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ORIGINAL ARTICLES.

ACUTE MASTOID SUPPURATION WITH PRESENTATION OF CASES.*

By PERRY G. GOLDSMITH, M.D., Belleville.

In the necessarily short time given to each paper it is obviously impossible to attempt any discussion which would include the anatomy, symptomatology, pathology and treatment of acute mastoiditis. I will give merely brief notes on three cases that have come under my notice within the last year.

1. Male, aged 50, while blowing his nose during a bad cold felt something suddenly snap. This was accompanied by the most intense pain in the ear but no discharge came externally. The pain was very great for some hours when the discharge first appeared at the external auditory meatus. Boracic acid powder was used freely but the discharge persisted. His wife having a severe earache some days following, I was asked to see her and after relieving her by opening a bulging drumhead, was asked to see the subject of this article for the first time.

On examining the ear the canal was found blocked by a large mass of boracic acid powder through which pus was trying to burrow out. After freeing the canal with a syringe I examined the drumhead and found a perforation situated behind the umbo and slightly below. I remarked on the seriousness of a running ear at the time, telling him that it might involve the mastoid in spite of all that could be done. The treatment consisted of placing small gauze strips in the canal in order to facilitate drainage, the cleansing of the ear frequently with a syringe used gently, and attending to the naso-pharyngeal vault. Yet the discharge went on in spite of everything, including the use of alcohol and other antiseptic astringents. Enlarging the opening in the drumhead the pus increased, welling out from the perforation as fast as one could wipe it away with a cotton-tipped probe. About two weeks after I first saw him he began complaining of a dull aching over the head radiating from the ear, and there was now for the first time tenderness over the mastoid,

* Read before The Ontario Medical Association June 1900.

found only on deep pressure especially over the tip. I used ice freely at once but the pain increased and some swelling of the mastoid was noticeable if the two sides of the head were compared from behind. There was also a sagging down of the posterior superior wall of the canal next the drumhead.

I advised operative measures at once but the patient and his friends would not think of it saying as many others similarly situated have said that it was only a running ear. I persuaded him however to go with me to Toronto where we consulted Dr. Jas. Macallum, who concurred in the diagnosis and agreed that operative measures were certainly indicated. We returned, and as the patient demanded it, I waited a few days longer, but the continuation of the discharge with a deep boring pain in the mastoid region, so bad at nights that he could not sleep, with a slight rise of evening temperature, induced him to allow an operation to be done.

This was done by Dr. Macallum and myself and the whole mastoid was found full of pus and necrotic debris necessitating the removal of the entire pneumatic spaces and the tip of bone and exposure of the lateral sinus and removal of granulations and debris. The discharge from the ear stopped at once and the patient made a rapid and uneventful recovery.

In this case I take it, the sudden opening of a blocked Eustachian tube while blowing the nose severely, caused a rupture of the drumhead. Infection subsequently took place and the discharge occurred, the egress of which was retarded by too much boracic acid.

2. Male, aged 57, farmer, came to me not so much because he was ill himself but because his wife was coming regarding a lachrymal abscess. After I examined his wife and evacuated the abscess he asked me to look at his ear. He gave the following history. Two weeks previous following an intense earache of 24 hours duration a discharge appeared in the left ear, giving immediate relief from pain. The discharge persisted and increased in amount, the odor not having been at all foul at any time. He suffered great pain at times on that side of the head making sleep almost out of the question. This pain in his head radiating from his ear and mastoid region, became at times almost unbearable and was accompanied by great depression and weakness and frequent spells of feverishness and chills. In fact he was thought to be going into typhoid fever. The pain however, became co-incident with a swelling in the temporal region with marked œdema over the mastoid, and the discharge markedly lessened.

On examination I found the left side of the head projecting out as it were, the left ear and temporal muscle being very prominent. Pain was very marked on deep pressure over the mastoid antrum. In fact the patient would cringe from me every time I would press the bone. The discharge was of a thick yellowish nature unmingled with blood, and not of a foul odor. The superior and posterior wall of the canal next the drumhead, markedly projected into the lumen of the canal. Temp. 98; pulse 65; resp. 18. The left pupil sometimes was smaller than the right and enlargement of the retinal veins but no optic neuritis was present.

I advised operation at once but they would not consent to its performance until the next day. His condition was unchanged except for the left eye, where marked dilation of the pupil replaced the previous con-

traction. The usual curved incision close to the auricle was made and pus found at the top of the ear coming from a sinus leading to the antrum and extending forward into the temporal fossa. This pocket was well cleaned and the incision extended to the top of the mastoid. After retracting the periosteum from the mastoid the anterior and posterior lips of the wound were well separated. The mastoid cortex was rapidly opened with mallet and chisels while pus and necrotic debris were exposed to view. The superficial cells were scraped away and the mallet and chisel used to extend the opening into the bone. In extending this backwards I came on to a misplaced but thrombosed lateral sinus. This was opened and a small clot turned out, but except some sharp haemorrhage which was easily controlled by gauze packing, did not cause any delay. After enlarging the opening in the bone I proceeded to obliterate all the pneumatic spaces and clean out the antrum which was full of granulation tissue and debris. I followed the dead bone upwards and inwards and liberated an extradural abscess containing two drams of foul pus. The wound was cleansed by flushing with a solution of zinc chloride, 40 grs. to the ounce, a suture was placed in the upper part of the wound and iodoform gauze strips packed into the wound. I might also say that owing to necrosis in the tip of the mastoid I pared the bone from the sterno-mastoid muscle and removed the tip.

For the succeeding five days one could not have wished things to progress more favorably. The wound was dressed once and no discharge was found coming from the ear, and the condition of the mastoid wound was all that could be desired. The temperature, pulse and respiration taken every three hours were normal; appetite good; was free from all pain and slept well; the pupils were equal; slight facial paralysis owing to tight packing. On the morning of the 5th day his temperature was 101, pulse 104, respiration 20. I dressed the wound and found it perfectly sweet. He had a slight chill before noon, but at two o'clock in the afternoon the temperature was 99, pulse 78, but at 5.30 it rose to 104, pulse 84; chills and vomiting, and very marked drowsiness, but no headache. I examined the wound again and was satisfied it was all right. The drowsiness, vomiting (without taking food), high temperature and slow pulse, certainly looked like a collection of pus somewhere in the brain substance and I considered the advisability of trephining the temporo-sphenoidal lobe for exploratory purposes. The fundi of the eyes were not characteristic of anything abnormal except enlargement of the retinal veins in the left. The urine was examined and I think showed the real seat of the trouble. Sp. gr. 1007; albumen 35 per cent., acid, amount 20 oz., deposit of hyaline granular and pus casts and connective tissue debris. The feet and eyelids soon became puffy; the amount of urine decreased in spite of everything I could do; pilocarpine, intestinal elimination and hot pack were only of temporary benefit and the patient passed into coma and died, no urine having been voided for the last 24 hours. Temp. ranged from 104³ to 96°.

I examined the head, post mortem, and found the brain clear, the wound healthy, and hard bone in every direction.

Now, I think in this case we had a case of interstitial nephritis of some years duration which was owing to some exciting cause, possibly the anesthetic, which was equal parts of chloroform and ether, associated with an acute attack of nephritis or some absorption of pus possibly through lateral sinuses, may have taken place, leading to a pyonephritis or pyæmia. I do not pretend to say which it was, and leave the question open. Suffice it to say the man died and I thought it hard luck. I was unable to get a photograph of the case and did not get a measurement of his head, but I have since learned that he was obliged to wear a hat when I first saw him that was three inches larger than his usual size.

3.—Man æt 43 consulted me for a pain radiating from the ear and extending over the left side of the head.

The previous history given me was as follows:—Five weeks previous to my seeing him during an attack of la grippe, he complained of an intense ear ache which lasted for nearly a week. Nothing seemed to allay the pain, not even that abominable linseed poultice that is so frequently put on and around the ear for ear-ache. At the end of a week the ear began discharging, giving great relief to the pain. To use the patient's words, it ran splendidly for about two weeks, when it lessened greatly, but the pain in the head increased, great pain and swelling over the mastoid being present. The pain being worse at night and was relieved by morphine pills freely administered. A swelling now appeared above the ear and extended forwards over the zygoma to the outer part of the orbit. This was poulticed for days and subsequently blistered, but of no avail.

I now saw the patient for the first time. His head was tied up in a poultice and he looked the picture of misery.

On examination I found a deeply inflamed drumhead showing a small recent perforation situated in the posterior and lower quadrant. There was no discharge in the canal worth mentioning, none at any rate in the cartilaginous meatus. There was some oedema over the mastoid, much less than what there was previously I am informed, and very doubtful tenderness on deep pressure over the antrum. It was difficult for the patient to notice any material difference between the pressure on each mastoid. There was marked tumefaction in the region of the temporal fossa; a sagging downward of the posterior superior wall of the canal was also noticeable. It was not well marked, however. Viewed posteriorly the left ear and mastoid were very prominent; temperature 99, pulse 88. I advised operation at once but in deference to patient's request, delayed 24 hours, meanwhile using ice freely to the mastoid and temporal region. This gave great relief from the pain.

Expecting to find pus in the temporal fossa I began the incision well forward, but close to the upper part of the auricle, extended it in a curved direction downwards and backward close to the ear as in the ordinary mastoid incision. Hemorrhage was very free but was easily controlled by clip forceps; pus was found as anticipated, coming from the temporal fossa which it had reached by perforating the bone. I now made an incision at right angles to the anterior end of my preliminary incision, upward for about one inch, in order to more easily clean the temporal fossa.

I stripped the temporal muscle well forward and downward in order to give free vent to any pocket there might be present. The periosteum was denuded from the bone under the muscle but no rough bone was found. Having temporarily packed this region I proceeded to strip the periosteum from the mastoid, and open the antrum. The antrum lay very deep and chiseling to it sclerosed bone had to be removed. It was like ivory in places and was probably caused by repeated attacks of otitis media he had while young. There was but little necrosis in the mastoid cells proper but the antrum was filled with granulation tissues and dead bone. This was removed, the cavity scraped with a sharp spoon until hard bone was encountered in every direction, swabbed with zinci chloridi, grs. 30-5 and irrigated with 1-2500 formaline solution. The upper parts of the incision were stitched and a small gauze drain placed under the temporal muscle and the remainder of the wound packed with iodoform gauze and a dressing applied.

The patient has slept well ever since ; there has been no pain whatever ; no difficulty in opening the jaws as there was previously ; no rise of temperature, in fact it has been normal ever since the operation. The tumefaction in the temporal region has gone and the dressings are hardly stained after being left on for three or four days.

The peculiarity in this case was the absence of the two cardinal symptoms, viz.:—*pain on pressure over the mastoid and the presence of discharge.* Yet the tumefaction mentioned above, the history, and the general condition of the patient were sufficient indications for operation.

A CASE OF CHRONIC SUPPURATION OF THE ANTRUM OF HIGHMORE WITH SUPPURATION IN THE ETHMOIDAL CELLS.

Male, aged 38, consulted me for what he termed catarrh, the predominating feature of which was one-sided nasal discharge.

The history was as follows:—When very young he had an attack of neuralgia of the face which got well by the use of hot applications. This was followed by a discharge of yellowish matter from the right nostril which has persisted ever since. In fact his friends tell me that he always had a drop of matter on the end of his nose and was often spoken of as "wipe your nose." Nothing seemed to be of any use and as he grew older the discharge increased and the right nostril became almost completely occluded. He was unable to sleep on his back owing to spasms of coughing that it caused. Bending over to pick up anything would cause a gush of pus from the nose. On examination I found pus in large quantities in the nose. This being wiped away, pus was seen to be coming from the middle meatus of the nose and the region of the opening of the antrum. This was increased by leaning forward or tilting the head downward and to the opposite side. The middle turbinated bone was very large. With a post-nasal mirror no pus was seen on the walls of the vault or posterior end of the turbinals. There was no tenderness of the teeth nor had there ever been any to his knowledge. They appeared quite healthy. Transillumination showed opacity in the right antrum but none in the frontal sinuses. I was unable to catheterize the

antrum but by aspiration with a Politzer bag, patient at same time swallowing, I could increase the pus in the nose very materially.

My diagnosis was pus in the antrum and probable infection of the ethmoidal cells. Under cocaine anæsthesia and suprarenal extract, I removed a large part of the anterior end of the œdematous middle turbinal, and with cutting forceps, punch like, removed the remainder and opened the anterior ethmoidal cells. Here rough bone was encountered and with a curette I scraped away a good deal of dead bone and granulation tissue. At the patient's request I did not then open the antrum. One week following, he had free nasal breathing, almost no post nasal discharge and was able to sleep on the back comfortably. I again saw him. He informed me that no one could imagine how much better he was.

I now opened the antrum with a trocar, through the inferior meatus of the nose, under the inferior turbinal bone. Pus did not come as I expected but on syringing forcibly it began to come very freely. The amount was very large considering the usual size of the antrum.

I continued to irrigate the cavity daily for a week and throw into the antrum a 10 per cent. solution of protargol and at times 10 grs. to the oz. of zinc chlor. At the end of a week there was practically no discharge whatever, though I was satisfied it would collect again. The patient went home as he said, cured, but in two or three weeks the discharge again came from the nostril relieved by irrigation of the antrum. I wished to do a thorough operation through the canine fossa and scrape the cavity clean, draining through the nose, but he objects to that, saying he may have it done in the fall.

I did not drain through a tooth because I do not believe the abscess to be of an alveolar origin and did not care to sacrifice a good tooth when as good a result could be secured through the nose, though drainage will not cure a case of such long duration. Thorough curetage and packing I think is the only means of curing the case, though there will probably always be some discharge from the ethmoidal cells.

A CASE OF ANKYLOSIS FOLLOWING INJURY.

BY DR. J. T. CLARK, TORONTO.

In presenting this case it is not my intention to attempt a paper on ankylosis or its treatment. I wish merely to give the history of the case and show you the patient in the hope that something may be learned from the discussion. Up to the time of his accident Mr. Pearce was a healthy laboring man. He is now 50 years of age. Family history and early personal history reveal nothing bearing on the case. For nine months before this accident he was working for a butcher in the village of Huntsville, Muskoka.

On the night of December 26th, 1898, he was out with a sleighing party, sitting in the front of the sleigh with his back to the driver and leaning over. It seems that the driver took advantage of his position and sat on his shoulders for some time until the sleigh struck a hole in the road when both were thrown out with considerable force, alighting in the same relative position on the road. It was found that Pearce was unable to move either hand or foot but was quite conscious all the time. There was a slight scalp wound in the left temporal region. He was removed to Dr. Hart's hospital in Huntsville. In about fifteen days he had recovered the use of his right arm and says that for a few days he could move it in any direction, then a severe pain came between his shoulders and all down the right arm to his finger tips and power to move it was gradually lost again, except flexion and extension at the elbow. He gradually recovered some power over the legs so that in three weeks from the time of accident he was able to get out of bed and into a chair without assistance, and in two weeks more could shuffle about the ward but could neither dress nor feed himself. Seven weeks after the accident he left the hospital and came to Toronto, and I saw him for the first time on February 22nd, 1899. His condition then was as follows:—

Patient quite stooped at the shoulders. Was very deliberate in his movements, seeming to dread the pain if a joint were moved too far. Was very tender on examination of the affected joints and when passive movement was attempted. The joints of the feet, ankles and knees were quite free, as were also those of the spinal column except those concerned in rotation of the head. The movement of the hip joints was limited allowing him to take a step of about twelve inches. There was very little adduction or abduction except what was obtained by tilting the pelvis. There was no noticeable atrophy of the thighs or legs. Patellar reflexes were exaggerated. The shoulder joints were so firmly ankylosed that the arms were literally pinioned to the sides and they were so tender that very little scapular movement could be obtained on attempting passive movements. By fixing the scapula a small amount of movement at the joint

* Read before the Toronto Medical Society.

could be made out but it gave him great pain. The elbow joints were all right but the wrists and all the joints of the hands were perfectly solid with the exception of the articulation where the metacarpal bones of the thumbs join the trapezii. These were moderately free. The inferior radio-ulnar articulations were ankylosed in semi-pronation.

The deltoid muscles were very much atrophied, the arms quite thin, the muscles of the forearm atrophied but from the middle of the forearms to the finger tips the subcutaneous tissues were greatly swollen so that the fingers were nearly three times their natural size; the circulation was very poor, the skin tense, blue, and cold. There was no sphincter paralysis at any time; the heart and lungs were in good condition, the bowels very much constipated, the appetite good.

I tried to get him admitted to the Hospital as a city patient but failed on account of the accident taking place when he was working in another municipality, so I hardly knew what to do with him. Just about that time a professional masseur came to me looking for work, so I sent him this patient and instructed him to perform passive movements to the affected joints and massage to the hands, arms and shoulders. True to the nature of his kind, he promptly took full charge of the case, located the *precise seat* of the trouble, high up between the shoulders (having made the remarkable discovery that in this man the seventh cervical vertebra makes a greater prominence than the others), and proceeded to cure him with electricity, leaving out the massage and passive movements as unnecessary. After three months of that treatment he came back to me with the ankylosis a little firmer, although there was more scapular movement on account of the tenderness gradually wearing away, and the hips were considerably freer which I attributed to the fact that he had unknowingly practised the necessary passive movements in walking daily a mile to and from the professor's office for his electricity. This time I succeeded in getting him admitted to Grace Hospital where consultation was had with Dr. McKenzie, Dr. McPherson and Dr. J. M. Cotton, and operated on May 29th, 1899, about five months after the accident. Both Dr. McKenzie and Dr. Galloway were present at the operation and gave me valuable assistance and advice. Chloroform was given and the adhesions forcibly broken down, making reports loud enough to be heard several rods away. Cold packs were applied to the parts for twelve hours after operation, and massage and passive movements were begun on the third day, and continued vigorously for an hour each day. He was also encouraged to work the joints all he could himself.

This gave very encouraging results, so one week later he was etherized and the process repeated. After this the use of the shoulder was soon entirely recovered, the muscles started to grow, and as the massage improved the circulation in the hands and forearms, the oedema gradually subsided and the joints of the hands and wrists steadily improved, but continued so far from perfect that on July 20th, (about two months after the first operation) he was again anaesthetized and these joints again broken down, followed by the same after treatment as before. The result is as you see—not perfect to be sure—but he has two quite useful hands, capable of handling any rough tools. I sincerely hope to hear an

interesting discussion on the subject by the experienced gentlemen who form this association. I should like very much to learn,—

1. What was the cause of the ankylosis? It was undoubtedly of the fibrous variety which the books tell us is the result of joint disease or of keeping an inflamed joint too long at rest.

2. What is the usual expectation as to cure or otherwise in such cases?

3. Can anything further be done to increase the usefulness of this man's hands?

A CASE OF INCARCERATED OVARY.

HORACE C. WRINCH, M.D.,

House Surgeon St. Michael's Hospital, Toronto.

Miss A. B., aged 26. Six years ago the patient developed a hernia in the left groin after severe exercise. The pain was severe at the time and persisted, recurring at frequent intervals ever since. A truss was ordered but only worn occasionally for a short time, then discontinued altogether. The pain was sometimes worse during menstruation but not always. Various nervous symptoms developed, especially headaches, which were frequent and severe. Menstruation has been irregular. During the last eighteen months there has been frequent and distressing vomiting which was treated by lavage, but without success. Three months ago the patient was admitted to St. Michael's Hospital and placed under a course of dieting and kept absolutely at rest, but with only slight improvement in the gastric symptoms and none in those of a nervous character.

There being a great deal of pain from the hernia it was decided after two months to perform the operation for radical cure. This was done, when it was found that the hernia was of the inguinal variety and that the left ovary and tube were within the sac and firmly adherent to it. Both were removed (the ovary being small and misshapen) and the wound closed in the ordinary way.

Healing was by first intention and recovery rapid. Full diet was commenced on the fourth day after operation. The vomiting did not recur. The patient was discharged on the thirtieth day after operation, their being only some slight nervous symptoms remaining.

SELECTED ARTICLES.

ON THE PRESENT STATUS OF THERAPY AND ITS FUTURE.*

By LEWELLYS F. BARKER, M.B., *Tor.*,
Associate Professor of Pathology, Johns Hopkins University.

The only means we have of judging what the future has in store is to review the history of the past and to view accurately the present tendency or drift. The history of therapy is the history of medicine, for medicine began with therapy. It is not my purpose in the time allotted to me to undertake a recital of this history; I shall have to be content simply with an enumeration of epochs and perhaps a hint at the periods of progress.

Historians are gradually collecting for us the data concerning the earliest therapeutic efforts. The history of the earliest medicine shows of what a jumble these efforts consisted. With the dawn of intelligence the sympathy which was gradually evolved through the sense of pain led the primitive man to attempt to relieve the pain of his fellows. You recall the lines of a literary medical man :

“ The hunt is o'er ; the stone-armed spears have won ;
Dead on the hillside lies the mastodon.
Unmoved the warriors their wounded leave ;
The world is young and has not learned to grieve.
But one, a gentler sharer of the fray,
Waits in the twilight of the western day,
Where 'neath his gaze a cave-man, hairy, grim,
Groans out the anguish of his mangled limb.
Caught in the net of thought the watcher kneels,
With tender doubt the tortured member feels,
And, first of men a healing thought to know,
He finds his hand can check the life-blood's flow.

Disease is as old as man—it is only the knowledge of disease that is recent. In the fiercer physical struggle for existence which must have characterized the life of our primitive forefathers, external wounds and mangleings, as well as physical injuries due to exposure to the weather, to extremes of cold and heat, must have been common. Crude surgical procedures evolved by herdsman or shepherd began to be applied to man. The diseases peculiar to the female sex were first treated by the wise old women who had lived through the mysteries of the life of that sex. Of the nature of disease in general and particular the ghost of a true idea did not exist. Obscure diseases were regarded as instances of demoniacal possession. Prayers, chants and sacrifices to healing goods were univer-

* Address in medicine delivered before the Ontario Medical Association, Toronto, June 6th, 1900.

sal. Devils were exorcised chiefly through the medium of priests. The priestly art and that of the physician were often combined. In China, in India, in Chaldea, in Egypt, the development of early medicine followed the same fundamental principles, though each country manifested special peculiarities.

The medicine of the Greeks interests us as much as any. Philosophers all, with an intense longing for the good, the true and the beautiful, they have left behind them records which in many respects make modest even the reader of to-day. In Heraclitus, Democritus and Empedocles and, above all, in Hippocrates we meet with much that is practically good in modern medicine and philosophy, especially as concerns the individual life, the ideal development of the personality. Though infants in anatomy and physiology and almost entirely ignorant of the nature of specific diseases, the Greek physicians had accumulated an account of symptoms and conditions and a therapeutic armamentarium that surprises the modern who for the first time reads his Hippocrates. The treatment of fractures and dislocations, the trepanning of the skull, the tapping of the abdomen and chest, the mode of dealing with hernia show us how daring they were in surgical measures. Had they known how to control hæmorrhage, who can tell what operations these cool-headed Greeks might not have devised. They were far less happy in the more difficult field of internal medicine. Most of their ideas about internal diseases were wrong, but some of their descriptions of individual cases are magnificent. Concerning the therapy of internal diseases, Hippocrates had many sound principles, and described some good practice. He recognized the healing power of nature and urged his followers to aid and follow nature—"quo natura vergit, eo tendere oportet." In Hippocrates can be found the tenets of many of the famous schools which have followed him. The principle of "contraria contrariis" and that of "similia similibus" are both in his pages, but wiser than some who came after him he limited himself to neither. "According to its kind and the circumstances underlying it, a case must sometimes be treated by agents acting unlike the disease, sometimes, on the other hand, the treatment must be undertaken by agents acting similar to the disease. The reason for this lies in the weakness of the human organism." Perhaps the strongest part of the therapy of that day was in the emphasis laid upon diet, gymnastics, bathing and mode of life in general. Who but has read and appreciated the Charmides of Plato, that exquisite dialogue in which the principles of Greek temperance are embodied. For a long time after Hippocrates this personal hygiene was accentuated. The visits of young men to the temples of Æsculapius, there to be instructed as to how to live, were long continued. Walter Pater's appreciation of a visit of this sort described in Marius the Epicurean will be recalled by many of you.

In Galen's time theory and gross empiricism reigned supreme. The idea of the four elements, heat, cold, dryness and moisture influenced the giving of drugs. These elements in a sense corresponded to the four cardinal juices of the human body, blood, mucus, yellow bile and black bile. The therapeutic ideas of Galen, like his medical ideas in general, dominated medicine for a thousand years.

With the advent of Vesalius and the development of human anatomy one might have hoped for rapid improvement in therapy, but this improvement was not immediately forthcoming. Even Harvey's discovery of the circulation of the blood and Malpighi's studies of physiology and pathology were not immediately fruitful in a therapeutic way. Paracelsus alone stands out as a reformer in internal medicine and therapeutic effort. He bravely opposed the authority of Galen, recognized the fallacy of trusting to knowledge obtained from books and relied rather upon personal observation and experience. Analysis shows, however, that even Paracelsus did but little to advance the actual knowledge of therapy.

About this time there was a wide-spread awakening in all the natural sciences. Descriptive natural science and systemization ruled the thought of the day. During the period which followed a series of medical systems developed, based upon one-sided theories and badly based generalizations; Haller's doctrine of irritability, Brown's doctrine of stimuli, Hahnemann's homoeopathy, Gall's phrenology, along with many other schools came at this period to their development.

Real progress in therapy dates from the time when natural science became an exact study. Rigidly accurate observation followed by mature reflection has led to experimentation. Medicine of this sort is only a century old. It was almost synchronous with the widening of chemical discovery and of the working out by physicists of the principles which underlie many natural phenomena which up to the time had been entirely obscure, that microscopic studies began to be prosecuted seriously. Histology developed with Bichat; the cell doctrine with Schleiden and Schwann, pupils of the celebrated Johannes Müller. The French and Germans became enthusiastic for pathological anatomy. Rokitansky counted his autopsies by thousands. The older physicians like Sydenham and Boerhaave, found worthy successors in Louis, Schönlein, Traube, and Wunderlich.

Virchow's cellular pathology established an entirely new view-point whence disease-processes could be observed. Charles Darwin's work on the "Origin of Species," Herbert Spencer's philosophy and Huxley's researches in comparative anatomy stimulated investigators in all sciences to examine into the evolution of phenomena, to consider the order of events in organic processes. Enormous strides continued to be made in physics and chemistry, and the new facts discovered in these branches permitted of the development of physiology by Ernst Brücke, Carl Ludwig, Emil Du Bois Reymond, Helmholtz and Claude Bernard. Caspar Fr. Wolff, Karl von Baer, Balfour, and His unravelled the mysteries of embryonic development. Improvements in the microscope and in microscopic technique led to a deeper penetration into the mysteries of histology and microscopic anatomy, normal and abnormal, than the most enthusiastic could have hoped for a few years earlier. New instruments of all sorts were devised. Auenbrugger's percussion and Laennec's auscultation revolutionized physical diagnosis. The ophthalmoscope, the laryngoscope and the speculum, had much to do with the establishment of the specialties of ophthalmology, laryngology and gynecology

In the fight against infectious diseases a great victory had been won in the discovery of vaccination by Edward Jenner. Later on Henle's ingenious speculations concerning the nature of contagious diseases set many great minds in motion. With Pasteur and Koch came illumination. The infectious agent in the majority of infectious diseases is now known, can be cultivated in pure culture and can be utilized in animal experiment.

Physiological and pathological chemistry have been unveiling the mysteries of the fluids and solids of the body; pharmacology and toxicology are investigating the influences of drugs and poisons upon these. The application of Lister's happy idea with regard to wound infection, aided by the American-born boon of anæsthesia and a bloodless technique, totally changed the aspects of surgery. Wound infection, if not entirely an event of the past, has been enormously reduced. The holiest places of the body are to day invaded by the surgeon's knife; the abdomen, the thorax, the joint cavities and even the brain are frequently and fearlessly explored. The heart, the last organ of man to be made accessible to surgical treatment, can now be sutured with success.

But more time must be spent in glancing at the past; it is necessary at once to look at the present and to divine, if it be possible, whither we are being led.

As a result of development along so many diverging lines the study of modern medicine is concerned with a field so wide that he who glances over it, cannot fail to be appalled by its magnitude. No single intelligence can in these days be familiar with the details of growth in all its parts; no single individual can hope to work efficiently in more than one or two of its subdivisions. The complexity of the work demands a division of labor, and most is gained from the efforts of men who, familiar with the general trend of progress in the whole field, concentrate their activities upon some one corner of it. Individual workers in the special medical sciences are pushing their investigations at the moment with unwonted zeal. Anatomists are ever devising new technical methods; the cells formerly believed to be very simple "elements" are found to be highly complex organisms; parts of the body as, for example, the nervous system, are having their true cellular nature for the first time revealed; the structural basis of the intrinsic mechanisms of individual cells is in process of demonstration; the relations of the basis in one cell to that in other cells are being found out. Physiology, so long interested in the hydraulic principles of the circulatory apparatus and the muscle-nerve preparation, is being diverted into new channels of research, utilizing in its experiments the newly discovered principles underlying chemical and physical phenomena. The oxygenating and reducing processes which occur on the body, the various stages of anabolic and catabolic metabolism, the phenomena of secretion and excretion, the interrelations of the various bodily activities, the functions of the different neural complexes, the mechanisms of defence and adaptation—these are some of the subjects with which physiologists are now busying themselves.

In pathological anatomy and physiology just as strenuous efforts are being made as in the other fundamental departments. Our ideas

concerning inflammation have been so much modified that we are advised by some of the ablest pathologists to give up the term altogether. The nature of inflammatory exudates is still under discussion; what elements are of hæmic and what of local origin are disputed; the great cleft between the acute inflammations and the chronic processes associated with production of new connective tissue is still unsatisfactorily bridged. The ætiology of tumors, as yet unsolved, stimulates the embryologist on the one hand and the parasitologist on the other to renewed exertion. New tumors are being discovered; old ones are being regrouped; finer and finer distinctions between benignancy and malignancy are being drawn with results eminently satisfactory for the practical surgeon.

The therapeutic hopelessness that pathological anatomy inspires is more than compensated for by the faith in the future of therapy and prophylaxis directly derivable from a consideration of the teachings of pathogenesis. As pathological processes are traced further and further back to the earliest stages when function begins its deviation from the normal and the causes underlying those deviations gradually become recognizable the means of prevention and the indications for treatment become obvious.

Bacteriology appears to have done for us the greatest work of which it is directly capable; further advances in a similar direction promise to be made rather through the aid of chemistry and physics. The study of protozoan invasions is yet in its infancy and may have surprises in store for us. One cannot help but feel that we are on the brink of the discovery of the infectious agent in syphilis and the infectious fevers, but who can prophesy what the nature of the agent will be—animal: vegetable or less highly organized "ferment."

We have some reason to be proud of the present status of public hygiene. There never was a time when the general public was more industriously educated concerning the importance of hygienic measures than at present—never a time when the laity was more thoroughly exercised over this topic. Sanitary associations are innumerable; public health departments are everywhere demanded. Meat, milk and vegetables are inspected; impurities in food and drink are more and more excluded through the vigilance of the law. Contagious diseases are diagnosed early and isolated by city officials. Government sanitarium are in sight. Quarantine and disinfectant measures are more rigidly and fortunately more intelligently employed than ever before. Great epidemics are being choked at their starting places, the only mode in which they can satisfactorily be combatted. A fire can be extinguished by a fire department in its incipient stage—once well under way it is beyond the control of human interference. There is good prospect that ere long the world will be through with those tremendous outbreaks of contagious disease of bacterial origin which from time to time have so devastatingly swept over both Western and Eastern civilizations. Thanks largely to Anglo-Saxon enterprise the back yards of the world in which the embers of epidemics smoulder are being rapidly cleaned up; this together with the rendering ever more infection-proof of the materials to which the flame

of infection spreads bids fair to make the whole subject if not entirely, at least largely, a matter of history.

The present position of personal hygiene is a subject upon which we have less reason to congratulate ourselves. In principle we know much, in practice we do but little. Concerning climate, fresh air, diet, clothing, bathing, work, rest and recreation there is perhaps less dearth of information than negligence and inattention in performance. We behave hygienically when we are forced to do so, but not as a well planned order of life. Above all on this continent we have as yet to learn how to live and the problem here is less simple than elsewhere, for life here, especially in the great centres, is life at its most complex. Nowhere else is the strain so great—nowhere else does it so rapidly increase in tension. It must be a nervous system other than that which has been and that which is that will stand it. That nervous system may be now envolving, but in the meantime the unfit are succumbing in numbers even more alarming. Moderation in all things and elimination of the non-essential from our lives would do much to tide us as a race over the transition period.

Perhaps the most significant movement at present observable in medicine is the beginning of the application of the newer ideas of physics and chemistry to the solution of biological questions. One has ever to be on his guard lest he expect too much from the introduction of new methods of approaching problems, but in this instance the principles underlying are so fundamentally important and have already worked such marvelous transformations in the mode of thought and activity of chemists that we are justified in expressing great hope for the future in their use by medical investigators. The doctrines of van't Hoff and Arrhenius are pregnant with great possibilities. van't Hoff's brilliant generalizations with regard to the behavior of solutions are found to hold good by a whole series of workers—the laws of osmotic pressure appear to be strictly analogous to the laws of Boyle, Gay-Lussac and Avogadro concerning gases. The theory of the dissociation of electrolytes—salts, acids and bases—into their components, the ions (cations and anions), which we owe to Arrhenius, affords a satisfactory explanation of an enormous number of facts hitherto unintelligible. The newer doctrines not only correlate facts hitherto unconnected, but they have shown the way to new lines of experimentation and have acted as a most powerful stimulus to original research. While it is probably not true that chemical activity is due solely to ions and never to whole molecules, yet the number of chemical reactions which according to the physical chemists are purely ionic is very great, including certainly the majority thus far investigated. The studies of Kahlenberg and True on the toxic effects of acids and bases on plant life indicate that it is the hydrogen ion of the acid and the hydroxyl ion of the bases which is the active constituent. The significant experiments of Loeb on the power of muscle to absorb water in the presence of acids suggest the value of the physical-chemical method of thought in physiology. The work of Krönig and Paul upon the effects of disinfectant substances has made probable the ionic nature of this influence. The introduction by Dreser of the conception of the osmotic work done by the kidney and a calculation of the same in foot

pounds is of the deepest interest, even if his interpretation of his results as it would appear, has to be somewhat modified. The practical results in sight from the clinical studies by the method of physical chemistry undertaken by Hamburger, Köppe, Koranyi and others are being thankfully received by clinicians all over the world. Loeb, of Chicago, has recently interested us by proving the poisonous effects of pure solutions of common salt, and though his experiments have been upon lowly organisms, I should consider the medical man rash who continued to give a patient of low vitality large doses of ordinary salt solution when he can just as well introduce a solution in which the holding in a variety of salts corresponds more nearly to that of normal serum. Almost startling, too, is the assertion of Loeb that the eggs of echinoderms can be fertilized in the absence of spermatozoa by magnesium ions. If the phenomenon of fertilization—that *sanctum sanctorum* of physiological processes begins to be invaded by physical chemistry—what may we not expect from that science in the future. It would take too long to refer to other work in this field—to the constant reciprocal relation existing between chlorides and achlorides of the blood and urine, to the newer ideas on the occurrence of oedema, to the speculations concerning so-called ion-proteids. Suffice it to say, that the promise for the future in pathogenesis and in pharmacodynamics is much brightened by the advent of physical chemistry. Were a medical student, suited by heredity and environment to look forward to the higher things in medicine, to ask me the question, "How can I best fit myself to make real advances in knowledge in medicine and therapy during the next twenty-five years?" I should say, "In addition to a thorough medical course, arm yourself with sufficient mathematics and gain a thorough theoretical and practical training in the methods of physics and chemistry and especially in the principles and methods of what is called 'physical chemistry.' After this turn your attention to the solution of medical problems." Not that the doctrines of van't Hoff and Arrhenius will be able to clear up all difficulties—the doctrines themselves may even be found to be only helpful hypotheses and later be supplanted by others less faulty, but all our knowledge is but relative, and at present new knowledge can probably be easiest reached by working with the methods referred to.

The conviction is not infrequently expressed that surgery having gone so far cannot have many great conquests still before it, but when we review recent progress it would seem hazardous to deny the possibility of still more interesting advances. The extensive use of local anæsthesia since the introduction of cocaine in 1884 has led to striking modifications in surgical technique. The general narcosis produced by ether and chloroform together with perfected hæmostatic methods had a tendency to encourage slow operations. With cocaine anæsthesia and infiltration of the tissues with nearly indifferent fluids surgeons have been again compelled to operate more quickly and with greater efforts at precision. The discovery of the X ray has made bone surgery much more accurate work than it could ever have been before. Most noteworthy, perhaps, in modern surgery, are the operations which are now undertaken upon the liver, gall-bladder and bile ducts. These together with gas-

trointestinal surgery have elevated abdominal surgery to even a higher rank than that attained by pelvic surgery through the activity of the gynæcologists. Progress can certainly be expected still in the treatment of surgical diseases. Max Broedel in Kelly's service has just shown us by a study of its blood-vessels the safest way to cut into the pelvis of the kidney.

The sharp line between medicine and surgery is breaking down. The two domains overlap at their boundaries and the importance of medical men and surgeons working together is becoming more and more appreciated. The establishment of a journal, the *Mittheilungen aus dem Grenzgebiete der Chirurgie und Medizin*, is an indication of the feeling which exists. The surgery of the future aside from emergency cases will be largely done in hospitals. Surgeons, to attain the necessary technical skill and familiarity with normal and pathological living tissues, must stand for years over an operating table. A trained corps of assistants and nurses is essential for the more difficult problems which now fall to the lot of the surgical specialist.

Compared with the brilliant achievements of the surgeon the therapeutic efforts of the physician are felt by most medical men as well as by the laity to be somewhat disappointing. In spite of the extraordinary keenness of diagnostic power which has been developed in internal medicine the painfully exact studies at pathological histology and in physiological and pathological chemistry, the wide-spread activity in pharmacological and pharmacodynamical experiment and the indefatigable efforts of the manufacturing chemist to supply new drugs, the view is prevalent and rightly so that in the treatment of internal diseases "we have more to hope for the future than to entrust to the present." The explanation is obvious. The age is one of doubt. Authority now less than ever before counts for anything. There is a lively fear of empiricism, an insatiable desire for rational explanation. Pathological anatomy stimulated to brilliant diagnosis, but, for a time at least, it encouraged therapeutic pessimism. Skoda, the type of a therapeutic nihilism even went so far as to say "we can diagnose disease, describe it and get a grasp of it, but we dare not expect by any means to cure it." In such a temper drugs of unknown physiological action cannot conscientiously be set to act upon bodily tissues in disease in which we are ignorant of the deviations from the normal of the chemical and physical processes going on in the cells. The death blow came first to polypharmacy; to-day, with many physicians, pharmacotherapy, as a whole, is almost moribund. Ask the prescription chemist how his work now compares with that of fifteen or twenty years ago. He will tell you that he is lucky if he fills ten recipes to-day, where he formerly filled a hundred. The druggist in the village or small town may still receive an occasional prescription which orders ten or fifteen varieties of herbs, but the fine old concoctions known to our fathers have almost entirely disappeared. It is seldom in this day that more than one or two drugs are prescribed at one time and these too often because "the patient must have something." A dozen drugs altogether suffice for the pharmacotherapeutic armamentarium of some of the most eminent physicians on this continent.

The reaction against the use of drugs, together with the development of the expectant method of treatment, permitted of a more accurate study of the natural cure of the disease than was before possible. Consistent homoeopaths who pushed their minimal dosage to such a degree that any conceivable drug effect was prevented did much, though unintentionally, to illustrate the healing power of nature unaided. Dietl's studies of pneumonia, treated without blood-letting, convinced him and the world that the effects of therapeutic interference in this disease had been greatly over-estimated.

Marked as have been the advantages derived from these therapeutic revolutions I cannot help but feel that the time has come for a more hopeful outlook for therapy in internal medicine. More thought among the best men might with advantage be given to it. Not that a whit less attention should be given to diagnosis or to pathological study—only through these is a successful therapy thinkable—but may we not interest ourselves more in the therapeutic measures of proven value which are really at our disposal. I am fully aware that some practitioners fail to properly diagnose their cases, that there are those who have but little scientific knowledge of disease, and it is these usually who possess the largest magazines of misplaced confidence in drugs. It may even be said to be certain that the majority of men in practice who leave it temporarily to undertake post-graduate work, would be benefited more by instruction in the wealth of diagnostic aids recently put at our disposal than by a course in therapeutics. That the skilled diagnostician, however, can be of greater service to his patients if he put the same keen, well-directed intelligence into motion with regard to treatment that he uses in diagnosis instead of stopping short at the diagnosis and shrugging his shoulders when therapeutic effort is mentioned, must be patent. As Leyden put it: "The task of therapy is to help the patient as far as possible with the means at its disposal at the time; it dare not postpone the treatment to future discoveries. Specific therapy, long looked upon as that alone which is safe and worth striving for, is deprived of its absolute dominion; instead of 'curing diseases,' our task is altered to 'making patients well.'"

I cannot help but think that one of the causes of therapeutic pessimism among the better men in the profession lies in the fact that when therapeutics is spoken of most men call pharmacotherapy disproportionately into mind. It is because they are insufficiently known and appreciated that dietotherapy, climatotherrpy, hydrotherapy, kinesiotherapy, electrotherapy and psychotherapy are not ranked with pharmacotherapy, and yet, in the majority of cases with which physicians deal, one or more of these is of far greater importance than treatment with drugs. Psychotherapy especially has a great future. Not until physicians become better psychologists and learn better how to apply psychic methods in the treatment of disease can we hope for the disappearance of such psychic epidemics as that represented by Christian science. In the near future psychopathogenic mechanisms should be carefully studied in order that psychoprophylaxis can have a wider field.

What the future of pharmacotherapy will be, who will be rash

enough to judge? That it will be great seems certain. That it cannot soon be great seems sure. Synthetic chemistry has supplied us with a host of new bodies for experimentation. Only a very small percentage of these have thus far been found to be of value. Antipyretics, analgesics and hypnotics especially are being multiplied. They have to be slowly tested on animals, then on healthy human beings and last of all on human beings in diseased conditions before their actual value can be ascertained. The effects of drugs like acetone-chloroform and urethane astonish us, however, and whet the appetite for further discovery.

No single system of therapy is likely soon again to hold general sway. *Contraria contrariis* and *similia similibus* have ceased among scientifically cultivated men to be a universal guide of therapeutic action. The biologically fundamental principle of Pflüger and Arndt, namely that "minute stimuli, excite to vital activity, stimuli of medium strength favor it, strong stimuli inhibit it, strongest abolish it, it being, however always an individual matter whether a given stimulus will prove to be feeble or one of medium strength or maximal," associated with the Ritter-Valli law that "diseased organs are in a state of heightened excitability" has been made by Oscar Schulz the basis of his "organ-therapy." Very valuable as the concept appears to be, medical men, with a caution born of experience, will be loath to accept it or any other generalization as an all-sufficient maxim.

The revival of organotherapy or ophototherapy, as the French designate it, is a marked feature of present treatment. One of the oldest methods, having been employed long before the Christian era, ophototherapy began with an attempt to produce an aphrodisiac effect by administering the genital organs of the respective sex to the individual who desired stimulation. It is rather curious that the present revival was inaugurated by Brown-Sequard, the composition of whose elixir vitae you know. Organotherapy has, however, this time a rational basis in the conception of an internal secretion, deduced by Brown-Sequard from the studies of Claude Bernard. The production of experimental cachexia thyreopriva and the bringing of the proof that the transplanted thyroid would save an animal from the disease suggested the possibility of the use of thyroid substance in myxœdema and cretinism with the marvellous results which most practitioners have by this time been permitted to observe. The chemical analyses of Baumann showed that an iodine compound in the normal thyroid is an important element in the gland.

This "*Parenchymasaftherapie*," as Virchow designates it, is obviously a substitution-therapy—a restoration to the diseased body of chemical substances, the removal of which from the normal body gives rise to symptoms of disease. It is in atrophic conditions of the gland that the therapy is valuable. Myxœdema and cretinism are diseases which correspond to the "altruistic atrophy" of Hansemann, while Basedow's disease is thought by many to be an example of "altruistic hypertrophy." Had the principles underlying thyroidtherapy been earlier recognized we should not have expected benefit from the administration of thyroid extract in hypertrophic conditions of the gland.

The French are busy testing the effects of thyroid-therapy on the

healing of fractured bones. The experimentation is still in progress and it is too early yet to say much regarding it.

Ponfick's remarkable case, which makes it appear possible that the hypophysis and the thyroid may be compensatory glands, will doubtless stimulate to further study.

With the advent of a successful thyroid therapy, the notoriety hunters soon introduced organic extracts of the most various sorts. Cardin, cerebrin, hepatin were launched and vaunted. Examination of the manufacture of a certain prostate extract showed that it was being prepared from female animals! Such empirical attempts were worse than useless. They represent a return to the primitive.

With certain of the organs we are, however, provided with a rational basis for experimentation. Mering and Minkowski proved the disastrous effects upon the animal of extirpation of the pancreas. The diabetes which followed extirpation could be prevented by transplantation of pieces of pancreas. Yet for reasons not satisfactorily understood pancreas therapy has not been made practically useful.

Again, the effects of removal of the adrenals have been carefully studied. Addison's disease is believed to be largely the result of loss of adrenal substance. Unfortunately, the administration of adrenal extract, while it may alleviate some of the symptoms of Addison's disease, has no effect on the others. The attention paid to the adrenal of late by physiological chemists has, however, been most fruitful. The studies concerning the blood-pressure raising constituents are extremely valuable. The active substance has been isolated and its chemical nature studied. The work of Abel and others upon epinephrin is furnishing most interesting data for future use.

Rhinologists are using adrenal extract as a vaso-constrictor in the nose. Fresh from the German press comes a careful paper by Stoeizner (in Heubner's clinic), detailing a large series of cases of rickets, markedly benefited by adrenal extract. He finds that the cranio-tabes, the sweat, the delayed coming of the teeth, the irritability of the vaso-motor system, the general restlessness and excitability, the curious smell of the urine, are all very markedly improved by the treatment. The softening of the thorax is frequently benefited. The spasm of the glottis and other symptoms of tetany, however, generally appear to remain uninfluenced by the adrenal extract. The improvement can frequently be made out during the first week of treatment. An amelioration of the symptoms goes on rapidly for a few weeks, later on more slowly.

The spleen and bone-marrow extracts which have been introduced increase the white and red corpuscles of the blood, possibly owing to the nuclein which they contain. That hypophysis extract is of no value in acromegaly would not be surprising, if acromegaly should turn out to be, as some investigators believe, rather an instance of "altruistic hypertrophy" in the sense of Hansemann than one of "altruistic atrophy."

One of the most recent advances claimed in ootherapy is the feeding of ovarian substance as a substitution-therapy in cases (1) where the ovaries have been removed at operation, and (2) at the climacteric to relieve the phenomena characteristic of that period. The substance is

given in Germany in the form of Landau's oophorin tablets. Loewy and Richter report that this ovarian substance has a remarkable capacity for increasing the oxygenating power of the body-cells in cases in which the ovaries have been removed. Their protocols are very convincing. Whether or not the therapy will be useful in preventing the obesity so characteristic of so many such cases we must wait to see, but the Germans feel confident that it will.

The advances along the lines of opotherapy are sufficiently indicated by the foregoing experiences. Physiology, experimental pathology, physiological chemistry, pharmacology and pharmacodynamics must lead the way.

In the struggle against infectious diseases a rapid extension of the powers of the physician is observable. The resistance of human beings as a whole is being increased not only by the slow method of natural selection, but by a more rapid mode through personal hygiene. Prophylactic inoculations have been multiplied since the work of Pasteur. The cholera inoculation, that for pest and that for typhoid appear to be Flexner in Philadelphia is now experimenting with a prophylactic against the bacillus dysenteriae so deadly in its effects in the Philippine Islands and Japan. The introduction of Behring's serumtherapy in diphtheria has undoubtedly greatly reduced the mortality of that disease, indeed, diphtheria is now scarcely a disease to be dreaded. Aside from the serum against diphtheria, however, there is as yet little of practical value to acknowledge from this side.

The antidiphtheric serum is an antitoxic serum. That introduced against tetanus is also an antitoxic serum. To be ranked with these two is probably also Calmette's serum against snake poison. Tetanus serum is only preventive, not curative, possibly owing to the fact that the antitoxine injected subcutaneously or into the blood cannot reach the toxine when once the latter has combined with the protoplasm of the nerve cells. Even intracerebral introduction of the antitoxine is not fully satisfactory for obvious reasons. All the other sera which have been introduced, namely, those against cholera, the streptococcus, pneumococcus, the bacilli of plague, anthrax and typhoid fever, are not antitoxic sera but antibacterial sera. They do not neutralize the poison which the bacteria produce, but have the power of killing the bacteria in the body of the patient and of dissolving them up. Not a single one of these sera is as yet practically useful as a therapeutic measure.

Ehrlich's studies make it probable that with these anti-bacterial sera at least two bodies are necessary for successful action: (1) the *inter-body* or *immunizing body*, and (2) the *end-body* or *complement* (formerly called *addiment* by Ehrlich). The latter is present in normal serum and is the true dissolving body, but it can act only when it is bound to the bacterial cell by means of the immunizing body. The anti-bacterial sera are rich in the immunizing body. It may be possible that they are insufficient owing to there not being enough of the end-body present. Wassermann is now making experiments in this connection. He hopes that by increasing the amount of end body or complement available that

the anti-bacterial sera may be rendered valuable in the treatment of disease in human beings.

Had not this paper already become too long it would have been interesting to refer to the progress making in the treatment of conditions of autointoxication and of the so-called constitutional diseases, but I must forbear.

From what has been said it is obvious that we have no reason to be discouraged as regards the future of therapy, but rather cause for hope and enthusiasm. We have learned the secret of progress and some formulæ for daily action. The secret of advance lies in the consciousness of the fact that it is the orderly application of the well-trained intelligence to medical problems that alone yields valuable results—not the haphazard guess work of the ignorant and untrained mind. Prolonged technical education and systematic research lead to therapeutic advance. In daily life, in the application of discoveries already made, the quack and the routinist physician, with the healing power of Nature behind them, will cure many cases, but we can be sure that greater success and especially greater mental satisfaction will attend the efforts of the physician well educated in the various medical sciences who, thinking *all around and through his case*, arrives at the most accurate diagnosis possible and gives the patient the benefit of a well-planned, conscientious treatment, utilizing every means which will tend to his cure or relief. If this physician have a specific he will be glad to employ it; if radical cure be impossible he will not neglect the palliative; if at last the exitus lethalis cannot be prevented he will at least see that the end is euthanasic.—*John Hopkins Bulletin.*

STERILITY IN THE MALE.

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When a husband and wife who desire a family find themselves without offspring after some time of married life, as a rule the wife is urged to seek medical advice. The physician whom she consults is frequently, all too frequently, satisfied with making a gynecological examination. He makes his diagnosis and arranges his treatment according to the data furnished by such an examination, which reveals to him a more or less likely cause of the sterility. Such a procedure is always unscientific and frequently the cause of much unnecessary suffering. For what is the use of treating the wife for sterility if nothing is known concerning the condition of the reproductive organs of the male?

The results of a number of careful clinical as well as pathological investigations have proven the male to be the cause of the sterility of matrimony in over 30 per cent. of all sterile matrimonies, and this fact alone suffices to discredit all attempts at treat of the female alone in cases of sterility, unless it is determined that the male is in full possession of normal organs with normal secretions.

The sterility of the male may be of two different kinds—it may be due to impotentia coeundi or to impotentia generandi, to an inability to perform the sexual act, or to a lack of normal secretions.

The discussion will be limited here to the latter of these defects, to the impotentia generandi, and more especially one kind of this species. Under the head of impotentia generandi two conditions are to be classified, the one being aspermia, the absence of discharge in the sexual act, the other being the more frequent and more important condition of azoospermia. I shall discuss here only the latter.

The condition of azoospermia is characterized by the discharge of a fluid in the sexual act which, though absolutely like the normal fluid in color, consistency, odor, and quantity, differs from it by the lack of the most essential factor, the spermatozoon. It is perhaps not superfluous to emphasize the fact that nothing but a microscopic examination of the fluid can enable us to make a differential diagnosis between the normal and the sterile semen.

We are sufficiently well informed as to the frequency of this condition of azoospermia as a consequence of various morbid conditions. After bilateral epididymitis the combined statistics of Gosselin, Godard, Liégeois, Terrillon, Bergh, Neisser, Noeggerath, Kehrer, Lier and Ascher, as collected by Finger, show azoospermia in 207 out of 242 cases. Recent investigations of Benzler, however, are more favorable. In his cases on 38.7 per cent were sterile, whereas the rest had offspring. Other diseases which are regarded as important in the etiology of azoospermia are diseases of the testicle, as chronic inflammation, tuberculosis, syphilis,

tumors, congenital displacements, traumatisms; furthermore, chronic diseases, as alcoholism, obesity, diabetes, general tuberculosis, and to some extent and for a shorter or longer period of time acute febrile diseases.

The facts just mentioned are pretty generally accepted, but the local conditions in the sexual apparatus which are the direct causes of the azoospermia are still little known. The text-books contain very little information on this point, and what little they do contain but too frequently appears copied from generation to generation, and some of the statements are *prima facie* improbabilities.

Under these circumstances I thought it necessary to start a series of investigations of my own. Through the kindness of Prof. Ludvig Hektoen, of Rush Medical College, I have received for examination the sexual organs of one hundred males. I wish to avail myself of this occasion for a public expression of my best thanks to Professor Hektoen, without whose aid it would have been impossible to obtain the necessary material for such an investigation.

The organs were taken from a series of post-mortems without special selection of the cases, in order to reach an approximate idea of the frequency of azoospermia and its pathology in the general run of cases. Taking into account how unreliable the statements of most patients concerning former infections are, I have paid no attention whatever to their histories, and have relied exclusively on the pathological data, as they cannot lie. The post-mortems were all performed by Professor Hektoen or by his assistants, and the painstaking and thorough methods of these gentlemen have placed the pathologic diagnosis beyond doubt.

In the pathology of azoospermia two great classes are to be differentiated, one comprising the azoospermia due to lack of production of spermatozoa, the other comprising the azoospermia due to the obstruction of the system of sperm channels. I shall consider the latter of these two classes first.

Obstruction of the sperm channels has never been observed anatomically in the tubuli recti, in the rete Halleri, in the vasa efferentia and the coni vasculosi, but from here on in every portion of the sperm channels, the tail of the epididymis, the vas deferens, the ampulla, the seminal vesicle, the ejaculatory duct. An obstruction can be caused, as in every hollow organ, either by compression from without or by loss of epithelium and obliteration from within.

Since 1847, when Gosselin gave his first report, the compression from without has usually been represented as the most important mechanical obstruction in the way of the seminal flow. But aside from Gosselin's own observations, which were made with the help of injections and which are open to serious objections, no proof has ever come forward in favor of this theory. And when we take into consideration the strength and rigidity of the muscular wall of the seminal channel in the tail of the epididymis, its natural coiled up condition, and especially the possible and probable sources of error in experiments with injection, it appears more and more likely that this theory, though hoary with age, is nevertheless untenable because anatomically unproven. Not until the compression from without produced by the well known thickening of the

epididymis, the remnant of an acute epididymitis, has been proven anatomically to produce obstruction can we consider this theory well established.

It is, of course, an entirely different matter when we have to deal with a tubercular or gummatous destruction of an entire portion of the vas deferens together with its cavity. Here we have obstruction, but the obstruction is produced less by a compression from without than by the discontinuity of the epithelial tube.

The interruption of continuity of the epithelial channel of the vas deferens is a most potent and not at all infrequent factor in the production of azoospermia, as my own observations as well as those of Simmonds have proven. These obliterations of the vas deferens are actually observed and are so readily demonstrated that it appears remarkable that they should not have been recognized long ago as the true cause of obstruction in the vas deferens, in the place of the compression from without which has been handed down from author to author and has been accepted without controversy.

The complete stages of this obliteration show a vas deferens which is composed only of the external and middle muscular coats, while the mucosa, and frequently also the internal longitudinal muscular coat, are transformed into a mass of cicatricial connective tissue without a trace of epithelium. In two males in whom I found such complete obliteration, the findings in the other parts of the sexual apparatus warranted the diagnosis of tuberculosis in one and of syphilis in the other case. In two additional cases in which such occlusions were found, neither syphilis nor tuberculosis could be demonstrated. The stages preceding complete obliteration I have repeatedly had occasion to observe. In the more advanced stage the epithelial lining is defective, the cells being very small, more like endothelium, and not standing in two rows as they normally are. The lumen of the canal also shows changes, being transformed into a narrow and often twisted and distorted cleft. In other cases the epithelial lining is almost or entirely perfect, but the wall just outside the epithelial lining shows complete absence of the normal tissue of the mucosa, and instead of that a ring of hyaline tissue poor in nuclei and forming a rigid layer under the epithelial lining. We have to deal, then, with strictures of the vas deferens, or merely with changes in the wall apt to disturb the normal function.

In the portion of the vas deferens where it joins the seminal vesicle we find normally an enlargement of the size of the vas and of its lumen. This portion, the so-called ampulla of the vas deferens, may be completely occluded, as I have observed in two cases: so that a cross-section, instead of showing the numerous epithelial sinuses, shows nothing but a mass of fibrous cicatricial tissue in a ring of muscular bundles. Sometimes remnants of the normal glands are seen detached in the wall of the ampulla, slightly dilated, but without any communication with the vas deferens, and therefore never containing spermatozoa. In another number of cases the same hyaline zone which has been described in the vas deferens has been observed surrounding the epithelial lining of the ampulla.

Obliteration of the seminal vesicle in itself does not mean any direct obstruction to the flow of the semen from the testicle to the urethra, as the semen might pass on directly from the vas deferens into the ampulla, into the ejaculatory duct and the urethra. But from physiological experiments of Rehfisch and others it is likely that obliteration as well as removal of the seminal vesicles interferes seriously with the normal function. I have observed total or partial obliteration of the seminal vesicle in three cases. In other cases I have found the hyaline degeneration of the wall of the seminal vesicles which corresponds to the same process in the vas deferens, and may be the anatomic explanation of cases of spermatorrhea, the seminal vesicles losing by the hyaline degeneration their normal ability to expand with the increasing amount of their contents.

The next portion of the channel through which the semen has to pass is the ejaculatory duct, which is embedded in the tissue of the prostate. Finger has claimed to have observed cases of obstruction by obliteration of this part of the channel by the formation of scar tissue following posterior urethritis with small abscesses of the prostate. But his descriptions must on closer examination appear very unsatisfactory and doubtful, though they are much repeated in his own writings and much quoted by other authors who have never themselves seen such obstructions. The objections which I have myself been compelled to raise against Finger's statements are the following :

1. In his macroscopic descriptions he mentions the presence of areas of cicatricial tissue on the colliculus seminalis by which the openings of the ejaculatory ducts have become occluded. In his microscopic descriptions, however, it is just the orifices of the ducts which are not obstructed, whereas the deeper parts show an apparent obliteration.

2. Finger does not say anywhere that he has examined the prostates, which form his material, on series of sections. It is true that sections may show the orifices of the ducts, also the more distant parts of the ducts and an apparent obliteration between the two. But unless the prostate gland has been cut in complete series of sections, it is absolutely impossible to state whether the duct really is obliterated or whether its course follows such a curve that parts of it which are contained in one section do not appear in other sections at all. I may mention here that I have examined every one of the prostates with ejaculatory ducts, which form my material, on complete series of sections—about three hundred sections to each of the ten prostates examined.

3. As proof of the obstruction to the seminal flow Finger mentions furthermore that in the cases which he believes to have found obliterated he has observed the ejaculatory ducts filled with spermatozoa. I have examined ten prostates, in none of which the orifices of the ejaculatory ducts were occluded, and in every case where the testicles produced spermatozoa the ejaculatory ducts contained them in larger or smaller numbers, so that this appears to be a normal condition of the dead prostate.

4. Finger's statement that he found the ducts dilated behind what he believed to be an obliteration is worthless, because this dilatation also is

a normal condition due to some terminal or post-mortem processes which fill the ejaculatory ducts with spermatozoa.

The tissue surrounding the ejaculatory ducts has been found sclerosed, poor in nuclei, undergoing hyaline degeneration, by Finger, myself and others, but it is not probable that this alone is sufficient to give rise to an obstruction of the flow of semen. In my anatomical observations at least these hyaline ducts were filled with semen just as well as the normal ones.

It is possible that the ducts being embedded in the non-yielding, firm tissue of the prostate may be compressed from without by the formation of tumors of cystic or adenomatous or fibroid or mixed nature, or by abscesses of the prostate. I have observed both abscesses and tumors of the prostate, but none of them produced a sufficient compression of the ducts to give rise to obstruction.

The obstructions farther on in the male sexual tract, though important for the question of sterility in the male, do not come under consideration here as they do not produce azoospermia. The obliterations which are anatomically demonstrated to be productive of azoospermia are those of the vas deferens in its various portions down to the ampulla, and of the seminal vesicles.

As to the etiology of these obliterations and the stages preceding them, the structure of some of the most pronounced cases characterizes them sufficiently as tubercular. In other cases, however, their origin is less clear. But as the changes are of a chronic, not of an acute, nature, as they correspond to chronic changes produced by infections in other organs, there is little doubt that we have to attribute them to a similar causative factor. Taking into consideration the frequency of inflammatory affection of the vas deferens in gonorrhoea and the absence of characteristics of any other infection in these cases, we are probably not far from the truth if we assume that these cases are due to gonorrhoeal infection. But it would be going too far to classify them all as gonorrhoeal cases, as other infections appear to be able to produce similar pathologic conditions. In the absence of bacteriologic investigation of these cases I do not wish to go further into this question.

Now an interesting question in physiology has to be raised. We know that usually, when the normally present excretory duct of a gland is obliterated, this gland undergoes speedy degeneration and we know from experimental as well as pathologic data that this holds true in glandular organs generally. The testicle makes a most remarkable exception in this regard. It has been demonstrated experimentally that after artificial obliteration of the vas deferens, produced by cutting and ligating the duct, the testicle does not always undergo atrophy. My pathologic observations as well as those of other observers, especially Simmonds, proved this to hold good also in cases of pathologic obliterations of the vas deferens. With the exception of the case of syphilis, where the testicle was also destroyed by the disease, all of my cases of obliteration of any portion of the vas deferens presented normal function of the testicles with enormous quantities of spermatozoa in the portions of the seminal channel located between testicle and obliteration. Even macros-

copically it could be observed that these portions of the vas deferens were dilated by a thick, whitish mass. If the physician keeps these observations in mind, he will find himself able to diagnose this condition of obstruction on the living subject, a point of the greatest importance with regard to a possible operative treatment and cure of these obliterations.

Ever since Gosselin's first publications the obstruction of the seminal channels has received the largest share of the attention of investigators, and the condition of the testicle itself has more or less been neglected. This may be due to the fact that the pathology of the testicle is so extremely difficult and complicated that what some authors consider normal senile changes, others ascribe to syphilis or smallpox, and others again to chronic general diseases or to local inflammatory disturbances.

So much, however, becomes evident, as soon as any number of testicles is examined, that deviations from the normal are extremely frequent. Another condition which makes the pathology of the testicle especially difficult in a consideration of the testicular origin of azoospermia is the fact that the seminiferous tubules show a great independence of each other, so that one tubule may present complete atrophy while neighboring tubules may be in the most florid and active condition. It is therefore necessary to examine many sections from many different parts of the organ before passing judgment on the physiological abilities of the gland. This necessity implies a very large amount of work, so that so far I have been obliged to examine more than 15,000 sections.

Without going too much into the minute details of the pathology of the testicle, I may state that there are two great classes of suspended or destroyed spermatogenesis, that with and that without associated symptoms in the connective tissue surrounding the seminiferous tubules. At the present stage of our knowledge of human physiology we can speak only of arrested or suspended spermatogenesis as long as we find any normal spermatogonia. Not until these too have disappeared and the sustentacular cells are the only remnants of the epithelial lining of the seminiferous tubules have we any right to assume complete and definite destruction of spermatogenesis.

In the small series of cases in which I have found aspermatogenesis without changes of the surrounding connective tissue, this lack of normal action in the testicle is in all cases a partial one, so that some portions of the testicle show normal activity while other portions show considerable changes of the epithelial lining. The pathologic tubules then present either a single layer of epithelium composed of spermatogonia and sustentacular cells, or in cases further advanced even the spermatogonia have disappeared and nothing but sustentacular cells are left. While in the other tubules all developmental stages of the spermatozoa can be observed, these pathologic tubules present not a trace of spermatozoa or even spermatocysts or spermatoblasts. Similar observations have been made by Cordes, but unfortunately his report becomes entirely inadequate just at this most important point, because he says nothing definite as to the changes in the surrounding connective tissue, which he mentions only casually. It is true that similar changes occur with and with-

out changes in the surrounding connective tissue; still there are marked differences, and certain types of aspermatogenesis which occur frequently with changes of the connective tissue never are observed without these. Cordes has not separated the two in his report and this mars the usefulness of his otherwise meritorious work for this particular part of the question.

The infiltration with fat which occurs in cases of suspended spermatogenesis without changes in the connective tissue, and which, as I may anticipate here, occurs also in cases associated with changes in the connective tissue, is frequent and often very marked. The observations of Cordes are very positive on this point and give clear evidence of the physiological occurrence of fat infiltration in the epithelium of the testicle. The amount, however, which is found in these cases can hardly be considered normal, as in many cases it amounts practically to a complete disappearance of the cell protoplasm of the testicular epithelium.

Neither age nor disease to which the patient has succumbed appears to have any influence on the production of aspermatogenesis without changes in the surrounding connective tissue. The condition has been observed in individuals as young as 24 and as old as 53 years, these men having died from various acute or chronic diseases. It is therefore not clear what is the cause of this aspermatogenesis in these cases.

In the second and much larger class of cases we find as the one pathologic lesson common to all cases of this kind the changes in the surrounding connective tissue. The most marked of these is the formation of a zone of hyaline tissue around the seminiferous tubules in the place of the normal flat connective tissue cells which form the physiological sheath of the tubules. This zone of hyaline tissue cuts off the epithelium from its supply of nourishment, normally derived from the blood-vessels of the intertubular connective tissue. Its size varies from a scarcely noticeable thin line to a thick band, which by and by usurps the place of the entire seminiferous tubule.

Degenerative changes of the epithelium accompany the formation of the hyaline rings. In some specimens all of these changes occur simultaneously, in others only certain stages are present. Where the hyaline zone is thin we find the epithelium of the tubule either normal, even containing spermatozoa, or the spermatozoa are absent and we find only a few layers of epithelium, or even only one layer, the border-lines between the cells frequently becoming indistinct. There is, however, a distinct cavity of the tubule which is sometimes filled with spermatozoa. With the enlargement of the hyaline zone the epithelial masses are pushed toward the center of the tubule, which appears narrowed, the epithelium itself appears lower, the nuclei become indistinct and may disappear completely. With the further encroachment of the hyaline zone the epithelium is reduced to a very thin, flat layer resembling endothelium, and these tubules contain nothing but a few fragments of cells. The advancing hyaline zone becomes folded and wavy, resembling somewhat the hyaline zone of the corpus luteum of the ovary in its later stages. In the most pronounced cases the lumen of the tubules disappears completely, and instead of a channel lined with epithelium nothing is seen but a

more or less wavy and hyaline mass of tissue with very few nuclei, without any trace of normal testicular epithelium.

These degenerative changes may occur in small portions of a testicle which in other portions contains normally active tubules, but they may also occupy an entire testicle, so that not a trace of normal epithelium is to be found. I have tried to make sure whether a testicle which does not present any acute inflammatory changes can present complete destruction of its epithelium by the hyaline degeneration of the interstitial tissue. I have examined one testicle, for instance, on more than 500 sections without finding one single epithelial duct, and from many testicles 200 and 300 sections have been examined with similar result. It becomes evident, therefore, that without any obstruction in the vas deferens azoospermia may occur by complete destruction of testicular epithelium and without discoverable syphilitic or tubercular disease. For just those cases which presented the most complete atrophy of the testicular epithelium gave no anatomic evidence of the nature of the process which had worked such destruction. Frequently the rest of the sexual apparatus was found absolutely normal, the epithelium of the epididymis perfect, the vas deferens open—no acute inflammatory changes anywhere.

The only other changes which now and then were found associated with the epithelial destruction were of an endarteritic nature, but were not observed regularly by any means. It is important to notice that where this atrophy did not comprise the entire testicle, but only parts of it, it did not appear in disseminated patches, but followed the individual seminiferous tubule in its entire extent from the albuginea to the hilus of the testis. It is therefore not probable that this atrophy is due to smallpox, for while it is well known, since the work of Chiari, that the orchitis of smallpox occurs in patches, it is also known that these patches are roundish, in the shape of small abscesses, rather than in the shape of stripes following the seminiferous tubules. It becomes also clear that these atrophic changes cannot be due to syphilitic vascular changes exclusively, because they so frequently are found to effect one or the other seminiferous tubule only, whereas interference with the vascular supply due to syphilis could not but afflict more than one tubule, a conclusion which is warranted by the normal anatomy of testicular vascularization.

It is perhaps necessary to mention that the rete Halleri, the vasa efferentia, and the epididymis have been found absolutely normal in most of these cases; but the vas deferens or the seminal vesicles frequently showed hyaline degeneration of walls associated with the hyaline zone present in the testicle. It is therefore more likely that the same process which led to this chronic affection of the vas deferens also affected some, or many, or all of the seminiferous tubules, reaching them not on the path of the circulating blood, but along the vas deferens—in other words, an infection which usually creeps along the mucous surfaces, very likely gonorrhoea.

It is evident that the larger reduction in size of the active seminiferous tubules, the greater the possibility of interruption of normal spermatogenesis, and the more probable a condition of diminished numbers of

spermatozoa or oligospermia. Here also we find the anatomic basis of the clinical observation that when no spermatozoa can be found in the semen in the first specimen it is necessary to examine repeatedly in order to form a correct idea of the physiological abilities of the testicles.

The condition described here is most frequently bilateral, but may be more pronounced on one side than on the other. Both testicles may present complete atrophy due to this condition. Wherever this condition occurs, it can be recognized macroscopically, not necessarily by the size or consistency of the testicle, but by the whitish, homogeneous stripes on the cut surface of the organ.

Fuerbringer, the father of the scientific interpretation of these conditions, has advanced our therapeutic ideals by introducing the plan of the surgical investigation of the testicle and its excretory ducts. He has advised in certain cases to lay bare and excise the epididymis in order to investigate its contents. In a case of an obliteration of the vas deferens surgical interference does not appear hopeless. Experimental anastomosis of divided ends of the vas deferens has been practised successfully on the dog by Van Hook. It has been practised on the human being after the unintentional division of the vas deferens in hernia operations, but the success in these cases is of course much harder to prove.

If no dilatation of the vas deferens or the epididymis indicative of an obliteration is found, it would be correct to split the testicle and examine its cut surface; also to examine some testicular juice squeezed out from the cut surface. The uncertainty, which is the worst torture of patients afflicted with these troubles, can thereby be settled one way or the other in the most reliable manner possible. Suture of the split testicle is neither difficult nor dangerous.

Cases of azoospermia due to obstructions in some part of the vas deferens are much more hopeful and much more amenable to our treatment than azoospermia of testicular origin. This much the crude outlines of the results of my investigations presented here are, I hope, well able to demonstrate. And if we can help only a few of the unfortunates afflicted with this kind of sterility, we shall have made another advance in the scientific treatment of a hitherto much neglected and little understood pathologic condition.—*Medicine.*

INTESTINAL ANTISEPSIS IN TYPHOID FEVER.*

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At the outset I assent to the view that typhoid "is no more primarily an intestinal disease than is smallpox primarily a cutaneous disease" (Osler), or lobar pneumonia is solely a disease of the lungs. It must, however, be conceded that in a majority of the cases of typhoid fever the seat of the principal infection is the intestinal tract. This being the case, there would seem to be naturally embraced in the symptomatic treatment of typhoid fever some form of intestinal antiseptics. Compared with the treatment by baths, or the importance of correct feeding and the judicious use of stimulants and good nursing, intestinal remedies occupy a subordinate position, particularly since the Brand method has been so generally adopted. Indeed, every detail of the former items of treatment is so vitally important that whatever I may say in favor of intestinal antiseptics is in no wise intended to disparage the use of these more efficacious human agencies. Hence, I do not claim that the antiseptic treatment deserves to be ranked as a specific method; neither have I any statistics nor startling testimonials to bring forward.

To address antiseptic remedies to the bacillus of Eberth or its toxins, or to the intestinal lesions, would, I believe, be futile. The claims put forth by some clinicians that typhoid fever may be aborted in this manner are sadly in need of confirmation. The principal indication for the use of antiseptics is the meteorism which owes its origin to decomposable material in the prima via. The normal antiseptic fluids in the intestines, particularly the bile, are present in diminished proportion in this disease, owing to defective hepatic secretion. This may tend to increase the amount of decomposable matter. From analogy, the digestive tract must similarly miss the hydrochloric acid which normally inhibits putrefactive changes. These reasons, coupled with the introduction into the system not uncommonly of an overabundant ailment, explain to some extent at least the occurrence of tympanites in this disease. Assuming milk to be the principal article of food, I would advise the use of HCl in small doses after each feeding, with a view to supplementing defective gastric secretion in cases in which meteorism is a pronounced symptom. In typhoid patients who are robust, the employment of calomel during the first few days of the fever is to be advised and encouraged. An agent of acknowledged worth as a hepatic stimulant, its value as a disinfectant of the gut, it must be recollected, is also considerable. Moreover, it serves to remove retained decomposable material, "and so places the bowel in a favorable condition for the subsequent maintenance of antiseptics." (R. H. Quill). I have repeatedly observed that its employment in this manner was followed by a milder course of the disease than is ordinarily encountered.

* Read before the Medical Section, College of Physicians and Surgeons, Philadelphia, Feb. 12, 1900.

It has been my habit for a number of years to prescribe intestinal antiseptics throughout in cases of enteric fever, except in a small minority of light forms. I have never been able to satisfy myself that it is practicable to produce and maintain intestinal antiseptics, however free the use of this class of agents, but have observed that they render the dejecta less offensive. I must admit also that intestinal antiseptics are powerless to inhibit the potency of the bacilli and hence to diminish the quantity of typhotoxin supplied to the circulation. In short we cannot hope to destroy the typhoid bacilli harbored by the walls of the ileum; and they, or most of them, have long since gained the circulation and adjacent organs—*e. g.*, the mesenteric glands, gall-bladder, etc.—where they develop their toxins. On the other hand, it is highly probable that intestinal disturbance in typhoid fever is in a measure at least dependent upon disorder of function which is the indirect effect of the typhoid infection. Some of the toxins occupying the intestinal canal result from the virulency of usually harmless organisms, whose habitat is the intestine. Presumably these toxic substances are absorbed from the tract and add to the gravity of the situation. A rational indication for treatment under these circumstances is to either neutralize in or eliminate from the intestinal canal these toxic substances. Perhaps the most efficient agent, and one that is free from all objections, is water. The free use of water tends to cleanse the gastrointestinal tract, besides increasing elimination of the typhotoxins and other retained substances through the kidneys—the principal channel through which nature aims to effect their excretion.

It is a manner of common observation that moderate constipation in typhoid fever is favorable and is attended with less meteorism than is met with in cases showing even moderate diarrhea. Owing to this fact I hesitate to recommend, nor have I been in the habit of employing, laxatives to unload the bowel for their eliminative effects, except, as indicated before in speaking of the use of calomel, in the early stage. Numerous advocates of the purgative treatment are to be found. Their claim that it rids the intestines of the typhoid bacilli and their toxins is absurd, in view of the fact that most of the bacilli, as intimated before, soon pass beyond the reach of purgatives. Osler contends that they are not indicated, "as it is not likely that the typhoid bacilli multiply and develop their poison to any extent in the intestinal contents themselves." I have, however, observed that saline laxatives given into divided doses until the evidences of their action are obtained are powerful to cut short the intermittent form of fever, sometimes seen late in protracted cases. That secondary bacterial invasion from the intestinal tract sometimes occurs, for which the debilitated state of the body furnishes the golden opportunity, is I think indubitable; and on this theory I have been led to use, as stated, saline laxatives with gratifying results. I regard it as undoubted that the diarrhea in typhoid fever is sometimes ascribable to the irritating properties of food residue from improper and overabundant feeding. Under these circumstances a mild laxative is followed by amelioration of the intestinal symptoms. I trust that my statements concerning the use of laxatives will not be construed as corroborative of

the claims of the Woodbridge treatment—a method that should be mentioned only to be condemned.

Intestinal antiseptics have a limited sphere of usefulness, exerting as they do a favorable effect upon some of the intestinal features, particularly tympanites; they also exercise a mitigating influence upon the diarrhea when present. The latter symptom, however, does not furnish an indication for their use unless the number of stools exceed three or four daily. The bowel antiseptic that I have employed for many years is salol. While this drug has a marked symptomatic influence, it is questionable whether complete antiseptics of the intestinal canal is accomplished by its use, and the same may be said of the remainder of the aromatic group—naphthol, benzo-naphthol, and naphthalin. The dose of salol in cases of average severity is three grains every three hours. When the indications are urgent, as much as two grains every hour may be employed for a short period, or until the urine is perceptibly tinged. It is best to use the drug in powdered form, as I have seen compressed tablets pass through the gut unchanged. In cases in which marked distention of the bowel is present as a symptom of the typhoid state, turpentine is to be preferred; it is an efficient antiseptic and also exercises a stimulating effect upon the circulation and the secretions. White turpentine is the preferable preparation, and may be administered in doses of three to five grains every three or four hours.

For the constipation which is sometimes present throughout the entire course of the disease, I have found an enema of soap suds given every second day to be followed by the best and speediest results. In a few instances I have practiced intestinal irrigation, with a view to diminishing absorption of toxins from the rectum and colon. This method is not to be thought of in cases in which the principal lesions are in the small intestines with moderate tympanites. On the other hand, in a considerable proportion of the cases the ulcerative process is largely confined to the colon; there is marked tympanites due to overdistention of the colon, and an active diarrhea, sometimes of a dysenteric character, or involuntary discharge of the feces may occur. In these cases intestinal irrigation, judiciously and cautiously carried out, tends to sweep from the bowel both decomposable material and a variety of resultant toxic products. Doubtless the accompanying catarrhal inflammation is decidedly benefited by this method of treatment. On the mode of administration will depend largely the success of this method. In the first place the antiseptic solution used must be warmed; it must be gently reduced at a low pressure, so as not to distend the inflamed and ulcerated colon. Soft-rubber rectal tube, "fenestrated at the sides, is to be gently passed up to, or a line within, but not through the sigmoid flexure" (W. W. Johnston). The end of the rectal tube attached to the fountain or Davidson's syringe is to be detached after introducing about one quart of the solution, when the latter will escape without voluntary effort on the part of the patient. For this purpose I prefer salicylic acid or mercuric chloride; the strength of the former solution should not exceed one-half of one per cent, nor that of the latter 1 in 6000. In bad cases these irrigations should be practiced every fourth hour, whilst ordinarily thrice daily suffices.—*Therapeutic Gazette*.

THE PHYSIOLOGY OF THE SUPRARENAL CAPSULES.

At the February meeting of the New York County Medical Society, Professor Moore, of the Medical Faculty of Yale University, discussed the physiological properties of the suprarenal capsules. According to the report in the *Medical News*, he said: Our knowledge of the physiology of the suprarenal comes from three sources. First, from clinical medicine and the pathologic anatomy of these glands with the symptoms due to changes in them. This was the method that first brought the suprarenals into notice. Dr. Addison, in 1851, showed that their degeneration was associated with nervous and muscular asthenia and very greatly lowered blood-pressure. The second source was by the removal of these suprarenal glands from animals. Brown Séquard, in 1855, showed that the removal of one of these glands from a guinea pig was often fatal and the removal of both was always fatal. Later observers, however, have denied this. Schaefer suggests that in these cases of survival, accessory glands remained, which are not rarely found at dissections, and they make up for the organs that were removed. The third source of our knowledge of the physiological properties of the suprarenal is the one that is now of special interest. It is due to injections of the gland and the observation of the results it brings about. The ingestion of suprarenal substance by the mouth causes no marked symptoms. Subcutaneously administered the results are neither very striking nor uniform. Intravenously the suprarenal extracts produce marvelous effects. A fraction of a milligram causes a rise of blood-pressure to double or treble what it was before. This is all the more striking as blood-pressure is usually very stable and is affected by very few drugs. The increase of blood-pressure arouses the vagus, and this acts as a safety-valve in the prevention of over-stimulation of the heart. As a consequence, when large doses are administered, the ventricle stops beating, just as if the vagus were directly stimulated, although the auricles continue beating. If atropin is used to paralyze the vagus before the administration of suprarenal extract, the heart stimulation is noted. It might be thought that suprarenal substance causes a rise in blood-pressure by its action upon the vasomotor system and constriction of the small blood-vessels. It is, however, a stimulant to all muscle fibers. All the nerves leading to a part may be cut, yet constriction will take place when suprarenal extract is administered. If a freshly excised vessel of a diameter of ten to twelve millimeters be acted upon by some fluid containing suprarenal substance, the diameter at once goes down to one or two millimeters. The vessel practically becomes obliterated. This action has been seen very well in the inflamed conjunctiva.

Extract of suprarenal is not affected by acids. The active principle retains all its energy even in a solution of ten per cent. of mineral acid. Alkalies destroy it at once. At one time the active principle was thought to be a reduction derivative of pyridin acting like nicotin or coniin, which are reduction derivatives of pyridin. These substances resemble supra-

renal extract so much that it is surprising they have not been used more therapeutically. If suprarenal substance be heated with dilute acetic acid and then with zinc acetate the material obtained is most active. One-millionth of a gram to the kilogram weight of an animal will produce an easily perceived effect. Curiously enough, a much smaller dose produces an exactly opposite effect, that is to say, it lowers blood-pressure. This happens with a good many drugs, however, and might have been more or less expected.

The subject of the significance of the glands during life is still a matter of unsettled theory. Animals are usually killed by the shock of the removal of both glands. It is an extremely delicate operation, almost inevitably involving important abdominal nerve-plexuses and so readily leading to a fatal termination from surgical shock. Of late, attempts have been made by infection of the glands with various bacilli to produce gradual degeneration. One operator has had reported success in this way, and the procedure was followed by the development of the symptoms of Addison's disease. As to the mode in which the suprarenal affects the system, there are two principal theories. Schaefer thinks that there is some substance secreted by the gland which keeps up muscular tonicity, not only the muscular tonicity of the blood-vessel walls, but also that of the whole muscular system. The French school advances the theory that in the course of body metabolism certain substances are produced which lower muscular tone and that the secretion of the suprarenals neutralizes these substances. They urge the fact that the blood of animals from which the suprarenal glands have been removed is toxic for other animals. This argument, however, loses some of its weight when we recall that the injection of blood from any animal whose nutrition is very much lowered may seriously affect a healthy animal.—*Dietetic and Hygienic Gazette.*

COMPARATIVE DRUG VALUES AS OBSERVED IN THE TREATMENT OF 752 CASES OF WHOOPING COUGH.

Dr. Charles G. Kerley read this paper. As the cases had developed, they had been separated into groups of twenty, and were allowed to cough without treatment until the height of the paroxysmal stage had been reached, which usually required from ten to fourteen days. Careful records had been kept of most cases both night and day. The ages of the patients treated varied between six weeks and twenty-six years. Three patients only had reached adult life. Five-sixths of the patients had been under four years of age, and one-half under two years of age. The duration of the attack had ranged from three to twenty weeks, the usual duration having been between six and eight weeks. He had found that the very young and the very delicate often did not whoop during a severe attack of whooping cough. The drug treatment consisted of in-ufflation, internal administrations and inhalations. Resorcin and boric acid, combined with bicarbonate of soda, were used by means of insufflations in six institution cases, but had been discontinued after three days because the treatment had been impracticable and useless. Vapo-cresoline had been tried with absolutely no result. He had allowed it to be used in a number of cases in private practice, because it quieted the nervous parents, and did the child no harm. Alum, fluid extract of horse-chestnut leaves, dilute nitric acid, cocaine, bromoform, bromides, belladonna and antipyrin had all been tried. The first three had been used, and been found valueless. Alum had appeared to be of some service, but had been badly borne by the stomach. Bromoform had proved very unreliable. Cocaine in doses of one-tenth of a grain every four hours for a child of two years had been employed in about twenty-five cases. It had controlled the severity of the paroxysms somewhat, but not sufficiently to warrant its continuance. He had found great benefit from quinine if a large amount could be given. It was difficult to give from twelve to twenty grains of this drug daily, as required. When quinine could be given in capsules, the number and severity of the paroxysms would be remarkably controlled—sometimes the number diminished one-third to one-half. He had used belladonna in sixty institution cases, administering it up the physiological effect; this had required from five to seven days. He had not observed from this any influence in a single case. True, the cases upon which it had been used were very severe, but they had yielded to other means. The children had been from six to seven years of age. Equal parts of bromide of sodium, ammonium, and potassium had been tried in sixty institution cases, using from twelve to sixteen grains daily for a child of one year. The results from this treatment were better than those previously mentioned. Antipyrin had been used in sixty institution cases, and he had found that it had controlled the paroxysms better than any other

drug he had employed, and caused only a trifling depression if administered with ordinary care. The combination of the bromide with antipyrin had been used in sixty cases, with better results than from using either one of these drugs independently. For a child of eight months, half a grain of antipyrin, and two grains of sodium bromide should be given every two hours for six doses, and then administration should be discontinued for a period of twelve hours. For a child between two and a half and four years of age, two grains of antipyrin and three or four grains of bromide should be given every two hours for twelve hours, and then discontinued for twelve hours before being resumed. The steam spray and fresh air were also useful adjuncts to the drug treatment of whooping cough. A child suffering from whooping cough should be frequently changed from one room to another, and the best possible ventilation secured. The author's conclusions were: (1) Every case of whooping cough may be relieved, either by modifying the severity, or diminishing the number of the paroxysms; (2) the duration of disease is probably not shortened by treatment; (3) remedies sedative in character, with fresh air, give the best results; (4) if the remedy is to be of service, its beneficial results may be noticed within twenty-four to forty-eight hours; (5) the best results are obtained when antipyrin and the bromides are commenced at the height of the paroxysmal stage and then pushed vigorously; (6) being sedative in character, the good effects may be lost in a prolonged case; and (7) children may have whooping cough and never whoop.—*Pediatrics*.

PHOSPHATURIA.

The clinical importance of phosphaturia varies according to the chemical variety which the phosphorus presents in the urine. The temporary variety where the phosphatic salts are amorphous is not of present importance, nor is the local disorder which results in the production of the triple form of deposit; but the third variety, in which the urine contains a deposit amounting, it may be, to a third or more of its whole bulk of stellar crystals of phosphate of lime, is full of interest, not only because it is little understood, but also because it is rare and not infrequently fatal. In cases of this type the phosphates are present permanently in excess, but periodically the daily average of the amorphous salts is increased by a more or less copious shower of stellar crystals. The patient complains of thirst, polyuria and languor. In cases where there is an increase of the urea as well as of the phosphorus, emaciation may become a feature. The urine is of low specific gravity and contains neither albumin nor, until the later stages, sugar; often not then. This form of phosphaturia is usually met with either in young adults of neurotic heredity or in men at middle life who have lived freely, curtailed themselves of the requisite amount of sleep and relaxation, and pursued brain-work under conditions where exercise was neglected and open air treated as a luxury. The disease may run a course symptomatically resembling diabetes melitus, but without sugar in the urine; or it may alternate with true diabetes, there being sometimes an excess of phosphates and no sugar, and at others sugar, but no remarkable excess of phosphates. The initial polyuria may excite suspicion in the patient's mind and lead him to see his medical adviser; but, if the case be one in which no sugar is found on application of the usual tests, it is apt to be looked upon as trifling and as wholly explained by a passing condition of nerve or digestive disturbance. Especially is this likely to happen if the urine chances to be examined at a time when the phosphates are only present in the amorphous form. As time goes on, the patient's thirst increases, he is conscious of progressive failure of his general vigor, and not infrequently he is annoyed and puzzled by an unreasonable irritability of temper, which is new to him. Neuralgia is a source of much misery in some cases, and may attack any nerve, but is specially prone to invade the branches of the trigeminal or facial; in others, the prevailing discomfort is a liability to recurring attacks of unaccountable drowsiness which no effort of will-power can shake off. When emaciation ensues there is always risk of the onset of phthisis. Guthrie Rankin (*Lancet*, Mar. 24, 1900).—*Monthly Cyclopaedia*.

MISCELLANEOUS.

Toi.sorial Antisepsis in Boston.

The board of health of Boston has issued an order enforcing cleanliness in barber shops in that city, its provisions being that "the place of business of all barber shops, together with all the furniture, shall be kept at all times in a cleanly condition. Mugs, shaving-brushes, and razors shall be sterilized by immersion in boiling water after each separate use thereof. A separate clean towel shall be used for each person. Alum or other material used to stop the flow of blood shall be used only in powdered form and applied on a towel. The use of powder puffs is prohibited. Every barber shop shall be provided with running hot and cold water. No per-on shall be allowed to use any barber shop as a dormitory. Every barber shall thoroughly cleanse his hands after serving each customer.--*N. Y. Med. Record.*

Cancer Infection in Relation to Operative Treatment of Cancer.

J. Bland-Sutton, in the *Clinical Journal* of January 24, 1900, says the cause of cancer has been earnestly sought for, but as yet it has not been found. The disease is still insidious in origin, of steady progress, rebellious to treatment, and distressing in its termination. When extensive operations are necessary for the removal of cancer the result is often questionable, and one of the most important complications is cancer infection. These tumors have no proper limits, and it would be impossible for an exper microscopist to tell exactly where the morbid growth leaves off and normal tissue begins. This constitutes one of the worst difficulties in dealing with them surgically. Again, a common method of extension of these growths is by way of the lymphatics, and the extent to which this infection has taken place cannot be accurately defined in a given case. The old rule that carcinoma spreads along the lymphatics and sarcoma by the veins is approximately correct. This refers to those cases in which the abdominal wall has developed cysts after ovariectomy; these he thinks are due to the infection of these structures during the removal of the diseased ovary. It is this accidental infection of the cut surfaces that leads to that rapid dissemination of a cancerous growth which sometimes follows extirpation, in some cases removal seeming only to accelerate the disease. In cancer of the breast recurrence is due to their removal or cancer infection. It is difficult, particularly in thin persons, to remove the entire gland. Occasionally the surgeon removes a cancerous breast, the pectoral muscles, the axillary glands and lymphatics, together with their surrounding fat, and this is followed by wide-spread tumors infiltrating the skin that was raised in the operation. This result is due to the distribution of cancer cells in the course of the operation. He especi-

ally recommends in operations upon the breast for cancer that the lymphatics be followed into the axilla and the tissues removed *en masse*, avoiding the opening of the lymphatic channels and the dissemination of the cancer cells. This method is far superior to the dissection of isolated glands.—*Medicine*.

Ozoena.

Cozzotino, in the *Ann. des Mal. de l'Or*, reported in the *Jour. Laryng. Rhin. and Otol.*, discusses very fully the bacteriology and histology of this disease. His observations establish the fact that the first pathological change takes place in the periosteum, and medullary space of the bone. The atrophic process in the erectile turbinate tissue is a later stage, and is accompanied by the obliteration of the efferent ducts of the glands. The epithelium is the last structure undergoing change.

The writer claims to have established that atrophic rhinitis is not the result of catarrh; but that the atrophy of the membrane follows upon the anæmia resulting from the involvement of the arterioles in the preliminary periosteal changes.

The bacillus muscosus was present in all his cases, but this he considers due to the stagnant glairy mucus, coating the fossæ, affording a favorable nidus for the bacillus, which was in no way responsible for the disease itself. Any inflammatory cells and micro-organisms found in the superficial layers of the mucosa are due merely to the final atrophic state of the epithelium, and the constant presence of irritating decomposing mucus.

The ozoena patient is predestined from infancy to a nutritive deficiency which determines the gradual changes in this bone and periosteum.—WISHART.

The Treatment of Obesity.

Dissatisfied with the results obtained by following the régime of Oertel, von Hosslin (*Münch. Med. Woch.*, 1899, No. 38) has followed out a combination method for the treatment of obesity, his procedure resting on the following principles:

1. Nourishing the patient with a purely albumen-fat diet according to the principle of Ebstein's gout-obesity diet.
2. Increasing metabolism by means of hydrotherapy, in the form of cold applications and sweat baths.
3. Administration of thyroid tablets.
4. Increase of oxidation by means of active bodily exercise.

Carried out in its entirety this method leads to the very best results, though the author reports that the omission of any part of this line of treatment is likely to lead to an increase of the patient's weight. He cites instances where the treatment has been successful, and others where omission of a part of the detail has caused increase of the patient's weight.

—*Medical Age*.

The Treatment of Disorders of the Digestion, Associated with Chronic Rhino-Pharyngitis and Tonsillitis.

Aviragnet, in *La Presse Medicale*, reported by *Jour. Laryng. and Otol.*, considers that the gastro intestinal dyspepsia, from which children, the victims of chronic rhino-pharyngitis usually suffer, is due to the constant swallowing of the muco-pus secreted by the diseased parts. He advocates the treatment of such cases, by nasal irrigations, and the injection of resorcin in olive oil—5%. This is injected into each nostril, with the child laid on its back.—WISHART.

Treatment of Hematuria with Gelatin.

Dr. Schwabe (*Therapeutische Monatshefte*, 1900, No. 6) says that by Carno in 1896, and after him by Dastre and Florence, in France, the hemostatic action of gelatin was noticed. Later Lancereaux used gelatin in the treatment of aneurisms. The provings of the gelatin therapy have up to date shown favorable results, and indications for the same are becoming more extended; as a result tampons of gelatin are used even in local bleeding, and have proven to be very reliable. Schwabe reports a case of hemorrhagic nephritis accompanied by severe hemorrhage from the kidneys in which the gelatin was very efficacious. He used hypodermically in the usual combination 25 cubic centimeters, which he injected under each clavicle. He also allowed the patient to take half a liter of ten-per-cent. solution of gelatin daily for eight days. On the eighth day all red blood-corpuscles had disappeared from the urine.—*Med. Age.*

Prognosis of Laryngeal Cancer.

Chiari, *Ann. des Mal. de l'or*, reported by the *Jour. Laryng. Rhinol. et Otol.*, has had under his charge in the past eleven years eighty-three cases of laryngeal cancer, in twenty-five of which operation was advised and performed. The results are tabulated as follows:—Eight died shortly, nine died of recurrence from six to eighty-six months after operation, and eight remain cured, six having passed the three years' limit. Thyrotomy is urged in all suitable cases.—WISHART.

Palatable Castor-Oil.

R	Saccharin	gr. xii.
	Olei gaultheriæ (or menthæ pip)	℥. xv.
	Alcohol	ʒiv.
	Olei ricini	Oi.

This addition of saccharin, aromatic oil, and alcohol has been used in making cod liver oil palatable, and is very successful.—*Med. Times and Hosp. Gaz.*

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EDITORIAL.

THE TUBERCULIN TEST IN THE DIAGNOSIS OF LATENT PULMONARY TUBERCULOSIS.

It is generally agreed that the prognosis in a given case of pulmonary tuberculosis largely depends upon the undertaking of proper treatment at the very onset of the disease, during the *pretubercular* stage, or the *latent* period, before the appearance of the signs and symptoms by which the condition is ordinarily recognized. The specific bacillus is only found in the sputa after disintegration of lung tissue has begun, and while its diagnostic value is undoubted, to wait for its appearance before making a diagnosis means to wait until the tubercular foci have begun to soften and ulcerate, until secondary infection has occurred with often widespread involvement of tissue, and thus allow the time to pass when treatment might have been undertaken with fair hopes of success. Moreover in acute miliary tuberculosis and in cases where the infection remains localized in the glands, joints or bones, the examination of the sputa is of no value in arriving at a conclusion. Clinicians have therefore been

studying methods by which the disease may be recognized before the curable stage has passed. Among the more satisfactory means that have been employed may be mentioned the use of the X ray, and tuberculin, both of which have been found of undoubted value.

The ill results which followed the employment of tuberculin in the *treatment* of pulmonary tuberculosis, where it frequently produced a reaction with softening of the tubercular foci and dissemination of the bacilli throughout the system, prejudiced the profession so much against it, that its use was almost entirely discarded. In veterinary practice, however, it continued to be employed for diagnostic purposes and its practical value has been generally recognized. At the present time there appears to be a decided reaction in favor of its use in the detection of cases of latent tuberculosis in the human subject. Among others, we have such competent authorities as E. L. Trudeau, J. T. Whittaker, E. O. Otis, Von Jaksch, and J. M. Anders advocating its merits in properly selected cases. To show the value of the test, Anders (*N. Y. Med. Jour.*) has collected 1470 suspicious cases in which a positive reaction was given in nearly 72 per cent. In a certain proportion of cases of undoubted tuberculosis of long standing, the reaction fails to occur, perhaps because the patient has become naturally tolerant, or in some cases because the test has not been properly carried out. It has also been urged against the tuberculin test that a reaction occurs in about ten per cent. of apparently healthy individuals, but here the response to the test is less marked, and it is well to remember how frequently a tubercular infection exists entirely unsuspected.

The method of carrying out the test is important. Trudeau recommends that the patient's temperature be taken thrice daily for two or three days before making the test. Then inject one milligramme of tuberculin at night as an initial dose. If there is no alteration in the temperature curve during the following two days, on the evening of the third, inject three milligrammes. If no reaction occurs, wait two days and then inject five milligrammes. Trudeau rarely goes above this amount though a larger dose may be necessary to cause a response in affections of the glands or bones. Anders recommends slightly larger initial doses—from two to five milligrammes, thinking that the results are more certain. According to Trudeau children are especially susceptible to the action of tuberculin, and the agent should not be used in cases where the temperature rises above 100° F., for here the diagnosis should be made by other means. Either Koch's original tuberculin or its modified form may be employed.

Used in small doses, in incipient or latent cases, this agent appears to be free from danger and it will undoubtedly find a much more ex-

tended use than it has at present. The profession cannot refuse to ignore the value of an apparently harmless method by which a diagnosis can be arrived at in so large a proportion of cases, especially when an early recognition of the disease is a *sine qua non* to successful treatment.

ANTITYPHOID INOCULATION.

In the February number of the CANADA LANCET we referred editorially to the employment of sterilized cultures of the typhoid bacillus as a vaccine in the prophylaxis of typhoid fever. This treatment had been used with encouraging results in India and was largely resorted to among the troops bound for service in South Africa. The subsequent deplorable outbreak of typhoid amongst the British troops in various parts of the field of operation offered excellent opportunities for a study of the degree of protection afforded by inoculation, and to compare the incidence and the severity of the disease among the inoculated and the uninoculated respectively. Only very meagre reports are to hand at the present time, but such as have appeared, encourage the hopes of those who considered the method of value in the prophylaxis of the disease. Dr. Conan Doyle (*Brit. Med. Jour.*) writing of the outbreak at Bloemfontein, believes that if vaccination had been made compulsory, the army would have escaped from most of its troubles. While by no means an absolute preventive, it certainly modified the course of the disease very materially. Professor Wright, of Netley, furnishes equally interesting information confirmatory of the same fact. In the beleaguered garrison at Ladysmith, typhoid fever occurred seven times as frequently among the uninoculated, and he thinks that fuller reports may be even more favorable. Better results might also be expected if the vaccination had been more thoroughly carried out and revaccination resorted to. The publication of the complete statistics will be awaited with great interest, not only by the medical profession but by the military authorities and the general public.

THE PLAYTER EPISODE.

The recent fining of Dr. E. Playter to the tune altogether of about \$500.00, on the charge of having established a nuisance by opening a sanitarium in Deer Park for the treatment of consumptives, has aroused a good deal of interest in the profession. As an appeal has been entered against the ruling of the magistrate the case is still *sub judice*, and therefore not open to discussion. We are bound to say, and are at liberty to say,

that granting, for argument's sake, that the conviction was just, the fine was excessive, unnecessary, and has the appearance of vindictiveness on the part of some one. We express no opinion as to Dr. Playter's skill and success as manager of the institution, nor as to the wisdom of establishing at all an institution altogether too small to meet the needs of the public—but it is our opinion that the outcome of the case will be to stampede the public into an unreasonable fear of tuberculosis. The pendulum is already swinging much too far, and it will be in the near future the duty of the profession to hold the public in check, or the inmate of a consumption sanitarium will be regarded with the same dread and aversion as now attaches to the unfortunate sufferer from small pox or insanity. We shall await the re-trial of the case with much interest.

EDITORIAL NOTES.

University of Toronto Medical Faculty.

The Senate of Toronto University have recommended the following appointments :

J. J. Mackenzie, B.A., M.B., to be professor of pathology and bacteriology, in place of Dr. John Caven, who has resigned.

Dr. J. A. Amyot, to be associate professor in pathology and bacteriology, or professor of clinical pathology, at his option.

Dr. F. N. G. Starr, associate professor of clinical surgery and also demonstrator of anatomy.

W. Mackeown, B.A., M.D., demonstrator of clinical surgery.

C. L. Starr, demonstrator of clinical surgery, instead of assistant demonstrator of anatomy.

A. R. Gordon, M.B., demonstrator in clinical medicine, instead of assistant demonstrator of anatomy.

Dr. R. D. Rudolf, lecturer in medicine and clinical medicine, instead of assistant demonstrator in anatomy.

Dr. K. C. McIlwraith, demonstrator of obstetrics, instead of assistant demonstrator of anatomy.

Dr. W. P. Caven, associate professor of clinical medicine.

H. T. Machell, M.D., associate professor of obstetrics and pediatrics; his work to be confined to pediatrics.

G. Chambers, M.A., M.B., demonstrator in clinical medicine.

Dr. G. R. McDonagh, professor of laryngology and rhinology.

W. H. Ellis, M.A., M.B., professor of toxicology.

Bertram Spencer, M.D., professor of medical jurisprudence.

Dr. W. H. Beemer, to be extra-mural professor of mental diseases.

The Senate also decided that in future there would be an examination at the end of the third year of the medical course.

American Pathological Society.

A meeting of pathologists and bacteriologists recently held in Washington, appointed a committee consisting of Drs. W. T. Councilman, S. Flexner, H. C. Ernst, L. Hektoen, W. H. Park, Theobald Smith and W. T. Howard, Jr., to arrange details relating to the organization. We are pleased to see this section of the profession following the example set by other branches in the formation of a separate association.

Medical Incomes in the U. S.

Dr. J. M. Dodson, of Chicago, is authority for the statement that the average income from practice in the large cities of the United States is \$2,000; in smaller towns, \$1,500, and in country districts, \$1,200 yearly. The largest income he knows of in America is \$80,000, though two or three New York physicians are said to make over \$100,000.

British Columbia Medical Association.

The above association met at Vancouver on August 9th and 10th.

Trinity Medical College.

The fall session at Trinity Medical College will begin on Sept. 18th this year, the introductory address being delivered by Rev. Armstrong Black, D.D., at 4 p.m. in the College Theatre.

PERSONAL.

Dr. Victor A. Hart, of Sault Ste. Marie, has returned from a six months' visit to Europe. While abroad, Dr. Hart took the triple qualification of Edinburgh.

Dr. J. L. Bradley (Trinity '95) has also taken the triple qualification at Edinburgh, and Dr. W. I. Taylor (Trin. '98) has passed the examination of the conjoint board of London.

The honorary degree of F.R.C.S. of England, has been conferred upon Mr. I. H. Cameron, of Toronto, and Dr. Roddick and Sir William Hingston, of Montreal. These gentlemen are to be congratulated on being the first Canadians to receive this honor.

Dr. P. MacNaughton (Trinity '88) has been appointed resident medical assistant in the Asylum for the Insane, Mimico.

Dr. J. A. Amyot has been appointed provincial bacteriologist in place of Dr. J. J. McKenzie, resigned.

Dr. Thos. Kerr, Dovercourt Road, Toronto, has sailed for Europe, where he will remain for some months.

Much sympathy is felt for Hon. Dr. Borden, Minister of Militia, in the death in action near Pretoria, of his only son, Lieutenant Borden, of the Royal Canadian Regiment. Lieutenant Borden was only 23 years of age, was an ardent soldier and a third year medical student in McGill College.

Dr. A. R. Robinson, of New York, has been spending a holiday in Muskoka.

Dr. A. A. Sheppard, formerly house surgeon at the Sick Children's and Toronto General Hospital, is opening an office in Sault Ste. Marie.

Dr. A. D. Stewart (Tor. '99), of last year's resident medical staff, Toronto General Hospital, has left to assume the duties of surgeon on the R.M.S. Empress of Japan, from Vancouver to Hong Kong.

Dr. J. B. Gullen, Toronto, is spending the summer in Europe.

We are pleased to note that Dr. J. N. E. Brown (Tor. '92), has been appointed Secretary to the Yukon Administration. Dr. Brown, who was Secretary of the Ontario Medical Association for several years, went to Dawson City about two years ago as secretary to Commissioner Ogilvie.

Dr. W. Stephens (Trinity '99), who has gone as a medical missionary to Western China, in a letter from Kiating dated June 26th, makes no reference to any troubles in China.

Dr. M. B. Dean, lately House Surgeon of the Toronto General Hospital, has begun practice at Fort William.

We are pleased to learn that Dr. Charles D. Parpitt (Trinity '94), who has been very ill with pneumonia, is recovering.

Dr. Jas. Third (Trin. '91), has resigned his position as Superintendent of the Kingston General Hospital. It is stated that Dr. Herald will be his successor.

Col. G. Sterling Ryerson, late Red Cross Commissioner with Lord Roberts' Headquarters, has returned home in good health. Col. Ryerson's work has received the highest commendation from both military and medical authorities in South Africa and from all the military correspondents. His services have been frequently mentioned in despatches from the seat of war. While it is a source of gratification to Canadians in general that one of their number should have been able to render such distinguished service, THE LANCET is particularly pleased as Colonel Ryerson is one of our associate Editors. We hope to have some contributions from him in our columns at an early date.

COMMUNICATIONS.

TREATMENT OF INEBRIATES.

Editor "LANCET," Toronto.

SIR:—As intimated in the May number of the LANCET, the bill regarding the treatment of inebriates prepared at the suggestion of the Ontario Government, from whatever cause, was not introduced at the last session of the Legislature. This bill was prepared with great care by a committee of the Prisoners' Aid Association in association with the Public Health Committee of the Ontario Medical Association. It was submitted to and approved by the medical members of the Ontario Legislature, and it was also strongly endorsed by an influential deputation which waited upon the Ontario Government. As this bill is based upon what is known as the probation system, and as the probation law had its origin in Massachusetts, I visited that state recently with a view more particularly of studying the practical working of the probation system. Possibly my observations and conclusions may be of interest to the readers of the LANCET.

The probation system was adopted in the State of Massachusetts several years ago in dealing with youthful offenders under 16 years of age, and the results were so satisfactory that about five years ago the system was extended to cases of adult first offenders and to the more hopeful cases of inebriety. The results it is claimed have been most gratifying. In every criminal court throughout the State an officer, called a probation officer, is appointed by the court, who takes the supervision of cases placed on probation under suspended sentences. The probation officer makes friendly visits to the probationers, not in the capacity of an infirmer, but in the capacity of a friendly visitor, and he does what he can to place the probationer on a higher plane of life and living. At the end of the probationary period the probationer appears in court and if the report of the officer is favorable the person on probation may be discharged or the probation may be continued. If the report is unfavorable the probation may be continued or the person may be committed either to prison or to a house of correction.

While in Boston I made it my business to look into the practical working of the probation system, I accompanied the probation officers while making their early interviews with prisoners in the police cells awaiting trial. I made the rounds with one of these officers outside to ascertain the truth or falsity of the statements made and I followed the cases as they were afterwards dealt with in court. I also attended the weekly probation court held for the purpose of dealing with cases whose term of probation had expired. Besides this I interviewed the chief probation officer and several of his assistants—two of whom are ladies—regarding the working of the probation system. I also interviewed others who are in a position to judge regarding the results attained by the system of probation. As a result of this investigation and these enquiries my conclusions are as follows: That from 80 to 85 per cent. of those

placed on probation for petty offences, and about 45 per cent. to 50 per cent. of those placed on probation for drunkenness are either reformed or at least are not known to be again arrested. It is claimed that 80 per cent. of all those placed on probation are reformed, but unfortunately the statistics are not compiled in such a manner as to demonstrate this. I found, however, that there is a consensus of opinion—among those who are in a position to know—that the probation system in Massachusetts is giving great satisfaction. The Secretary of the Massachusetts Prison Association said to me that although the statistics are not as complete as they might be, "We know that probation is doing a good work." I found, moreover, that there is now a bill before the State Assembly which, when adopted, will extend very materially the scope of the probation law.

I visited the State institution for the treatment of dipsomaniacs which is situated at Foxborough, about thirty miles from Boston. It is on a farm containing 100 acres, most of which is under cultivation. The hospital is on the cottage plan and there were 198 patients under treatment the day of my visit. Dr. Woodbury is the superintendent and he has one medical assistant. The institution is thoroughly equipped, including gymnasium, baths, lecture hall, etc., etc., at a total cost of about \$200,000. The income is about \$48,000 a year—\$13,000 of which is from municipalities, \$11,000 from industries, \$2,500 from pay patients, and the balance made up by the State. Patients are admitted on the certificate of two licensed physicians, and the municipality where the patient is committed is liable for the payment of the expense of maintenance, the same as in the case of lunatics. In cases, however, where the patient has no "legal settlement," the expense is borne by the State. Besides farming, the principal industry is broom-making. Patients are committed for a period of two years, but they may receive a conditional discharge (on parole or probation) any time after six month's detention. The average cost per patient is \$5.30 per week. This includes all expenses as follows: provisions \$1.32, clothing etc., \$1.77, wages \$2.21. The results of treatment (report for 1899) are as follows: doing well 37.12 per cent., improved 13.77 per cent., unimproved 32.93 per cent., dead 1.19 per cent., could not be found 14.97 per cent. In reply to my question the superintendent stated that the chief cause of relapse after discharge is lack of employment; a second cause is lack of efficient supervision.

While in Boston I also visited the Washingtonian Home for Inebriates, which is under the charge of Dr. Ellsworth, and I had an interview with Dr. Temple, surgeon to the Massachusetts' Home for Intemperate Women. I submitted the provisions of the proposed Ontario bill for the treatment of inebriates to these specialists as well as to Dr. Woodbury of Foxborough, and also to members of the Massachusetts Prison Association. And I was gratified to find the consensus of opinion was in its favor. Dr. Woodbury was very emphatic in his commendation of the idea of combining medical treatment with the probation system and he assured me he was convinced that very great good would be accomplished by making provision for home treatment in addition to general hospital treatment in connection with the probation system and as provided for in the Ontario bill.

Yours truly, A. M. ROSEBURGH.

BOOK REVIEWS.

A MANUAL OF CLINICAL DIAGNOSIS BY MEANS OF MICROSCOPIC AND CHEMICAL METHODS.

By Charles E. Simon, M. D., Late Assistant Resident Physician John Hopkins Hospital, Baltimore, Fellow of the American Academy of Medicine. Third Edition. Lea Bros. & Co., Philadelphia, 1900.

The chemical considerations in this work add largely to its interest and value, giving the student a much clearer insight into the substances with which he is dealing. A brief description, chemical and microscopic, of the various fluids of the body in the normal state, precedes in each case that of the pathological, a comparison most essential in such a work.

The blood is examined and described from every side. Each element is discussed with great accuracy, not only from its microscopic appearance, but with its chemical affinities and staining peculiarities, the preparation of stains and their application are clear. The section devoted to the secretions of the mouth contains many points of interest.

That on "Examination of Stomach Contents" is full of instructive points. Nearly all known tests for the different elements are given and commented upon, not from what others say, but from the author's own experiences. The tests and reactions are clearly described and, what is most important, directions for the preparation of reagents.

The clinical significance and mode of formation of pathological elements are tersely discussed. The study of faeces, normal and pathological, occupies some fifty pages, all points being dealt with, from the number of stools daily to the bacteriology of the contents. Intestinal parasites, gall stones and their analysis, chemical tests for blood coloring matter, albumen, peptones, bile pigment, &c., are all considered, as well as the special study of the alvine discharges in different diseases. Sputum is discussed from the microscopic and chemical aspects.

The chemical examination of urine is unusually deep for a text book of this character. The origin, mode of formation, reactions and clinical significance of the bodies found in it are described at great length. The simpler methods of examination are given, and possible errors in the reactions emphasized, while for those wishing to enter more deeply into the matter, more complex and exact methods are described. The organized elements are well illustrated.

There are short sections on semen, vaginal discharges, exudates and transudates, cyst contents and milk. In these the chemical as well as the microscopical characters are considered.

The author is evidently a strong advocate of Lumbar puncture. He cites a long list of investigations with results, and anticipates a bright future for the operation, for both diagnostic and therapeutic purposes.

The work is of great value to student and practitioner, and while it is admirably suited to guide one in the ordinary simple examinations of the body fluids, it may still be used as a reference for the deeper and more complex investigations that some cases demand.

H. C. P.

DUANE'S MEDICAL DICTIONARY.

New (3rd Edition. A Dictionary of Medicines and the Allied Sciences. Comprising the Pronunciation, Derivation and full Explanation of Medical, Pharmaceutical, Dental and Veterinary Terms; together with much collateral descriptive matter, numerous tables, etc. By Alexander Duane, M. D., Assistant Surgeon to the New York Ophthalmic and Aural Institute; Reviser of Medical Terms for Webster's International Dictionary. In one large square octave volume of 656 pages, with 8 full-page colored plates. Cloth, \$3.00, net; full flexible leather. \$4.00, net. Lea Brothers & Co., Philadelphia and New York.

The Third Edition of Duane's Medical Dictionary thoroughly revised, and with the addition of a large amount of new material, is to hand. As the author says "practical utility rather than historical tradition has controlled the selection of matter," so that obsolete words are omitted, thus leaving more space for material useful in a "working" dictionary. The pronunciation of words is indicated in a simple way, and the definitions are concise and accurate.

We have used the book and find that it comes fully up to the standard claimed for it in the author's introduction to the work.

To those who wish a good reliable working dictionary, concise in form and of moderate price, this book can be confidently recommended

A Practical Treatise on Sexual Disorders of the Male and Female.—By Robert W. Taylor, A.M., M.D., Clinical Professor of Venereal Diseases at the College of Physicians and Surgeons (Columbia University), New York; Surgeon to Bellevue Hospital and Consulting Surgeon to the City Charity Hospital, New York. Second edition with 91 illustrations and 13 plates in colour and monochrome. Lea Bros. & Co., New York and Philadelphia, 1900.

It is indeed a genuine pleasure to have the opportunity of reading a new edition from so careful and painstaking an authority as Dr. Taylor. In the second edition of this work he devotes chapters to the anatomy and physiology of the sexual organs; then he describes the nature and composition of the seminal fluid as a preliminary introduction to the discussion of impotence in the male. He deals exhaustively with the various conditions of psychical, symptomatic, atonic, and organic

impotence in all its phases, giving cases and treatment. The chapters on inflammation of the bulbous and prostatic urethra and also those dealing with the prostate and seminal vesicles are specially to be commended and invite our most serious consideration. New chapters on vaginismus and masturbation in women are added. The treatment of these various disorders follow along the lines deduced from a consideration of pathological conditions found, rather than from any preconceived notions. Some chapters are necessarily short in a work of this kind as chap XXVII on sexual perversion, but, as the author explains, these have been exploited *ad nauseam*. One cannot read this work without greatly benefitting by the many suggestions which invite one into new paths of thought.

C. A. T.

NETTLESHIP ON THE EYE (New Edition).

Diseases of the Eye.—By Edward Nettleship, F.R.C.S., Ophthalmic Surgeon at St. Thomas' Hospital, London; Surgeon to the Royal London Ophthalmic Hospital, etc. New (6th) American from the sixth English edition, thoroughly revised by William Campbell Posey, M.D. With a supplement on the detection of color blindness by William Thomson, M.D., Professor of Ophthalmology in the Jefferson Medical College, Philadelphia. Just ready. In one 12mo. volume of 562 pages, with 192 illustrations. Selections from Snellen's test-types and formulae, and 5 colored plates. Cloth, \$2.25, net. Lea Bros. & Co., Philadelphia and New York.

This is one of the most useful and handy little volumes for the student and busy practitioner, being concise and to the point, and for a work of its size Mr. Nettleship must be congratulated for cramming so much into it.

The publishers have added to the English edition in several parts, particularly in the chapters on methods of examination, and in some of the the therapeutic measures which have been employed by ophthalmologists on this side of the ocean.

A large number of illustrations have been inserted, an appendix on the laws governing the vesical tests for admission into the public services of the United States, also the methods employed in examining the eyes of school children in certain American cities. We can highly recommend this work to the student and general practitioner.

C. T.

We are glad to welcome another edition of Sampson's Operative Surgery. Useful alike to the student of medicine and the busy practitioner in the brevity and clearness of its descriptions of the various operations, it is yet sufficiently full for most purposes. The present edition shows a number of changes, the majority of which are improvements on past editions. It is sure to hold the high place in the profession that its merits entitle it to.—F. Le. M. G.

PUBLISHERS' DEPARTMENT.

The Journal of Surgical Technology

is the title of a new periodical, to be published monthly, beginning July 1, 1900. It will be devoted to the consideration of the technic of surgical procedures, at a subscription price of \$1.00 a year. Valuable premiums are offered with the first subscriptions. Address the Technique Publishing Co., 404 East 14th St., New York City, N. Y., for sample copy.

An American Remedy in Ireland

The Antikamnia Chemical Company have forwarded to us from their London House, No. 46, Holborn Viaduct, samples of their five-grain antikamnia tablets, and also of antikamnia and codeine tablets. The former are so well known that it seems hardly necessary to do more than refer to them as an unequalled analgesic. The antikamnia and codeine tablets contain four and three-fourths grains of antikamnia and a quarter of a grain of codeine. This is a valuable combination, the synergetic effects being all that could be desired.

—Extract from *Dublin Medical Journal*, March, 1900

"An appendix to the 'International Directory of Laryngologists and Otologists,' compiled by Mr. Richard Lake, is in course of preparation. In it will be found corrections of names and addresses already given, an additional list of names and addresses received since publication, and an obituary list.

"Considerable additions have been obtained for the foreign list, which will materially add to its value and completeness. The decision of the editors of the *Journal of Laryngology, Rhinology and Otology*, under whose auspices the Directory is published, to allow no name to be inserted in the British list for which sanction has not been given in writing, at once explains some omissions and criticisms. The editors, whilst desirous of making the Directory as complete as possible, consider it best to adhere to this course. It is therefore hoped that all engaged in the practice of Laryngology, Rhinology and Otology will assist as far as possible in making this useful work complete," by sending in their names and addresses to the editor, "International Directory of Laryngologists and Otologists," 119 Shaftesbury Avenue, W.C.—*Journal of Laryngology, Rhinology and Otology*, April, 1900.

Dr. W. E. Hamill, who conducts the Canadian Medical Exchange, has removed to his former office at 88 Yonge St., upstairs.

Intestinal Rest in Typhoid.

It is an axiomatic principle in both Surgery and Medicine that a congested or inflamed part needs rest.

The Surgeon recognizes this when he immobilizes the fractured bone and retains the fragments in apposition; the physician likewise appreciates the great importance of this principle in cases of gastric ulcer when he feeds his patient by the rectum in order to avoid irritating the inflamed part, either directly, or by exciting gastric motility. Although Typhoid Fever is essentially a systemic disease, its characteristic local lesion is the intestinal ulcer, which should, as far as possible, be kept at rest. Milk, which has heretofore been regarded as the only proper exclusive food, is as a recent writer says, "not a liquid diet, but a deceptive solid"—capable of filling the small intestines with dense indigestible curds which scratch and irritate the ulcerated bowel, and in addition, ferment and cause gaseous distention, tympanites, etc. Liquid Peptonoids, on the other hand, is open to none of these objections. Its administration affords rest to the ulcerated intestinal tract, because:

1st. It is pre-digested and therefore promptly absorbed from the stomach, leaving no residue for the bowel to dispose of.

2nd. No curds are formed as from milk.

3rd. It is absolutely aseptic and cannot cause fermentation, tympanites or increased peristalsis, resulting in diarrhea.

4th. It has the requisite nutritive power to maintain life for weeks and even months, especially in febrile conditions.

Another advantage of Liquid Peptonoids is its palatability, which renders it grateful to the patient, especially when given *ice cold*.

From one to two tablespoonfuls every two, three or four hours, should be given as necessary. When an efficient intestinal antiseptic is required, as it very frequently is in this disease, Liquid Peptonoids with Creosote provides both food and remedy at one and the same time. The unpleasant taste of the Creosote is almost entirely abolished in this combination. Each tablespoonful contains two minims of pure beech-wood creosote and one minim of guaiacol, its active principle.

Uterine Derangements.

I have used Aletris Cordial in my practice for over a year, and to say that I am pleased with it does not nearly express the degree of my satisfaction. Aletris Cordial fills a long-felt want with me. Symptoms attending uterine derangements have always been perplexing to physicians, but with this remedy the trouble vanishes as dew before the rising sun.—
L. M. McLendon, M.D., Georgiana, Ala.

Warner's New Therapeutic Reference Book.

Regarding this hand-book of therapeutics, we wish to say it is one of the very few guides of its kind offered students and busy practitioners. As its preface states, it is not intended to teach graduates anything about

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digestion ; it promotes assimilation, and it enters
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paration is of great value in the treatment of nervous and
mental affections.* From the fact, also, that it exerts a double
tonic influence, and induces a healthy flow of secretions,
its use is indicated in a wide range of diseases.

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therapeutics, but is to be regarded rather as a handy aid to a poor memory. Many exceedingly valuable tables are represented, including the metric table, thermometric equivalents, etc., valuable tests for various matters, including urinary tests for albumen, sugar, etc., etc., comparative values of certain foods, a complete dose table of drugs, a list of diseases and their remedies, hints as to indications of pregnancy, recommendations as to Post-mortem examinations, etc., etc. The brief mention above gives but a faint idea of the many valuable departments of this new book.

The subjects are interesting and are written in such a manner as to give a comprehensive idea of what is in the author's mind. "Warner's New Therapeutic Reference Book" must not be confused with "Warner's Therapeutic Reference Book." The latter has been discarded, the new one taking its place. So many new features have been added and the other parts entirely re-written to a great extent, that it may be termed a new book.

It is bound in two styles, one leather at 50 cents, and the other a leatherette at 25 cents per copy, postage prepaid in both instances.

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