cases in which he found speedy and surprisingly complete relief following its use. His conclusions were that it lessens the acuteness of the attack, that it markedly loosens the phlegm and mucus, and that the duration of the disease is reduced from several weeks to a few days, or at most two weeks. His formula is difluor diphenyl 5, vaseline 10, adeps lanæ hydrosus 85, and this he uses by inunction over the neck or interscapular region after thoroughly cleansing the skin and rubbing it with a rough towel. Antitussin is not administered internally, as it deranges the stomach. The dose by inunction is from ʒ ij. to ʒ iij.

Besides its use as above it has been found valuable as an antiseptic, and for this purpose is applied as a five to twenty per-cent. ointment or dusting powder. Thimm uses it in venereal ulcerations, after cauterizing the ulcer with carbolic acid.

W. A. Bastedo.

ANUS AND RECTUM. (SURGICAL.)—No rectal examination in women can be considered at all complete which does not include bimanual exploration of the pelvis, and the examiner must acquire the same skill in this as the gynæcologist, though he will more frequently explore with one finger in the rectum than in the vagina. It is also true that many obscure cases both in men and in women will at once become clear under anæsthesia. So little does diagnosis depend upon any specula that we need not stop to consider these instruments.

This does not apply to the Kelly long tubes for high rectal and sigmoid exploration. These may in certain cases be of great value both for diagnosis and for treatment. I have modified his original design so as to make the long tube resemble the ordinary valve speculum except in its length. The instruments are difficult to use and not devoid of danger, but in expert hands they occasionally yield excellent results.

Hemorrhoids.—These may be divided into external and internal. External hemorrhoids present themselves in two perfectly distinct forms. The first is shown in Fig. 220, and is a venous tumor, produced by the rupture of an external hemorrhoidal vein and the extravasation of its contents. Such a tumor forms suddenly, is exquisitely painful, and sometimes looks and feels like a large black grape; it will slowly subside and disappear when treated by rest in bed and applications of powdered ice in a rubber *baudruche*, with the internal administration of a saline cathartic. The most appropriate treatment, however, is a free incision with a small, sharp-pointed, curved bistoury, the tumor being transfixed and incised in the direction of the radiating folds of the anus. As a result of the incision, a small, round clot—the pressure of which has caused all the suffering—may be turned out of its bed.

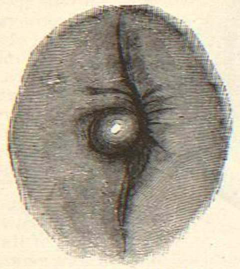
Fig. 220.—External Venous Hemorrhoid. (Smith.)

The other form of external hemorrhoid is a cutaneous and not a venous tumor, and is well shown in Fig. 221. This is often spoken of as a condyloma, but that name is better applied to another condition. Such a tumor as this is composed of skin and connective tissue. It often results directly from the irritation caused by the first variety, and is, in fact, the remains of the venous tumor; or it may be caused by the irritation of some ulcerative disease within the rectum. It is not painful unless it happens to become acutely inflamed, and is generally best left alone. When operating for more serious trouble, with the patient under ether, I occasionally snip them off with a pair of scissors, but when a patient applies for relief from them alone, I usually advise non-interference. The wound made by removing them is painful and they generally do little harm.

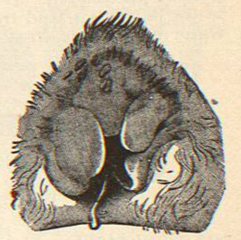
Fig. 221.—External Cutaneous Hemorrhoids. (Esmarch.)

Internal hemorrhoids are those which arise within the sphincter muscle, from the internal hemorrhoidal vessels. They present many variations in structure. One perfectly distinct variety is known as the capillary. This is in reality an erectile tumor composed of the terminal branches of the arteries and veins, and of the dilated capillaries which unite them. This form of tumor is never of large size, and never projects far into the cavity of the rectum. It is, in fact, much like a nævus of the scalp. It may be situated high up in the rectum, but is generally near the anus; the surface is granular, and the membrane covering the vessels is so thin that it may be broken by each act of defecation. Such a tumor never appears outside the anus unless the protrusion is caused by some other affection, but it may be seen by carefully pulling open the parts with the fingers, and from some part of its mulberry-like surface there is apt to be a jet of arterial blood, coming *per saltem*. This is, above all others, what is most properly called the "bleeding pile."

This form of hemorrhoid may be cured by a single thorough application of fuming nitric acid, and it is the only form in which this plan of treatment is likely to be of permanent benefit.

In the other forms of hemorrhoids there is a distinct tumor, sometimes of considerable size, made up of mucous membrane more or less eroded, of connective tissue, and of blood-vessels. These tumors may cause decided symptoms before they are sufficiently large to protrude from the anus. One of the first is an unsatisfied feeling after defecation, as though the rectum were not fully emptied; and this is explained by the increase in size of the tumors caused by defecation. This feeling passes away after a few moments, when the circulation has again become natural. Other symptoms are pain, more or less obscure, and referred to the loins and thighs; difficulty in micturition; diminished sexual appetite and power; hemorrhage; and sometimes a peculiar train of nervous symptoms referred to the legs—symptoms which will deceive both patient and physician into the belief that an ataxia is developing. After the tumors reach a stage which causes them to protrude beyond the sphincter in defecation, the resulting symptoms are well known. In ordinary cases the patient will reduce the tumors himself after each protrusion. They may, however, become strangulated and be entirely beyond the patient's power of manipulation. In such a case, after a period of rest, and after the relief which may follow a spontaneous escape of blood, the hemorrhoids may return of themselves or be put back by the patient.

If the strangulation be more intense, gangrene may set in and a part of the mass may slough, or a portion may suppurate. Under such circumstances there will be great pain, and more or less constitutional disturbance, with fever. The gangrene is very evident, both to the eye and the sense of smell, from the greenish or blackish color and fetid odor of the part, and is rather a favorable termination to the trouble, as it generally results in a radical cure.

Treatment.—The treatment of internal hemorrhoids is both palliative and curative, and it is a great advantage to the surgeon to know what can be done for a timid pa-