

as possible, a satisfactory amount of function may not infrequently be recovered. The endothelium clothing tendons and tendon sheaths (as indeed everywhere in the body) possesses a large capacity of regeneration, provided function be restored early; but if fibrous tissue be allowed to contract into a scar and produce adhesions, it can evidently never be replaced by endothelium. Thus orthopedic measures to be successful must be instituted as early as possible.

Phlegmons of the dorsal surface are much rarer and less dangerous.

PHLEGMONS OF THE FOOT.—Deep phlegmons, underneath the plantar aponeurosis, cause, as in the hand, inflammatory signs on the dorsum, long before anything appears on the sole, and may lead, if care is not exercised, to incision in the wrong place. If the process invades the tendon sheaths in the neighborhood of the ankle-joint there is apt to follow rapid extension up the leg.

Incisions should be made when possible so that the scar will not be exposed later to pressure.

PERIPROCTAL PHLEGMONS.—The atrium of infection in this important class of phlegmons is in the great majority of cases in the rectum. Slight abrasions from the passage of feces, scratches produced by hard and pointed bits of food—such as fish bones—small ulcerations caused by stagnation of feces in the lacunae of Morgagni—all these represent opportunities for the invasion of pathogenic germs. Moreover, it must be admitted that infection may occur with an intact mucosa, through the lymphoid tissue in the wall, in analogy with the same process in the tonsils. Catarrhal inflammation, ulcers of any kind, inflamed hemorrhoids, may be the starting-point of a phlegmon. Infection of the anal skin, *e.g.*, eczema; extension of inflammations of neighboring organs, such as urethritis, Cowperitis, prostatitis, and in the female Bartholinitis—all these may give rise to a phlegmonous proctitis.

The intelligent treatment of these phlegmons is inseparable from a knowledge of the anatomy of the parts. Without going too deeply into this question, we must remind the reader that the perirectal connective tissue—that tissue namely in which phlegmons mainly run their course—is divided into an inferior or superficial, and a superior or deep portion; the former called the ischio-rectal fossa, the latter the pelvirectal space.

It is the levator ani muscle with its enclosing fascia, the superior and inferior diaphragmatic fasciæ (or, as it usually appears in English literature, the two layers of the triangular ligament), which divides the two spaces.

Phlegmons, therefore, may be superficial (*i.e.*, situated in the ischio-rectal fossa), or deep (*i.e.*, in the pelvirectal space); or they may spread sometimes through both regions. In the first case they may extend to the perineum, scrotum, groin, or thigh, while in the second case they spread by direct continuity into the pelvic and thence into the abdominal retroperitoneal areolar tissue, and so up to the kidneys or in front over the anterior abdominal wall. These are naturally much the more dangerous. Portions of the peritoneum, even of the bowel, may become gangrenous, and septic peritonitis develop. Death most often results in from two to ten days. Such phlegmons are fulminating in character. Inasmuch as virulent anaerobic gas-producing bacteria are invariably to be found in the feces, it becomes evident that periproctal phlegmons may at any time assume the fulminating type of emphysematous gangrene, or "gangrène foudroyante." The bacteriological aspect of the question has already been discussed.

Another type, described especially by Kraske in connection with a wound, is characterized by gas formation, but with a much milder course. It is said that the *B. coli* is the etiological factor; but such a conclusion, in view of recent work upon the anaerobes in gas phlegmons, must appear at least dubious.

The onset is insidious; locally the wound shows often nothing but a breaking down of the granulations and slight œdema in the neighborhood. Fever is slight or

absent. Gradually, however, there develops a tissue emphysema and small gas-containing abscesses, with necrosis of the tissues near the wound surface. At times metastases develop, even in the absence of fever or chill. Ultimately the patient becomes both restless and sleepy (if the apparent paradox be allowed), then somnolent, and in the course of weeks usually succumbs. Recovery is quite rare.

Some authors describe a third form, characterized by gangrene, called the "diffuse, gangrenous phlegmon." This is, however, merely a variety of the fulminating type of phlegmon.

In the above we have been speaking especially of the severe spreading forms of the disease. They may be complicated, or not, by gas formation, and their prognosis is an extremely bad one. When infection is less virulent we get a more circumscribed inflammation, with early formation of abscess. The acute ischio-rectal abscess is often styled a phlegmon, but within the limits of this article it can hardly be considered such.

Infections of the pelvirectal space are much more frequently spreading in type. *Diagnosis* is here difficult on account of their deep situation. Still, careful digital examination will often discover an inflammatory mass causing the rectal wall to bulge inward. Even before such swelling occurs, the presence of rectal and vesical tenesmus with deep pelvic pain should lead to a probable diagnosis of pelvirectal phlegmon. If left alone, or diagnosed late, the condition is apt to cause extensive abscesses and break through into neighboring organs or the skin, when it does not lead to a fatal issue.

Treatment.—This is of course early incision. This should never be made through the rectal wall, no matter how tempting a pointing abscess may be; for in such case drainage is poor and feces enter the abscess cavity. The incision, both in ischio-rectal and in pelvirectal infections, should be through the ischio-rectal fossa. When the abscess is deep—*i.e.*, pelvirectal—the levator ani should be exposed, and then a blunt instrument should be passed between the two heads of the muscle, where they reunite beneath the prostate. The opening should be made secure by a large stiff drain.

PHLEGMONS OF THE TESTICLE.—Phlegmons in this region acquire a special interest from their tendency to gangrene. They originate mostly from phagedenic ulcers or wounds of the penis, urethra, and perineum; or from suppurative cavernitis of the corpus cavernosum; or from urinary extravasation, or as a result of suppurative proctitis. They are characterized by an extremely tense swelling of the scrotum, with frequent ending in gangrene of the skin, the inflammation often spreading rapidly on the abdomen and the thigh, and also deeply to the tunica vaginalis and the cord. In this last case it leads on not infrequently to phlegmon of the pelvic cellular tissue and even to peritonitis.

In virulent infections, and especially with urinary infiltration, also when the phlegmon connects with paraproctitic processes, there frequently develops gas in the infiltrated tissue. Especially in these cases is the gangrene apt to be deep and extensive. The bacteriology of this condition has already been described.

It is a point of considerable practical interest and importance that an ordinary infective phlegmon, arising from some focus in the anal gut or the ischio-rectal fossa, may spread with great rapidity and severity over the perineum, scrotum, and the neighboring parts, and thus simulate a urinary extravasation so closely as to induce surgeons of experience to do median perineal cystotomy.

PHLEGMONS OF THE THORACIC WALL.—These are fortunately rare, for the prognosis is always grave. They usually spread from a purulent axillary adenitis and invade most often the anterior wall, lying upon the fascia underneath the greater pectoral. They may arise primarily in the deep fascia from penetrating wounds. Usually they break through the skin, rarely into the pleura. Kümmell,²⁵ of Hamburg, describes one case which, extending from an empyema, spread over the whole of the

right side of the back and down over the gluteal region, as far as the great trochanter.

Diagnosis may be extremely difficult in the early stages. The one symptom at that time is extreme pain over the whole side of the chest, so severe as to make respiration difficult. This, with the accompanying fever and chill, causes the condition to be easily mistaken for pleurisy. It may be several days before redness of the skin, or fluctuation at some point, renders the diagnosis unmistakable. A careful consideration, however, of the nature of the pain, and of the severe constitutional signs, ought to permit fairly early diagnosis.

Kümmell²⁵ reports that of ten cases in the Eppendorf Hospital only two recovered; the rest all died of general sepsis. No doubt some of these belonged, however, to the old days of "expectant" surgery. At the present day earlier diagnosis and radical incisions ought to save a much greater proportion.

PHLEGMONS OF THE ŒSOPHAGUS.—Phlegmon in this region is situated in the submucous tissue and is very rare, but may be extensive. Some cases described as phlegmons are evidently small localized abscesses. When pus has formed it tends to break through into the œsophagus or the trachea, rather than to spread through the mediastinum or into the pleural cavity. It may follow the arrest of a foreign body in the œsophagus, or represent the extension of a phlegmonous gastritis. In a few cases no cause can be ascertained.

The symptoms, apart from those of constitutional disturbance, are mainly of local origin—difficulty of deglutition, with pain along the course of the œsophagus, especially behind the sternum and radiating to the back; nausea; cough; occasionally vomiting of purulent material.

Diagnosis is extremely difficult except in cases in which the history of the stoppage of a foreign body is clear.

Treatment.—With the œsophagoscope a prominent abscess may be discovered and opened. In severe cases the question of external incision must be considered, if the symptoms indicate a lesion above the thoracic cavity. Apart from these indications treatment must be expectant.

GASTRIC PHLEGMON.—Cases of this kind are usually diagnosed with certainty only post mortem. The phlegmon complicates carcinomatous disease not infrequently, simple ulcer but rarely. Occasionally it is caused by foreign bodies or traumatism. It involves mainly the submucosa. The stomach wall is usually immensely thickened, inflamed, and œdematous. Perforation may occur in either direction. Clinically the picture is that of acute gastritis with peritoneal symptoms and fever.

Kinnicutt²⁶ has lately described a striking case.

PHLEGMONS OF THE LARYNX.—In perilaryngeal phlegmons the symptom which dominates the clinical picture is naturally that of a dangerous œdema of the larynx. And yet, for the sake of an exact knowledge of the subject, the writer feels inclined to offer a prefatory note of protest against the loose, slipshod way in which the term "œdema of the larynx" or "œdema of the glottis" has been so generally used, as if it represented a disease entity, instead of being, as it is, merely a symptom. It may be due to entirely non-inflammatory causes, such as severe nephritic or cardiac disease, in which it appears as part of a general anasarca; or to the pressure of a tumor causing local stasis. When of inflammatory origin the œdema may be the result of a primary infection in the submucosa, occurring in the course of infectious diseases as a metastasis; or of a primary local erysipelas (if we admit that such really does occur). On the other hand, it may be caused secondarily by extension of some inflammation of neighboring parts. It is under this heading that the laryngeal phlegmon is ranged; such a phlegmon may have arisen in the floor of the mouth, or in an adenitis at the angle of the jaw; or it may have developed from a peritonsillar or peripharyngeal infection, or, from an infection located in the connective tissue of the neck; or finally its starting point may have been in the areolar tissue of the submaxillary triangle, this last

representing Ludwig's angina in the strict sense of the term.

These phlegmons are accompanied by the usual local and constitutional signs. In this place it is necessary to speak only of the dominating sign of local laryngeal œdema, when it is of any severity. The symptoms depend mainly on the diminution of the laryngeal opening. The obstruction occurs usually by swelling of the aryepiglottic folds. Thus we have inspiratory dyspnoea and hoarseness. Pain may be constant, but is increased by swallowing.

The one point upon which emphasis must be laid is that the submucous infiltration may develop with extraordinary rapidity. While this is true of infective œdema, it is especially so of the traumatic œdema. The breathing must be constantly watched. A tracheotomy may become necessary at any moment, and indeed many patients have died for lack of it. von Ziemssen's rule was, "never under any circumstances to leave a patient suffering from œdema of the larynx, and rather to do a tracheotomy with a penknife, if proper instruments are not at hand, than to let him suffocate."

While the prognosis of phlegmons generally is never especially bright, it becomes decidedly darker when they become complicated, as in this region, by laryngeal œdema. Sestier (quoted by von Bruns in "Handbuch der prakt. Chir.") found in 213 cases of œdema glottidis (no doubt of various causation, not solely of phlegmonous origin) 158 deaths. Of the total number 30 had had a tracheotomy done. No doubt present-day methods would show much more favorable results.

As regards *treatment*, besides the matter-of-course incision for the original phlegmon, the surgeon must be constantly in readiness to do a tracheotomy for the secondary œdema laryngis. Where the necessity stops short of a tracheotomy, ice should be given, and the ice-bag kept applied externally. Intubation is contraindicated.

COMPLICATIONS.—These are mainly of the nature of metastatic inflammations. Suppurative synovitis and arthritis complicate phlegmonous erysipelas not uncommonly. The same result may be brought about by direct extension of the inflammation into the deep structures. An infective pneumonia has been described as due to a streptococcus metastasis from phlegmonous erysipelas. Endocarditis and albuminuria are rare.

Septicæmia, pyæmia, or septicopyæmia not infrequently develop from a phlegmonous focus. Septic inflammations of the various serous membranes may come on, especially following streptococcus infections—pleurisy, empyema, peritonitis, meningitis. The *B. aerogenes capsulatus* may also cause peritonitis or meningitis.

DIAGNOSIS.—There is really no other disease from which it is necessary to differentiate phlegmon when superficial, as it usually is. The question of diagnosis comes in only as between its own various forms. It is desirable, however, to distinguish these, both for therapeutic and for prognostic. The rapid development of gas and of gangrene and its fulminating character distinguish easily cases of *gangrène foudroyante* from those of ordinary phlegmon (Class I.); but less easily from cases of urinary extravasation. A late case in the Royal Victoria Hospital, Montreal, of a *B. aerogenes capsulatus* phlegmon, starting from the rectum and involving scrotum, penis, and groins, simulated so perfectly a urinary extravasation that it was only at post-mortem that the absence of the latter could be made quite certain. Still, in most cases, a diagnosis should be made from the previous history of urinary trouble, and from an examination of the urinary tract.

The diagnosis of a deep, subfascial phlegmon may occasion considerable difficulty. The deep pain, the fever, and other signs of constitutional disturbance will point plainly enough to an infected condition; but to determine the exact localization of the process, whether it is in the soft tissues or in the bone, *i.e.*, an acute osteomyelitis, may be far from easy. In acute osteomyelitis the pain is apt to be more severe, more localized; while subcutaneous œdema develops to a less extent and rather later.

Moreover, acute osteomyelitis occurs almost constantly during adolescence and develops at an epiphyseal end. As a matter of fact it is really nothing more nor less than a phlegmon of bone; and its treatment is the same as for phlegmon of the soft parts.

In the case of phlegmons of Class II.—gas phlegmons—a very early diagnosis is of great importance for successful therapeutics. Bloodgood²⁰ has reviewed these cases from the surgical standpoint in a very thorough manner, and I quote from him.

"Unquestionably in gas-bacillus infections an early diagnosis is always possible, and not at all difficult. In any recent wound with symptoms of infection, one should at once make cover-slips from the fluid in the wound. The presence of large bacilli, morphologically like the gas bacillus, even with the absence of gas bubbles or emphysema, is practically, in the majority of cases, pathognomonic of a gas-bacillus infection. If one finds in addition air bubbles in the fluid, or emphysema in the tissues, plus the presence of bacilli in cover-slips, there is practically no question about the diagnosis."

Under the head of treatment I shall quote further remarks of Bloodgood, which are a corollary to the above.

I suppose we may assume that a phlegmonous erysipelas, *i. e.*, a phlegmon of the deeper structures developing by extension from a true erysipelas of the skin, is a pure streptococcus infection. If we have any faith in antistreptococcus serum, we must be careful in such cases not to overlook in the general phlegmon the coexistence of the cutaneous erysipelas; for in such cases, if in any, would the serum have a chance to do good.

PROGNOSIS.—The outlook in any of our three classes of phlegmon is usually grave; but by all odds gravest in the phlegmon of gas gangrene. The fulminating cases of ordinary phlegmon (Class I.), which kill in a few hours, are rare. More often the patient dies of the infection during the first week or two after the onset. If he escapes then, he may die later of chronic suppurative fever and pyæmia. If he recovers, he may be left with a functionally impotent limb.

In cases of gas gangrene (Class II.) the prognosis, without operation, is practically always toward a fatal ending. With early and proper treatment it is by no means so black as our predecessors have painted it; and it is yearly becoming less grave. The earlier and more thorough the operation is, the brighter becomes the outlook.

Welch⁷ says that results are better after amputation than after incisions only. Of the cases collected by him of emphysematous gangrene, affecting primarily the extremities, the recoveries numbered 68 per cent. after amputation, and 33½ per cent. after incision without amputation.

TREATMENT.—The treatment of phlegmon may be considered under the three headings—non-operative, operative, and serum-therapy.

Non-Operative.—Naturally this can be thought of only in the mildest cases. Take, for example, a cellulitis originating in an infection of the hand, and spreading with greater or less rapidity up the forearm. The surgeon incises such cases almost invariably as soon as he sees them, and counts the disfiguring scars—so disfiguring, especially on the back of the hand—as not to be weighed for a moment in the balance. Let us admit, upon the whole, that he is right. And yet, how often does the general practitioner apply in these cases hot antiseptic formentations alone, and see his conservatism, or the patient's disinclination to the knife, justified by the event! There is room here for the exercise of the nicest surgical judgment. The writer believes that in the early stages of these spreading cellulitis cases, mild types of phlegmon as they are, hot antiseptic applications or the hot continuous bath should be tried first; that, however, both the local and the constitutional symptoms should be watched carefully and almost continuously. If, after a variable number of hours, to be judged by the intensity of the process, the infection is evidently advancing, multiple incisions should be practised.

Some surgeons prefer cold applications, especially in phlegmons of the deeper regions, such as the periaryngeal or periesophageal. Elevation of the part and absolute rest are matters of course.

It may be mentioned at this point that Cr d 's ointment²⁷ (a salve containing fifteen per cent. of soluble metallic silver) has been strongly recommended by some in the treatment of septic infection of wounds. It is usually rubbed into the skin after the fashion of the mercurial ointment in the treatment of syphilis; and it is claimed that the formation in the blood of powerfully bactericidal silver salts effects a general antiseptics of the entire organism (Werler²⁸). The writer is unable from personal experience to give any opinion upon the question; but the method of treatment has not come into wide use.

Operative.—This will vary, according to the case, from a few superficial incisions to the amputation of a whole extremity. Multiple incisions are the rule in moderate cases. After incisions the parts should always be kept enveloped in hot, wet antiseptic dressings or in the continuous bath. The value of the latter in severe local infections has been particularly demonstrated by the experience of the great Hamburg clinic, and more lately by that of various hospitals elsewhere.

Incisions in the early stages must be numerous and they must enter the subcutaneous tissue, so as to allow of the escape of as much of the infected serous exudate as possible. In the later stages, with a large amount of pus present, they must be extensive enough to secure a free opening for the pus wherever it may happen to be; that is, the pus must be followed relentlessly into all recesses, and counter-openings must be freely made. Necrotic tissue should be removed as thoroughly as possible. Rubber drains of a good size should be inserted into the main openings. Copious hot irrigation with bichloride solution should be used. Care should be taken not to place the incisions too near each other, for fear of gangrene of the intervening skin from lack of blood supply.

Verneuil prefers to incise with the thermo-cautery in order to avoid the considerable bleeding which frequently occurs. This is of doubtful advantage. A certain amount of bleeding is more likely to do good than harm, by relieving the congestion of the part, and also by removing some part of the infective material.

The serious question of amputation must often be weighed. The tendency of the inflammation to spread rapidly and deeply over the larger part of the limb must be our main guide to the virulence of the infection and the necessity for amputation. The constitutional disturbance, in especial the height of the fever, has less significance, for in the grave asthenic cases reaction may be comparatively slight. In general it may be said that when we have an intense œdema, steadily and rapidly advancing, which has approached the proximal joint of the limb and which shows the dusky hue of threatening gangrene; and when the constitutional signs are severe, or when the patient is in an asthenic typhoid condition—in other words, when clinically we have before us the excessively severe, fulminating, or almost fulminating, type of infection, then amputation at the joint is urgently called for. In most of such cases the indication for such radical procedure will have been made absolute by the failure of previous multiple incisions to arrest the advance of the œdema. It will be a question for individual judgment whether an earlier amputation through the shaft of the humerus or the femur may not be advisable.

Even when the infection has spread beyond the limb on to the trunk, amputation at the joint should still be done; for recovery in such cases has been recorded, and indeed not so very infrequently. Amputation through the forearm or leg must be a rare thing. It might be considered in cases of fulminating gangrene or spreading emphysematous gangrene; but the lesion in such cases has usually spread beyond the knee or elbow by the time it is accurately diagnosed, so rapid is its advance.

The above remarks are applicable especially to cases of Class I., those of ordinary phlegmon. Cases of Class II., gas gangrene, require, from their especial virulence, con-

sideration apart. Bloodgood in his admirable article in "Progressive Medicine," 1900, has summed up the indications so well that I need only quote them:

"If the infection is recognized early and the destruction of the soft parts and bones is not extensive, free incisions with immediate continuous bath treatment should be tried. If the general symptoms of infection are not immediately relieved, amputation should be done. If, however, the infection is recognized late, one should take no risk, but amputate at once. An early diagnosis will often save life; and from many observations an amputation may not always be necessary."

The treatment of cases of Class III., urinary extravasation, is treated elsewhere in the HANDBOOK. Here it need only be said that multiple incisions and free drainage, as for any other kind of phlegmon, fulfil the main indications.

Serum-therapy.—The question of serum-therapy in streptococcus affections is one which is yet far from settled. It is well known that Marmorek prepared his original antistreptococcal serum from a streptococcus obtained from a case of pseudomembranous angina. Great expectations were entertained of the new serum in all diseases supposed to be caused by the streptococcus, and Marmorek went so far as to request of accoucheurs that it be used in puerperal sepsis to the exclusion of the tried clinical methods of curetting and irrigation. These early hopes were doomed to disappointment. Clinically it soon became evident that the new serum had but little curative power, while experimentally it was shown that Marmorek's serum was totally inefficacious against diseases of streptococcus causation other than that of the original one. Thus cases of phlegmon, erysipelas, and puerperal sepsis remained nearly always unbenefited.

Since these early experiences, large numbers of isolated cases of all kinds of supposedly streptococcus infection have been reported. With the exception of a certain number of favorable, occasionally even of brilliant results, these reports tend to demonstrate the general inefficiency of the serum. Petruschky examined the question especially in regard to phlegmon, and came to a conclusion entirely unfavorable to Marmorek's serum.

The conclusion generally arrived at¹⁷ was that the streptococcus genus was composed of a number of species, which, however similar in morphology or cultural characteristics, differed materially in the matter of their immune sera. Of late years a close study of the streptococci has discovered a considerable number of these more or less differentiated species. Van de Velde,¹⁸ in Denys' laboratory at Louvain, has endeavored by immunizing with a number of these different streptococci simultaneously, to overcome this difficulty, and to produce a serum which he calls "polyvalent"—a sort of shotgun serum which if it missed one streptococcus might hit another. This "polyvalent" serum, it is said, has met with slightly more success than the original, but has not come into general use.

On the other hand, within the last year or two, various workers have tried to demonstrate the essential unity of all the various streptococci with the exception of that of *Pferdedruse* (our *Strangles*). Streptococci cultivated from cases of tuberculosis, measles, erysipelas, scarlatinal angina, abscesses, phlegmons, puerperal sepsis, angina in acute rheumatism, ulcerative endocarditis, and *Pferdedruse*, were examined thoroughly by Meyer¹⁹ in respect to their morphology, virulence, hæmolysis, growth in filtrate of their own culture medium, and their specific immunizing sera. Similar investigations have been conducted by Widal and Besançon,²⁰ Menzer,²¹ and Marmorek.²² All tend to prove the "unity" of all the various streptococcus families, except that of *Pferdedruse*. If they are a unit, why then should any antistreptococcus serum fail to do good? Much further investigation is needed.

The whole question is beset with difficulties. There is the one already mentioned, that one variety of streptococcus apparently will not immunize against another. So long as it is impossible to say to which particular

streptococcus a given infection is due, the use of Marmorek's serum or of any other antistreptococcus serum remains largely a matter of chance. Further, it is becoming more and more evident that the streptococcus does not play such a dominating rôle in many infections as has been believed. Certainly in the case of phlegmons we have reason to believe that the staphylococcus, Welch's gas bacillus, the bacillus of malignant œdema, and other less known organisms, may either singly or in symbiosis with each other or with the streptococcus, cause infections which it has hitherto been the custom to ascribe, usually without thorough bacteriological investigation, to the streptococcus alone.

Phlegmons, in which bacteriological examination carefully conducted both aerobically and anaerobically has shown infection with but one organism, are rare; and it is reasonable to believe that in many cases in which antistreptococcus serum has been given with negative results the infection has been one, not of the streptococcus, but of one of the other organisms mentioned; or, at least, of a symbiosis of the streptococcus with these others in which the streptococcus played the minor part. In this connection a case²³ reported from St. Petersburg is interesting. It refers to a septicæmia treated without the least benefit with antistreptococcus serum. Following this in success, antistaphylococcus serum was administered, with brilliant results. The writer refers to another case in St. Petersburg, one of ulcerative endocarditis, in which antistaphylococcus serum gave a similar good result. Unfortunately cultures were not made; yet the facts are suggestive. We have been in the habit of ascribing without careful investigation the causation of many diseases to the streptococcus, and perhaps quite wrongly.

Another point which may explain the general in success of the serum is this: that if we are to believe Aronson,²⁴ the antistreptococcal sera on the market contain comparatively very small quantities of anti-bodies.

In view of all these difficulties, all that can be said is that the practitioner, in desperate cases, may use antistreptococcus serum on the off-chance of its doing good; but he must await more certain bacteriological knowledge before he can use it with judgment or with any sure hope of its success. His main reliance must be placed on early diagnosis, and prompt and thorough surgical treatment.

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PHLORIDZIN.—C₂₁H₂₄O₁₀, 2H₂O. A glucoside obtained from the root-bark of the apple, pear, cherry, and other fruit trees. It forms in fine, colorless, silky needles,