TRANSACTIONS OF THE PHILADELPHIA ACADEMY OF SURGERY.

Stated Meeting, December 2, 1901.

The President, DE FOREST WILLARD, M.D., in the Chair.

CHRONIC PHAGEDÆNA DUE TO MIXED INFECTION.

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AND

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HISTORY OF CASE BY DR. LOUX.—J. B. McC.; aged twenty-five years; occupation, dentist; nativity, England.

Family History.—One sister died at the age of nineteen from diabetes; father is suffering from gall-stones; other than this the family history is negative.

Personal History.—Patient denied ever having chancre or chancroid. He states that at the age of sixteen years he contracted gonorrhœa, which was followed by stricture, and was treated by gradual dilatation. There was a tendency to recontract (apparently from the history of the case of resilient stricture), so much so that the patient was trained to pass his own instrument, and was instructed to do so, with the view of preventing a stricture of small calibre. He further states that there was ever present at the meatus a slight discharge of a mucopurulent character, and, as the discharge had never been examined microscopically, its character and the contained flora are not known.

Whenever the patient indulged freely in the use of alcoholic liquors, he would suffer with retention of urine, requiring catheterization.

Present History.—In January, 1901, after a night's debauch (followed by retention of urine), the patient attempted to catheterize himself, using considerable force. In the attempt he broke the catheter about one inch behind the meatus, causing a free hæmorrhage. Following this trauma to the urethra (discovered two weeks afterwards), a hard induration on the floor of the urethra appeared one inch behind the meatus; the nodule rapidly increased in size. It developed into a periurethral abscess, rupturing externally. He now consulted a surgeon, who incised the abscess freely, followed by irrigation and the usual antiseptic precautions. He further states that under this careful treatment he noticed a rapid destruction of the surrounding parts and a communication into the urethra. He was then advised to remain in the hospital, but this he refused to do.

I saw the case in consultation for the first time on February 20, 1901. The tissue on the under surface of the penis (from the frænum back one and a half inches) was destroyed apparently through a phagedænic process, involving the skin, subcutaneous tissue, and floor of urethra, including the corpus spongiosum; the skin showed the greatest resistance to the necrotic process, since the destruction extended well underneath the overlying skin, which was irregular along the edges.

The base of the diseased area was markedly indurated, not limited, but was gradually lost in the surrounding tissues, resembling the œdematous infiltration of chancroid.

On examining the urethra I found two strictures,—the first was a filiform stricture about three and a half inches from the meatus, and the second was at the bulbomembranous junction.

On March 6 I operated upon the strictures, doing an internal urethrotomy on the anterior stricture and a modified rapid dilatation on the posterior one, with continuous drainage of the bladder with a soft catheter. At the same time I curetted the necrotic area, cutting away the diseased overlying edges of skin, followed by a free application of carbolic acid to the diseased surface. Unfortunately, this did not control the phagedæna. I then decided to drain the bladder through the perineum, using a Watson tube, and attempted a plastic operation on the penis, which was done a few days after the perineal drainage was established. The plastic operation was done with great precaution, first cauterizing the surface of the ulcer, which was then removed,

including the adjacent induration; a second set of instruments was used for the plastic work, which consisted in making a new urethra and covering the same and adjacent denuded area with skin flaps taken from the side of the penis. The operation was followed by primary union. The perineal tube was removed, the sinus closed, and the patient was discharged from the hospital April 2 as cured.

On April 25 the patient returned to my office with a recurrence in the right skin flap at the junction of the glans penis. The patient was placed in the hospital, and the ulcer excised by an elliptical incision, including a portion of the corona of the glans penis; the edges were brought together with a few stitches, followed by primary union. At the same time it was noticed that the corresponding left skin flap was becoming indurated, with a tendency to break down along the edges. So rapid was the destruction of the skin and deeper structures that any further operative procedure was abandoned.

An attempt was now made to control the phagedæna with the Paquelin cautery, but without any result. We then tried an application of formalin, 20 per cent. solution, which seemed to check for a short period the rapid progress of the disease. New areas then became involved; there was already much of the penis destroyed, as shown by the plate (Fig. 1), and we decided to amputate the penis at the penoscrotal junction. After his return to the hospital, it was noticed that one superficial inguinal gland on the right side was enlarged about the size of a hazel-nut; this gland showed a tendency to break down.

On September 6 the amputation of the penis was performed, and at the same time the broken-down gland of the right groin was removed; both wounds recovered primarily. There has been no recurrence of the disease to the stump of penis, but a marked recurrence in the right groin, destroying skin and superficial tissue about three and a half inches long and two inches wide. On November 6 the ulcerated area was thoroughly curetted, the diseased areas of the skin cut away, and the entire surface of the ulcer wiped out with pure nitric acid. The wound granulated, and the patient was discharged from the hospital on November 30 as cured.

Pathologic Report by Dr. Coplin.—The first material for examination in this case consisted of "A," Inoculations on vari-

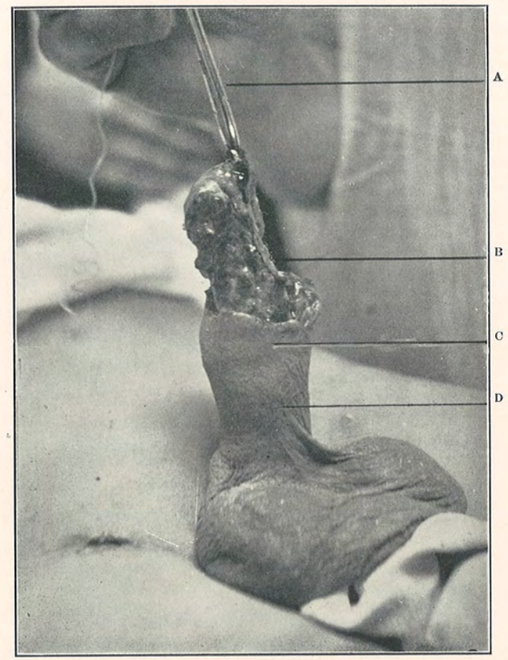

Fig. 1.—Phagedæna of the Penis. Photograph before operation. (Case reported by Dr. Loux and Dr. Coplin.) A, Hæmostat by which organ is extended. B, Fibrous septum marking superior margin of corpus spongiosum. Just below the leader from B is seen the necrosing end of the spongy body. C, The undermining extended down to about this line; at points, *e.g.*, around the urethra, the subcutaneous necrosis extended somewhat deeper. From C to D is the zone of induration. The amputation line was about the point marked by the leader from D.

ous media; "B," Material for spreads; "C," Fragment of tissue; all from penis.

The following is a summary of the result of the examination made by Dr. R. C. Rosenberger:

"A." Inoculations were made from the material upon glucose agar, bouillon, and liquid blood serum. Incubated for forty-eight hours, a growth was demonstrable in the glucose and urine agar. After incubation for this period, cultures were made and placed in an anaërobic condition. These cultures may be dismissed at this point, as they yielded no information not obtained by the aërobic method.

Upon urine agar there developed small, pinhead-sized colonies, yellowish in color, granular in appearance, and more or less discrete.

Spreads made from these growths and stained by the ordinary methods contain cocci .9 micron in diameter, occurring in pairs, grouped and ungrouped. Some of the pairs consist of cocci with flattened sides in apposition. They retain the dye when treated by Gram's method.

In glucose agar the growth follows the stab, and is also seen upon the surface; it is of a golden yellow color.

Spreads made and stained by ordinary methods show the same organisms described above as found in urine agar, and possessing the same morphologic and tinctorial properties.

The tubes of bouillon and serum showed a growth in seventy-two hours. Each medium was clouded, and a delicate, easily broken-up pellicle formed upon the surface.

Spreads were made and stained by ordinary methods. Upon microscopic examination two organisms were seen,—a bacillus and a coccus. The bacillus was slender, 1 micron to 3 microns in length, and .4 micron in thickness, and occurred in groups, short filaments, and ungrouped. It decolorized when treated by Gram's method.

The coccus measured .9 micron in diameter, occurring in small groups and presenting the morphologic and tinctorial characters of the staphylococci of suppuration. Plates were made, and after isolation of the organisms the bacillus was inoculated into milk, gelatin, and upon potato and other test media. Upon these different media the bacillus yielded the reactions common to organisms of the colon group,—generating a small quantity of

gas, turning blue litmus red, growing with a brownish color upon potato, etc. The coccus is evidently the *Micrococcus pyogenes aureus.*

Inoculations from fresh material were also made subcutaneously into the ears of a rabbit. In seventy-two hours there was noticed swelling and redness around the site of inoculation, followed by pus formation.

Inoculations made upon plain and glycerin agar from the pus showed in forty-eight hours a pure culture of the *Micrococcus pyogenes aureus.*

Spreads made from the pus and stained by ordinary methods for bacteria contain a few polynuclear leucocytes, granular detritus, and shreds of fibrin. A few micrococci are seen, .9 micron in diameter, occurring principally ungrouped and retaining the stain when treated by Gram's method. No bacilli were demonstrable.

In six days the inflammation in the inoculated ear subsided, and since that time the animal has remained apparently healthy.

"B." Spreads made and stained by ordinary methods show numerous polymorphonuclear leucocytes and a few lymphocytes. Numerous cocci are seen, some of which are .9 micron in diameter, occurring in small groups, but mostly ungrouped. A few are found within the cells; they retain the dye when treated by Gram's method. An occasional bacillus is seen which measures 3 microns to 4 microns in length, with rounded ends and occurring extracellular. The cocci resemble the micrococci of suppuration. The bacillus was not obtained in culture, but from its morphology resembles the *Bacillus subtilis,* probably a contaminating organism, and having no bearing upon the suppurative process.

"C." The specimen consists of a small, irregular wedge-shaped mass of tissue, .7 centimetre in its greatest, .5 centimetre in its shortest diameter, and .3 centimetre in thickness. It is of a pinkish color and the surfaces are irregular and rough.

Specimen was fixed in a saturated alcoholic solution of bichloride of mercury, and embedded in paraffin; sections were cut and stained by the usual laboratory methods.

Histologic Examinations.—One surface of the section is nearly covered by stratified squamous epithelial cells. In the middle portion of the surface the epithelial cells have entirely disappeared, or rather been converted into a mass of necrotic and

richly granular *débris.* Beneath the necrotic surface a moderate degree of tissue reaction is present. The cells found here are for the most part polynuclear leucocytes, although lymphoid and spindle-shaped cells are also present in abundance. A few mast-cells are also noticeable in the sections stained with toluidin blue. Beneath the surface the mass is made up mostly of a delicate, connective-tissue reticulum. Throughout this latter tissue abundant new and newly-forming capillaries are present; some of these contain a few erythrocytes, others a few leucocytes, and still others are comparatively empty. At points a large number of polymorphonuclear leucocytes and wavy spindle-shaped cells are seen, together with a few mast-cells.

The lower surface of the mass shows a few areas of necrotic tissue, throughout which are scattered a few polymorphonuclear leucocytes.

A number of sections were stained with Löffler's methylene blue and by Gram's method.

In the preparation stained with Löffler's methylene blue a large number of bacilli and cocci are seen. Most of the bacilli are thin, 1.5 microns in length, and occur in groups and in short filaments. Where a few are seen in a field a tendency to polar staining can be recognized. This latter feature is not seen in all the bacilli. The bacilli are situated generally between the cells, though some can be seen within the cells. They do not stain by Gram's method. A second organism is a large bacillus, 3 microns to 4 microns in length, with rounded ends, occurring mostly individually.

The cocci mentioned are .9 micron in diameter, and occur principally in pairs, with their flat sides in apposition. They retain the dye when treated by Gram's method and are intra- and extra-cellular. A few other cocci are seen that are slightly smaller than those just mentioned, but possess the same peculiarities as to situation and staining reaction.

All the bacteria mentioned above are scattered through the specimen. They are most abundant deep in the tissue, although some (bacilli and cocci) are found in the most superficial layers of the necrotic epithelial cells. The small bacillus referred to resembles very closely the bacillus of Ducrey, both morphologically and tinctorially. Every peculiarity of the bacillus, however, is not present, but the size, situation, and staining properties sug-

gest this probability very strongly. The cocci are undoubtedly the ordinary micrococci of suppuration.

Diagnosis.—"A." Inoculations upon glucose and urine agar. Pure culture of the *Staphyloccocus pyogenes aureus.* Inoculations in bouillon and liquid serum, a bacillus probably of the colon group and the *Staphylococcus pyogenes aureus.*

"B." The spreads contain cocci possessing the usual mor-

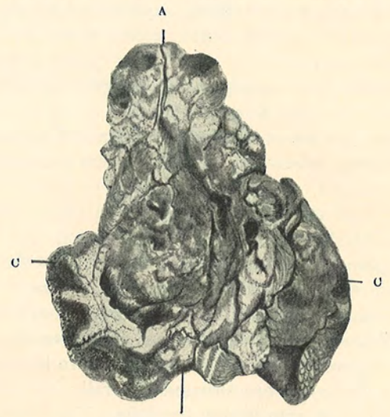

FIG. 2.—Penis after amputation; inferior surface. Natural size. (Case reported by Dr. Loux and Dr. Coplin.) A, Fissured ulcer marking area of urethra beneath the glans. B, Urethra at point of amputation; laid open. C C, Undermined skin incised on inferior surface and turned back (dorsalwards) in order to indicate the extent of the undermining. Just below the leaders from C C the intense induration is indicated.

phology and tinctorial reactions of the micrococci of suppuration.

"C." The tissue shows a widely destructive inflammation, the necrosis being of the liquefaction type. Bacteria are present in abundance; one of the organisms present cannot be differentiated from the bacillus described by Ducrey; it is not our intention, however, to insist upon the identity of the germ found with the microbe described by that observer. The histology of the tissue excludes malignant disease. At the time of this examination tuberculosis was not suspected, even after most careful search for the bacillus as well as close study of the histology of tissue submitted.

Result of the examination of the amputated penis. The specimen delivered to the laboratory consists of an irregular cylindric mass of tissue measuring 8 centimetres in length. (Fig. 2.) One end of the cylinder is surrounded by skin, which at the extreme end is normal in appearance. This end measures 3.5 centimetres in diameter, and evidently corresponds to the line of amputation. The corpora cavernosa are somewhat retracted below the surface and appear slightly denser than normal, the right being somewhat more resistant than the left. The spongy body—corpus spongiosum—is inconspicuous, but the urethra can readily be identified in its centre. The subcutaneous tissue and the tunica albuginea present nothing noteworthy. Upon laying the urethra open, it is found that its length does not exceed 0.5 centimetre. Its mucous membrane at the line of incision is apparently normal, but at the external opening is ragged and ulcerated and undermined to within 0.3 centimetre of the line of incision. The width of the band of attached skin varies; at its widest point it is 4.5 centimetres, and at its narrowest point a little less than 2 centimetres. As already stated, the skin is normal along the line of incision. The free margin of the skin is ulcerated, ragged, undermined, and presents areas of superficial necrosis which extend from 5 to 20 millimetres from the free margin of the ulcer upward and backward upon the otherwise normal skin. The free margin of this ulcerated portion is slightly indurated, the amount of induration varying in different areas. At all points the margin is undermined, and in the neighborhood of the urethra the undermining at one point extends 2.5 centimetres. The urethra for a distance of about 4.5 centimetres has been entirely destroyed, and with it practically all of the spongy body. The glans has been for the most part destroyed. The remaining portion of the glans measures 3 centimetres by 2 centimetres. The superior surface of the glans (all the remaining portion) is covered by a wrinkled mucosa, the margin of which forms the ragged, indurated, and necrotic edge of the ulcer. There is but little undermining of the mucosa. The surface of the ulceration is beset with minute granules and covered by a grayish pellicle which can be removed with very little manipulation. The ulcerated portion is somewhat indurated, the degree

of induration varies in different parts, but is usually more marked near the margins of the ulcer.

Small masses were cut from different areas, fixed, dehydrated, and embedded in paraffin.

Sections cut from the region of the glans show the specimen to be covered by stratified squamous epithelial cells. Beneath the epithelium is a quantity of loose connective tissue and a few bundles of non-striated muscle.

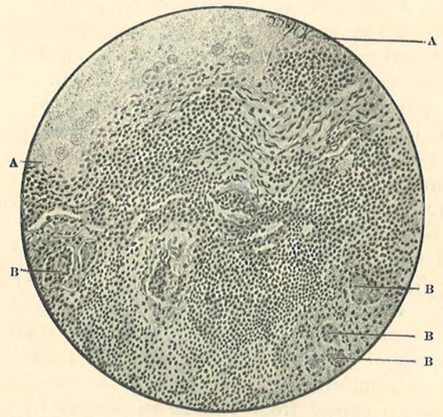

FIG. 3.—Section of floor of ulcer, case of chronic phagedæna. (Reported by Dr. Loux and Dr. Coplin.) A, A, The area between these two points is superficial and composed of the tissue undergoing liquefaction necrosis. Aside from the contained granules, a few granular and necrotic cells showing fragmentation and karyolysis are also present. B, B, B, B, Giant cells; other giant cells are also seen at several points in the field. Lymphoid cells are abundant throughout the field, and just above the centre and to the right are a number of fibroblasts. No area of caseation is present in this field.

Sections taken from the dorsum of the penis (Fig. 3) show it to be covered by stratified squamous epithelium upon one surface. Beneath this epithelial layer is a large quantity of rather dense connective tissue and non-striated muscle. Here and there can be seen accumulations of small round cells, polymorphonuclear leucocytes, a few epithelioid cells, and giant cells,—distinctly suggestive of tubercles.

They are for the most part discrete, but in one or two areas

a beginning coalescence of two tubercle-like agminations can be detected. Beginning caseation is also noticeable in other areas.

Sections taken from the region of the urethra show the mass to consist almost wholly of granulation tissue. The lining epithelium of the urethra is in some parts destroyed and encroached upon by the granulation tissue. No well marked tubercles are seen in these sections, but a few giant cells are scattered throughout. The sections were also stained for bacteria, and especially for the tubercle bacillus.

Upon examination of sections stained with Löffler's methylene blue, in the blood-vessels, intracellular and scattered irregularly through the tissue, numberless bacilli were demonstrable.

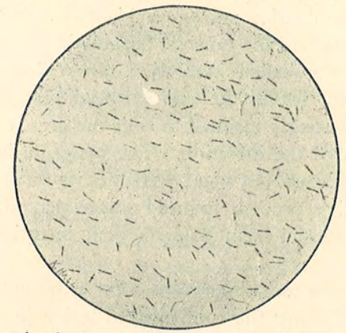

FIG. 4.—Bacillus of soft chancre (Ducrey). The irregular staining of the organism and variations in morphology are well shown. From section stained with methylene blue. Zeiss 2 mm. homo. im., projection eyepiece No. 2.

They average 1.5 microns in length, possess rounded ends, and exhibit polar staining. They do not retain the dye when treated by Gram's method. (These bacilli are similar to the organisms met with in sections from the same case made some time before, and which were then thought to be the bacilli of Ducrey.) A few cocci were also seen. No tubercle bacilli nor any other acid resisting bacilli were demonstrable.

The tissue removed from the groin was not examined; it was ordered sent to the laboratory, but was not delivered in a condition permitting examination.

Diagnosis and Remarks.—The process is clearly not a simple one. The profound tissue alterations are evidently the

result of a violent infection, mixed in character, and rapidly extending; a careful histologic study fails to show satisfactory evidence that the tissues are making any efficient effort to limit the spread of the bacteria. Not only do the bacterial findings clearly show the existence of a mixed infection, but the histology discloses the presence of two forms of necrosis occurring separately and only together in the sense that one may be consecutive to the other, a view not supported by a study of the sections. The liquefaction necrosis is evident superficially, restricted to the skin and outer layer of granulation tissue, while the caseation is present at or near the areas of giant cell agmination and not evident elsewhere. Our inability to demonstrate the tubercle bacillus in its usual form, or in some of its so-called involution types, does not exclude tuberculosis, but leaves the one essential link missing; personally, I am strongly inclined to urge the presence of tuberculosis as a part of the infection. The pyogenic infection is of course demonstrated, but space precludes its further discussion. The suppurative process induced experimentally seemed to differ in no essential from staphylococcic infections frequently seen.

Probably the most important point to be settled, if settled it can be, is whether the fundamental lesion in this case was chancroidal; should we accept the bacillus of Ducrey as the cause of soft chancre, then the bacteriologic findings are to be weighed against the clinical aspects of the case. If the clinicians decide that the lesion is not chancroid, then the bacteriologic finding is of still greater import, as I think we have demonstrated the presence of an organism that at least cannot be differentiated from the bacillus in question if it be another germ.

The bacillus of Ducrey [1] (Fig. 4) is given by Cornil and Ranvier [2] as the cause of chancroid. After the appearance of the papers by Krefting [3] and Unna,[4] I sectioned a number of soft chancres and studied the pus from others. I was greatly impressed with the constancy of the organism, although occasionally I examined lesions, clinically thought to be typical instances of chancroid, in which the organism

could not be found. Since that time, Peterson,[5] Nicolle,[6] Istamanoff and Akspiantz,[7] Leuglet,[8] F. Bezançon, V. Griffon, and Le Sovrd,[9] and others have done much to establish the specificity of the organism described by Ducrey. Nicolle maintains the value of finding the organism as a test differentiation from the initial lesion of syphilis.

If the writers quoted, and others that could be mentioned, are correct in their view, then the case is one of chancroid running an unusually lengthy course and with an unusual destruction of tissue. Although, as already stated, we have failed to demonstrate the tubercle bacillus, I cannot ignore the histologic picture quite faithfully portrayed in some of the sections. Admitting the doubtful points, this lesion would be regarded as a manifestation of (1) staphylococcic infection, (2) infection by the colon bacillus, (3) infection by the streptobacillus of Ducrey, and (4) tuberculosis, the morbid processes not necessarily occurring in the order given.

[NOTE.—Since the foregoing report was submitted there have been no recurrences at points of previous operations. About the middle of February, 1902, the left epididymis became tender and slightly enlarged, and rapidly increased in size. On March 4, Dr. Loux removed the left testicle with the cord as far as the left external ring; although the examination is not as yet completed, it is sufficiently advanced fully to establish the diagnosis, and proves the testicular enlargement to be due to an acute, rather disseminated tuberculosis involving both the globus major and globus minor.

In the light of the added information, the conclusion previously reached, that the condition was primarily either chancroidal or septic, the probabilities favoring the former, and that upon the initial infection was engrafted tuberculosis, seems to be thoroughly established.]

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[1] Monatsheft für praktische Dermatologie, ix, 1899.
[2] Manuel d'Histologie, 1901, Tome i, p. 676.
[3] Archiv für Dermatologie, 1892, p. 41.
[4] Monatsheft für praktische Dermatologie, xiv, 1892.
[5] Centralblatt für Bakt., xiii, 1893.
[6] Thèse de Paris, 1893.
[7] Société Méd. du Cancase, 1897.
[8] Société de Dermatol., 1898.
[9] La Presse Médicale, December 12, 1900.

TETANUS AFTER VACCINATION.

Dr. Richard Harte showed a boy that had been under his care at the Episcopal Hospital, a case of tetanus. He works in a hat factory, and is in the habit of handling skins, particularly of the rodent variety. Five days after vaccination the arm was slightly reddened; nine days after vaccination the wound was all right, except red and slightly ulcerated. When he was admitted to the hospital, October 25, his jaw was distinctly stiff. He complained for a day or two of a feeling of discomfort in the back. On admission he had a distinct trismus and tetanic convulsions. They were, from then on, very marked. He would be thrown into a state of convulsions by touching his leg or arm. There was opisthotonos, sometimes very marked; his body thoroughly arched, resting on head and heels, and sometimes at night he would have convulsions, where there was distinct pleurothotonos.

For treatment after admission, fifty cubic centimetres of antitoxin serum were injected, and, in addition, he was given chloral, morphine, and bromide freely. The convulsions were not apparently controlled in any way by the serum, but by full doses of chloral, ten grains every two hours for a while, until he came under the influence of it, the convulsions were controlled. When the effects of the chloral passed away, the convulsions would return.

The first day the antitoxin was given in doses of fifty cubic centimetres. Then it was cut down and continued cut down for many days, until he took ten cubic centimetres. The trismus he had was very marked, but at no time was there any difficulty in nourishment. He did not complain very much of pain, and at no time did his temperature go above 102° F.; usually it was about 100°. For a long time the reporter did not think the boy would get well; but when he fought things out for ten days, then it looked as if he were destined to recover, and from that time on his recovery was very marked from day to day. There is nothing in the wound; just the remains of the old vaccination mark. There is nothing there to interest you.

Dr. De Forest Willard remarked that the doubt expressed by Dr. Harte in the efficacy of the serum was shared by the majority of surgeons. He used the chloral and bromide. In a

case that the speaker had succeeded in curing, he kept the boy for twenty-eight days under chloral, bromide, and morphine, absolutely saturated, and the disease did not yield until after twenty-eight days. (*Transactions of the Philadelphia College of Physicians*, xvii, 27.)

Dr. Shoemaker said that there was one peculiarity in this case which distinguishes it from postvaccinal cases recently reported, viz., the shortness of the period of incubation. The others have run from the nineteenth to the twenty-fifth day generally, as was developed in a report and discussion regarding several cases at the Philadelphia County Medical Society. These reports made it very probable that there was postvaccinal infection.

Dr. Taylor stated that he had only treated one case of tetanus with antitoxin, that of a boy of eight years, who first developed tetanus seven days after the receipt of injury, which was a punctured wound of the foot. In addition to antitoxin, he was given large doses of chloral and bromide, so that he was kept deeply narcotized. Whenever the chloral and bromide were diminished in amount, his convulsions recurred. This condition persisted for a long time, but he finally recovered.

This is one of the very few cases which he had seen recover where the symptoms developed soon after the receipt of the wound. Almost all cases of recovery reported after the use of antitoxin have been those of chronic tetanus.

Dr. Rodman reported a case of tetanus where the antitoxic serum was used subdurally, but the patient died on the fifth day, the time they usually die in cases of acute traumatic tetanus. Tetanus developed quickly after the injury. He agreed with Dr. Harte that chloral and morphine are the best remedies we have. It would seem from an analysis of a great many cases of tetanus that exactly the same experience that Dr. Harte has had has been met with by many surgeons, that is to say, that while chloroform and morphine will relieve the spasms of tetanus, the results are not so abiding as under chloral. It seems undoubtedly to be the agent that controls the spasm better than any other drug. From the time of Hippocrates it has been recognized that if a case occurs after fourteen days it is apt to get well; certainly more than 50 per cent. recover.

He called attention to the statistics of Professor Yandell, of Louisville, who analyzed 415 cases,—the largest number analyzed

by any authority. His statistics, taken in connection with those of the War of the Rebellion, show very clearly that if patients survive the fifth day after the onset of the disease, they are apt to recover. There is a marked falling off in the death-rate after the fifth day. This fact should lead surgeons to support the patient; feed them very judiciously, even under chloroform, with a stomach-tube; keep them in a quiet room; allay the spasms, and prevent irritation of any kind, either central or peripheral; by so doing, and keeping the patient alive until the fifth or sixth day, tide them over that period of greatest danger. He did not think that point had been sufficiently dwelt upon. If it was necessary, give chloroform, introduce a tube into the stomach, and feed systematically. He had seen cases recover under such treatment. There was no specific for tetanus. He thought the reports of Roux and others had been too optimistic.

Dr. John B. Roberts said that he had been very doubtful about these cases of tetanus being really caused by infection with the tetanus bacillus through the vaccination wound, because it is so common to have a wound of infection healed before the tetanic symptoms show themselves. A person vaccinated might readily attribute the disease to the vaccination, when infection had taken place through a small wound on the hand or foot which had been forgotten. He saw a case of this sort some years ago, where the child and his family declared that he had not been wounded. The symptoms were those of tetanus, and he soon was able to show a cicatrized wound on the hand, of which the boy and his family had not thought.

He mentioned a recent case of possible tetanus which he had treated with tetanus antitoxin. He used the remedy, because he feared the patient might be developing tetanus, and he was afraid to wait until the symptoms should become sufficiently pronounced to make the diagnosis sure. A woman, aged forty-one years, was admitted to the Methodist Hospital with a wound of the right hand caused by a circular saw The joint between the middle and proximate phalanges of the index-finger had been opened, and the extensor tendons of the index-, ring-, and little fingers had been cut by the saw. Tenosuture with fine silk was done, and a wet corrosive chloride of mercury dressing was applied. Five days after the accident slight pain was felt in the region of the masseter muscles, and there was perhaps a little stiffness when the woman

attempted to open her mouth widely. The abdomen, however, was not rigid, and the temperature was below 100° F., running quite close to the normal line. Her pulse was from 72 to 88 and the respirations varied from 20 to 40 per minute. On the next day, which was the sixth day after the accident, she showed a slight tendency to frowning in the skin of the forehead when she tried to open her mouth widely. This, however, she could do without much difficulty. There was a slight tendency to sweating, and the temperature in the evening reached 99.8° F. Although there was no abdominal rigidity, the symptoms already mentioned, with slight pain in the back of the neck as well as in the jaw, made him fear to wait longer. He therefore gave her an injection of twenty cubic centimetres into the subcutaneous tissues of the abdomen. Her temperature fell to normal the next day, and even went a little below normal. The pain and stiffness gradually subsided, and she was discharged on November 22. From the first suspicion of tetanus, he gave her ten grains of chloral three times a day.

Her case is perhaps worthy of mention, though the testimony as to the value of antitoxin serum is indefinite, since the diagnosis was not established. On the whole, he thought it was better to give the remedy early in suspicious cases, because, when the disease is actually established, treatment seems to be of very little value in the great majority of cases.

Dr. Harte said, in regard to the remarks that Dr. Roberts had made as to whether there was any other previous evidence of traumatism about his case, that he felt quite confident that there was not. Again, with regard to the boy's vocation. He was working in a factory, handling skins, handling the skins of rodents, a form brought from South America. That he was doing all the time. There was no protection to the wound; simply a granulation, a granulating sore on the arm; and, owing to the work he was doing, all the conditions were favorable for infection, which naturally made him think this was a case of true tetanus, due to infection, primarily through the sore, either from the primary vaccination, from the point itself, or from some material in the work he was handling.

INTESTINAL AND FACIAL ANTHRAX.

Dr. De Forest Willard reported the case of a man, twenty-four years of age, a wool sorter, who was admitted to the Presbyterian Hospital, November 3, with a large sloughing ulcer in left cheek, one and one-half inches from angle of mouth, surrounding which ulcer marked œdema of tissue extended over the entire side of the face and across to right eyelid and forehead. The ulcer was dark with elevated and puffy edges, and a small circumferential area of dusky redness with circle of vesicles. The accompanying pain was only slightly burning and stinging in character. He had a history of burning and itching pains in a pimple which had appeared six days previously. This ulcerated on the second day, and the vesicles appeared almost simultaneously. Pulse 102; temperature 100° F.; respiration 20; his condition fairly good. The superficial cervical glands were enlarged.

The entire area of the carbunculous mass was dissected out, cutting deeply through the cheek down to the submucous layer, keeping outside of the vesicles. In the removed tissues anthrax bacilli were found abundantly, and cultures were readily obtained from the tissues, but not from the blood. The fresh wound was then cauterized with pure carbolic acid, thoroughly irrigated with bichloride 1 to 1000, and solution of potassium permanganate, and the whole left side of the face covered with a layer of mercurial ointment. On the following day the wound was irrigated with permanganate of potash, and pure carbolic acid again applied, followed by mercurial ointment. Quinine, fifteen grains, was given daily. Two days later the man began to suffer intense abdominal pain, which caused him to writhe in agony, and he had twenty-one stools in the twenty-four hours. Although his mouth and breath showed no symptoms of ptyalism, yet, in view of the possibility of mercurial absorption, the ointment was discontinued. Later progress of the case, however, showed that the mercury was in no wise responsible for this condition, but that it was undoubtedly a local intestinal infection similar to that upon the face. This inoculation could readily have occurred through careless handling of food with unwashed hands. The infection could gain entrance through even the slightest lesion of the mucous coat of the intestine. The abdomen became tense and swollen, with

marked evidences of enteritis and peritonitis, which symptoms persisted for two weeks. Vomiting was persistent, and the diarrhœa continued, though to a less degree. Pains were paroxysmal, but were controlled by morphine and paregoric. Fifteen grains each of salol and quinine were given daily, with moderate stimulation; also carbolic acid internally in small doses. His temperature rose to 104° F., and varied from this point to 102° for ten days. The abdominal symptoms did not abate. The tension of the abdomen was so great that the size of the spleen could not be determined. Milk was not borne at all, but raw and cooked eggs were retained. Enemas were of little service, as they were quickly rejected. On the fourth day streptococcus infection of the scrotum occurred with great œdema, which was relieved by free incision, irrigation, and drainage of about five ounces of pus. Antistreptococcic serum was then injected, twenty centimetres, upon six successive days. Either this or the evacuation of the pus from the scrotum lowered the temperature to 102° F., but the abdominal symptoms remained persistently. Vomiting of dark green fluid continued, and the diarrhœa persisted in spite of remedies. The œdema of the face slowly disappeared, and the condition of the facial wound improved decidedly. The scrotal wound was irrigated three times a day with permanganate of potash solution, and the facial wound washed and dressed with carbolic solution.

At the end of two weeks, the nausea, pain, vomiting, and diarrhœa still continued, with extreme distention and tenderness. The abdomen now showed through the tense walls evidence of an accumulation of pus in the left iliac fossa. The abdomen was opened three inches below, two and one-half inches to left of umbilicus, and three quarts of the most horribly offensive pus evacuated. The stench was so great that it pervaded the whole hospital. This pus contained streptococci, but no anthrax bacilli nor coli communis. The collection was only slightly walled off from the peritoneal cavity, and no opening was discovered, consequently it was impossible to decide positively whether this infection was a streptococcic one along the line of the cord from the infected scrotum, or whether there had been a small perforation of the bowel from the anthrax ulcer. The cavity was thoroughly washed and drained with hot salt solution. It remained very offensive for several days, but gradually contracted. There

has been no escape of fæces, and the discharge is now small and non-offensive. It is washed three times a day with peroxide of hydrogen and creoline. The facial wound has filled to the level of the skin, and the scrotal wound is closing. Fortunately, the patient has had no lung or throat infection.

The man is greatly reduced in flesh, but is eating and sleeping well; has had a septic parotitis, but bids fair to recover.

This man's recovery was undoubtedly due to the prompt excision of the carbuncle, the evacuation of the pus, the faithful care of the Resident Physicians, and the untiring attention of two nurses, who for weeks patiently endured the dangers in the case. By the use of rubber gloves, protective clothing, etc., they fortunately escaped infection, and no contagion occurred in the hospital. The man was strictly isolated, and all contaminated material burned.

This case, so far as he was able to learn, made the tenth reported in Philadelphia. Doubtless there have been others unrecorded, as there are many morocco factories and tanneries in the northeastern section of the city. Mutschler[1] (ANNALS OF SURGERY, October, 1901, p. 555) reports two cases under his care which were treated by circumferential injections of pure carbolic acid, and both recovered. They were situated so near to the eyelid that excision was not feasible. Of the ten cases, five died, and the fate of one is unknown. His own case of recovery is the only one of internal infection. The diagnosis was confirmed by discovery of the special bacillus in all these cases. All of them were workers upon hides or wool. Considering the immense number of hides that are imported from foreign countries, and the fact that it is very difficult for any government to prevent the cupidity of individuals from selling the hides and other portions of animals dying from anthrax, it is remarkable that more infections do not occur. The burning of every carcass entire would be the only effectual method of stamping out this disease.

DR. GIBBON said that he had a case of anthrax under his care at that time, and it was the second which he had seen in Philadelphia within two years. His first case resembled Dr. Willard's very closely: the lesion was upon the side of the neck, and the œdema extended down over the upper portion of the chest. The patient was engaged in loading vessels, and was accustomed to handling hides, and it was probably in this way that he became infected. The patient complained little of pain, and presented mild constitutional symptoms. The patient made a good recovery under local antiseptic treatment. Three days ago he saw the second case to which he referred. This was a colored man who drove a wagon for a morocco factory. He said he did not handle hides, but did clean up the yard about the factory, and in this way handled small pieces of hides. The lesion in this patient extends across the front of the neck, consisting of a thick, dark scab three-quarters of an inch wide and two inches long, around which is an œdematous area. There are no distinct vesicles, such as were seen in the first patient. This man presents, however, an enlarged gland above the lesion. The diseased area was excised and the base cauterized by Dr. Stewart. The patient suffers no pain and presents no constitutional symptoms, and is with difficulty kept from his work. In both of these cases the anthrax bacillus was found.

[1] See page 147 of present volume of Transactions.

DR. JOPSON said that anthrax was more prevalent in Philadelphia and vicinity than had been supposed. When Dr. Ghriskey and he reported a case in the Episcopal Hospital in 1899, they were only able to find three cases on record in the city in which a bacteriological diagnosis of anthrax had been made and confirmed. Since that time a considerable number of cases have been observed. Dr. Given observed one, Dr. Mutschler two, Dr. Gibbon has just described two, and Dr. Willard's case makes another one. And he ventured to say that if the attention of physicians was more often called to these cases, many cases previously regarded as erysipelas, cellulitis, or allied conditions would be found to be anthrax. Dr. Fussell had given him notes of four cases, treated by Dr. Kelly, of Manayunk, in which, though no bacteriological examination was made, all recovered under simple antiseptic treatment; yet, from the histories and location of the lesion, it is likely the majority of them were cases of anthrax. Many cases of this nature are overlooked, especially in the manufacturing districts of the city, such as Kensington and Manayunk.

GANGRENOUS HERNIA.

DR. R. G. LE CONTE showed a fresh specimen of gangrenous ileum, illustrating a strangulation due to a band and a volvulus. The subject was a man, aged fifty-five years, who was admitted

to the Pennsylvania Hospital in a moribund condition. The following meagre history was obtained. He had had a reducible right inguinal hernia for twenty years. Two days before admission the rupture became irreducible, with increasingly severe pain in the lower abdomen. Obstruction was apparently complete from the onset of the symptoms, and in a short time vomiting began, and was continuous until he died. On admission to the hospital he was in collapse, pulse very rapid, small, and thready, facial expression pinched and anxious, respiration entirely costal. The abdomen was greatly distended, universally rigid and tender, with a semicircular area of dulness extending from the right short ribs to the anterior superior spine of the left ilium. The abdomen was opened in the median line, and this loop of gangrenous bowel immediately presented. It was about two feet in length and four inches in diameter, and filled with dark, bloody fluid of a cadaveric odor. It consisted of the lowest portion of the ileum, strangulated by a fibrous band two inches in length, running from the mesentery to the ilium. In addition, there was a half-twist from right to left in the strangulated bowel. The fibrous band was thick and strong and evidently of long duration. It is probable that the volvulus had occurred, and, as a result of the twist, the fibrous band had been drawn taut, with the production of immediate and complete strangulation. In the presence of so serious a lesion, and with death impending, it was deemed hopeless to attempt further surgical interference. The patient expired shortly after removal from the operating table.

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