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VIENNA AS A CENTRE FOR POST-GRADUATE WORK.

THERE are about one hundred men, apart from Austrians, doing post-graduate work in Vienna at present, the greater number being from various states of the Union to the south of us. About 80 per cent. of these are taking eye, ear, nose and throat work. In these branches the courses are given largely in English. The graduate who comes to Vienna for either medicine or surgery is sure to be disappointed, unless he has a fairly good knowledge of the German language. Of course, if he can spend nine months or a year here, the language difficulty disappears. There are any number of excellent teachers of German in Vienna and their rates are very moderate, the average charge being two kronen (about 40c.) an hour. During the three to six months required to gain a working knowledge of the language, he can profitably spend a part of each day in one of the many private laboratories where more or less English is spoken. This helps to relieve the tedium and gives him, at the same time, an opportunity to apply his knowledge of German. Or, he may spend a part of his time in an "Ambulatorium Klinik," which corresponds to our Outdoor Department. These departments, however, are not given the attention, in most cases, they deserve, or that they receive in London and Edinburgh. The Lorenz clinic is probably an excep-

tion. The only course given in English, that I am aware of, apart from the specialties, is that of Priv. Doc, Dr. Braun, on the heart and lungs. This course is admirable. His English is fair, and the rounding out of his sentences in German, but suffices to maintain one's interest in the study of the language.

HOSPITAL FACILITIES, NURSING, ETC.

The Allgemein Kranken-haus, with its 3,000 beds, supplies ample material. Vienna has one decided advantage over both London and Berlin—the work is centralized; no time is lost in going from one hospital to another. The hospital itself is old and quite out of date. The cubic space allotted each patient is very inadequate. I counted 25 beds—all occupied—in a room not as large as the Sampson ward in the Kingston General Hospital. The clinical theatres are antiquated and not easily accessible. The operating theatres are much inferior, in arrangement and equipment, to those of the better Canadian hospitals. A new hospital is in process of erection. Already two departments—the gynaecological and the obstetrical—are completed and they are a perfect dream in hospital architecture. The Viennese move slowly, however, and it will be probably fifteen years before the entire building is ready for occupation.

The nursing is much below the Canadian standard, apart from a few sisters that are to be seen here and there throughout the buildings. The typical Krankenhaus nurse seems to occupy a place midway or scarcely midway, between the historic Sary Gamp and the modern Florence Nightingale.

The American Medical Association of Vienna is in a flourishing condition. Its headquarters are at the Café Klinik, Alserstrasse. Here a register is kept and all information regarding courses may be obtained.

Notwithstanding the excellent work that is being done in Vienna in many departments, one is reminded daily by the modest 12 x 18 in. photographs that hang on the dusty walls of the various clinics, if in no other way, that Skoda, Rokitansky, Kaposi, Billroth, etc., are gone, and somehow or other, the feeling creeps irresistibly over one, that Vienna has been shorn of much of her greatness, and that the grand old temple of Aesculapius no longer rears its majestic form on the shores of the blue Danube.

JAS. THIRD.

Vienna, May 28th.

EMPHYEMA OF THE ACCESSORY SINUSES OF THE NOSE.

THIS report of a few cases of suppuration in the nasal accessory sinuses has been prompted by what has seemed to me to be a lack of interest in the subject on the part of the general practitioner. A short study of the skull will demonstrate the close relationship of these cavities to important organs of sense and even to the brain itself.

In an effort to stimulate your interest it has seemed best to relate the clinical symptoms and conditions of a few selected cases, the means of diagnosis, and the treatment, with the results.

For diagnosis the chief requisites are a good artificial light, a head-mirror, nasal speculum, rhinoscopic mirror and probe. Transillumination by means of a small electric lamp in the mouth or under the brow often serves to confirm the diagnosis. If the Antrum of Highmore is normal, the light in the mouth will produce a bright reflex in the face just under the eye and through the pupil of the eye. During this test the room must be arranged so that every ray of light can be excluded from it. The contrast between the bright illumination of the healthy side and the darkness of the diseased side is very striking.

At times a radiograph is useful in determining the extent of the disease, and the operation to be undertaken. In the matter of treatment, the passing of a curved canula for the purpose of irrigation into any of the sinuses through the natural orifice is not only difficult, but frequently impossible. On the other hand what, in Vienna, they call "punction" of the Antrum of Highmore through the antro-nasal wall, beneath the inferior turbinate, is comparatively easy, and with the use of cocaine, painless; thus making irrigation of this sinus simple and certain.

On January 7, 1907, Mrs. W. complained that three weeks previously she had had a cold in the chest and head. During and since the attack, her head had ached over the left eye. In other respects, she was well.

For some days a blur had come over the vision of the left eye. L.V.:—20/200. On examination, the optic disc was found to be swollen + 1.00 D. Dr. Diss reports urine O.K. No uterine, or other trouble. Transillumination shows the left frontal sinus slightly darker than the right. Hot douches and hot applications did not relieve the condition. So three days later I excised the the left mid-

dle turbinate to facilitate drainage from the frontal sinus, and enlarged the natural opening of the sphenoidal sinus. Fifth day—less pain—V:—20/30. Sixteenth day—no pain—no discharge. V:—20/15 and remained so.

On November 11th, as the result of a cold in the head, this patient developed pain in the left side of face. Purulent discharge followed from the left nostril. Examination revealed pus in the middle meatus. Transillumination of the right maxillary sinus was clear and bright, with a bright pupillary reflex, but on left side it was dark and there was no pupillary reflex.

By means of a curved trocar and canula the left Antrum of Highmore was entered below the inferior turbinate, and much pus washed out. There was no recurrence and the cold speedily subsided. This illustrates the sudden onset with pain and discharge in an accessory sinus, and the prompt and permanent relief from irrigation in these acute cases.

In March, 1907, I saw another such case, with Dr. Glidden in Little Falls. This was a boy of eighteen (18), who had had grippe for a few days. He was in bed suffering with pain in left side of the face and left ear. There was a profuse discharge of pus from the left nostril. I had seen this boy before with a mild involvement of sinuses occasioned by a large spur which obstructed the drainage on that side of the nose. I therefore went prepared to irrigate the Antrum of Highmore, which was done, bringing away fully an ounce of creamy pus. The membrani tympani which was red and bulging was incised, hot irrigations were instituted, and recovery soon followed.

A few days later his brother came to my office with unilateral pain and discharge from the left nostril. Transillumination confirmed the diagnosis of acute Empyema of the maxillary sinus. One washing was sufficient to cure this by means of trocar and canula through the inner wall and under the inferior turbinate.

All such cases do not respond so promptly—possibly because the acute condition has been preceded by a chronic condition of which the patient was oblivious.

Such a case was Miss M——, brought to me by Dr. Frost, October 8th. One week previously she complained of indefinite pain in the right shoulder and neck. Later, there was dizziness on turning over in bed, or at any time if she moved quickly. It was not exactly dizziness, but a feeling of something going around in the right side of her head about the ear which forbade the recur-

bent posture. For two or three days before I saw her, she had pain in the right eye and temple, with general prostration. I found acute tenderness over the right brow. Rhinoscopic examination showed a condition of hypertrophy of the turbinated bodies. No discharge was seen. Transillumination was clear on the left side—dark on the right for both maxillary and frontal sinuses. Irrigation of the Antrum of Highmore brought away a large quantity of stinking pus. This relieved the so-called dizziness in and around the ear. The frontal sinus could not be reached because of the enlarged middle turbinate—hence it was excised the following day. This facilitated drainage from above, but the eye remained very weak and there was considerable pain over the eye on rising in morning. The erect position allowed the frontal sinus to drain, and hence the worst pain was felt in the morning. All this time no pus was to be seen in the region of the naso-frontal duct. It was first seen a week after the removal of the middle turbinate, and on the same day the frontal sinus was washed out with considerable difficulty by bringing away thick pus. On account of the increase of dizziness with pain in the face, the antrum was again punctured and washed, bringing away more stinking pus. After this she improved so that she could sleep comfortably lying down and the eye felt and looked natural; but she continued to have mild attacks of dizziness about the right ear, which terminated with free discharge from the nose.

On November 4th, the antrum was again washed, again bringing away more stinking pus. There was no pain in the brow.

In order to secure free and permanent drainage of the antrum, under local anæsthesia, the anterior one-half of the inferior turbinate was excised, and the whole inner wall of the Antrum of Highmore removed.

Since the operation, the antrum has been perfectly clear, as can be seen by inspection. The dizziness has not returned, but the pain and tenderness in the brow is not entirely gone, though the eye feels strong. It is still a question whether a more radical operation on the frontal will be needed before a cure is obtained. In the beginning, the nose was douched with a hot soda solution and is now being sprayed with a solution of carbolic acid, menthol and eucalyptus in benzoinol.

The next case illustrates well chronic empyema. Mr. J.— consulted me first on September 26, 1906, complaining that he did not breathe well; his nose discharged constantly, and he suffered from headaches. All these symptoms date from one year previously,

when he had a severe attack of grippe, terminating in pneumonia. His nose had been broken in youth. It is flattened externally and pushed to the left. Internally, the septum is deviated to the right, making that side very narrow. Rhinoscopic examination revealed an abundance of pus in the right side, which appeared to come from high up under the anterior end of middle turbinate, and also from further back near the natural opening of the Antrum of Highmore. Transillumination showed the right cheek and right brow dark. He brought an almost unbearable stink into the office with him. The source of this was in part revealed when the Antrum of Highmore was washed out, bringing away foul-smelling pus.

A week later, under general anæsthesia, I did a Coakley frontal sinus operation. This is a modification of the more radical, or at least extensive, operation of Prof. Killian of Freiburg.

It consists in making an incision through the brow down to the bone one-eighth of an inch above the margin of the orbit. The upper flap is then retracted and the whole front wall of the sinus removed with chisels. This gives free access to the sinus which is thoroughly curetted so that not a vestige of mucous lining remains. The naso-frontal duct can be enlarged by curetting the anterior ethmoid cells. The posterior ethmoid cells cannot be reached in this way. The sinus is then packed and the incision closed except one angle. This operation failed to entirely stop the flow of stinking pus, on account of the diseased condition of the maxillary sinus. On November 4th, this sinus was opened freely through the anterior naris under local anæsthesia by removal of the anterior and of the inferior turbinate, and as much of inner wall of the sinus as possible.

Since this last operation, there has been no discharge and no odor. The frontal sinus was slow in granulating—dressings being continued until January 15th (three months). The only deformity is a slight pitting at the inner angle of the brow, which can be remedied by the injection of paraffin. Through the nasal speculum can be seen at present, under the inferior turbinate, a fair sized opening into the maxillary sinus with clean dry edges.

An illustration of ethmoid disease is furnished by Miss O—, sent to us by Dr. Bartlett, Port Leyden, on October 16th. She stated that she had had a bad cold since last spring. The right side of her nose was occluded; mouth dry and sore. She had been doctoring for catarrh and had spent all summer in the Adirondacks, as her failure in weight, poor appetite, want of ambition, etc., had led to a diagnosis of tuberculosis. Examination revealed a large polyp springing from

the post ethmoid region, and occluding the right posterior naris. The left side was normal. The following day she submitted to an operation which consisted in the removal of the large polyp and a number of smaller ones, together with the ethmoid cells, which were found to be diseased. A week later, she reported at the office. Her color was noticeably improved, her carriage more alert, and her face had lost its anxious look. She said she was feeling fine—better than in a year. Her mouth was no longer sore and her appetite was good.

The symptoms in this case were exaggerated, but I know of no class of patients that are more appreciative than those relieved of ethmoidal obstruction in the nose.

Utica, N.Y.

H. FARRELL.

NEURASTHENIA

Read before the Medico-Chirurgical Society, Ottawa.

Mr. President, and Gentlemen:—

The subject for discussion assigned me to-night is neither new nor rare, but rather old and common. Unconsciously, our first impulse is disgust and displeasure, for we all admit that, when by the shifting changes that equalize the grist to our various professional mills, a neurasthenic patient is shuffled on to us, we are far from having feelings of inspiration and delight, but rather of hatred and chagrin.

We know at once the dose we have to sit quietly and take—of blue, depressing questions and sentiments—of sadness and heart-ache; imaginary generally, but real to him; repeated over and over again.

And this is not the worst, for we are robbed of the inspiration and delight which buoys us up and emulates us to undertake great things, because we know we are not soon going to cure this patient; and that the murmurings and bubblings will return again, again and yet again: except our fees are too large or our sympathy too small.

No doubt this is not the patient for the brilliant, gushing practitioner to make a sudden reputation on, but is the ideal case for the quack and charlatan to manipulate and impose upon.

The physician who would successfully treat a neurasthenic patient must have a great heart, in deep sympathy with the suffering, semi-demented patient; with a profound knowledge of the science of life and health, and of the analyses of the causes in the complex condition presented in this morbid, chameleon-like disease.

But, sir, I claim it is our duty to begin the treatment of neurasthenia long before the patient breaks down, even years before it actually develops, and often a generation or more previous.

It should require at least as much skill and intelligence as is used in the care and breeding of the lower animals.

We must act as in the treatment of any other disease, and get at the primary cause and remove it, which involves heredity, school life, recreation, and our modern social and business life.

We must have homes and good homes; let the mothers look after the homes and teach the daughters how to make homes and be healthy, instead of running associations and clubs for the saving of wicked men. Let them learn how to present a good, healthy, capable girl, who knows how to make a home, to a young man for a wife, and there will be less drinking, and fewer men's clubs, and more happiness, and less disease and sorrow, and less cause for anxiety and worry and for intense application for all parties.

Let the children be taught self-control, self-denial, self-reliance, courage, the reasonable simple rules of diet, exercise, sleep, rest and recreation—how to meet and bear trouble and disappointment—in fact, sir, it is a study of the betterment of the race.

I am convinced more and more that the life of the race may be increased 25 per cent. not only in length, but in capability; and the happiness, morality, and spirituality increased 100 per cent., by the medical profession arising to its duty and society obeying its dictates.

I fear that we, as professional men, to whom our patients and society look for advice and guidance in our specialty,—and to whom else can they look if not to us, sir?—that we have not had the influence, nor have we tried zealously enough to control the wild, careless, insane condition of the social customs of our times, chiefly with respect to the lives of our girls, who must grow to be the mothers of our race.

Everything else but vitality and force is looked after; school and study; music, painting and fancy work; indoors and reserve; and

the accursed dress, until, I say, with all respect, pity and regret, that 75 per cent. of our women are a disgrace to the race, because they are victims of would-be fashionable mothers or of ignorant fathers or husbands frequently. This condition has got to be changed or the multiplication of neurasthenia must go on and increase.

Sir, I ask the privilege to urge the plea to the medical profession here and abroad, to exert more influence in combating the primary causes of neurasthenia—this downward tendency to nerve degeneracy of the race—in the ignorance, errors and evils of our educational, business, social and dress customs, and the absence of all adequate education in the rules of diet, hygiene and physical development of our modern times.

What is the definition or common sense meaning of this "neurasthenia"? Unless we obtain a clear understanding of the condition, causes and analyses of the effects, we will not be able to succeed in treatment.

Neurasthenia—asthenia or weakness of the nerve force—is simply a debility, a run-down, tired-out state, so that the organs do not functionate properly, and this very stagnation brings on quickly a thousand other troubles, infinitely more serious and painful than the former, which soon react and increase the primary condition, thus forming a vicious circle.

It is identical with what occurs in other mechanics or machines, like a hot water furnace; fuel and help are scarce, hence the heat is scant, which primary condition is annoying and imprudent, but soon 100-fold greater mechanical complexities arise, the coils freeze and burst, the house, furniture and furnace are damaged, which cause infinitely more trouble and expense than the primary loss of heat, and these, reacting, intensify the primary condition, for the furnace is damaged, and so the capability of producing heat is paralyzed. So in the neurasthenic, debilitated patient, digestion, both in motor and secretory functions, is delayed or paralyzed, and retention, fermentation and putrefaction follow, and through reflex irritation and absorption of poisonous products and ptomaines, severe acute effects are obtained—gastritis, dilatation, enteroptosis, torpidity of liver and intestines, which give us the horrible picture presented in the full-fledged neurasthenic patient.

I would appeal to you, gentlemen, to handle these cases of neurasthenia with all seriousness, thoroughness and patience; for, while we are tempted to always shun and despise, frequently to laugh at, and sometimes to swear at these patients, yet there is no

section of our profession where the achievements are more noble, where the demands are greater, and where gratitude is more sincere.

People say: "Oh, you have a noble profession—going about relieving pain, curing sickness, saving life." Ay, but the dressing a wound, setting a broken bone, relieving a neuralgic pain, the attention of a fever patient—what are any or all of these in comparison to the mental torture and feelings of the neurasthenic patient? They are willing to endure any physical torture we may impose; they are glad even to die if they can be freed from the hell on earth which they suffer. We should feel more delighted and proud of having done a noble deed, after a long struggle, pulling one of these patients out of the slough of despond, than a layman who saves a drowning man, or a fireman who rescues a life from the flames. Living and suffering mental and nervous anguish and morbidity should appeal to us more forcibly than physical pain or than even death.

Some people, even some physicians, say, "nothing wrong with her or him, nothing to be done only run a bill." A professional brother who is here to-night said the right thing regarding this subject to me some years ago. He said: "When a patient sends for a physician there is something either mentally or physically wrong, and the mental requires our help just as much as the physical derangement."

There are a great many degrees of severity and modifications of manifestation of this disease which we shall analyze further on.

A physician's success depends on a clear common sense understanding of the meaning, causes and analysis of the effects of this disease, and his capacity to inspire his patients with hope and confidence; the thoroughness and persistence with which he presses his treatment and his personal attention to detail.

Physicians who have not time nor inclination to devote thus to neurasthenia and those who tell patients that "their sufferings are imaginary, mental, trifling," have not the modern conception of this disease and are unfit to deal with it.

TREATMENT OF THE DEVELOPED CASE OF NEURASTHENIA.

For convenience of reference, and not for any real distinction, we will make three classes:

1st. The mild case.—Patient continues at his or her usual employment, but under difficulties, has that "tired feeling," out of sorts often, is irritable, easily worried, finds it a task to do work that formerly was easy and a delight; dislikes to meet customers or shuns friends except some special ones to whom he pours out his troubles;

gets easily confused and complains of loss of memory; is easily exhausted; can't sleep well, looks haggard; has headache, palpitation, indigestion and constipation, or disorder of some of the other organs; if a female, pain in back and thinks she must have womb trouble, the veritable "womb crank." How often has some uterine trouble or some laceration or some disease requiring laparotomy been discovered, and to these attributed all the ills the suffering patient complained of, and only after months of treatment find that the main symptoms continue and that the real cause is neurasthenia.

2nd. The advanced case.—Possibly working, but should not be; if in female, likely laid up in bed, despondent, mournful, has attacks of syncope, can't endure any work, fatigue or irritation, difficult to cheer. If male, is unable to do business, gets greatly depressed at times, does strange things, bordering closely on hypochondria. In both, we have advanced stages of digestive disturbance and auto-toxemia.

3rd. The grave case.—Unable and unfit for work or for reason; everything looks blue; thinks he is going to die or some great disaster coming, or threatens own life and harps on impulses he often has to murder or injure his loved ones; is difficult to convince of his delusion or soon returns to his old fad. If a female, likely bed-ridden for long time and is a subject for faith cures and the like—practically a hypochondriac and often bordering closely on melancholia.

The latter, or third class, had better be dismissed briefly by sending to a properly conducted institution where every moment he shall be observed and supervised, or with a thoroughly capable nurse, away from friends and home; but the sanitarium is the best; often the Weir Mitchell rest cure and forced feeding is necessary and succeeds well in these cases.

However, the sanitarium often proves to be the very worst place for these patients; the fact of other similarly sick people being there constantly reminds them that they are not well, and it is exceedingly difficult to have them surrounded by brightness and cheer; everything soon becomes too monotonous or irksome for them.

But class one and two, or the worst of No. 1 and the best of No. 2, are the cases that trouble us most, and require greatest judgment and tact. Not bad enough to be sent away, or not prudent to do so; and yet too far deranged to continue active duties, and difficult to obtain proper assistants, we are constantly frustrated in our best plans and efforts.

The latter part of class 2—if we are perplexed with management of—had better be classed with No. 3. The first half of class 1 is a very large class! Who in active life, at the present rate of speed, tension and living, fulfilling any of the higher offices or professions of to-day, but has felt it more or less? Where is the woman of any consequence in society, or having the responsibility of any considerable household on her hands, but is afflicted thereby? We have a large field here, and our great duty is to prevent the progress onward to classes 2 and 3. I should be humiliated, sir, if my intellect or my ambition proved so small as to be incapable of becoming a neurasthenic. The brainiest, the most capable, and unselfish, the best of our race, are most exposed and most likely to become its victims.

The general exhaustion may be shown in an indigestion, not sound sleep, constipation, irregular or painful menses, headaches, ptoses, deranged metabolism, neuralgias, palpitations and weak spells, irritability, anaemia, etc., but we must not overlook the underlying condition and fail to interpret it properly, and only give a stimulant or the delusive Nux, some soporific or a pepsin; to temporarily whip on to greater use of borrowed strength, mortgaging the future, without resting; meanwhile the reserve or latent strength is being reduced and the patient is rushed on more rapidly and surely to bankruptcy.

Mortgaging the future may pull us temporarily through either a financial or a physical crisis, but we have to bear in mind that it must be paid back with interest; and he who doesn't reduce his expenses and increase his savings, after giving a mortgage, will most certainly collapse when the mortgage is due.

And right here is where the wise, honest physician finds his greatest obstacle; patients demand immediate help and results; they want drugs; they are irritated by our advice and sermons, and will fly to the greatest quack who will promise most and who stimulates them farthest, without caring whether the brittle, over-tensioned system snaps, and crashes down, a wretched broken mass; or, perhaps less sudden but more horrible, the stimulant is increased and increased until the unwary patient finds himself a wretched victim of morphia, whiskey or some other drug.

Sir, I believe that Nux Vomica, Alcohol or Peruna and coffee are capable of producing, or of urging on to advanced neurasthenia, much more rapidly than we are generally cognizant of.

Let us first rest, call a halt, reduce strain, change mode of life, demand more recreation, more rest especially from worry and long

hours; more sleep, abundance of outdoor life with cheer and pleasure, taking mind off self and work. This is one of the characteristics of neurasthenia, that the mind constantly reverts to itself—patient wants to talk of own ills all the time; switch him off as you may and back he comes; every side track and every event or article in the world will be twisted to have something like his case, and back he comes to himself and his cares like a boomerang. I have christened this the boomerang sign.

Nothing but constant diversion and keeping at it will conquer this and the better we succeed here, the sooner our patient will improve; and nothing helps like complete change from friends and old surroundings, with agreeable and ludicrous, funny or pleasant, and enjoyable out-of-doors games or sport—his hobby if he has one.

It is generally the man who has no hobby that goes down; it is well said that every one should have his hobby, to take his mind off cares. In this regard, those who have troubled to take statistics report that the average life of a steady man on the stock exchange, Wall street, or similar business intensity, is 12 years; but the man who goes on a big booze once in two or three months and abuses himself badly, burning his stomach, liver and kidneys; chilling his lungs, rolling in the dirt and all dissipation; stands it longer notwithstanding the abuse, because of the rest and relaxation to the mind.

Another great hindrance to the honest, capable physician is money and means. We can only adopt the measures that the patient's means will allow and unfortunately those patients require the most costly details of treatment in travel, food and surroundings.

It is very important for us to consider here to what extent neurasthenia arises from, or is influenced by indigestion, lithemia, insomnia, etc. Exhaustion of nerve energy is often the primary cause of inaction of the organs, and of physiological and metabolic derangement, but the early tremendous disturbances produced by indigestion (intestinal auto-toxemia, faulty metabolism and elimination) are so great, that the primary cause sinks into insignificance, and the person is suddenly a wreck, changing to better or worse just as the auto-toxemia is relieved or advances.

In fact, in the early stages of neurasthenia, before the toxemia and irritation has developed, patients feel not too badly, and later on each time as we succeed in removing these effects, the patient feels better; but just as soon as these are permitted to return, the purgatorial fires are fanned into fury, everything is demoralized, all seems dark blue, all hope, cheer and connected thought are paralyzed and

dismal despair controls; this secondary wretched condition works more harm and shock to the already depressed nervous system in a few hours than weeks of the primary neurasthenia.

Hence, I would warn all to give the greatest attention to these secondary conditions which soon become forcible primary causes, and ever remember the close relationship between neurasthenia and digestive disturbances, with toxemia and ptosis of abdominal organs.

My experience leads me to conclude, after laboriously following up the history and career of a great many cases, that 50 per cent. of all neurasthenia is produced primarily by lithæmia, gout or faulty metabolism, and indigestion, with the consequent irritation, auto-toxemia, insomnia, and debility. Or, in simple Anglo-Saxon, that just as much neurasthenia is caused by improper eating and exercise as by overwork and worry.

Sydenham long ago recognized suppressed gout, where the mind and nervous system chiefly suffered a real neurasthenia, and this occurred more frequently than disease of the great toe.

Alexander Haig, who may be a crank, and may have fads, yet who has dug up many important truths for the welfare of our race, regards that faulty metabolism from the gouty or lithæmic diatheses is the great cause of neurasthenic conditions.

Some go even so far as to define neurasthenia as the exhibition on the nervous system of indigestion and auto-toxæmia. I think it would be better to say that these conditions produce a large percentage of neurasthenia.

To further show the complexity of this part of our subject, I will state a few axioms or facts, and although they are apparently contradictory, yet they will enable us to find the truth:

1. I can recall a dozen of families; three or four of each have frequent attacks of neurasthenia; none of those are engaged in exhausting or sedentary employment, but rather easy, healthy occupations; yet all are subject to lithæmia migraine and constipation, and their attacks of neurasthenia come or go, as Haig and Sydenham said, with their gouty attacks.

2. On the other hand, we all remember many patients, whose attacks of indigestion, lithæmia or gout were brought on by fretting or worry which first precipitated an "attack of the nerves," or neurasthenia.

3. Again, we have often met persons, in the evening, who were bright and good-natured and hilarious, perhaps at a medical banquet; but the next day they were sour, cross and stupid; or, similarly, some

lady we had to visit next day for an attack of nervous exhaustion, and she assures us it was due to cheese or salad she had eaten at the party the night before.

4. Against this, digestion, metabolism and even appetite are suddenly all deranged by anxiety; we have all experienced this personally when some error or hopeless change was reported to us from an important patient, or when we were up against our examinations.

5. We frequently have this statement from our patients: "Well, doctor, the day that my digestion is bad and my bowels don't act, I can't sleep that night."

6. The converse: "Doctor, the night I sleep, my stomach gives me no trouble the next day.

7. Furthermore, ptosis of the kidneys, stomach, intestines, etc., is always accompanied by neurasthenia.

8. We have all observed a fall or injury cause a ptosis of one or more abdominal organs, and this derangement was soon followed by neurasthenia.

9. I can produce several cases where from sudden loss of wife, husband or favorite child, great mental depression and neurasthenia and ptoses of abdominal organs followed.

10. Again, as in a case where the late lamented Dr. Stewart had exhausted every means of diagnosis and was about to decide it to be neurasthenia, a simple laparotomy found a small incipient cancerous growth.

Thus, neurasthenia may be a symptom only of some other primary disease of digestion or metabolism, etc., just as these may be a symptom of the primary disease neurasthenia.

The true position is this: Neurasthenia is always due to exhaustion from over-exertion or irritation, whether it is primarily caused by overwork and worry, or comes secondary to indigestion, faulty metabolism, eye strain, uterine diseases, etc; hence, there is no use in treating the eyes, uterus, or kidneys alone, if trouble is primarily due to neurasthenia, and no success in giving nerve tonics alone if disturbance is primarily due to the uterus, the eyes or to gout, etc.

THERAPEUTICS AND TREATMENT OF SYMPTOMS OF NEURASTHENIA.

We have already considered the general management and prophylaxis of cases of neurasthenia, and from what has been said it is clear that the management of symptoms is the main thing left for us to do; and this entails a broader and more general consideration of the whole practice of medicine than is desirable to undertake here.

Let us not be discouraged; we should have just as certain results in the treatment of neurasthenia, if we can but obtain the conditions, as in any other disease. Remember, that nature returns to the normal, if we but give her a chance.

Obviously, neurasthenia produced by widely different cases requires different treatment. The patient who is exhausted by toxic disease, tuberculosis, gastric ulcer, excessive physical strain, should have more rest and less exercise. The dolting, brooding, despondent patient requires more life and excitement; and conversely, the one who has had too much society and excitement and loss of rest, requires quietude and rest.

Neurasthenia caused by sedentary and mental occupations, or by indigestion and lithæmia, should have abundance of exercise and outing. It is remarkable how a vigorous muscular exercise induces sleep, clears the brain, cleanses the blood, by burning up the waste and removing the cause of depression.

Pay great attention to digestive disturbance, constipation, intestinal, auto-toxæmia; see that the functions of the liver, kidneys and skin are performed well, as would be done in any other case. Support the abdomen by a proper appliance, and this is necessary in the great majority of cases, and yields most gratifying results; attend to gross derangement of any special organ; study the cause of insomnia. It is often due to slight intestinal irritation from undigested particles, or flatus, which would cause no trouble where sensibility was normal—a hot rectal douche often relieves this; frequently acrid secretion in stomach prevents sleep; some mild, alkaline drink to neutralize or the hot water flush, lavage, to the end of digestive tract is most successful. The head is often full, hot and throbbing, with the feet cold. Change this order of things by cold to head and heat to the feet; cold, very cold air is decidedly conducive to sleep, hence encourage sleeping outside or with window out. Hot bath and gentle massage on retiring; if in very nervous, excited state, give full dose of bromide or trional, get the effect but don't continue too long.

Now with regard to any special means of strengthening the nerves. The best observers have decided that these are mainly delusive, except so far as anæmia and general nutrition is concerned; then iron and arsenic and strychnia give us good assistance. It is questionable whether phosphates and hypophosphites, and other fancy preparations, act otherwise than stimulants. But there is a section of therapeutics that I wish to mention with some emphasis in conclusion—I refer to animal extracts. There is no doubt that in

many cases of neurasthenia, if not in all, that the exhaustion is farther back than even the nerves, that there is a deficiency in the products or stimulants normally supplied to them, and that the nerves respond when, and only when, this product or stimulant is present. I refer to the secretions of the ductless or blood glands. I will only briefly mention this here with a few illustrations, as we know the subject is but in its infancy yet, and is too large to be thoroughly discussed here.

We are all familiar with the depression, acute neurasthenia, that follows destruction of the suprarenals, thyroid, testicles and ovaries. I have found that a fresh, thoroughly active preparation of these glands have given most encouraging results in many cases of neurasthenia. I have been able to obtain quiet, healthy, refreshing sleep; remove the creeping, crawling, throbbing head symptoms, improve the general nervous excitement and depressed state, besides many other special conditions that time will not permit me to relate. In their use, the discouraging part is that these have to be continued until nature restores the exhausted glands; the encouraging part is, that it is not a stimulant but a supply resting the gland until nature restores the organ.

J. E. HANNA.

HYPERMIC TREATMENT IN SURGERY.

OF late years the method of treating disease by artificial hyperemia has assumed a place of great importance in modern surgery. The men primarily responsible for the position it holds to-day as a therapeutic agent are Bier, of Berlin, and his assistant and co-worker, Klapp. It has taken some time to place it upon its present scientific basis and to evolve the technique required, but now we have a method easy of application, possessing an extraordinary range of action, and in the hands of able technicians productive of excellent results. It has been called one of the greatest therapeutic discoveries of modern times.

What makes hyperemia such a valuable healing agent is the variety of properties which it possesses. It is in turn analgesic, bactericidal, resorbent, solvent and nutritive. The fact that it diminishes pain is a most valuable feature from the patient's point of view, and its rapid effect upon acute inflammations of the larger articulations, especially those gonorrhoeal in origin, is really remarkable.

To its bactericidal action we owe in many cases the absence of suppuration. That it has this property, or at least the power of diminishing the virulence of toxins in the blood, no one can doubt who has seen the effects produced in cases of severe infection which have been subjected to a rigorous course of obstructive hyperemia. This Bier has clinically proved. He says: "I have shown many times through exploratory puncture that large acute abscesses which held enormous numbers of staphylococci, and from which pure cultures have been grown, have in a short time through treatment by venous hyperemia become sterile; later, been transformed into clear serum, finally vanishing, and leaving no trace of their previous existence."

Its resorbent power is seen by the above and by the rapid disappearance of inflammatory exudates under its curative power. The quick healing of compound and ununited fractures is but one example of its reparative power. Hyperemia may be either active (arterial), or passive (venous). Obstructive is another term for the venous form. Active hyperemia may be induced in various ways. Of these heat is the most practicable, and Bier uses it in the form of hot air, enclosing the limb treated in a hot air cabinet, or exposing it to the action of a hot air douche.

Obstructive hyperemia may be induced in two ways, (*a*) by the obstructive bandage, and (*b*) by the suction-glass. The obstructive bandage, the older and more tried method, is used in treatment of the extremities, head, scrotum and shoulder joint, while the suction-glass is necessarily confined to more localized conditions, such as furuncles, carbuncles, puerperal mastitis, fistulas and sinuses. Special forms of suction-glasses are also used in treatment of cellulitis of the extremities.

In Bier's clinic in Berlin the following technique is employed in the production of venous hyperemia: When an extremity is to be treated, a Martin bandage about $2\frac{3}{4}$ " wide is used. This is wound in overlapping turns around the limb, some distance above the part affected. In affections of the hand or foot, it is usually applied above the elbow or knee. There is no danger of any exudation into the joint. The bandage should be applied only with the degree of

tightness necessary to compress the thin-walled veins and retard the venous flow, the calibre of the arteries being left unchanged, as a free supply of blood to the part is at all times imperative. If the bandage is applied too loosely, obstruction affects the lymphatic flow only. A safety-pin or tapes may be used to fasten the loose end of the bandage. For the thighs a thicker, wider bandage is necessary, as the thin variety used for the arms is liable in fleshy subjects to unduly constrict the parts. If one desires to limit the zone of hyperemia entirely to the affected area, the limb may be bandaged from its extremity up to just below the part to be treated. The points to be observed are:

- (a) There must be no pain.
- (b) One must be able to feel a full strong pulse at all times below the site of the bandage.
- (c) The limb must be warm, not cold.
- (d) There must be no subcutaneous hemorrhages.
- (e) The bandage should always be applied to a healthy area adjacent to the seat of disease.

The patient's own feelings are a good and usually trustworthy index as to whether the bandage has been correctly applied or not. If his discomfort is increased, or there is paresthesia of the limb, or the limb is white below the bandage, the application is faulty and must be remedied. To avoid injurious pressure effects the site of the bandage should be changed daily, and if the patient's skin is at all tender, an alcohol rubbing will harden it, and alleviate any discomfort that may have been caused.

A lengthy application of the bandage causes more or less edema of the limb. This usually disappears in the intervals between treatments, but if in chronic cases it is slow to do so, exposure to hot air rapidly hastens its absorption. In many chronic diseases the benefits derived from obstructive hyperemia are increased if the limb is at first immersed in water as hot as can be comfortably borne from five to ten minutes, an active hyperemia being thus first induced, after which the bandage is applied.

Treatment of affections of the hip joint by means of the elastic bandage has not so far been very satisfactory, on account of its anatomical peculiarities. The shoulder joint, however, lends itself readily to this method of treatment, and excellent results have been obtained.

The technique employed is as follows: A folded towel is loosely knotted around the neck. A stout piece of rubber tubing

covered with soft felt is passed under the axilla of the affected side, and the ends brought up over the shoulder, one end being passed through the loop of the towel. The two ends are clamped tightly enough together to obstruct the venous return. A cotton or flannel bandage is then fastened in front to the lower part of the tubing, passed across the chest under the other armpit and carried round across the back to be fastened to the tubing behind. This holds the tubing firmly in position, draws it toward the spine and sternum and relieves the joint from pressure. The duration of treatment should not in any case be more than twelve hours daily, and should be broken by frequent pauses to prevent abrasions and pressure necrosis, as it is impossible to vary much from day to day the position of the bandage.

To produce obstructive hyperemia of the head a piece of garter elastic of ordinary width is used. In length it should be almost the circumference of the neck. At one end a hook is sewn, at the other, a row of eyes, so that the degree of compression may be varied. The band is fastened behind, and a small pad may be placed over the spine to relieve the pressure at that point. If it is correctly applied, the countenance shows a slight blueness of color and slight edema, and the band may be left in position from twenty to twenty-two hours. Bier has used this method of treatment a great deal in acute inflammations of the scalp and face, but with persons suffering from arterio-sclerosis, it is to be used cautiously.

To produce obstructive hyperemia for treatment of diseased testicle and scrotum, these parts are drawn upwards and a piece of rubber tubing of small calibre, wrapped around with flannel to prevent an abrasion of the skin, is clamped or tied around the base of the scrotum. The sound testicle also may be included without injury.

The dangers and faults ascribed by adverse critics to the practice of obstructive hyperemia, such as increased pain, decubitus, pressure atrophy and varicose veins are, as a rule, directly attributable to faulty technique, and not to the method itself.

Hyperemia has long been produced by means of suction-glasses. Bier, after brief trial, discarded them, until Klapp improved them and brought them to their present state of perfection. The glasses are made in many different forms, dependent upon the part to which they are to be applied. They correspond in principle to the old-fashioned cupping-glass, but the vacuum is created by means of a rubber bulb or suction pump. To make them perfectly air-tight, and

to overcome any irregularities of surface, the rims are, in the Berlin clinic, usually smeared over with an ointment composed of equal parts of lanoline and vaseline. In the case of discharging wounds the surrounding skin is smeared over to prevent further infection through hair follicles and excoriation of the surface by the acrid secretions. The hyperemia produced in this way affects both the superficial and the underlying tissues. The application should not cause pain but only a feeling of gentle tension, and the color of the skin should be bluish-red or red, not white. Every precaution should be taken to ensure surgical cleanliness. The glasses should be mechanically cleaned, boiled, and then placed in a bichloride solution until wanted. With reasonable care, contamination of the rubber caps may be avoided, thus not only obviating the necessity of frequently sterilizing them, but also prolonging their period of usefulness.

Polyclinics offer a field peculiarly suitable for suction-glasses and the patients themselves soon learn to apply them intelligently, but they should always be under the supervision of a person experienced in this method of treatment. A larger suction apparatus is employed for the extremities, a rubber cuff encircling the limb tightly, while the air is exhausted by a suction pump. They are often combined with special orthopedic apparatus for passive motion of stiffened joints. The same rules hold for these as for other methods of obstructive hyperemia.

The use of hot air, as already mentioned, produces an active hyperemia, thus increasing the supply of blood to the part, and aiding in the absorption of adhesions, infiltrations and exudates. This method, therefore, has a wide field of usefulness in the treatment of chronic conditions and neuralgias, and may be employed in two ways, (*a*) with the hot air cabinet, (*b*) the hot air douche. The cabinet is simple in construction, being merely a rectangular box of seasoned wood, and lined with some non-conducting, non-combustible material. It is provided with a lid, and one or two apertures at the sides, to fit the limb or body part to be treated. These apertures are thickly padded with felt, and provided with cuffs of non-conducting material which are tied around the limb. The flame used is that of a Bunsen burner, or spirit lamp. The heat is conducted through a small funnel-shaped sheet-iron chimney which is bent at a right angle to enter the box. A square of wood is fixed opposite the mouth of the chimney to diffuse the current of air evenly throughout. The lid contains a few small ventilating holes, and a thermometer

is attached to show the degree of heat. This should never be uncomfortable to the patient, nor should any pain be experienced. The toes and fingers should be protected as a precaution against burns of the second degree, the sensitiveness of the skin being diminished by the intense heat. Treatment should be about one hour daily, this however to be regulated at will by the surgeon. After the treatment has been finished there should be a delay of from five to ten minutes before opening the cabinet, as sudden changes of temperature are injurious. The burner, if gas is used, should always be lighted before being placed under the chimney to avoid danger from explosion. The douche is made by adding an arm with a ball and socket joint to the chimney.

We have given a fairly full account of the technique employed in treatment by hyperemia; let us now consider some of the affections in which its value has been proved.

The first disease that Bier attempted to treat by means of it was tuberculosis of the joints, and what directed his attention to this as a field for experiment was the relationship between valvular heart affections and pulmonary conditions. Other workers in the realm of medicine had noticed the prevalence of tubercular foci in anemic lungs, the anemia having ensued as a result of certain heart affections, while in hyperemic lungs these foci were rarely found.

Farre and Travers, in 1815, published observations upon the frequency of phthisis with stenosis of the pulmonary artery. Rokitansky of Vienna, in 1838, said that a hyperemia of the lungs following upon valvular affections of the heart, practically rendered one immune to pulmonary tuberculosis. He also ascribed the like immunity, which has been observed in persons with deformed and deviated spines, to the resulting venous hyperemia of the lungs. It was these statements which drew Bier's attention to tuberculosis of the joints as a suitable medium to test the value of his method. He soon found, however, that active hyperemia was not efficacious in this respect, and so he confined himself solely to the obstructive method, and for this the elastic bandage is used.

The general rule in Bier's clinic is to apply the bandage twice daily for one hour; longer, if this does not produce satisfactory results. It has also been found where treatment has been successful up to a certain stage, and then followed by a stationary period, that a suspension of the process for eight to twelve days will usually have a good effect. Treatment unduly prolonged may cause a chronic edema of the limb, and an overgrowth of connective tissue in sinuses.

and ulcers. Elevation of the limb and hot air will assist in removing this edema. All cold abscesses should be opened, the pus evacuated, and the abscess cavity irrigated with a solution of normal saline. Tampons are to be avoided, as also curetting and probing. All dressings should be removed while treatment is being given, the limb being loosely wrapped in a sterile towel.

Suction-glasses are also used in open bone tuberculosis, and in tubercular adenitis, where there is breaking down of gland structure. The neck-band besides should be worn in the latter case. Unless a tubercular joint is extremely painful, fixation is not recommended, and the ordinary movements of daily life are permitted. With the knee joint in advanced cases, however, an exception must be made, as here danger lies in possible deformities arising from the softening of the bones. Contact of diseased articulating surfaces is to be avoided, and splints and crutches are necessary while the inflammatory stage is still present in lower limb to relieve the diseased joint from the body weight. In advanced cases with luxations and contractures, extension combined with hyperemia gives good results. Tuberculosis of the spinal column, the sacro-iliac articulation, and the os sacrum is treated by the suction-glass. Hyperemia is contra-indicated in (*a*) purely hydropic forms of tuberculosis, (*b*) where the functional result obtained by hyperemia is not equal to that of resection in a shorter time, and (*c*) where the patient suffers from phthisis, or amyloid degeneration is present. In the first case, aspiration and injection of iodoform are indicated; in the last, amputation.

In tuberculosis of the testicle, the technique described above is used. If the gland has broken down, and is adherent to the skin of the scrotum, the suction-glass may be used to remove the debris after incision. The swelling of the epididymis usually persists, and castration should be the last resort. Klapp, using the suction-glass and cuffs—the glass large enough to receive the hands—has been repeatedly successful with spina ventosa. Tuberculosis of the tendon sheaths is treated by obstructive bandage, the rice bodies if present being expressed through small incisions, and the incisions closed.

Acute localized inflammations, such as furuncles and carbuncles, are best treated by means of suction-glasses applied for forty-five minutes daily. If taken in time sloughs rarely form, but if the yellow blister has appeared, they are difficult to avoid. Occasionally incision is necessary, but only a single one is used, the former extensive cross-

incision being no longer deemed necessary. To prevent further infection, the neighboring skin should be well smeared with ointment, and this carefully removed after treatment by ether or benzine, and a fresh dressing of eucalyptus oil applied. All crusts should be removed. Carbuncles are treated in the same way as furuncles, and the usual constitutional regimen in either case should not be omitted. Carbuncles can generally be cured in about five days, carbuncles in about ten, and even those of diabetic origin heal fairly rapidly. When dealing with furuncles of the face it is well to supplement the use of the suction-glass by the neck-band.

Adenitis of the axilla of the neck and buboes of the groin yield readily to the hyperemic influence of the suction-glass, a special form of which is used in cases of subcutaneous and subperiosteal panaritis. ritis.

Most excellent results have been obtained in puerperal mastitis. For this, a large-sized glass is used, different forms of which are in the market. Early treatment will prevent suppuration and loss of gland function. Treatment should last about forty-five minutes, the glass being applied for five minutes then removed for three. If the milk is not sufficiently drawn off, the ordinary breast pump may be first applied and the breast thoroughly emptied, or if the nipples are in good condition the child may be permitted to nurse. Between treatments the breast should be firmly supported by a binder, and daily carefully examined lest an abscess exists, and in case of pus forming early incision is called for. Obstructive mastitis responds readily without incision, while infective mastitis usually demands it, and the hyperemia promptly relieves the pain. As a general rule, the shape and function of the breast are excellently preserved, except in very severe cases of phlegmonous form.

Hyperemic treatment of acute infections and inflammation of the larger articulations is highly recommended. The results here to be dreaded are ankylosis and general sepsis. Acutely infected joints may be divided into three classes, (*a*) gonorrhoeal, (*b*) metastatic, (*c*) traumatic. Here, as elsewhere, the earlier the treatment is instituted, the better the results. The obstructive bandage is used, and for about twenty-two hours. This may be divided into two treatments of eleven hours each. With good technique, pain and fever rapidly disappear, and passive motion of joint is soon permitted. If pus forms, the joint should be opened by a small incision or with a trocar, and the cavity flushed with normal saline. These irrigations should be repeated daily until bacteriological examination of the

exudate shows an absence of bacteria and loose sterile dressings should be used. With the subsidence of fever, the time of application of the bandage can be shortened. Excellent results are reported in cases of gonorrhœal origin.

In dealing with felon and phlegmon of the tendon sheaths, we have one of the best proofs of the value of obstructive hyperemia. If phlegmon of the tendon sheaths or a felon comes under observation in the early stages, a vigorous application of venous hyperemia will usually clear it up. When we remember the disposition of the synovial sheaths in the hand, the danger of letting it get beyond us is apparent. However, if pus forms, incision is indicated, and it should be as small as possible, as a large one, by unduly exposing the tendon, helps to diminish its vitality. Pus should be gently pressed out through the openings daily, and the wound irrigated with normal saline. Tampons and drainage are to be avoided. After the first day, with decrease of pain, passive motion may be begun, but should not be attempted for some minutes after removal of the rubber bandage, lest there be bleeding from the granulations. Active movements should be insisted upon throughout the course of the disease. Seventy-five per cent. of all Bier's cases healed with perfect function.

Acute osteomyelitis also has been successfully treated in this manner, Bier having reported cases as far back as 1893. With children, incision of abscess and application of bandage usually suffice; in advanced cases the usual operative measures, plus hyperemia, are to be recommended.

Acute inflammations of the head and neck are treated by means of the neck-band, which should be applied from eighteen to twenty-two hours daily. The condition of the patient must, however, be considered. Let the beginner try his hand first upon adults, as he will then be better prepared to grapple with the untoward complications which so often arise with children.

Inflammations of the floor of the mouth, facial erysipelas, cerebro-spinal meningitis, parotitis, acute and metastatic, middle ear disease, mastoiditis, parulis, acute coryza, diphtheria not involving the larynx, have all been treated, some much more successfully than others.

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DIPHTHERIA.*

LET us consider diphtheria first. Diphtheria is an acute infectious disease. It is generally considered also to be contagious. It is due to the absorption of the toxins which are produced by the inflammatory reaction set up by the pathogenic activity of the Klebs-Loeffler bacillus in any part of the body, but usually upon the mucous membrane of the throat. There is no such thing as pseudo-diphtheria. The name is a misnomer. Either the case is, or is not, diphtheria. Undoubtedly we get membranous, or at least follicular exudates, on the throat that clinically may be undistinguishable from diphtheria; but, in the absence of the Klebs-Loeffler bacillus, these exudates can not be considered diphtheric in origin. This is a practical paper, however, and therefore it would not seem advisable for me to set up an arbitrary standard in the diagnosis of the disease. You will notice that I have said that it is generally considered contagious; but personal observation of the disease has convinced me that, in comparison with some other contagious diseases, such as measles, whooping cough, or scarlatina, it is only feebly contagious, and might be classed as about on a par in this respect with lobar pneumonia.

At present the clinical and bacteriological conceptions of diphtheria are not entirely in accord. On the one hand, we have the enthusiastic bacteriologist assert that there is only one way to diagnose diphtheria, namely, by the microscope. On the other hand, the clinician affirms that he can unhesitatingly point to a particular case as one of true diphtheria, and to another case as one of simple sore throat. Naturally, these diverse views have caused considerable confusion. It is no doubt a fact that the specific bacillus has been found in throats that are free from membrane, and from constitutional reaction. The accidental presence of diphtheritic microbes in a throat which is free from inflammatory or constitutional reaction does not constitute diphtheria.

The widespread use of throat cultures by individual physicians and boards of health has simplified the diagnosis. The results of the culture are made the final court of appeal in all cases. At first sight that seems a delightfully simple and easy arrangement, but those who have been engaged in laboratory work, as well as those who have

*Practical observations on the diagnosis and treatment of diphtheria and scarlatina, read before the Ottawa Medico-Chirurgical Society, Nov. 15, 1907.

been studying diphtheria closely from a clinical standpoint, appreciate the fact that perplexing questions are constantly arising as regards both diagnosis and the regulation of quarantine. Without going far into statistical details, let me say that the clinical and bacteriological diagnoses were in accord in 85 per cent. of the cases admitted to the Contagious Diseases Hospital, Ottawa, in five years; that is, about 85 per cent. of the cases admitted showed the Klebs-Loeffler bacillus. In about 20 per cent. of the cases, swabs were sent in before admission. About 40 per cent. of the swabs sent in from suspected cases gave negative results. No positive diagnosis was made on microscope preparations got directly from the swab. These gave information of very little value. They, at times, show granular bacilli very much resembling some forms of the Klebs-Loeffler bacillus. These granular bacilli are generally harmless mouth organisms, for they do not appear subsequently in the plate cultures. The result of the cultures have invariably to be awaited. In our experience in the hospital, various factors were found to affect the rapidity of the growth and the certainty of the results. The recent use of disinfectants on the throat, the temperature at which the culture was kept, the site from which the swab was taken, and, most important of all, the freshness and moisture of the culture media, all had their effects. And let me say here, that if one wishes satisfactory results, one must prepare his culture media uniformly, and often. In cultures from some cases of clinically true diphtheria, no Klebs-Loeffler bacilli were found, even after repeated and careful trials. This was believed to result either from the way the swab was applied to the throat, from the unusual seat of the diphtheritic process, or from the recent use of disinfectants. What the true cause of failure was could not, at times, be ascertained. Sometimes, in spite of one or two negative cultures, the third culture again showed the organism. This is explained by the fact that the pharynx may be rendered completely free from diphtheritic bacilli by the use of disinfectants, and yet these organisms may keep on growing in accessory sinuses, and in the posterior nares, and ready to develop again in the pharynx and anterior nares whenever the opportunity offers.

On an average, about 40 per cent. of those in attendance on diphtheria cases show the typical bacillus in their throats, but generally without any appreciable lesion. These were not treated as diphtheria patients, for they certainly had not the disease. Further, no secondary case was ever positively traced to such a source of infection.

Again, there is no doubt that we at times find on primary cultures bacilli very much resembling the Klebs-Loeffler bacillus in appearance, but which on further investigation are found to be something else. There is one thing certain, that a more positive diagnosis can be made from the older cultures—say, 18 to 24 hours—than from those of 6 to 12 hours. From what has just been said, the following conclusions seem to be fairly justified:

1. A positive report from a throat culture is not an infallible proof that the patient has diphtheria; and, on the other hand, a negative report does not exclude the presence of the disease.

2. In cultures from cases of genuine diphtheria, the bacilli cannot always be found. Their growth may have been interfered with by the previous use of disinfectants; by long exposure of the culture outfit to light, heat or other unfavorable influences, or the situation of the local process may be such that it is not readily accessible to the swab. The bacteriological report is not therefore always infallible; but, at the same time, is by far the most reliable single diagnostic means at our disposal.

3. It is unwise and injudicious to await the bacteriological report in suspicious cases before administering antitoxine, because the laboratory diagnosis is not always infallible.

Notwithstanding the splendid results which have been attained by laboratory methods of diagnosing diphtheria, it is nevertheless true that equally splendid results have been attained by purely clinical observation. In the great majority of cases, thorough examination and careful observation and consideration of all the factors concerned will enable one to make a positive diagnosis of diphtheria without awaiting the result of bacteriological examination. This is particularly true in obscure and anomalous cases, and should always be employed where possible. In applying this method, it is always necessary to remember the three chief sites for the disease, and upon which the classification is based, namely, (*a*) tonsillar, or pharyngeal, (*b*) nasal, and (*c*) laryngeal. For, although often two, and sometimes all three may co-exist, it is generally true that one form predominates to such an extent that it may, for all practical purposes, be considered *the* form of the disease present in that particular case.

Primary nasal diphtheria is sometimes difficult of diagnosis. The practical points to be remembered are:

1. The thin irritating, sanious discharge (often brownish from the presence of blood) is quite different from the watery or abundantropy mucus seen in simple catarrhal inflammation. This difference

should at once lead to a more careful local examination, when the membrane can usually be detected.

2. The very considerable depression.
3. Gradual elevation of temperature, and not as a rule very high.
4. Characteristic odor (a valuable diagnostic point).
5. History.

Pharyngeal or tonsillar diphtheria may be confused with various forms of tonsillitis and pharyngitis. The most difficult are the milder forms, and in these, the bacteriological report is of special benefit and should always be utilized. A careful history helps greatly in the diagnosis. It will generally be found that the membrane is, at first, thin, translucent, gradually or rapidly but persistently spreading, becoming thicker, greyish and even brownish, uniform, firmly attached to the throat, reforms if removed. There is gradually rising temperature, considerable depression, and possibly albuminuria. The throat symptoms of measles or scarlatina may simulate diphtheria, but diphtheria *very rarely* complicates early scarlatina.

Laryngeal diphtheria is generally indicated when the characteristic laryngitis appears as the extension of a previous process. An exception to this occurs in cases of measles or scarlatina, but these, of course, may be differentiated by their other symptoms. The other special features of diphtheria of the larynx are:

1. The *progressive unremitting* dyspnoea with aphonia; marked supra and infra sternal recessions; extreme restlessness, usually slight elevation of temperature and, as a rule, rapid pulse. The disease steadily advances to alarming laryngeal stenosis and frequently death, if not relieved. Simple catarrhal laryngitis usually shows, on the other hand, frequent and decided recessions and the crisis is usually nocturnal. In this type, the bacteriological findings are not of great benefit, and in the majority of cases it is unwise to await the report.

To sum up the points in diagnosis, it cannot be too strongly emphasized that a bacteriological examination is invaluable in the diagnosis of nasal and tonsillar diphtheria. In the laryngeal variety of the disease it is not nearly so reliable, and in this form of the disease it is frequently unwise to delay treatment.

In the nasal type, by careful observation, a diagnosis can usually be made accurately from the local manifestations alone; but in the tonsillar type, the local aspect of the disease is so variable that it is very difficult to be certain of a diagnosis on this basis alone. In the

laryngeal, the facies, restlessness, stridor, progressive dyspnoea should not be mistaken.

The constitutional symptoms may be simulated by other diseases, but particular attention should be concentrated on the gradual onset, depression, slowly rising temperature, and albuminuria.

The antitoxine treatment needs no laudation, let alone any defense. It has reared its own lasting monument. It undoubtedly gives the best results when used early. Very much larger doses are required, and much less brilliant results obtained when used late. For, after a few days, the primary specific lesions become complicated by the invasion of other bacteria, and a mixed infection results. In such cases, active local and symptomatic treatment are urgently required.

In the ordinary tonsillar case, when seen early, antitoxine should be administered at once, and repeated every four or six hours, doubling the dose each time, till the symptoms show some remission. At the same time, active local measures should be carried out by spraying or gargling with some standard antiseptic solution.

The patient should be kept quietly in bed. In this connection it is deemed unwise to struggle much with a child. If it resists spraying, more harm may be done by thus taxing the heart than by the omission of the spray.

Stimulants may be used when the pulse demands, but not before, and the best stimulant is alcohol in some form, or strychnia. In the laryngeal type, owing to the spasmodic nature of the disease, it is better to use either alcohol or digitalin, or some other diffusible stimulant, such as ammonia or camphor. If paralysis occurs, it is generally not alarming, but if swallowing is very difficult, we may feed by gavage. The prognosis is good. The paralysis generally disappears in from three to six weeks through rest and by giving small doses of strychnia. In the nasal type, active antitoxin treatment is imperative. The irrigation method is the best way to treat the local conditions. They are generally accompanied by a very considerable depression, and consequently stimulants are required. As a rule, larger doses of antitoxin are administered than in the treatment of the tonsillar variety.

In treating laryngeal diphtheria, a rapid, concise plan of action is imperative. Antitoxin should be given in full doses. The patient should be placed in a steam tent. Then should follow a full dose of morphia and atropine. Stimulants are useful, but not strychnia.

If the dyspnœa is not relieved by the morphia in from 20 minutes to one-half hour, intubation should be performed at once. A little strong whiskey given immediately after intubation will often produce coughing and thus clear the throat and revive the patient. The tube should be left in from three to five days, and *precise* and *accurate* directions given to the nurse as to care and feeding. This is important. Nothing should be taken for granted. The necessity for clear directions will be apparent when I tell you that I once saw a nurse, who had been two years in training, trying to pour milk down the tube to feed the child, as she said.

Patients should be at once isolated, and those who have been exposed should be immunized by a suitable dose of antitoxin—not less than 1,000 units. Of course, isolation can be best carried out in a suitable hospital, but can also be satisfactorily employed at home.

My personal observations make me believe that diphtheria is only slightly contagious, and therefore that isolation is comparatively easy; but, nevertheless, it is better to err on the side of restriction rather than of laxity, and therefore all cases of sore throat or nasal discharge in children in schools, or at home should be at once reported to a physician and a careful examination made. They should be kept in quarantine till at least two successive negative cultures have been obtained. This period extends all the way from ten days to two or three months.

In conclusion, will you allow me to express my personal convictions on a few points? If parents were alive to the seriousness of throat or nasal affections in children; if physicians would enforce quarantine for all suspicious cases; if they would administer antitoxine promptly and in adequate doses; and if the antitoxine and intubation treatment were rationally and fearlessly carried out, the mortality from diphtheria should be practically nil. Three-fourths of the deaths that have occurred from diphtheria in the last four years in the city of Ottawa can be traced to neglect or delay in applying adequate treatment. Either the patients were seen too late, or, if not, they were treated too late. That is, they were not treated properly by either the parents or the physician. Why should any child die of diphtheria? Is it not a fact, and do not 99 per cent. of the men in this room believe that, if seen early, any case of diphtheria can be cured? And why cannot the patients be seen early? Simply because the parents or those responsible are not educated to the seriousness of the initial symptoms. Even when seen early, on

account of one consideration or another, active and rational treatment is not instituted, and rigid precautions are not taken to preclude the spread of the disease. And whose fault is it? Principally the fault of quacks and charlatans, and even at times it is the fault of some weak-kneed or mercenary practitioner.

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