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# TRANSACTIONS

OF THE

Twenty-third Annual Meeting

OF THE

AMERICAN LARYNGOLOGICAL ASSOCIATION

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HELD AT

NEW HAVEN, CONN.,

*May 27th, 28th and 29th, 1901*

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TRANSACTIONS OF THE TWENTY-THIRD ANNUAL  
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THE PRESIDENT'S ADDRESS.

LARYNGOLOGY AND ITS PLACE IN MEDICAL EDUCATION.

BY HENRY L. SWAIN, M.D.

FELLOWS OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION:  
You have just listened to the warm words of welcome from President Hadley and have learned how all Yale welcomes you here to-day. And while it is gratifying to feel that it is the great university and that for which the name of Yale stands in the world of to-day, which has brought you here at this time, I trust that you will presently discover that New Haven has all the other attractions which any city of her size can boast. I make haste to assure you that the City of Elms, clad as you see her to-day in all her spring-time beauty, as well as this seat of learning, opens wide her doors, bidding you partake of all that is hers. Forget for the moment, gentlemen, the busy lives which you live at home and indulge yourselves with all the good things of science and all the relaxation and pleasure which the recreation here will give you if you give it but half the chance.

And now that you are most warmly welcomed to our hearth,

it becomes necessary for your presiding officer to fulfil one of the duties and privileges of his office and inaugurate the scientific proceedings by a formal address.

The subject which naturally suggests itself is the one for which we have gathered together. Our Association exists for a definite purpose, and we yearly come from far and near not merely to grasp one another by the hand and receive that inspiration for new and better work which no one values more highly than I, and which can be obtained in no other way than by the free interchange of thought and idea both in the formal meetings and in our quiet side talks after the day's business is over. We assemble ourselves for more than this personal gain and enjoyment. We come because we love this Association and desire to perpetuate it in an ever widening circle of usefulness, and by fostering it we also contribute our goodly share to make for Laryngology a most worthy place among the sciences.

This then suggests our theme, "Laryngology and Its Place in Medical Education," and furthermore points out the first consideration, namely, the perpetuation of our Association as an element in the development of the great science to which we have devoted our lives. What can we individually and as an association do toward this end? Whether as an association we have been a success or a failure, whether Laryngology is on the uppermost level among the specialties, pre-eminent among them all for vigor, effectiveness and high views, or stands low in the list is not to be argued at this juncture. Whatever we are, we have become by the work done by our predecessors and by our own present endeavors. Hence we can perhaps best judge of present and future needs by contemplating the work done in the past by the means then at command and deduce from that what we can hope to accomplish by present resources and conditions. However much we may strive to glorify ourselves, we cannot forget that for all the opportunities we have to work and bring ourselves into yet greater prominence, it was our predecessors who, building on the work of former years, made our smaller or our greater endeavors possible. And furthermore we have to consider that what we too do is, when all is said, but the foundation upon which future generations must build. Hence can we be too careful in what we do? Ought we not at least once a year to pause and together contemplate the work done and see, so to

speaking, if by comparison it is up to standard? Have not the times so changed and the conditions of our present day needs so altered the trend of events that new rules should be evolved for our greater growth? Are not the needs of a builder of to-day vastly different as he starts to erect his sky-scraper from those which even he needed twenty-two years ago? Would twenty years ago one great political party have accused the other of imperialism, and the other, finding itself facing a tremendous problem which came with the force and weight of the resistless progress of the great message to all people, "Liberty to all and for all," have been compelled to consider and enact new laws the results of which we can now only dream of and conjecture? Shall we as an association find no new lessons to learn and merely learn the old ones more perfectly? I think not.

When our specialty was young, when together with the surprising advances of modern medicine as a natural evolution our society came into being, there were in the country but comparatively few who devoted themselves to the exclusive practice of any specialty, much less our own. With the discovery of the laryngoscope, years before, many were attracted to the study of laryngology, interesting as it then was on account of its newness, and there began to be chronicled the many phases of diseases of the larynx. Naturally these investigators desired to meet together to discuss and to compare their ideas, and so in 1878 there were banded together a certain number of gentlemen to form this Association, the object of which was as stated in the constitution, "the promotion of knowledge in all that relates to diseases of the upper air passages." Fifty men seemed to represent the most progressive thought of the time. How well they planned is evident at this day, as we, profiting by their forethought, force of character, and knowledge, count ourselves fortunate in being numbered with them. They had, however, an enthusiasm, an engrossing desire, an inspiring ambition to keep their struggling plant well cared for. They fostered it by contributing to its needs their best endeavors. The workers of those days are however, many of them not with us. During the past year another one of our founders has been taken from us, one who was always an active worker, whom we honored and highly esteemed, Dr. Rufus P. Lincoln. Seemingly capable of years of further usefulness, he suddenly succumbed to unsus-

pected disease and was wrested from our midst. Those who remain feel that, having borne the burden and heat of the day, perhaps they can leave the severer tasks to the newer blood which by careful selection they have taken into partnership to do the work of the hour. We have their counsel and their help, but do we each and all of us work as hard, as earnestly and faithfully as did they? Is the interest of this Association pre-eminent to all others? Have we that exclusive devotion which characterized their early endeavors? The question is one of personal responsibility. Each must answer for himself.

A danger which now lies and which must ever hereafter be before us is the outcome of the fact that, in the rush of progress, the tendency to specialize became too attractive as compared with the days of the beginning of this Association. Many have been induced to become laryngologists, and, as nasal pathology has become better understood, rhinologists. This latter, rhinology, seems so easy, perhaps because the organs are more accessible, that in these latter days the ambitious soul has felt himself a full-fledged rhinologist after a six weeks' post-graduate course; licensed, as one has said, to destroy mucous membrane wherever found. It became necessary, therefore, for our Association to recognize the fact that amid the throngs of devotees to the head mirror there were many justly pre-eminent, and fifty seemed a small number to put down as representing even the best; or to put it in another way, there were more than fifty eligible to the Association. We let down the bars, and have since numbered ourselves constitutionally at seventy-five, and now do we not find that number full small? Whether danger lies then in being too exclusive, or in the fact that our numbers, belonging to two or three special societies, may falter in their allegiance, or if they keep pace with all, that they must of necessity divide the energies which they might have put into one, are questions which we should consider, and concerning which, when your secretary, I have often thought. If the personal enthusiasm does not exist, who shall evolve it for us? Ought we not to exert ourselves each and all and keep up an enthusiastic interest in the welfare of the Association? If we are to hand down to our followers as great a heritage of growth and expansion as we have received, must we not work a little harder? It is not sufficient to merely live up to the letter of the law and read a paper once in three

years. Such lukewarmness on our part never will stand the tide of competition, never keep our standard way above and ahead of other organizations. We want the best papers and the enthusiastic presence of every fellow every year, and not once in three years.

What has kept our Association absolutely pre-eminent in the land is the careful selection of the candidates for fellowship, but it was left so largely in the hands of the Council and more especially its executive officer, namely, the Secretary, that many of us lost the interest which we could and ought to have had. During my first year of secretaryship I was appalled when I contemplated how much you trusted to that officer's judgment and advice. My predecessors were among the very best men the Association has ever had. You remember them—Lefferts, Delavan, Knight—large-minded men, of broad culture, and of wide reputation, who did their work well and unerringly. My successor is all that could be desired in efficiency and tact, and the immediate future is assured. But I know he feels as did I, and I am sure that I do not detract one jot or tittle from the honor and respect in which you hold those who preceded me in office, if I say to you that one of the greatest needs that this Association at the present moment has is that we all, individually and collectively, should take more personal interest in the management of its affairs. To this end the by-law which comes up to-morrow seems most pertinent.

It is only human to be more interested in an affair of your own creation than in the work of some one else. So from now on if the proposed by-law is accepted we cannot put upon the Secretary or the Council the sole responsibility of the selection of the fellows, nor can we fail to have the chance to interest ourselves personally in their election. By the present amendment we shall all have, present or absent, the responsibility resting upon ourselves if ever anybody is elected who is not deserving or is not desired by the majority of the members of the Association. Furthermore, the Council will, in the list which they send to you have merely endeavored to go over the names of all the men in the country and select from them those seemingly best fitted for the honor. If these lists from which they select do not contain all the names that they should, the responsibility again rests with each of us individually for not nominating to the Council those whom we

know to be eligible in every way to be co-workers and associates with ourselves.

If you stop to think for a moment you will readily see how much more the Council needs our advice than formerly when you consider how impossible it would be for any three or four men of the Association to know intimately all those engaged in our particular line of work.

Now if by this or any other means we, my fellow members, will keep up to its highest pitch the spirit of enthusiasm for our Association, the new men coming in will partake of it and there will never be a chance to raise a question but that we have the best work of every man.

If I have wearied you with this appeal, which is so personal in its application, pardon the zeal which provokes it, for it is the outcome of a strong desire to keep our Association in the future as in the past, second to none.

In passing, perhaps a word should be said, lest in speaking as I have about this, our own Association, I have left the impression that our sister organizations were in any way inimical to us, for this they certainly are not. Just as I fully believe that the ultimate good of mankind is being subserved by the dispensation of the consolations of religion by all the various creeds which make up the present day faith, so I also think the great movement toward a wider and broader knowledge in all branches of medicine is being, in a way, promoted by each and every medical society. It would, therefore, be stultifying ourselves were we in the least to imply that the work of the greater and more useful laryngology was being done by others with any less sincerity of purpose than by ourselves, as would be the case were we to leave the imputation that they sought in the least to add to themselves by detracting from us. Nor in wishing that we might do more and better work does it signify anything more than to hope thereby to stimulate endeavor, and thus emulating each other we should all work harmoniously together for the one grand aim, to learn all we can and contribute to the great work of all disciples of Æsculapius, to lessen suffering, to alleviate pain, to ward off disease, and, in short, to make the healing art more of the great force it should be in the world, free from all charlatanry and mercenary ambitions, the noblest of all callings.

And now, gentlemen, while much more might be said in the



line of suggestion as regards the great work of our Association. I have one point more at heart which I should like to ask you to consider for a short moment with me.

We have been considering the weal of our Association in the light of contributing as it has done in the past to the growth and broadening out of laryngological science. We contribute to it in another way which is suggested by the fact that we meet under the shadow of a great educational institution, and that almost all if not all of us have been or are teachers. In the broad sense of the motto which is on our program, *docendo discimus*, we surely can all be so classed. So let us, glancing for a moment at the past of medical education, get a glimpse of what the relationship of laryngology should be to the medical education of to-day.

Within the last twenty-two years the problem of medical education has assumed great proportions, *pari passu*, with the strides of the art and science of medicine. In those earlier days the best schools gave two courses of a part of a year each and at the end gave the applicant his diploma provided he seemed worthy. However, this did not signify very much, for in all the States any one could hang out the sign of doctor, and no one would inquire whether he had a diploma or not, an example of the most wonderfully incomprehensible carelessness or foolhardiness on the part of the American people that could be chronicled. It was left for the medical schools themselves to first improve what a diploma stood for before the public would listen for a moment to passing any laws which would in the least control the practice of medicine. Now in most States—in our own. I am sorry to say, only after much effort—no one can practise without a license, which to the public mind means that a certain prescribed course of study has been followed out. When they see a sign in going into a strange city they feel that the State guarantees them something in the way of knowledge. But are they usually satisfied therewith? The past has guaranteed them nothing and they are suspicious. They will even ask a stranger in the street passing by who the best doctor for such and such a trouble is. That implies specializing, but the main implication is that they want not only an M.D., but they desire a good one. Still they accept the lay interpretation, and the wonder is that we are as well qualified as physicians as we are, for the general

public has not only never helped us to improve ourselves, but has resisted our best endeavors in the way of good legislation.

If we had waited for their assistance, we should still have the old duplicate, two-session course of study. But with that spirit of high endeavor which must always signalize the work of the true physician, medical men sought in every way to improve themselves, and gradually the medical schools lengthened their courses until now the best require four years and advise a hospital post-graduate course.

With the lengthened course new problems have suggested themselves about the curriculum. How to divide the courses? Shall each student take every course? Is the old method of continued long courses in three or four subjects throughout a year or more better, or should not the student take concentration courses, putting all the thought upon one, or at the most two subjects, for a shorter length of time? What shall be done with the multiplying specialties? Shall each student be compelled to take every one of these? These questions interest us now to-day in common with all other medical educators, and while we are chiefly interested in the teaching of one specialty we must look at the whole problem in order to fitly estimate the value of the individual parts.

To revert to our former figure, it is necessary to have in mind the kind of a building and to what purpose it is to be devoted before the architect can advise with precision and propriety about the individual parts. The master builder always makes a rough form of what his arch is to be before cutting the stone. So here, setting aside for a moment the finer details, the problem is in any given case. Do we wish to educate men to be physicians or to be mere specialists, otologists, gynecologists, proctologists, or do we desire to lay a broad foundation of the scientific branches, build thereon the clinical edifice and into the latter put such elements of specialism as shall give the man the equipment necessary to cope with disease as it arises, knowing enough of all to appreciate the needs of his patient and his own limitations, and well enough grounded to appreciate his own qualifications leading to ultimate specialization. The crying need of the times is not for specialists, but for those who will make a special training of general medicine, internal medicine. But the days of domineering pedagogy in medicine should be numbered. To



give a degree because the student has attended certain courses and paid his tuition, regardless of his attainments, is no better now than it used to be, and we must live up to our duty as it presents itself to-day. If we simply, because we have a little more to teach, take a longer time to do it, wherein are we better than our predecessors, who, having less to teach, did it in a shorter time? Considering what we have to draw upon, what heights and depths of knowledge, we might question ourselves, Do we do so much better, higher-grade work than did the teachers of twenty-two years ago? I am afraid not always, and if not, why? Largely because we still have grammar school methods in teaching. The academic courses in our universities have been struggling with the question and are gradually solving it by increasing the electives, giving more freedom and independence to the student mind instead of goading him on to do the same old tasks by the same old methods which his great-grandfather did in the study of Latin and Greek, as was formerly the case. Notwithstanding this trend, it is still felt by the leading educators that a certain amount of work must be done. While much more freedom is given to the student in his electives, he must take a certain amount of work in order to be a candidate for a degree, which latter he can only attain by proving his title thereto by passing an examination. In other words, if he can in any way attain a certain standard of knowledge he can obtain his degree, but the latter may be conferred for knowledge gained in various prescribed ways, and not always by the wearying monotony of so many hours of Greek, Latin and Philosophy. It seems as though if this banishment and ostracism of petty pedagogy has begun in the academic course, it should find its best demonstration in the professional schools. Here preliminary education is supposed to be finished. From them, therefore, any restraining weight of old-fashioned schoolmaster methods can be removed.

If this is true of the subject of medical education in a general way, surely argumentatively it would apply with the greatest of force to the teaching of specialties. But to make the problem clear, it may be well to map out what might be considered a fairly ideal course of medical study. A certain standard of knowledge should be attained by the student in the scientific branches. He should have learned a prescribed amount before

he is allowed to enter the practical work. Let this be at the end of one, two or three years of work, according to his ability or the amount of work previously done. The examination admitting him to the practical side of his work should be most rigid, so that no unfit material would be allowed to get past and hold back the progressive work in the higher practical courses. This would correspond to the "Physicum" of the German university, and could be the outcome of several methods of arranging the courses.

It would seem particularly incumbent upon any new plan of work to so arrange it that it is not necessary for every student to spend the same amount of time in studying each branch. Why should the faculty say to the student in advanced work of this kind that he must have learned all that is necessary to pass the examination in a certain prescribed time? Why would it not be better to make the odium of failing to pass an examination so great that no student would apply until he knew that he was fit and ready? Would it not be better to give him a minimum amount of time which he must have spent upon the work and let *him* say when he thinks he is ready for his examination.

If it seems best to still continue to keep the students in classes, the concentration courses which have been undertaken in some of the medical schools seem to recommend themselves as perhaps better suited to such a professional and scientific course as the study of medicine. By that is understood, instead of taking four or five subjects and spreading them through one or two years, to concentrate all the work of any given period entirely upon one or two subjects, and in this way hold the student's interest instead of dividing it. If therefore by proper adjustment of the courses and their length to the needs of the student the "Physicum" has been passed and the practical work begun, why say that it must be two years more or that in two years he is expected to come up for examination for his degree? Let that be a minimum. Let him know that he must pass a severe but fair examination. Let him understand that to be dropped will make him have to face an even harder one next time, and if left to himself he will not come up until he feels prepared. Do not compel him to spend one year devoted to the study of medicine, surgery, pathology and obstetrics, and one year in the special studies, which now number a dozen or more, and tell him

that he must pass an examination in every one whether he is interested in them or not. If it still seems best in the practical work to adhere to the class routine, a point even more debatable than in teaching the scientific studies, one should at least expect to allow the student some latitude in selecting what courses to take.

We do not intend to graduate specialists, but if a man intends to be an otologist, teach him: medicine, surgery and pathology if you will, all that he can assimilate, but why dwarf the growth of his tree of knowledge by weighing him down with a course of obstetrics lasting a year and make him take another year's work in gynæcology. Or the other way round, suppose he is to be a gynæcologist—and you are bound to allow that a man will think for himself, or if he cannot, the sooner he goes into a trade the better—do not stultify his intellect by saying that you and you alone have the right to say what he shall study. Such a choice should be the outcome of your greater knowledge of his probable needs, tempered by his desires, taste and ambitions. Why make him in his final clinical year spend an *equal* amount of time on ophthalmology, otology, rhinology, laryngology, dermatology, orthopædics, psychiatry, pædiatrics, hygiene, and a long list of other subjects which are not pertinent to his chosen specialty? If he is up to the standard of intelligence which we must tend to promote by encouraging its expression, he could select certain courses which were cognate to his chosen field of work, or if he was not quite sure which he had better take, what more useful place could the faculty fill than to advise on this very point? A very different position from the one usually taken *i.e.*, that it does not make a bit of difference what a man wants to do, he has got to take all these things before he can come up for graduation and pass an examination in all before he can have his diploma. How much more dignified it would be to say to the student that he would be expected to present before graduation a thesis on some subject which he will elect as one of major interest to him. Upon such a subject he will have to pass a rigid examination and also upon three or four cognates, similar if you will to the usual courses leading up to the degree of Ph.D. That would allow him of a fair range of work in the special lines and yet does not compel him to take work that is not interesting or agreeable to him.

Suppose he elects, for example, a surgical subject. His surgery would then be his major, and the work of the entire last two years would have this in mind. In his first year he would be obliged to take four of the different subjects which are demanded of a student in that year, and he could elect to take all the surgical work allowed and in addition medicine, therapeutics and pathology. Let him then have an examination if you will. The second year he would select from the specialties those which would bear on his subject, and would learn of abdominal surgery, of gynecology, of otology, orthopædics, take courses on bandaging and all the clinics he desired to fill in spare moments. Would that not be a fair course to be supplemented by a hospital?

Now, what is to be said of the man who, when he enters his clinical period, does not know what he wants to do? He will be able to find out of the entire possible list enough to interest him, and if he desires to develop into the general practitioner he will be able to choose many things in medicine as a major, and his cognates are numerous and interesting. He is obliged by the rules to take enough work, so that when he graduates he will not be an ignoramus, and if the same results follow the possibility of electing what course to take as has been the case in other branches of educational work, from the very fact that the student is not compelled to take anything he dislikes he usually, instead of taking too little work, takes all that he possibly can, and I am gratified to learn this is the actual experience of some of the leading medical schools, where some of these ideas have already been adopted. Freedom encourages work rather than lessens it. As compared with such men who have zeal and earnestness in their work, the indifferent student soon drops behind and finally out of medicine altogether into some more fitting line of work.

Now, all this has been to lead up to the teaching of specialties, and we can illustrate the point in our own chosen field of work. We have for years all of us devoted our time to the teaching of laryngology, but there are none of us, I take it, so sordidly self-centered, so narrow-minded, so fixed upon one idea that we cannot interest ourselves for one moment in the work of our fellow laborers in the great cause of education and profit thereby. We all of us, as just stated, teach laryngology either directly or

indirectly, by showing the world what good laryngologists should be and should accomplish. Our example is freighted with good or ill according as we live near or far from our high privilege. If in our work and in our teaching we see only the spur of the septum and never take our eyes from it as a source of all disease to which flesh is heir, the opprobrium to which we, perhaps, too easily allow ourselves to be open, we shall soon assume that position among our fellow practitioners which we would richly deserve. If on the contrary we always stand as believing our work to be only one small but important part of the great fight against disease in the world and in aiding and prolonging a better life in those who depend upon us we shall evolve our true mission and be respected as is our just desert. We must not be looked upon as viewing tuberculosis, for example, simply from the dollars and cents which we may garner by helping the victim of laryngitis to be more comfortable in his latter days. We should be found in the forefront of the movement which has brought all the world to realize that tuberculosis is a preventable disease, that we have not got to fold our hands and allow the monster to stalk up and down the land seeking whom he may devour, merely praying for the crumbs which may drop from his table, so to speak, but should continue, never ceasing to cry to the distressed and ignorant victims that their disease is an infectious one and by their carelessness their own most loved and cherished ones are immolated, sacrificed to the monster. That if they would only be careful enough, how Utopian it sounds, this devouring power could be stayed and in the years to come claim for its victims as really few as does smallpox. The stand we must take is that we can control the fearful ravages of this dread disease, and we must teach this in no uncertain language to our classes. We must not leave this to the professor of the diseases of the chest alone. We must be more than laryngologists. And what shall I say of the present teachings and opinions regarding tonsillitis? We can no longer appropriate it as we used to as our own. The general practitioner has stolen another of our dependencies and now we are told that instead of the rheumatoid diathesis causing the tendency to inflammation of the lymphoid structures, the latter are ports of entry where infection takes place locally and then generalizes in many cases into what we knew formerly as a typical attack of acute articular rheumatism. All these years



we have been having the cart before the horse, so that not only has the professor of internal medicine to state that rheumatism is an acute infectious disease, but he as well as we have to teach that one of the sources of that infection is or may be the tonsils.

Without running on over the long list that might be brought to show our connection with the greater world of general medicine, enough has been said to point clearly to the two salient points of any orthodox, up-to-date treatment of the subject of laryngology as applied to undergraduates. We must in teaching it give two distinct courses. One, a general one, for any or all of the students to take. The other special, where the men who make it a major or a greater cognate can get their further insight into the work, which shall give them all they can assimilate at a time and pave the way for further development if they so choose into full-fledged specialists.

Of course this is most remote from the suggestion of expecting to graduate a fully equipped M.D. and at the same time an expert laryngologist, but we can and should give the man who desires it more of that kind of work than the one who does not.

As to precise methods and details, it would be folly for me to attempt to discuss them in the presence of the Nestors and very creators of the art, so I will but briefly refer to that part of the subject, more that I may round out these remarks than that I may hope to offer anything new or suggestive.

Whereas it might be considered debatable whether the old-fashioned didactic lecture has not outlived its usefulness, especially when such a mass of text-books and current literature exists where the desirous soul can quench its thirst for knowledge beyond the possibility of asking for more, yet this very plethora of material makes it the more incumbent upon the teacher in these days to select assimilable and proper pabulum for the growing mind and serve it out in proper proportion for easy acquisition. No student can do this as well as his instructors even when we are arguing along the lines of liberty, as in this address. Then, again, think how much that is really new is transpiring each year. In referring to the old didactic lecture I had in mind cases where for seventeen years the same material would be served up year after year to the students, the jokes and sarcasms, the witticisms and the dry, meaty problems, following each other with unfailing and unaltered sequence. That was

very far from the lecture of to-day, which I think should be so bright, so full of new and interesting facts that it would serve to introduce the student to any given subject better, perhaps, than any other way I know.

Now, in large clinics in large cities this may be a clinical lecture illustrated by patients, where also operations demonstrating methods and means may prove helpful in impressing ideas. In the small cities and clinics it may seem wiser, and I am not at all sure that it may not always be the better way, to give the lecture where the student is not attracted from the subject material at hand by some freak of the patient or some incident of the operation.

There is much to be said upon the point of tersely, clearly and interestingly impressing by word of mouth certain facts which seldom would be gleaned by the student, even if he read, and give to those who will never trouble to look the subject up a few facts to guide them when they are actually brought face to face with disease in their active practice.

I believe the best plan to be, as in most schools to-day, to lay out a distinct scheme of lectures, say fifteen or twenty, and in them discuss in a general way the various important subjects of our specialty, especially where they reach out toward general practice, or where the general practitioner is most liable to hit them. Make this as interesting and instructive as possible and leave it open to all comers. It will serve to introduce the men who make it a major and will usually be ample for a minor. Similar courses to be given in all specialties. Then subsequently in rhinology and laryngology, those who wish to go more deeply into the work are divided into sections and are taught to use the laryngoscope and the rhinoscope, first upon the phantom and then upon educated living subjects. When the difficult technique of complete examination is so thoroughly learned that the details of the movements are so mastered as to be nearly reflex and mechanical, then they are to be turned in sections of at the most four each into the clinics, there by actual contact and study to develop first diagnosis, then details of treatment, and finally some of the easier operations. These may all be taken by every aspirant for a degree if he chooses and can be accommodated, preference always being given to those making the subject a major. And if all is taken the student must have at graduation

a good clear understanding of the most common diseases and sufficiently clear that he will know his limitations. He can, if laryngology is a major, be put through a genuine test such as a first class thesis on some scientific research work. He will then be given a written examination to prove his general knowledge of the subject, and then by being given cases to diagnose and report in the clinic, prove his more intimate acquaintance with the finer details. The written examination can also be taken by the men who have made laryngology a cognate.

When such a "major" graduates he will be ready to go to any other or larger city at home or abroad and begin to develop his attainments in the capacity of an assistant.

As a "minor" he will probably take a course of lectures and one of the short practice courses in learning the technique. This will put him in a position to develop later if he will, or will round out his work for general practice.

Now, what would be the result of such a course of medical study? The men would all have a broader and more general interest in their work. They would not have to drag through courses of lectures which did not interest them and from which, as proved by the results of examinations, they got but little if any good. While it might result in but few men attending some courses those who did would reap many fold more benefits than in the old way of seeing things from the rear of a large jostling crowd of eager students. If a man has a genuine desire to learn he can do so and do more even than before, and we as teachers, like the students, will enjoy our work immensely better, for nothing is more harassing than to attempt to give of our store of knowledge to a man whose heart is not in his work and who goes through it simply to get his sheepskin. Away with such "cramming" processes in the pursuit of a profession. And if all this is true shall we not get better men out into the world and thus promote the progress of medicine and the advance of laryngology? Even if we do so by ever so little, then is the time you have so patiently borne with me in this consideration not altogether wasted and valueless?

Now, having fulfilled, all too poorly, I fear, one of the duties devolving upon your presiding officer, I hasten to do the next and much more pleasing one of opening the real work of the day. Much lies before us, a splendid array of papers. Let us go into



our work with spirit, and with this I also desire of you a large modicum of forbearance for the obvious shortcomings of your President.

*Paper.*

A LEAF FROM THE ANCIENT HISTORY OF THE  
ANATOMY OF CATARRH.

BY JONATHAN WRIGHT, M.D.

It certainly seems fitting, meeting as we do beneath the umbrageous elms of this classic city, that some one should attempt to signalize the event by dealing with the traditional lore which for two hundred years has been associated with the name of New Haven and of Yale. In order, however, that none of you may be too much shocked by the intrusion of an exceptional departure from our usual routine you have been sufficiently warned, I trust, by the title of my paper on the program, to be prepared to depart a little from the beaten paths of modern laryngology and rhinology and seek the more unfrequented by-ways pertaining to our life work. I am sure it will be a relief to you, as it has been to me to desert for a moment the cacophony of Rokitanski, Dmochowski and Zuckerkandl and seek a grateful refuge in the broad bosom of Hippocrates and the catholic companionship of Plato and Aristotle.

It has been frequently asserted, perhaps in the ardor of debate, that there is no such thing as catarrh. The records of it are coeval with those of the human race. In fact, Darwin gives us good ground for believing that we might pursue the subject even further back and into the pedigree of our simian ancestry, for he says that monkeys are not infrequently afflicted with it in their native arboreal habitat. (Descent of Man.) But coming down to comparatively recent times we find a record of about the year 3500 before Christ, in which it is set forth that King 'Sahura, of the fifth dynasty, was grateful to his physician Sekhet'enanch for having made his nostrils well."\*

\* Edward Meyer: Geschichte des Alten Aegyptens II., p. 95.

To our shame and confusion, on reading further, we find that this old rhinologist requested as a reward that a tablet commemorating the fact should be set up in the ante-room of the king's palace. Whether this suggestion of unethical advertising was carried out in its entirety or not, I do not know. At least it is a fact that the slab, with the inscription and the physician's portrait and that of his wife, was found in the king's tomb. We can therefore only comfort ourselves with the reflection that there is no record of his having been a Fellow in good standing of the Ancient Egyptian Laryngological Association, and we may also conjecture that perhaps, after all, he was nothing but a general practitioner, for the phrase "made his nostrils well" was in all probability a mere figure of speech, in Biblical language, for the restoration of the royal health.

We must therefore seek a later era for a surer indication of the beginning of the conception of catarrh of the upper air passages. It is important that we note a passage in that most ancient of all medical books, the so-called Papyros Ebers:\* "There are four vessels in the two nostrils, two carry blood and two carry mucus." This crude conception seems the more remarkable because the nostrils were the route by which the brain was removed in the more expensive modes of the universal practice of embalming the dead. This book was supposed to have been written, or rather compiled, at least 1,500 years before Christ, or about 200 years before the exodus of the Israelites. When we come to search the Susruta,† the most accessible of the old Hindu books of medicine, of immeasurable antiquity, we find not a glimmer of an idea of nasal anatomy. We find ourselves quite at home, however, when we note that their ignorance of anatomy was counterbalanced by the dogmatic assurance with which they discoursed as to disease and especially as to its cure. There are thirty-one diseases of the nose. Although the cure for some of them was likewise applicable to "a morbid baldness and a reddish yellowness of the hair," a careful perusal of the description of the local therapy will convince the unprejudiced critic that barring the compressed air spray it seems to have been about as far advanced as much of our present non-operative treatment. I

\* Rendered into German by Dr. H. Joachim, 1890, *vid.*, p. 181.

† In the Latin translation of Hessler, 1844.

have, however, limited these remarks to a consideration of the anatomy of nasal catarrh as revealed in ancient medicine. We have seen the poverty of the Oriental records as to it. This condition of ignorance is amply explained by the horror with which the Egyptians and Hindus alike regarded those who had been defiled by the contact of a dead body, and by their reverence for live animals as the hosts of the transmigrated souls of the dead. This prejudice passed with their civilization into the Greek world of science. Vestiges of it still linger with us. There is a hint as to the origin of Hippocrates' idea of the source of catarrh to be found in Herodotus. (Lib. iv., cap. 187.)

"The Libyans, when their children come to the age of four years, burn the veins at the top of their heads. . . . others burn the vein about the temples. This they do to prevent them from being plagued in their after lives by a flow of rheum from the head, and such they declare is the reason they are so much more healthy than other men."

Herodotus shows great perspicacity in attempting to forestall attacks upon his veracity in this matter, for he has not escaped charges of mendacity in historical matters. "In all this," says he, "I only repeat what is said by the Libyans." Herodotus would be astonished to-day in visiting the sublunary world to find that the application of this Libyan practice in adults has been transferred from the top to the under surface of the cranial cavity, and that we still interfere at the age of four to prevent the flow of rheum, and that we still advance claims for results which no self-respecting Greek could unhesitatingly accept.

Turning now to the real and the pretended writings of Hippocrates, we there find a plainer indication of that error as to the origin of nasal and other catarrhs which lingered in medicine for more than two thousand years after the death of the sage of Cos. There is, however, as we have seen, good reason for believing, that the idea existed in a still more hoary antiquity in the medical beliefs of the earlier civilizations which flourished before the birth of modern history along the banks of the Nile and the Euphrates. I refer to the doctrine which taught that the cranial cavity is the origin of catarrhal discharges. Wherever Hippocrates may have derived the idea, it takes shape in the conception of the brain as a gland, which not only sucks air, odors

and moisture up through the sponge-like bones and the filter plate of the ethmoid (The Flesh, No. 16), but there redistills them into humors which trickle back through the cribriform plate to various localities. He named seven:\* the eyes, the nose, the ears, the stomach, the throat and lungs and the lips (The Glands, II.) The acrid humors were distilled to these parts by various routes, all starting from the brain. When we realize that the ancients—the Orientals, Hippocrates, Galen and their followers—knew nothing of the muciparous glands, and, of course, nothing of the functions of these microscopic structures, and when we realize the absolute mental necessity of finding some explanation of the origin of the secretions which bathe not only the respiratory tract, but the whole gastro-intestinal mucous membrane as well, it is not difficult to understand the dawning intelligence of primeval man accepting the perforations on the floor of the cranial cavity in the dried skulls as having been made for the trickling of fluids to parts below. In the Norse and Lombard legends we read of savage chiefs drinking from the skulls of their enemies, and we know they must have used the upper segment, and we can easily imagine the train of thought as to the function of the holes in the lower half, unfamiliar as they were with the fresh specimen.

Much of this idea is to be found in those Hippocratic treatises which are supposed to have been of later date than the founder of his school, but it is clear from a passage in the "Airs, Waters and Places" that Hippocrates himself, to whom all critics ascribe this book, believed not only that stomach catarrhs have their origin in the head, but he appreciated the clinical fact that nasal catarrh produces gastric symptoms: "Their bellies are subject

\* Occasionally one may find in the Hippocratic writings, but especially in the fragments preserved from the rival school at Cnidos, evidences of the Hindu and Oriental origin of Greek medicine in the respect which is paid to numbers, each locality or each influence being credited with a certain definite number. Thus there were so many diseases of nose and the lips and so many of the liver in the Susruta and again in the scanty reference we have to the School of Cnidos: See Galen (I.—VII. *Kulm T.* XV): "Hippocratis de acutorum morborum victu Liber et Galeni Commentarius." Pythagoras, who was one of the travelers in the Orient who may be conjectured to have introduced much of Eastern medicine to the early Greeks, is said to have had a great influence over the doctrine of the School of Cnidos.

to frequent disorders, owing to the phlegm running down from the head." Even Aristotle made the egregious blunder,\* great biologist as he was, of asserting that at the top of the nostrils there is a kind of a lid, which rises at the time of inspiration to let in the odors. Plato elaborated this idea still further by supposing that odor is of the nature of fire and ascends upward. In this we recognize Pythagorean ideas from the ancient Magi of the Orient. In Celsus, the only Latin medical writer we now possess, who wrote in the faultless classic idiom of Virgil and of Horace, we find no variation from the earlier Greeks in this matter.

The conception of the nostrils as the cloaca of the brain was not only accepted by learned men and physicians, but it permeated the structure of the ancient Greek tongue, as seen in many colloquial phrases, the same term being applied to a man's stupidity as to the evidences of nasal obstruction. In the Latin language this was carried to still greater lengths and is frequently noted in the poets and satirists. Horace, Juvenal, and especially Martial, present numerous instances of it. The term *Aprosexia* having had no such ancient anatomical affinities, has been of late years selected from a Greek lexicon, and, with the free and easy way of medical etymologists, the Latin suffix *Nasalis* has been tacked on it, and the phrase has been erected into a term for a clinical phenomenon which the Greeks indicated by the name *Coryza*, applied to a driveller. In the Latin classics "*Emuncta naris*" refers to the mental acuteness of the individual, because he was supposed to have the nasal pathway to the brain unobstructed.† Martial, from whom one quotes with trepidation‡ in mixed company, indicates a prejudice against a mental rather than against a physical infirmity when he writes, "*Nasutum volo, nolo polyposum.*"

In Galen's time, through the schools of Pergamos and of Alexandria, enormous strides had been made in anatomical knowledge. We can imagine the horror with which the Oriental soul viewed these strivings after light in old Egypt under the Ptolomies. We get a glimmer of it at Rome in Celsus' narration of vivisection as practised by the early anatomists. A glance

\* *De Anima*.

† *Horatii Satira*, I. 4. 8.

‡ *Martial, Epigram. Lib. XII.—xxxviii.*

at the headlines of a modern yellow newspaper is enough to give us a hint as to the impulse for such gossip.

Notwithstanding the great progress made, if one will keep in mind the quotation I have cited from the Papyros Ebers, one will see its trace in Galen's description of the anatomy of the internal nose in the "*Instrumentum Odoratus*": "Each one of the nostrils is divided at the upper part into two portions. One of these divisions leads to the mouth, and the other one upward, so that it starts from the entrance and ascends to the brain itself. From this there are two hollow, oblong offshoots (olfactory lobes?) having their beginnings from the anterior cavities and reaching to that part of the skull where the nose has its origin. At this situation of the sieve-like bones (the ethmoid), the function of which the name indicates, and the thick membrane, with which that of the bones is continuous, is pierced by many openings. Through these first the thicker parts of the excretions from the brain are transmitted, for things more vaporous mount to the sutures and escape from them. The thick part, such as phlegm in coryza, is carried downward, having first passed through the dura mater. After having been strained through the sieve-like bones it passes into the channels of the nose," some being expelled anteriorly by blowing, and some running down behind into the mouth. We see therefore that Galen's anatomy only made more specific and definite the old erroneous conception of the Orientals and of Hippocrates. Not only was his conception of the cranial cavity as a watering pot for the rest of the body unshaken, but it was apparently rather made the firmer by the frequent examination of the cullender plate of the ethmoid in the dried skull.

Before passing directly to the Renaissance of anatomy among the other arts and sciences, over a period of 1,400 years, we must pause a moment to note the observation of Theophilus, a physician bearing a military title at the court of Heraclius, the Emperor of the East, at Constantinople, in the seventh century. He indeed accepted the doctrine of Hippocrates and Galen, that the inspired air passes to the brain through the cribous plate, and the fluid secretions drip back into the air and food ways, but he recognized the olfactory nerves as such and as extending to the "foramina of the nose," the perforations of the cribriform plate. Galen had not accepted them as nerves, and Theophilus, although



regarding them as the first pair, did not observe the filaments passing through the perforations.\*

Nine hundred years later, Berengar del Carpi, professor of anatomy at Bologna (1502-1527), who did a thriving business in Rome, curing the clergy of syphilis: La Vita di Benvenuto Cellini (Guasti, 1890), with his new fangled mercury medication, was the first who, despite his subservience to and reverence for Galen, made more original observations on the anatomy of the nose and throat than any man of whom we have any record. He denied that the cribriform plate was pervious to the passage of liquids.† The first to describe the accessory sinuses in a recognizable manner, he declared the fluids in the cranial cavity found their way through the Sella Turcica into the sphenoidal cavity. He inferred this from his mistake in regarding the nutrient canal of the bone as the channel of communication. Clinically, we are in a position to-day to assert that the sphenoidal antrum is the occasional origin of post-nasal catarrh. The pituitary body being recognized as the part of the brain which elaborates this fluid, and having its site in this locality, seemed to lend force to this suggestion. Zerbi, who lived in the latter part of the fifteenth century, a little before Berengar, had noted the filaments of olfactory bulbs, but supposed they were processes of tissues through which the cerebral secretions dripped as through a seton. Achillini, who died in 1512, described their distribution to the nasal chambers, while a few years later Massa, in 1542, the year in which Vesalius' great work first appeared, recognized them, if not as nerves, at least as structures by which odor was perceived.‡ Thus we may conjecture that it was supposed by many that the holes in the cribriform plate were not pervious *intravitam*, in the time of Berengar as well as in that of Vesalius. The latter sought an escape for the cerebral fluids and the channel of the origin of nasal discharge in the lacerated foramina at the base of the skull. By his advocacy of this he embroiled himself in a fierce controversy with his teacher, Jacob Sylvius, for thus venturing to impugn the authority of Galen. Sylvius declared he knew Galen was right, because he had traced

\* De Hominis Fabrica, Lib. III., Paris, 1555.

† Carpi Commentarii—Anat. Mundini—1521.

‡ Massa, Epist. Med. et Philosoph. 1542. Epist. VI., p. 58.

small hollow channels from the ventricles of the brain through the cribriform plate. I cannot venture to impose on your patience by even alluding to the variations, modifications and contradictions of these ideas. Suffice it to say that the perusal of the works of these earnest seekers after the truth should inspire us with humility, for the thought will obtrude itself upon the consciousness of us all that in all probability another 400 years will show that we are as far astray as were they.

I need only mention the curious fallacy of Willis and of many of his contemporaries. They elaborated the old error which had long existed, that the nerves are hollow tubes or porous fibers. Through these the vital fluids of the brain are despatched to every organ\* and region of the body. Willis was contemporary with Schneider, but apparently was little influenced by his teaching. Before the appearance of Schneider's works, that is before about 1660, we find his ideas nascent in the seething scientific activities of the period. Indeed, in a work published more than a hundred years before, in 1546, Cardanus† suggested that the mucus which runs down from the nose does not really come from the brain, but very often is produced in the secretory organs of the nose and mouth. Van Helmont, who died at the age of 80, in 1644, twenty years before the publication of Schneider's book on catarrh, had a less accurate notion of the origin of pharyngeal secretions than Cardanus, but he at least, an advocate of the local origin of disease, refused to believe they came from the brain. He asserted‡ they arise from the superfluity of aliments which remain adherent at the upper part of the pharynx. Wepfer, whose work was published first in 1658,§ has the following note of his refusal to accept current doctrines as to the origin of catarrhs, and the destination of vapors. He says the latter were supposed to extend from the stomach to the head, "just as though the head was to be compared to the smoky roof of a house or the lid of an alembic," but he denied the possibility of this except by the way of the carotid vessels. It must be remembered that in spite of Harvey's work, published thirty years before, the idea of the arter-

\* Willis: *De Cerebri Anatome*, 1664.

† *Contradict. Med. Lib. II. tr. I., cap. 15, P. 457*, quoted by Sprengel *vid.* French translation of his *History of Medicine*, III., p. 280.

‡ *Opera Omnia. . . . Catarrh. Delirament. . . . Ed. 1682., p. 412.*

§ *Observations Anatomice ex cadaveribus eorum quos sustulit apoplexia.*



ies as air carriers still lingered a little, and we have seen Vesalius, long before this, suggesting the lacerated foramina through or near which the great vessels pass as channels of communication for the fluids and vapors of the brain. "At the base of the brain," continues Wepfer, "are the thick meninges, at that point most impenetrable and almost four times the usual thickness. The cranium in the live animal or the animal just dead, and not yet deprived of all the membranes, should not be thought to be similar to the representations of it in the books. All those holes which are seen, at the base especially, are occluded so that no ingress or egress is allowed to the vapors or the humors, as may easily be determined." In this pre-Schneiderian treatise\* we note the rule that great steps forward are rather the products of the age than the sole discoveries of any one man.

A view of the voluminous writings of Conrad Victor Schneider may well appall the stoutest heart. Never was the kernel of an important fact so wrapped up in the husks of verbosity; but notwithstanding this, his books are far from being absolutely unreadable, so far as the style is concerned, which is more than can be said of those of some of his countrymen in his day and later. He definitely and unmistakably pointed out the true condition of affairs and asserted that the base of the cranium was impervious to fluids, that the amount of fluid in the cranial cavity is insignificant. He taught that the catarrhal discharges came from the mucosa itself, in health as well as in disease, reporting an autopsy on a horse dead of glanders in which the brain was normal and the nasal mucosa the seat of the disease alone. He named the membranes, which give rise to the mucus in the nose, the anterior and posterior pituitary membrane, understanding by the latter what we now recognize as the pharyngeal tonsil. He intelligently described this structure as existing behind the septum, but he seems to have confounded the hyperplastic with the normal state. He likened the structure here to that of the tonsils. The whole mucosa when pressed even in the dead subject, gave issue to a glairy discharge. Although he thus recognized the mucosa as the origin of the secretion which bathes in its surface, he does not mention the mucous glands by name at all.

It was only by the development of knowledge as to these that

\* Schneider had then only just published his (1655) his treatise on "Cribiform bone."

the doctrines of Schneider came to replace those of Galen and Hippocrates. That is a part of the interesting story which the limits of time and space do not permit me to relate. Unfortunately the vast majority of workers in science do not realize the absorbing interest the study of the progress of the evolution of medical knowledge and medical thought possesses. They do not appreciate the enormous advantages such study offers the modern worker at the problems, which we meet face to face every day. They are the same problems in different phases and under different aspects with which were concerned the eager scholars who gathered around the dissecting tables of Vesalius and the active minds of the virile Greeks who clustered about the robed figure of Hippocrates at the shrine of Esculapius in the Isle of Cos.

#### *Discussion.*

Dr. JOHN N. MACKENZIE, of Baltimore, said that he had been very much interested in the paper of Dr. Wright, for, it had long been his custom, when seeking for something new, to turn to the ancients. One of the most alluring chapters in the whole history of this subject was that which tells of the ancient pathological conception of the disease. As Dr. Wright had justly said, it was a disease of the human race, and had probably existed from the remotest period of historic time. Attempts had been made in all the ages to invalidate this proposition, and notably the one made by Plato. The philosopher tells us in the "Republic" that the names of catarrhs were unknown to Homer, and only came into use in the days of Socrates. This assertion had been made the groundwork of the thesis, that they are the products of civilized life, and furnishes the basis of the Schneiderian argument that they are born of luxury and ease and the general degeneracy of mankind.

While it was undoubtedly true that an increased tendency to catarrhal affections belongs to modern man from the accidents of his environment, and while doubtless civilization produces many conditions unknown in the savage state, still it was probable that, as the chief causes had been operative in all ages, the origin of the disease was traceable probably as far as the origin of man himself. In this connection it was interesting to note the derivation of the term "coryza." It could be traced back through the dialects of the Hebrews, Arabians, Chaldeans and Assyrians to the time when history emerges from fable. The terms "angina" and "cynanche" are also of very early origin. It was strange that while the ancients had such crude percep-

tions of the pathology of catarrhal affections, especially the old Hippocratic school, they should have examined the interior of the nose apparently with a good deal of care. Whilst Hippocrates showered the pituita down from the cribriform plate we find subsequent writers giving pretty fair descriptions of conditions in the nasal cavities—polypi and other conditions of the nasal passages. The Greeks probably knew of their existence under the name of hypersarcosis and sarcoma, and the Latins under the terms “*germinatio*” and “*carnis excrescentia*.” It was a curious fact too that amongst some of the writers of the middle ages the development of certain forms of polypi was likened to the development of the clitoris and the hypertrophy of the female breast. It was only in a comparatively recent period that these bodies had been relegated to their proper anatomical place among the diseases of the nose. A most excellent differential diagnosis was given between the two diseases, especially in the works of Actuarius.

Coming down to more recent years, the speaker called attention to the characteristic description given by Morgagni of posterior hypertrophies. It was a reflection on our modern methods of post-mortem examination that these old observers seemed to examine the nose in every case. Morgagni’s description of the “loose red caruncles,” as he called them, which hang from the inferior turbinated bones, was most graphic, and for fullness, lucidity, and fidelity to Nature outranks most of the descriptions found in our modern text-books on laryngology.

### *Paper.*

## CHANCRE OF TONSIL, WITH REPORT OF THIRTY-FIVE CASES.

BY JOHN EDWIN RHODES, A.M., M.D.

It is quite beyond my intention to present an elaborate résumé of chancre of the tonsil.

Bulkley, in 1894, after ten years’ careful preparation, in an exhaustive study of “Syphilis in the Innocent,” gave a record of fifteen cases, and C. M. Hopman, in Heymann’s *Handbuch der Laryngologie und Rhinologie*, has quite thoroughly presented the subject of “Tonsillar Chancre.” However, a few general statements should accompany this record of cases.

Fifty years ago Velpeau insisted that chancre of the tonsil was impossible, but scarcely two years had passed after that declaration, however, when Martelliere reported four cases of this lesion.

In 1861, Diday called general attention to chancre of the tonsil, and reported five cases. Since that day statistics have continued to accrue, until Münchheimer, adding to statistics already given by Bulkley (307 cases, 10 of which were in the United States), cited 10,265 cases of extra-genital infection, of which 504 were tonsillar chancres, an average of about 5 per cent.

Possibly these statistics are misleading, for in my inquiries I have been met with the statement that while extra-genital chancres were not uncommon, many laryngologists had never seen a case of tonsillar chancre. In over 24,000 cases at the Metropolitan Throat Hospital, New York, not one case of chancre of the tonsil was to be found in the records. It is probable that sometimes it is unrecognized.

In the collection of information upon this special lesion of syphilis I have been strongly impressed with the fact that the disease should not always have attached to it the stigma that is still associated with it, of being a venereal disease only, when in fact it should often be classed among contagious diseases. It is frequently acquired in an entirely innocent manner, though often from those who are not themselves innocent victims of an infection.

Its classification as an infectious disease may be well illustrated in a case recently reported by Tulinow (*Tratch*, Vol. 22, No. 2), and very many similar cases are on record: Into the hospital at St. Olga came a brother and sister, aged five years and eleven months, respectively, having syphilis of the buccal mucous membrane. The little girl had been infected by her brother through kissing, the brother by a syphilitic janitor occupying the same room; the little girl had infected the mother, who had chancre of the nipple, and the father developed a hard chancre of the tonsil.

The etiology is interesting. The situation and structure of the tonsils would make them a favorable site for infection. The virus, received into the mouth, from whatever source, is carried into the crypts of the tonsil by suction or swallowing. It is probable that there is a previous abrasion, an inflammation, or at least a diseased condition of the follicles. It may be that, as Bosworth states, the virus being lodged in one of the crypts of the

tonsil, its entrance into the circulation is favored by a certain permanency of contact. A large number of cases are infected from mucous patches in the mouth of the syphilifer by kissing, a small number from bestial practices. Cases are recorded where infection came from Eustachian catheters, tongue spatulas, dental instruments, pipes, drinking vessels, and household or industrial utensils of various kinds. The infection is possible both by immediate contact and by transmission, the virus being conveyed to the mouth of the patient by any one of a thousand different media. Some cases have been infected in the feeding or nursing of children.

Owing to the great variation of the tonsil as to its size and density, no description of a chancre upon it can be given as typical.

Chancre here, as elsewhere, may be so trifling in its development, adenopathy so slight and symptoms so moderate that it might escape observation, or it may be classed by the patient as a simple sore throat which demanded no treatment, and possibly had been forgotten when the later lesions appeared. These cases are probably the most numerous.

There is another class, however, in which we may have a marked pathologic process, with an accompanying pain of greater or less severity, and rather defined symptoms. In these cases we find swelling of the entire tonsil, and it, as well as the surrounding tissues, are involved in a well-marked hyperemia, with possibly swelling of the anterior or posterior pillars, extending to and along the free edge of the soft palate, or downward to the base of the tongue. The tonsil may not present so much the appearance of an inflammatory condition, however, as of density of the tissues, and hardness on palpation is frequently very marked, as is that of the contiguous gland. The patch upon the tonsil consists of a superficial ulcer with a layer of dirty, yellowish detritus, showing a marked necrosis, clinging closely to its floor. The ulcer is usually oval or circular in form. The sub-maxillary gland of the corresponding side is always markedly enlarged, indurated and usually quite tender. A decided malaise may accompany the infection, the temperature may be slightly elevated and anorexia may be present. Pain in swallowing, or speaking, and extending to the ear, may be a marked symptom. In some cases, undoubtedly, mixed infection complicates the con-

dition, and obscures the diagnosis, or the process may assume a phagedenic character, with bacteria present in great numbers. The general explosion of the disease is no worse than in genital chancre, as a rule. The chancre usually disappears in four to six weeks.

I wish to present in some detail the following cases :

CASE I.—W. H. A., aged 34, single, was sent to me March 14, 1900, and gave me the following history :

About eight weeks previous to this visit he had noticed a swelling of the gland on the right side of the neck at the angle of the jaw. This was followed in a day or two by a slight irritation of the right tonsil. The developing soreness in this region caused him to seek a physician in a few days, who diagnosed the cause as one of a simple unilateral tonsillitis. Remedies were applied and he remained in the house a week. Then, going out on a very cold day, he said he had taken cold and the throat became more painful, and he remained indoors another week, but the following week exposure on another cold day aggravated the tenderness of the throat and the soreness became very severe, the pain extending to the ear, and so marked that the use of opiates was necessary for relief.

The tonsil was lanced, and various sedative applications were made with no relief. The patient thought at this time that the tonsil was considerably enlarged—infamed, and that superficial ulceration was present.

About five weeks before I saw him, or three weeks after the inception of the disease, he said blotches had appeared on the face and body, but these had quickly disappeared. On examination further into his history I found that he did not deny the possibility of syphilis, as he was loose in regard to his sexual relations, but had never had a genital sore. He used tobacco and alcoholics moderately, his general health was good, the appetite and digestion were normal and there was no loss of weight or strength. He gave no history of any previous illness. He had a temperature of 99° F., with a slightly accelerated pulse. Pain was very pronounced in the right side of the throat, on pressure, at the angle of the jaw and on attempts at deglutition. The gland was swollen to the size of a small walnut, quite hard and tender.

On examination of the throat I found the right tonsil considerably enlarged. The induration was striking, as it was very hard to the touch of the probe. The entire surface was covered with a dirty, yellowish secretion, which could not be wiped off, but there was no apparent loss of tissue or excavation. The tissues about the tonsil were hyperemic. The posterior pillar was much thickened with a dirty, yellowish patch upon it, and there was also evi-









dence of a similar process along the edge of the palate immediately above the tonsil.

With the probable diagnosis of chancere of the tonsil I removed a small section and sent it to Ludwig Hektoen for examination. His report excluded malignant disease, showing only a dense inflammatory infiltration, with necrosis on the surface and great accumulation of bacteria. The histologic structure could not be said to be specific of syphilis. Because of the intense pain, now extending over a period of six weeks, with little improvement, I placed him at once on iodide of potassium, beginning with grains ten, increasing rapidly to grains thirty-five, three times a day, and began daily applications of tincture of iodine by the swab. The pain began to disappear from the first visit and within a week had entirely ceased. The necrotic surface of the tonsil healed rapidly, the swollen gland at the angle of the jaw in ten days being only one-third its size when he came for treatment. About two weeks after he consulted me he developed a characteristic maculo-papular syphiloderm on the face and chest, and later had mucous patches in the mouth. All these conditions yielded readily under mercurials, and two months afterward he wrote me that his throat was entirely well, but that he was still following a mixed treatment. Recently his brother told me that he was in excellent health.

In searching for a cause of infection these facts developed: About two weeks after he came to me he brought his brother, traveling in the same line of business, and two years younger than my patient, to consult me. This young man gave me a history of genital chancere, and he had at the time of his visit well-marked staining of the skin over the chest and abdomen, the remains of an eruption which appeared four months previously. Upon inquiry I learned that my patient suspected that the source of infection was the same as the brother's. They were exposed at about the same time with the same individual. The variation in time, however, of the appearance of both the primary sore and the secondary eruption in the two cases led me to look for some other source. It developed that about ten days before the throat lesion appeared Mr. A. had kissed a chance acquaintance while visiting an inland city. He had also kissed her frequently at a previous visit, six weeks before, at which time he noticed an eruption upon her face, which she had said was caused by "poisoning in the woods." He believed this was of a specific nature. This was undoubtedly the source of his infection.

CASE II.—Mr. X, Y., single, aged 29, a gentleman occupying a fine social position in an inland city, came to me about April 20, 1900, complaining of a sore throat of about five days' duration. The pain was located in the region of the left tonsil, was accompanied by swelling of the tonsil, and swelling at the angle of the jaw. He had examined his throat a day or two previously and

had seen a yellowish spot on the tonsil, which he had attempted to "open" with a hat-pin. The pain was considerable and was rather marked when swallowing. The condition of the throat had continued to grow worse, and at the time of his visit he felt quite ill. On examination I found the gland at the angle of the jaw enlarged to the size of a walnut, much indurated, and not very tender on pressure. The left tonsil was much swollen in its entirety, somewhat congested, and at its center was a superficial grayish-yellow patch, somewhat circular in outline, about 3 mm. in diameter, which could not be wiped off, and did not bleed. The density of the tonsil was particularly noticeable on palpation with a probe, and the appearance of the superficial yellowish spot, and the marked involvement of the gland at the angle of the jaw, with the recent case in mind, caused me to conclude after a few days that this was a case of chancre of the tonsil. Local applications were made for several days, but without changing the local conditions, which continued uninfluenced by treatment to any degree until about five weeks after the chancre, a macular syphiloderm, symmetrically distributed over the trunk and extremities, with a palmar syphilide, appeared.

He was then placed on inunctions of unguentum hydrargyri and lanoline, equal parts, about grams vi. to viii., being thoroughly rubbed in for twenty minutes each day, and also the internal administration of hydrargyri iodidum flavum, one centigram, three times a day. He was also given, for a time, tonic doses of quinine, iron and strychnia. Under this treatment the general health improved rapidly; the swelling of the tonsil and the gland subsided, and the eruption disappeared. Only the palmar eruption could be seen in six weeks, and this soon disappeared. Under the stress of close confinement to business, in February of this year a circinate eruption appeared upon the wrists. A resumption of the inunctions caused this to quickly disappear. The internal treatment is still being continued, and he is now in excellent health. There is no clue to the method of infection in this case. It was certainly unwittingly and innocently acquired, and no source could be even suspected.

CASE III.—Mrs. M. O. D., singer and dancer in a music hall, married, aged 32, came to my clinic at Rush Medical College, April 24, 1901, and gave the following history: About six weeks before she had noticed a swelling on the right side of the neck, at the angle of the jaw. This, small at first, increased in size rapidly, and became very hard and very tender, the pain extending to the ear by the end of the second week. She had noticed no pain in the throat, at least none on swallowing. This condition continued without much change for about two weeks, but for the last two weeks the swelling had steadily lessened, and the soreness of the gland had disappeared. For the last two weeks, however, there had been considerable pain on the right

side on deglutition, and she had been unable to take much nourishment, only soft foods: for three or four days there had been some slight improvement in this regard. She had never had any severe illness, and her heredity was good. She was nervous and rather weak from recent lack of nourishment, and had lost a little in weight. Her pulse was normal; her temperature, 98.9° F. She had separated from her husband about three months before, and said she had had "no relations with other men since that time." She stated, however, that a roomer in her flat, a bartender, had kissed her frequently for some time before the swollen gland appeared, and had often brought home a bottle of claret, which they had emptied together, using the same drinking glass. On close inquiry at a later visit, however, she acknowledged that beside kissing her he had often put his tongue in her mouth. She further said that she had been warned later to have nothing to do with him, as he had syphilis. She had noticed that his hair had fallen in patches, and that he had blotches on his face. Her appetite was good; the digestion good; the bowels constipated. The menses had always been regular, but the week before they had appeared for only two hours.

On examination I found an adenopathy at the right angle of the jaw, a gland being markedly indurated and about the size of a large chestnut. There was no tenderness on pressure. The tonsils were scarcely, if at all, enlarged. The right tonsil had a fold passing diagonally from above downward and backward, almost dividing the tonsil into two portions; the posterior pillar was considerably swollen. The whole tonsil was slightly reddened. A patch, grayish-white in appearance, was seen on this fold at the lower part, which bled easily on being touched with a swab. There was an undefined appearance of recent ulceration on the anterior portion of the tonsil, and the same condition was found also behind the fold when it was drawn forward by a bent probe. On palpation with the finger there was distinct induration felt at the lowest portion of the tonsil. On examination of the larynx there was found some swelling of the right side, especially of the ary-epiglottic fold and the arytenoid. On further examination I discovered an exquisite macular syphilide, faint, but characteristic, covering the chest and trunk and the arms, not extending to the palms or to the lower extremities. On inquiry she then said that she had noticed this rash three days before, had considered it of no importance, but supposed it was due to the iodides some one had prescribed for her. A careful examination furnished no evidence of genital infection. All of these facts left no doubt as to the diagnosis or the manner of infection. An anodyne spray was applied to the tonsil with immediate relief, and she was at once placed on inunctions of unguentum hydrargyri and lanoline, equal parts, and a tonic of quinine, iron and strychnia. She was given necessary instructions as to

future care of herself, and warnings as to the dangers of giving the disease to others. She is still under observation and is doing well.

CASE IV.—My friend, George E. Shambaugh, M.D., furnishes me the notes of a case that came under his observation.

On December 14, 1899, Charles C. came to the dispensary at the Woman's Medical School, complaining of sore throat. He was unmarried, 30 years of age, a tinner by trade. For the past ten years he had been having one or more acute attacks of tonsillitis each winter. The attacks often terminated in an abscess of the tonsil. Two years ago he had an attack of gonorrhœa, but had never had syphilis.

The patient's present trouble began five weeks previous as an attack of acute tonsillitis with a chill and fever. After the first few days the fever subsided, but his throat had never fully recovered and for the past two weeks it had grown decidedly worse, yet at no time since the first week had it caused him much pain or discomfort. The patient's general condition was not good. His appetite was poor; he had night-sweats and he had been losing weight. The local symptoms complained of were a slight sensation of soreness on the left side of the throat, more marked on swallowing, and an accumulation of thick mucus in his throat. His trouble from the beginning had been located in the left tonsil. About two weeks previously he first began to notice an enlargement of the glands on the left side of the neck and at the angle of the jaw.

On examination a few glands, ranging to the size of a pea, could be felt along the left side of the neck, while just below the angle of the jaw on that side was found an oblong hard swelling about the size of a walnut. The surface of the latter was reddened and it was tender on pressure. No glandular enlargement in other parts was detected and nothing abnormal was noted about the genitals.

On examining the throat the right tonsil was found hypertrophied, but there was no acute inflammation. The left tonsil was greatly swollen and inflamed and had a distinct ulcer on the median surface. The ulcer was concave and was covered by a grayish membrane. It was located more to the posterior part of the tonsil, while the infiltrated anterior edge almost hid the surface of the ulcer. The tonsil was not tender on pressure. It was markedly indurated. A small bistoury plunged  $\frac{3}{4}$  inch into the infiltrated tonsil caused but little pain and its withdrawal was followed by a few drops of blood, but no pus.

A scraping from the surface of the ulcer examined microscopically showed the presence of staphylococci. A culture was made from the false membrane covering the ulcer, which showed an abundant growth of staphylococci, but no other bacilli.

December 16th patient complained of more pain on swal-

lowing. Examination showed a more marked swelling of the left lateral band of the pharynx than previously noticed.

At this time an examination of his mistress was made. She was not syphilitic.

December 18th patient had more pain on swallowing, and he was also suffering from severe hoarseness and from slight difficulty in breathing. A laryngeal examination disclosed a well-developed edema of the ary-epiglottic fold on the left side. The true vocal cords could not be seen. Fearing trouble from the edema of the glottis, I removed with a curved bistoury the ulcerating tonsil.

A microscopic examination of the excised tonsil, made by Maximilian Herzog, failed to give any positive evidence as to the nature of the disease. He reported as follows:

"The tissue excised from a tonsil and handed to me imbedded in paraffine, when sectioned, appeared to be markedly shrunken, this being probably due to the fixing, hardening or imbedding. The tissue is composed of small round cells of the lymphoid type. These cells, however, are not arranged like the normal lymphoid tissue of the tonsil (arrangement into lymph nodules), but they form a uniformly dense infiltration. In one place there is seen a circular opening lined by stratified squamous epithelium. This space evidently represents the transverse section of crypt of the tonsil. Sections were stained with carmine and Weigert's stain for elastic fibers, in the hope of finding the evidences of endophlebitis and endovasculitic processes. However, none such were found. The tissue, therefore, can, from the histologic point of view, be described only as 'inflammatory.' Positive evidence that this inflammation is syphilitic could not be found."

December 22d the hoarseness had disappeared and scarcely any pain was felt on swallowing. An examination showed that the edema of the ary-epiglottic fold had disappeared and there had been a decrease in the swelling of the lateral pharyngeal band. A culture made from the base of the excised tonsil showed abundant growth of staphylococci.

January 4th patient complained of soreness on the right side of the throat, which had troubled him for about a week. During this time the night-sweats were more pronounced. He also suffered from aching pains in his joints and from headache. Examination found a general sclero-adenitis ranging to the size of dove's eggs, a maculo-papular eruption located symmetrically over the trunk and extremities, the hair falling out, and mucous patches on the right tonsils and on the genitals. He was immediately placed on anti-syphilitic treatment, which resulted in the rapid and complete disappearance of all syphilitic manifestations.

The case was evidently one of acute tonsillitis, which became infected by syphilis and developed the typical Hunterian chancre on the tonsil. The source of infection probably came through



the use of a drinking cup, which was also being used by a syphilitic person working in the same shop, the syphilitic virus finding in the acutely inflamed tonsil a favorable point of entrance.

The inflamed condition of the large gland at the angle of the jaw was due to the existence of a mixed infection, as the abundant growth of the staphylococci on the culture made from the ulcer demonstrated. The more or less severe pain on swallowing which developed was probably due to the lateral pharyngitis which was set up by the local irritation of the inflamed tonsil. The edema of the glottis was caused in a similar way.

#### CONCLUSIONS.

1. Chancre of the tonsil is often unrecognized because hypertrophy and inflammation are so frequent and are so closely simulated by the early symptoms, which often differ little from an ordinary sore throat.

2. An enlarged and indurated tonsil with a superficial ulcer upon its surface, accompanied by enlargement and induration of the contiguous submaxillary gland and which is unchanged by a prolonged course of treatment, renders a diagnosis of chancre probable.

3. The character of the chancre depends upon the original condition of the tonsil as to size, density, the amount of follicular inflammation and the coincidence of a mixed infection.

4. A certain diagnosis cannot usually be made until the general eruption of the disease.

5. The explosion of the disease is no more severe than in chancre elsewhere.

6. The disease is contracted by direct contact or by various media, carrying the virus.

7. When we consider the frightful contagiousness of syphilis and the frequency with which it is conveyed to innocent persons, the most careful use of throat and nose, dental and other surgical instruments, clinical thermometers, etc., is necessary.

8. Separate instruments should be used for examination and treatment of known syphilitics, but the possibility of contamination before the existence of the lues has been recognized make it imperative that every operator should employ a rapid and efficient disinfection or sterilization of instruments after the examination or treatment of every patient.

9. Most careful instructions should be given patients as to the necessity of efficient isolation, the methods of infection, and the period of danger, and the use of individual household and other utensils should be enjoined.

*Discussion.*

Dr. J. H. BRYAN said that he could speak personally regarding the difficulty of recognizing the disease, for he had furnished to the author of the paper one case in which he had failed to recognize it until the occurrence of the general manifestations. The ulcer had presented a peculiar grayish appearance, which he had been at a loss to understand at the time. He believed the disease had been in this instance innocently contracted, though no history could be obtained which threw any light on its origin.

Dr. J. W. FARLOW said that it was sometimes difficult to differentiate between chancre of the tonsil and acute, ulcerative, lacunar tonsillitis, which was very well described and illustrated by Moure, of Bordeaux, in the *Journal of Laryngology* for 1895. It was true that in the latter disease the induration was usually wanting, but this was not always of much practical aid. He had seen a case recently where a doctor had made an incision in the upper part of the right tonsil of a young man. This had been followed by some swelling, ulceration, doubtful hardening and enlarged glands under the jaw. The question of a chancre was not easily solved. Later it was seen to be a circumscribed, lacunar, ulcerative form of tonsillitis in a young man of low vitality.

Dr. W. KELLY SIMPSON said that this paper showed an amount of research which was most praiseworthy, and it should prove of great value. He was quite surprised at the number of cases collected by the author and the frequency with which he thought it occurred. He himself had found it very rare in the clinics of New York City. Chancre of the tonsil might account for the presence of secondary manifestations in syphilis in those cases in which it might be otherwise impossible to detect the initial lesion. He knew of one case in which a young man had assisted a plumber in blowing out a pipe and as a result had developed a chancre on his lip. He thought it was generally believed that the secondary manifestations from extra-genital chancres were a little more severe than in cases presenting the ordinary genital chancres. He recalled one case of chancre of the mucous membrane of the nose which had given rise to secondary symptoms of a most virulent type.

Dr. EMIL MAYER said that recent bacteriological examinations had been made and it was clearly shown that instruments remained infected, even though they had been exposed to very high temperatures. This emphasized the necessity for sterilizing instruments by some other method than those in common use.

Dr. D. BRYSON DELAVAN said that he had seen a number of cases of extragenital chancre, and several cases of chancre of the tonsil, besides the one which he had reported to Dr.



Rhodes, the only one in which he had been able to secure a perfect record. In most of his cases the onset had been severe, particularly in relation to ptialism, and to glandular swelling. Probably many cases pass unnoticed, when we hear that in a clinic receiving thousands of patients annually not a single case had been noted in the course of a number of years. The sooner the profession and the general public recognized that syphilis was not merely a venereal disease, the better for all. Some authorities reported a surprising number of cases of extra-genital chancre in certain countries, such as Russia, where the habits of the people are uncleanly. The medical profession should exert itself to the utmost to teach the public that syphilis is an infectious disease, and that its spread should be controlled with the same caution as that of other infectious diseases. He hoped that the time might come when persons afflicted with it would be as carefully guarded as if they had smallpox.

Dr. GEORGE A. LELAND said that the first case reported to the author had been sent to him by one of Boston's best authorities on syphilis, with the diagnosis of probable abscess. There was a large red swelling of the left tonsil with eversion of its folds. He incised it and introduced his finger to search for the supposed cavity, and was surprised at the amount of induration present and at the absence of pus. In this case there was no adenopathy. A few weeks later the usual symptoms of syphilis appeared. Mention has been made of the pearly color of the tonsil, but this has not been the color in the cases which have come under his observation; on the contrary, it has been a brilliant, shiny red. The opalescent appearance he has only seen in secondary affections of the tonsil and not with the primary lesion.

Dr. RHODES, in closing the discussion, said he wished to again emphasize the fact that this disease is often innocently acquired and should therefore be frequently classed as an infectious disease, and also the necessity for perfect and rapid disinfection of instruments. A teacher in a dental school had told him recently that in the teaching of dentistry very little attention is paid to the manifestations of syphilis about the mouth, so that dentists are not taught to recognize mucous patches. Many dentists at the present day do not appreciate the importance of sterilizing their instruments, and while cases have been reported of suspected inoculation by this means, there are doubtless many more that could be traced to this source. It need not be further urged that anything short of the most careful disinfection of instruments in the hands of physicians and surgeons in routine practise is criminal negligence.

*Paper.*

REMARKS ON THE DIAGNOSIS OF ADENOIDS IN  
INFANCY. •

BY WALTER F. CHAPPELL, M.D.

IN most infantile affections it may be conservatively stated that the diagnosis is more difficult and uncertain than at any later period of life.

I am fully aware that the subject of adenoids has frequently received your attention, and I do not expect to present anything new to a society whose members are specially skilled in these ailments. Nevertheless I venture to relate my observations, believing that your discussion will awaken new interest and prove most instructive.

In a general way we can divide the diagnostic symptoms into objective and subjective. The objective symptoms are peculiar facial expression, mouth breathing, snoring at night and noisy respiration during the day, vocal changes, abnormal and excessive nasal secretions, sneezing and reflex neuroses, chest deformities and spinal curvatures. The subjective symptoms are headaches, stuffy feeling in the nose, dryness of mouth and throat, especially in the mornings, and sore throat, impairment of the taste, inability to concentrate attention, more or less stupidity and depression, earaches, deafness and tinnitus.

It seems unnecessary to consider in detail all these symptoms. I choose rather to take the negative side, and show that of the symptoms enumerated, mouth-breathing and snoring may exist without adenoids being responsible; and also that adenoids may be present without causing any obstructive disturbance in the upper air tract.

For expediency and clearness the age of three years and under will be taken as the period of infancy, and a further division will be made of those infants over six months, and those of six months and under.

The reason for making this division is that in early life some affections exist which a few months later either change their character or entirely disappear. Special difficulties also surround our

methods of diagnosis at this early period, as owing to the position of the soft palate and the small diameters of the naso-pharynx it is impossible to make either a digital or posterior rhinoscopic examination.

Two of our most important aids are therefore rendered unavailable, and it is surprising that so many have been willing to make a diagnosis of adenoids without more positive evidence. During a recent examination of four hundred and thirty-seven infants under three years of age, forty-five were found under seven months old who had some nasal obstruction, but in no child under three months was the obstruction due to lymphoid hypertrophy in the naso-pharynx. In fact, in my experience I have been unable to demonstrate to my satisfaction the presence of adenoids in so young an infant. Occasionally I have thought I had a case, but was disappointed to find that no appreciable amount of lymphoid tissue could be removed. Since I began to doubt the theory of congenital adenoids I have employed an ear curette as a means of diagnosis in all suspected cases with negative results.

I might say at this point that until about two years ago no adenoid instruments could be obtained small enough to use in the post-nasal space of infants, and as the index finger is too large, I have been curious to know what means were adopted in those cases selected for operation. I have investigated the literature of congenital adenoids and find that most writers treat it indefinitely, stating usually in a brief way the probability of their presence at birth, but no author, so far as I am able to find, relates any definite personal experience.

Hall, in his work on the "Throat and Nose," says that adenoids would seem in some rare instances to be congenital, but that no dissections of new-born infants had confirmed his theory. Some years ago I made a number of post-mortem examinations on new-born infants, but found no case of adenoids. I think, therefore, the evidence is rather against the congenital theory, and, if true, this is an important point to be remembered in determining the cause of noisy and obstructive respiration.

The following conditions may cause respiratory obstruction simulating that caused by adenoids in the naso-pharynx of infants under six months:

1st: Lymphatism and lithamia.

2nd: Syphilitic or gonorrheal rhinitis.

3rd: Congenital atelectasis.

4th: Digestive disturbances.

5th: Congenital highly arched palate.

6th: Very small or occluded nostril or nasal passages.

7th: Unusually small post-nasal space with large Eustachian eminences.

8th: Marked anterior projection of the bodies of the cervical vertebræ.

9th: Some malformations of the soft palate.

10th: Hypertrophy of the tongue.

Some of the conditions enumerated are rare, but all have occurred in my experience, and should be given consideration in every case where the cause of obstruction is not evident. This would prevent many mistakes, and lessen the disappointment experienced when operations have been performed for adenoids without giving the expected relief.

*Lymphatism.*—This name alone opens a rich field for thought and discussion. I intend only at this time, however, to touch on the ways it may influence the upper respiratory sounds. The upper air tract is a favorable location for the early manifestations of lymphatism, either in the severe and rare form of leucæmia or in the so-called lymphatic temperament or lymphoid diathesis.

The latter now claims our attention, as its presence is usually apparent in the enlargement of the faucial tonsils and other lymphoid tissues in the pharynx and on the base of the tongue. There are some cases, however, where the cervico-bronchial glands or the mucosæ of the trachea and bronchi are principally affected. In these cases the manifestations appear very early, and in my belief may even be present at birth. The mucous glands may alone be implicated, or it may extend to the dense network of lymphatics and lymph nodes surrounding the trachea and bronchi. In either case the lumen of the tracheo-bronchial tract is narrowed and considerable stenosis may result.

Under ordinary circumstances no marked symptoms of respiratory embarrassment might be evident until the child cried or during feeding. At these times what had been only a little hard breathing now became a labored and noisy respiration from the child's efforts to get sufficient volume of air, and presents a marked resemblance to obstructive adenoid breathing. The dif-

ference between them is that in all degrees of obstruction above the uvula, the infant is obliged to remove the nipple from the mouth every few moments to obtain air. When the obstruction is lower down the nipple can be retained in the mouth during the entire period of feeding. Furthermore, when stenosis of the trachea-bronchial tract exists sonorous and asthmatic chest sounds may be heard while the child is nursing, which cease immediately when feeding is over.

*Lithæmia.*—The lithæmic diathesis may be manifested at the early age by recurring attacks of rhinitis, pharyngitis, tracheitis and bronchitis. Infants of this type may have a family history of rheumatism or gout, which renders them extremely sensitive to exposure or any change of temperature. Crying, feeding or anything which disturbs the vascular supply of the upper air tract, may produce temporary symptoms of obstructed respiration. Recurrent naso-pharyngitis is frequently seen in these lithæmic teething infants, and produces a condition which might readily be mistaken for a recurrent inflammation in a small adenoid. A case of this kind has recently been under my care. The primary attack began when the infant was four weeks old, and recurred at intervals of about six weeks until it was nine months old. It then had its most severe attack, accompanied by an acute follicular tonsillitis, and followed a week later by a severe rheumatic infection. Erythema papulata appeared over the surface of the body, accompanied by severe acid perspirations, irritable bladder, and a temperature ranging from 101 to 105 F. These symptoms lasted about four weeks when convalescence began. In all the attacks the first symptom noticed was the child's refusal to take the bottle, or that it would take only an ounce or two at a time. An examination of the throat showed that the pillars of the fauces and the posterior pharyngeal wall were swollen, red and dry in appearance; later the mucons glands became prominent and stood out like small beads over the surface of the membrane. In forty-eight hours the membrane looked cedematous and began to secrete a clear fluid, which soon became white, thick and tenacious, and could be removed from the throat and nose in long firm strings. The quantity of this secretion was surprising, and it completely occluded the naso-pharynx and nasal passages. The complete cycle of an attack lasted about seven days, when the

child again took nourishment in usual quantities and soon returned to its normal state of health.

The lithæmic infection is usually confined to the superficial tissues but may spread beneath the pharyngeal aponeurosis, forming a small retropharyngeal abscess, which may increase gradually in size for a period of several months and produce a great deal of respiratory disturbance.

Either syphilitis or gonorrhæal rhinitis may cause prolonged nasal stenosis. The former class of cases are the most frequent, and can be easily diagnosed if other manifestations are present. If, however, the infant has every appearance of health and thrives well the cause of the rhinitis may not be suspected. Gonorrhæal infection of the nasal mucous membrane is happily rare. The diagnosis is not difficult, as the infection commences in the eyes.

*Congenital Atelectasis* produces respiratory symptoms which may sometimes be mistaken for adenoids by competent observers. If considerable lung tissue is involved the symptoms are so marked that a mistake should not occur. If little lung tissue is implicated the conditions of the respirations might not be readily understood.

*Digestive Disturbance.*—In some infants we have digestive derangements accompanied by vomiting and regurgitation of large curds of milk. The latter may in some instances lodge in the nasal passages and naso-pharynx, producing more or less nasal stoppage and noisy labored breathing. The size and firmness of these impacted milk curds would suggest that they had been some time in forming and that they were subjected to considerable pressure and rotary movement from the action of pharyngeal and palatal muscles.

Billard claims there is a non-traumatic œsophagitis, which accompanies stomatitis and gastro-intestinal irritation, and may produce considerable pressure on the trachea and larynx. He describes cases and verified his statements by a number of post-mortem examinations. Two patients have been under my care with symptoms similar to those described by Billard, and I could make no other satisfactory diagnosis.

Congenital hypertrophy of the tongue is also rare. I have reported two cases and have seen one other. One of the reported cases was very interesting because of the amount of respiratory obstruction.



Mr. H. had a large tongue from birth, which had always protruded between his lips and throughout his life had caused many alarming attacks of suffocation, chiefly at night. When four years of age its increasing size and unusual appearance induced his mother to consult several surgeons as to the advisability of removing a portion of the tongue. After his fifteen year the lingual veins became so engorged at times that it interfered greatly with his respiration, and on one occasion tracheotomy was contemplated for relief, but the application of leeches to the tongue made this unnecessary.

Children between six months and three years of age may suffer from the ailments we have just considered as belonging to early infancy but they have also other conditions which are not present at so early a period. The following table will be interesting as showing the relative frequency of age and abnormalities found in the four hundred and thirty-seven children I have already alluded to:

181 infants were three years old.

48 infants were 2½ years old.

100 infants were 2 years old.

62 infants were 1 year old.

27 infants were 6 months old.

18 infants were under 6 months.

Of these

87 had adenoids alone,

80 adenoids and enlarged tonsils,

44 hypertrophied tonsils without adenoids,

50 hypertrophic rhinitis,

21 foreign bodies,

20 eczema nares and folliculitis alæ nasi,

13 specific rhinitis,

4 deflected septa.

The balance suffered from more or less acute affections, not of special interest at this moment.

On glancing over the foregoing list many conditions will be recognized as liable to produce marked nasal obstructions. Large tonsils alone may cause snoring and mouth breathing. A superior or inferior hypertrophy of the tonsils may produce these symptoms. In the former the upper extremity of the tonsil is buried in the soft palate, and, adhering to its pillars, greatly diminishes the lumen of the laryngo-pharynx and causing noisy labored breath-



ing. I might incidentally state that any inflammatory changes in an inferior hypertrophy of the tonsil places the child in imminent danger of suffocation, especially if there is any suppuration.

Hypertrophic rhinitis is common in children, and is usually manifested by an enlargement of the anterior and posterior ends of the inferior turbinated bodies, and an increase of erectile tissue on the posterior margin of the vomer. These conditions are frequently mistaken for adenoids, but as they may accompany these conditions are frequently mistaken for adenoids but as they may accompany this condition it is important that their presence should be looked for and understood. On several occasions I have seen children whose naso-pharynxes had been successfully cleared of all lymphoid tissue, but as the nasal obstruction was not relieved, the physician was blamed for an incomplete operation. The hypertrophic rhinitis in some instances is not sufficient to obstruct the breathing, but the great quantity of mucus secreted and the inability or neglect of the child to blow it out, produced the stoppage.

Foreign bodies, such as shoe buttons, small stones, and medicinal tablets, are frequently put in the nose by children without the parents' knowledge. A discharge and snuffling of the nose soon appears, and if the cause is discovered it is at once relieved. If, however, the foreign substance is not found but remains for years in the passages, it becomes incrustated with various salts, and imbedded in granulation tissue until it is difficult to locate. The nasal stenosis does not come alone from the foreign body, but from an accompanying irritative rhinitis.

Septal spurs, ridges and deviations produce more or less nasal occlusion. They are not common in children under three years of age, but occasionally a deviation from traumatism may be found. When the anterior margin of the triangular cartilage is displaced to either side, even slightly, it may cause a valvular action of the alae nasi during inspiration, which occludes the passages.

As I have already stated, we may have adenoids without any mouth breathing or noisy respiration. This would indicate either a very wide or highly arched post nasal space or that the lymphoid tissue should be in a single clump immediately behind the septum, or in small, flattened clusters, well distributed over the surface.

Other symptoms usually lead to the discovery of the adenoids, such as recurring earaches, intermittent hoarseness, frequent colds, constant hacking cough, croup, or profuse post-nasal discharge. Headaches, paroxysmal sneezing, continued dry nasal sniffing, asthma, choreic movements of the facial muscles, nocturnal enuresis, night terrors, glottic spasm, and many other remote reflexes are added by some to this list.

We cannot be too careful in avoiding the limited opinions which special practice is apt to cultivate, and in view of the varied causes of obstructed and noisy respiration, we should exercise the greatest care in the diagnosis and treatment of all affections of the upper air tract of infancy.

### *Paper.*

## SEROUS DISEASE OF THE MAXILLARY ANTRUM, WITH A REPORT OF TWO CASES.

BY W. E. CASSELBERRY, M.D.

IN the critical study accorded diseases of the nasal accessory sinuses, empyema has been the centre of interest because supuration in the maxillary, frontal or other sinuses is found not only to underlie offensive nasal affections but to constitute a center whence septic material is absorbed and infection spread to neighboring organs. Less attention, especially in this country, has been given the muco-serous accumulations; indeed, the frequency of so-called "serous disease" of the antrum has been disclosed only of late by a systematic resort to exploratory puncture in the search for empyema and by assiduous post-mortem inspection of the nasal accessory sinuses. The clinical picture of acute rhinitis associated with acute inflammation of the maxillary or frontal sinus is not unusual. The pain and sensations of heat and distension are observed to be momentarily relieved by the occasional escape of mucus or muco-serum through the narrowed ostium into the middle meatus. This can be none other than an acute catarrhal sinusitis with excess of secretion, which condition has been verified at autopsies in influenza cases by Weichsel-

baum,<sup>1</sup> who found muco-serum which was not cystic retained in the antrum, and in diphtheria and pneumonia cases by Wertheim.<sup>2</sup>

Acute sinusitis may terminate in spontaneous recovery, in acute suppuration and then recovery, in chronic suppuration, and probably in chronic catarrhal sinusitis. The existence of the latter with retention of muco-serum is also verified by autopsy.<sup>3</sup> Whether it follows acute sinusitis or originates *de novo* is not material. Whether it can result in the retention of a serous liquid as in so-called "serous disease" which is not cystic, is still a subject of discussion. Granting tentatively the affirmative, chronic catarrhal sinusitis may then result in the following formations as products of the inflammation:

1. Polyps.
2. Cysts.
3. Osteophytes.
4. Hydrops inflammatorius or serous collection.

Polyps, cysts and osteophytes may also exist in conjunction with suppurative sinusitis.

Only large accumulations are described in the older literature, those sufficient to cause pronounced pressure symptoms, external deformity and, through erosion of the bone, the appearance of a fluctuating crepitating tumor with perhaps a fistulous opening. The term *mucocele*, while likewise applied to serous collections, is more particularly used when the contained material is mucoid, soft, semi-solid, varying to a thinner consistency, and the lining membrane the site of a low grade cell proliferation with edema, polyps and cysts. When, as may be the case with any sinus, but particularly with the antrum, the distended sinus contained a thin serous fluid, it was known as *hydrops antri*. Giraldes,<sup>4</sup> Virchow,<sup>5</sup> and Werner<sup>6</sup> early objected to the latter term as applying a false notion of the real pathological condition, maintaining that the fluid was not free in the sinus, but was contained in a cyst. Berger<sup>7</sup> also likens it to a specimen shown in conjunction with Magitot of a dentary cyst which had filled the sinus. Cysts, when not dentigerous, are ascribed to dilatation of a follicle or degeneration of a polyp.

Several modern authors, however (Browne, Kyle, Shurley, Schech), while recognizing a greater frequency of cysts, are disposed to retain the term "hydrops" or its equivalent as a con-

tinued recognition of a non-cystic serous exudation, either inflammatory with closure of the osteum, passive as in kidney disease, or from venous obstruction. Cases by Delie, Dmochowski,<sup>9</sup> and Krebs are cited in which there was no cyst wall and no "rest" or sinus angle unfilled.

Thus the matter stood until, in consequence of the systematic resort to exploratory puncture, smaller, often insensible, accumulations of muco-serum and serum are found to be relatively frequent. Noltinius,<sup>10</sup> in 1895, reported the stately number of 37 cases of "serous disease" (seröser erkrankung) of the maxillary sinus. He believed the fluid to be free in the antrum, therefore a muco-serous or so-called serous inflammation. The treatment was by simple drainage. Körner,<sup>11</sup> in 1896, reported 7 seven similar cases and confirmed Noltinius' views. Halasz,<sup>12</sup> in 1898, reported 5 cases. Dmochowski,<sup>13</sup> in 1895, in a prize essay, based on numerous anatomical sections, records 2 which particularly bear on this point. The first (Fall 1) was devoid of symptoms during life, but at autopsy had in the right antrum 3 c.c. of muco-serous fluid which contained epithelial cells and lymph corpuscles and clouded with acetic acid. The mucous membrane was much hypertrophied, yellowish and œdematous. When incised, a similar fluid escaped. Microscopically, the membrane showed ciliated epithelium in good condition, the fibers were pushed apart, and the meshes contained collections of small cells. Glands numerous but degenerated. No cysts. The osteum maxillare was patent. Other sinuses and mucous membranes unaffected. The case is interpreted as one of chronic catarrhal sinusitis. In the other case (Fall 13) there had been no symptoms during life indicative of antrum disease, but at autopsy, the osteum maxillare was found completely closed and the sinus distended by a transparent yellowish fluid which did not cloud on the addition of acetic acid and contained only fibrin. The mucous lining was thin, shiny, devoid of epithelium except in spots. Glands few and degenerated; blood-vessels numerous. In one angle of the sinus grew a cystic polypus, the size of a hazel nut. Dmochowski regards this case as an instance of "hydrops inflammatorius," and not as a large cyst, and remarks that a cystic polypus growing within a cyst has not yet been observed. He explains the development as follows: The chronic catarrhal secretion in consequence of closure of the osteum, distends the

sinus, the mucous membrane, and glands atrophy from pressure and the original mucous morphological elements disappear by fatty degeneration, there remaining in the fluid only fibrin, which also finally disappears. He regards the process as analogous to hydrops processus vermiciformis. Killain,<sup>14</sup> in Heyman's Handbuch, and Hajek (15), while regarding cystic formations as more numerous, accept as possible the free accumulation in the antrum of muco-serous and serous fluids. Out of 400 autopsies, Wertheim<sup>16</sup> found free serous fluid in the sinuses in 48, in the antrum in 14. Of the 48, 6 showed inflammatory changes in the mucosa.

Alexander,<sup>17</sup> on the other hand, maintains that these conditions concern always cysts, which opinion is based upon an anatomical specimen in which a clump of small cysts formed a bolster-like mass at about the center of the nasal wall of the antrum, and upon clinical cases in which, after curetting, remnants of cysts were identified. In 2 cases (Fall 3 and 4) with pus in the middle meatus aspiration yielded serum, arguing in favor of cyst in a suppurating sinus. In another case (Fall 6), on opening the antrum, there was found the collapsed wall of a large cyst, within which grew a small cyst. He regards this as a refutation of Dmochowski's position that a cyst cannot grow within a cyst. Hajek<sup>18</sup> also reports cysts yielding serum by aspiration from suppurating antra.

My own cases afford opportunity for study only from a clinical standpoint, yet they present features of interest which may tend toward a clearer understanding of the subject. The first is one of acute sinusitis with retained muco-serous secretion, and is serviceable for comparison of the fluid with that of the second case one of chronic "serous disease."

CASE I.—G. S. I. Recurrent nasal polypi, polypoid transformation of middle turbinated bodies. Septum deflected toward the left. No purulent discharge, nor shadow on transillumination at this time. Resection of middle turbinated bodies and removal of all tangible polyps. Much benefit. Some months afterward, in November, 1897, he returned suffering from an acute influenzal cold, with pain and edema through the left cheek, conjunctiva congested and temperature elevated. Transillumination gave diminished clearness of the left side. Aspiration by Schmidt's needle in the middle meatus yielded a syringe-ful, 4 c.c., of a clear straw-colored muco-serous fluid. This coagulated in part spon-

taneously, and on being centrifuged, gave a residuum of one eighth bulk, which microscopically showed a fibrous-like mass with a few epithelial and lymph cells. No cholesterol crystals. The supernatant liquid wholly coagulated on boiling. The urgent symptoms abated, but a few days later pus appeared in the middle meatus, and an exploratory puncture yielded ordinary pus. Suppuration persisting, eventually an opening was made in the anterior wall. Palpation with the little finger disclosed nothing. Sinus moderately curetted. Complete recovery. Four years later the patient writes: "Discharge ceased and opening healed immediately after drainage tube was removed by you. No further discharge. Nose in good condition, plenty of breathing room, very little mucous discharge.

Semon<sup>19</sup> describes a similar case in his own person, believing the muco-serum to have been free in the antrum, but others have interpreted his case as a cyst which had undergone sudden enlargement, and ruptured at the periods when he felt a free discharge and relief. In Case I. the large amount of albumin and the lymph corpuscles would indicate a mucous rather than a cystic secretion, and the fibrin indicates an inflammatory origin of the fluid. The question arises whether transformation from a muco-serous fluid to pus might not have been due to infection by the exploratory puncture, but in view of the fact that the puncture was made aseptically and that the many punctures to be recorded in Case II. had no such effect, the suppuration must be ascribed to other causes inherent in the case.

CASE II.—Mrs. C. S., aged sixty-two years, has had polyps removed from time to time. Examination, October 23, 1900. Bilateral multiple nasal polypi and consequent mouth-breathing, which is her sole complaint. No pain, sense of distention, purulent discharge, or asthma. After the removal of several polyps it was seen that both middle turbinated bodies were greatly enlarged and in a state of polypoid transformation.

October 30th. The transillumination test shows the infraorbital crescent on each side diminished but not in complete shadow, brighter on the right than on the left side. No pus in the middle meatus. Aspiration of the left maxillary sinus through the nasal wall in the middle meatus yielded a syringeful, 4 c.c., of a viscid transparent fluid which was submitted for bacteriological examination.

November 13. In order to free the upper part of the nostril of an impacted mass of polypoid tissue, to remove obstruction from the ostium maxillare and expose polyps attached to the borders of the hiatus, resection of the left middle turbinated body



was made by the author's method, described before this Association in 1891, in a paper entitled "The Radical Treatment of Nasal Polypus."

January 8th. Repuncture of the left antrum was now entirely negative, both on aspiration and irrigation. Improved clearness by transillumination. At the same sitting aspiration of the right maxillary sinus yielded a syringe-ful of similar fluid, this preceding any operating on that side, except the snaring of a few polyps several weeks ago.

January 22nd. Repuncture of the right antrum yielded two syringe-fuls, 8 c.c., of a clear straw-colored viscid fluid which was submitted for both chemical and bacteriological examination. Aspiration through the inferior meatus yielded an additional half-syringe-ful of identical fluid, now blood stained from previous punctures. Irrigation produced a counterflow through the ostium maxillare, but only under heavy pressure. It was thought a few drops of the serous fluid could be discerned in the washings, but not showing like pus it was difficult to tell.

January 29th. A fourth aspiration of the right antrum yielded a syringe-ful of very bloody fluid, probably made sanious by the middle meatus three days ago, or else by the puncture made a week ago.

February 5th. A fifth aspiration of the right antrum again yielded a clear serous fluid. A resection was now made of the degenerated right middle turbinated body with a large polypoid mass and polyp-buds attached.

February 25th. The sixth puncture test of the right antrum yielded only a few drops of a clear fluid mixed with numerous air-bubbles.

March 19th. Aspiration and irrigation of both antra were now entirely negative. There was no discharge and no discomfort. It would seem that natural drainage of the maxillary sinuses had been restored by removal of obstruction from the nasal surfaces.

#### *Chemical Report.*

The fluid had a slightly reddish tinge from the presence of a small amount of blood. On standing, the corpuscles separated, leaving a thin colorless supernatant liquid. Chemical tests showed the presence of serum albumin as well as what appeared to be a trace of mucin, the amount of the latter substance, however, being too small for positive identification. The proportion of the serum albumin was not large, certainly not over one-fourth per cent

(Signed) J. H. LONG.

Professor of Chemistry, Northwestern University Medical School.



*First Bacteriological Report.*

On December 11th, we received a fluid removed by aspiration from the left antrum of Highmore. Direct cover-glass smear preparations show no bacteria, but two culture tubes contained good large colonies of bacillus coli communis.

(Signed) F. R. ZEIT.

First Assistant Department of Pathology and Bacteriology,  
Northwestern University Medical School.

*Second Bacteriological Report.*

Specimens stained for bacteria show very few isolated bacteria, cocci, and single bacilli. Cultures: Smear inoculations were made on inclined agar, Loeffler's blood serum and human blood serum. Some of the tubes remained sterile, in others a few scattered colonies appeared, cultivations from which resulted in the separation of four species, micrococcus cereus albus, bacillus subtilis, Friedlander's pneumonia bacillus, and a small bacillus with the name not determined. (Here follow identification characteristics.) The cultures indicate that there was not a specific bacterium present. The species separated were not actively vegetative, because they did not grow promptly. Pathogenous: A guinea pig was inoculated subcutaneously with 5 c.c. of the fluid with negative result. Microscopic examination: Only a very few epithelial cells and blood-red corpuscles are visible.

(Signed) ADOLPH GEHRMAN.

Bacteriologist to Columbus Medical Laboratory.

It is of course impossible to specify the exact condition within these sinuses. On the assumption of cysts, the clinical phenomena are more difficult to explain than in most other cases. The "serous disease" was bilateral, and if cystic they must have well filled the cavity on each side, for the fluid was withdrawn from the left side at the level of the middle meatus, and on the right side by repeated punctures at different locations in both the middle and inferior meatus. There were no signs about the gums pointing to detigerous cysts. There was no distention. On the left side, if a cyst, it must have failed to refill after a single aspiration. On the right side, if a cyst, the irrigation counterflow through the hiatus, and the mixture of air-bubbles with the fluid on the sixth aspiration are inexplicable. The fluid was, strictly speaking, muco-serous, but not the product of an acutely active inflammation, for it contained but a trace of mucin, few cellular elements, and little or no fibrin. It resembled a cystic fluid, except that it did not contain cholesterin crystals. It was so largely serous as to fall

within the meaning of the terms "serous disease" and hydrop-inflammatory.

The diagnosis of a serous accumulation, without distention or deformity, must be based upon aspiration. The transillumination test is indecisive, although in both my cases the light transmission was distinctly impaired while not constituting a distinct shadow. This, together with nasal polypus, degeneration of the middle turbinated body, ill-defined browache or sense of fullness in the cheek, should suggest an exploratory puncture. To distinguish a free serous collection from a cyst may be quite impossible without a wide opening of the sinus, and even then and at autopsy, it has sometimes been impossible to determine the point. On transillumination, a fully developed cyst is said to permit or even enhance translucency.<sup>20</sup> Lambert Lack<sup>21</sup> reports perfect translucency when the antrum was distended by a mass of polyps without pus or other fluid. Muco-serous collections impair the translucency, but I judge the impairment would vary with the degree of thickening of the mucosa and intensity of the light.

The treatment is in part suggested by the success in Case II. Obstruction to the ostium maxillare should be remedied, and to this end enlarged middle turbinated bodies should be resected and polyps removed. Noltinius drained the antrum by a large trochar opening in the inferior meatus. If cystic or if recovery has not ensued by suitable nasal treatment, an opening in the anterior wall of the sinus sufficiently large for palpation, and then curetting would seem to promise a cure, and perhaps forestall what would ultimately become an empyema.

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### *Paper.*

## EMPYEMA OF THE ANTRUM OF HIGHMORE IN YOUNG INFANTS.

BY EMIL MAYER, M.D.

THE apparent rarity of this affection, judging from the few cases on record, due, in all probability, to the difficulties in the way of diagnosis, the remarkable unanimity of the symptoms in the cases diagnosed as such, the original methods employed for their cure and the all too brief mention or complete omission in most text-books, should make a study of empyema of the antrum of Highmore in young infants of engrossing interest to the rhinologist.

Not more than a dozen cases are to be found in the literature, three of which occurred in this country, to which the writer now adds another whose history follows:

Helen May P., aged  $2\frac{1}{2}$ , born in New York City, presented at the out-patient department of the New York Eye and Ear Infirmary on May 11, 1899. Her mother brought her to the ophthalmic department because of an eversion of the right lower lid. The child was examined by Dr. Skeel, who referred the case to the throat department, where it was presented at my clinic. The general symptoms noted were eversion of the right lower lid, a fistulous opening in the cheek on the right side from which pus exuded, and a most penetrating odor from the right side of the nose.

The child had been entirely well until six weeks previous, when an attack of scarlet fever complicated by pneumonia on the second day, occurred. Two weeks afterward she was taken with what was called diphtheria, very mild in the throat, but very severe in the nose. At the examination made at that time cultures were taken from the throat and sent to the Health Department of New York City. For this report I am indebted to my assistant, Dr. E. L. Graff, Jr.

"Helen May P. was reported on April 21, 1899, as having scarlet fever and diphtheria.

"Culture taken from the throat on the sixth day of illness failed to show Klebs-Loeffler bacillus. There was a membrane on the tonsils, and a profuse nasal discharge. One injection of antitoxin was given. The inspector of the department says there was much nasal trouble. No record of any other than the Klebs-Loeffler bacillus is made by the department."

An abscess formed on the cheek, and was incised May 5. This never healed and forms the fistulous opening mentioned. An examination showed the left side of the nose to be normal. In the right there was a mass of dry secretion and a vile odor came from thence. Pharynx normal. A small probe readily enters into the fistulous opening and reveals the presence of a large cavity in a downward direction. It has the feel of necrotic bone. Examination of pus showed streptococci and staphylococci in abundance. No Klebs-Loeffler nor tubercle bacilli found. General condition very good, the child being in apparently perfect health otherwise.

*Diagnosis.*—Abscess of antrum of Highmore due to diphtheritic infection. Cleansing solutions were advised and on June 13 I operated under ether. An incision was made through the fistulous opening from left to right about fifteen millimeters in length. The periosteum was scraped away and all bleeding checked, the fistulous opening in the bone was enlarged by a gouge and the interior thoroughly curetted, all necrotic bone removed and the cavity washed out. The probe was now bent at right

angles and introduced toward the nose, and with a little force it went through the thin bony wall and entered the cavity of the nose. This opening was enlarged and a rubber drainage tube suitably perforated was drawn through the external wound and protruded through the nose so that one end lay on the cheek and the other on the upper lip. The remainder of the incision was sutured. Dry dressings were applied. The tube was pulled out by the child on the second day and was reintroduced under ether. Daily irrigations with warm saline antiseptic solutions were employed and on the seventh day after operation the child left the hospital. Drainage was continued, the odor had promptly ceased and on the eighteenth day after operation the tube was removed and the wound allowed to heal.

The child has had no further discomfort, two years have elapsed and no indications whatever of a return of the symptoms have appeared. There is still some eversion of the lid and a firm cicatrix is noticeable at the site of the fistulous wound.

There are but few recorded cases of this affection in the literature and they are briefly mentioned here.

A brief notice of the presentation of a case of empyema of the antrum of Highmore before the Johns Hopkins Medical Society, by Dr. Walter B. Platt of Baltimore, appeared in the *Journal of the American Medical Association*<sup>1</sup> (February, 1900).

As a result of correspondence I am enabled to present the clinical notes of the case through the courtesy of Dr. Platt, which I here gratefully acknowledge.

Empyema of the antrum of Highmore in an infant of 5 months of age.<sup>2</sup>

The patient, E. L., entered the Garrett Hospital for Children, Baltimore, Md., December 1, 1899, age 5 months, female. Both parents appeared healthy and there was no history of syphilis in them. There was no history of previous disease of any kind in the patient, who had the appearance of robust health. The infant was fat, of firm flesh, and good color. Shortly after birth some swelling of the right side of the face was noticed by the mother, with a discharge from the nostril on that side. An opening soon formed on the lower edge of the right orbit, a little toward the inner side of the center, from which pus escaped. Pus was soon after seen to escape from the right upper gum, about half way back. Examination of the patient showed an



unusually healthy child. There was no skin eruption, no sign of past or present syphilis on skin or mucous membranes or about anus. Nothing abnormal was noted in thoracic or abdominal viscera.

There were no enlarged glands in neck or groin. There was a sinus below the right eye, as noted above. This was adherent to the bone, puffy about the edges, and gave vent to an occasional drop of pus.

There was a slight swelling of the right side of the face, hardly noticeable.

There was a slight discharge of yellow pus from the right nostril.

On the upper gum, about the region of the second molar tooth, is a small sinus from which pus escapes at times. The introduction of a probe shows presence of bare bone. A rudimentary tooth was here removed, and some minute pieces of dead bone removed, when a free opening into the antrum is found.

The diagnosis of empyema of the antrum was made, due in all probability to gonorrheal infection of the nose during birth.

There was no bacteriological examination made of the pus.

The discharge diminished rapidly until it was practically nil, and the child was discharged December 23, 1899.

Readmitted January 5th; found to have a loose piece of dead bone one-half inch long at opening of the sinus in the mouth, which acts as a valve to cover the opening and prevent drainage into mouth. This was removed with forceps, and patient discharged January 9th, relieved.

Readmitted February 2, 1900, and a small piece of necrotic bone, size of half apple seed, removed from the outer alveolar wall at the seat of the sinus in the mouth, which was syringed twice daily with boric acid solution, and again patient discharged practically well. February 12, 1900, "I have made every effort since the last date to see the child for the purpose of further examination, but as she lives some distance in the country I have been unable to get hold of her."

The first case on record was in 1847, by G. A. Rees. S. R., aged 2 weeks, had considerable swelling and inflammation of left cheek, the redness extending round the eyelid and just below the eye, an appearance of pointing; the swelling is deep-seated, implicating the floor of the orbit, so that the eye is protruded to



such an extent that the eyelids are incapable of closing over it, the conjunctiva is inflamed and chemosis present; on opening the mouth the left side of the palate is observed to be depressed so as to form a tumor on that side descending below the alveolar ridge; along the dental seam ulceration has occurred and one of the rudimentary molar teeth is apparent. A rudimentary tooth was extracted and a director found its way easily into the antrum, its entrance being followed by an inconsiderable discharge of thick matter.

On the next day the abscess near the inner canthus was incised. Warm water injected into the antrum from below came out on the cheek. Discharge of pus followed. After some weeks these openings closed and the patient was cured.

Rees believes that it was the *pressure of the arch of the pubis on the face in parturition* that gave rise to the mischief.

D'Aarcy Power<sup>4</sup> reports the following history of a child of 8 weeks suffering from empyema of the maxillary sinus.

This child of 8 weeks, nursing, showed a pointed abscess below the right lower lid, bulging of the entire right side of the cheek, skin red and hot. Pus exuded upon pressure; a sound introduced into the cavity showed that the upper portion of the maxillary bone was denuded. Power divided the fistula, scraped the granulations and made an opening in the floor of the antrum into the mouth, drawing through a drainage tube.

Alex. Douglas<sup>5</sup> reports a case of empyema of the antrum in a child 3 weeks old. The right cheek was swollen and the right eye protruded, presenting the appearance of an orbital tumor. On puncture over the alveolus pus exuded. Recovery was complete. Regarding the etiology—there was a possibility of infection of the nose from a sore nipple of the mother, from which pus exuded. Birth was normal.

Roure<sup>6</sup> reports a case of maxillary and orbital osteo-periostitis in a newly born; death.

A child of 15 days had a phlegmon of the orbit with sinus abscess—spontaneous opening at alveolar process of the superior maxilla and at the base of the lower lid. Death in a few days. The affection of the antrum was said to have been occasioned by the entrance of septic secretions in the facial cavities through laceration of skin at time of birth.

Moure<sup>7</sup> reports two cases, one of Greidenberg and the other

his own, in each of which there was an empyema of the antrum in a three weeks' old nursling. In Moure's case there was fistula under the lower lid, swelling of the palate and superior maxillary wall, constant flow of pus from fistula and nose, formation of sequestra and the raw denuded bone.

In an article entitled "Tuberculosis of the Upper Jaw in Little Children Simulating Empyema of the Antrum," George Avellis<sup>3</sup> says: "Cases of empyema of the antrum in infants have been published by three authors—Power, Moure and Greidenberg—each describing one. The main symptoms of the disease, which was presented as one of very rare occurrence, were: a fistulous canal below the lower eyelid, swelling of the palate and the upper wall of the jaw, a continued purulent discharge from the fistula and nose, formation of a sequestrum, and the recognition of rough denuded bone; finally exophthalmos. He doubts the diagnosis in these three cases and positively denies that they were cases of empyema of the antrum." In a typical empyema he says: "We deal with a purulent affection of the lining membrane of the antrum. The symptoms named above are, however, just such which do not belong to a true empyema, excepting only the flow of pus from one nasal cavity, which is not sufficient justification to assume the presence of an empyema of the antrum. What is the condition, moreover, of the antrum, for example, of a child three weeks old? The antrum is only  $\frac{1}{2}$  mm. deep in the fourth month of life. Previous to this its existence is only theoretical, therefore an empyema of the antrum in an infant is hardly possible on account of the development history." According to Avellis these cases were nothing more or less than a tuberculosis of the marrow tissue in the nasal and palatinal process of the upper jaw, in short, caries! "As the latter takes its origin from the infra-orbital process, the fistula naturally makes its appearance below the lower eyelid; the thickening of the palatinal process is caused by the caries of its marrow, the formation of a sequestrum, the denudation of the bone, the chronic suppurations, the formation of granulations, with the periosteal enlargement of the bone, the slow-healing process with the expulsion of dead bone—all in favor of tuberculosis of bone." He had also observed a case himself, which had previously been diagnosed as empyema. "An abscess developed below the left eyelid in a five-weeks'-old boy. This pointed, and small pieces of bone were expelled

through the copiously discharging fistula, while the cheek began to swell. At the same time a purulent and fetid discharge issued from the left nostril. In a hospital the jaw was scraped with an iron spoon after a flap of the skin had been turned back, according to Langenbeck's method, under the diagnosis of empyema of the antrum. Granulations, pieces of bone and one carious tooth were removed. The wound healed by first intention, the fistula below the eyelid closed with deep retraction and the formation later of ectropion. The nose, however, continued to discharge pus." After this condition had lasted for some time—the child was now  $1\frac{1}{4}$  years of age—Avellis was consulted.

"The anterior wall of the upper jaw was only slightly swollen, the hard palate, however, markedly bulged into the mouth on the left side. Palpation did not reveal a soft spot. The left nostril contained much pus. A sound passed into the nose revealed the presence at its bottom, namely, the dorsal portion of the palatal process of the upper jaw, of very rough, sharp and denuded portions of bone. A microscopical examination, which was held later, revealed the presence of a few but distinct tubercle bacilli in the discharge." He emphasized that an acute osteomyelitis of the upper jaw is also frequently mistaken for an empyema of the antrum.

On the other hand, Lenox Browne<sup>9</sup> says, regarding empyema of the antrum in children: "In the first instance these cavities are not strictly sinuses, but rather expansions from the olfactory recesses or pits, budding laterally and posteriorly into the substance of the cartilaginous nasal capsule. An exception is found in the case of the frontal sinus, which is developed at a much later period as an offshoot of the anterior ethmoidal cells, penetrating between the two layers of the frontal bone and quite apart from the nasal capsule."

The order in which these sinuses appear is as follows:

1. Maxillary at the fourth foetal month.
2. Ethmoidal at the seventh foetal month.
3. Sphenoidal at the third year of life.
4. Frontal at the seventh year of life.

The maxillary antrum is *well defined at birth*, but undergoes little change until the second dentition, the sixth to eighth year, from which date it develops rapidly in common with the facial bones; but this development is often unequal.

Several cases have been recently reported of this condition in the infant, and *it may occur in the newly born*. At the outset I would say, although the rudimentary character of the frontal sinus of the infant is an argument against its early infection, this by no means follows in the case of the maxillary, albeit it is rare until the age of puberty.

The cause for such a circumstance is sufficiently varied and direct. In the newly born may be named injury by instruments in delivery; the infection by vaginal discharges of the mother, in an eight-weeks'-old child, and by absorption through the nostrils of purulent secretions from a sore nipple in one aged three weeks.

It has been suggested that in these cases the disease is not an empyema, but an acute osteo-myelitis. The symptoms might possibly represent an acute periostitis due to staphylococcal infection, but the term osteo-myelitis is hardly applicable, for at no period of life do these air cavities partake of the nature of *marrow-holding* chambers, and at early infancy the diploetic walls are so exceedingly thin as to still further exclude the existence of myeloid spaces."

The question thus raised by Avellis having been so effectually answered as regards the question of existence of an antrum at so early an age, and also the impossibility of the occurrence of any medullary inflammation, there remains but to consider the possibility of infection from external sources. In the cases cited in the literature the mode of entrance was taken for granted on the theories of the writers, and hence Avellis might be justified in his unwillingness to accept them. In my own case, here recorded, the writer has shown how a healthy child, although no longer a new born babe, within a few weeks after a streptococcus or diphtheritic infection of a marked nature, develops antral disease with all the classical symptoms, which after operation with through and through drainage and without further treatment promptly recovered.

Comparatively few studies of the antra in infectious diseases have been made.

Bryan<sup>10</sup> states that empyema of the antrum may occur in the course of the exanthemata, particularly scarlet fever and measles.

Lothrop<sup>11</sup> makes the same statement.

Harke:<sup>12</sup> In thirty post-mortem examinations of cases of croup, diphtheria, measles, whooping cough, scarlatina and chicken-pox, not one was free from suppuration in the accessory nasal cavities, the antrum being most frequently affected.

Moritz Wolff<sup>13</sup> examined bacteriologically the accessory sinuses of twenty-three children who died of diphtheria. Of twenty-two examinations of the antrum of Highmore each case was found affected. There was either pus or muco-pus, or the mucous membrane showed signs of inflammation. Where this membrane was found cedematous the bacilli of diphtheria were found. Where the catarrhal state existed these were absent.

In five cases of measles the mucous membrane of the antrum was in a state of glossy cedematous inflammation. The diplococcus lanceolatus and the streptococcus were found, and once staphylococci.

Three cases of scarlet fever with genuine diphtheria were found with similar results.

Richard Mills Pearce<sup>14</sup> reports the results of bacteriological examinations, post-mortem, in fifty cases of diphtheria and scarlet fever. The accessory sinuses of the nose, the antra of Highmore particularly were thus examined.

Of the 50 cases examined, 44 were between the ages of 2 and 6 years. Of the entire number, 39 diphtheria cases were examined; in 25, inflammatory changes were present in the accessory sinuses. In 16 both antra were involved; in 5 one antrum only. The bacillus of diphtheria was present in all but three of the 39 cases. In one of these cases the streptococcus only was found, and in two the bacillus of diphtheria on one side and the pneumococcus on the other. In two cases the diphtheria bacillus was the only pathogenic organism found: in all others it was associated with one or more of the pyogenic cocci or with the pneumococcus. In two cases of diphtheria with measles the diphtheria bacillus was found in both. In five cases of diphtheria with scarlet fever the antra were normal in three and two contained the bacilli.

These cases indicate that infection of the antrum of Highmore is quite common in fatal cases of diphtheria and scarlet fever. It is probable, in view of its frequency in fatal cases, that it may occur in some cases which recover.

In most cases it clears up without any ill effects, but it is



very possible that in others it may so alter the condition of the lining membrane that later an acute inflammatory condition in the nose may readily set up chronic antral disease. It seems very probable too that in those instances where the bacilli are found persistently in the nose long after the subsidence of all symptoms, we have to deal with an infection of the antrum. In all cases therefore in which the diphtheria bacillus persists in cultures from the nose an examination of the antral cavities would appear to be indicated.

Among the causes of inflammatory conditions in the antra may be mentioned dental diseases, coryza, acute or chronic rhinitis, tonsillitis or pharyngitis. There may be a secondary infection in typhoid fever, acute rheumatism, suppurative processes in different parts of the body, typhus fever, acute fibrinous and broncho-pneumonia and in varicella. The presence of foreign bodies in the maxillary sinus must also be enumerated. Of the latter Ralph J. Wenner<sup>15</sup> reports a case of disease of the maxillary sinus in a child aged  $3\frac{1}{2}$  years, occasioned by an erupted tooth.

Bacteriological examination of the pus from the antrum showed diplococcus pneumonia and the staphylococcus pyogenes albus. Careful search was made for tubercle bacilli with negative result.

J. Guttman<sup>16</sup> reports a case of empyema of the antrum in a boy, aged 5, occasioned by caries of the teeth and followed by retrobulbar abscess. He quotes Goodhart as having mentioned a similar case in a boy aged  $4\frac{1}{2}$  years.

From the study of the bacteriological examinations and from the recital of cases here recorded, we may conclude that it is established beyond question of doubt that empyema of the antrum of Highmore in young children is not merely caries or tuberculosis or an osteo myelitis, but is as distinct an affection as in later life.

That so few cases are noted in the living is in all probability due to the fact that the mortality is greatest when this complication occurs, and also that in the very young the presence of localized pain is so difficult to establish, as the little sufferer cannot indicate it.

In all the reported cases the symptoms are the same, namely, fistula under the eye, usually discharging pus, ectropion, one-



sided purulent discharge from the nose with foul odor and eroded bone. Careful observation, especially in nasal diphtheria when the bacilli are persistent, may enable us to discover other cases and by prompt attention recovery result.

Regarding treatment, incision, curettement and thorough drainage will be followed by complete cure in the vast majority of cases.

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CHRONIC EMPYAEMA OF THE FRONTAL ETHMOIDAL AND BOTH SPHENOIDAL SINUSES, WITH EXTENSIVE NECROSIS OF THESE BONES, COMPLICATED WITH ADENOMA OF THE POSTERIOR ETHMOIDAL AND SPHENOIDAL REGIONS.

BY J. H. BRYAN, M.D.

MRS —, aged 48 years, consulted me in the latter part of January, 1899, complaining of excruciating headaches referred to the left side of the head, but with greatest intensity over the left frontal region. The pain was constant, and has been increasing in severity until now it has become unbearable. She attributes the beginning of the headaches to a period about eight years ago, when during the convalescence from an attack of pneumonia she was seized with a most violent pain in the head, which was accompanied by great prostration. The condition at the time was described by her physician as a congestion of the brain. It passed off, however, within forty-eight hours. From that time until the present she has been annoyed by the dropping of mucus into the post-nasal space.

This has increased within the past two years; and recently the discharge has become very fetid, so much so that she suffers continually from morning sickness. With the increase in the discharge the headaches have also increased, but whenever there is a diminution of the flow of the secretion the headaches become intensified. On examination there was no swelling about the face; but there was great pain on firm pressure over the supra-orbital ridge, and very great sensitiveness on pressure just under the ridge near its inner angle.

A rhinoscopic examination disclosed only a moderate amount of swelling of the middle and inferior turbinals on the left side, and a very slight deviation of the septum to the right. The middle meatus was to a considerable degree obliterated by the overhanging middle turbinal. No secretion was observed in the anterior nasal chamber. A posterior rhinoscopic examination showed the posterior extremities of the inferior and middle turbinals on both sides to be normal in color and size. Some thick, yellowish secretion was observed flowing into the post-nasal space over the posterior extremity of the left middle turbinal. After thoroughly cocaineizing the parts, the probe revealed extensive caries of the anterior ethmoid region. Examination of the frontal and maxillary sinuses with the electric light was of negative result.

The serious character of the patient's condition was explained to her; that there was an abscess of the frontal and ethmoidal sinuses with extensive bone disease, and an operation was advised; but upon her earnest solicitation an external operation was to be postponed until all intra-nasal methods had been tried.

April 22, 1899. Complaining of pain in the left eye, a blurring sensation, and with a feeling that the left eye is larger and heavier than the right. Examination by Dr. Wilmer who had examined her eyes in 1896, found the refraction the same as at the first examination. The curvature of the cornea in the left eye slightly changed, the slight astigmatism with the rule being less than in 1896. Vision in the left eye  $\frac{20}{20}$  as before, but now print near at hand seems clearer with the right eye than with the left. In both eyes fields for white and other colors are normal. Fundus normal, no pulsation of retinal vessels. The anterior ethmoidal cells were frequently curetted and much diseased bone was removed from time to time, giving the patient temporary relief by a freer drainage; this improvement, however, was only of slight duration.

May 10th an unusually large piece of bone was removed from the anterior ethmoidal region by the curette, thus admitting of the passage of a cannula into the frontal sinus, which was washed out with a saturated solution of boric acid; a large quantity of thick, fetid pus was brought away. This was repeated on several different occasions, but instead of giving the patient relief only increased her suffering to a very great degree. The passage of the cannula into the frontal sinus revealed such an extensive disease of the bone, all hope of removing it through the nose was abandoned; and the pains increased to such an extent that the patient readily consented to more radical measures being taken for her relief.

June 4th. The patient having been prepared for the operation, and the left eyebrow shaved, she was placed under ether anesthesia. An incision commencing just within the supra-orbital notch was made over the supra-orbital ridge down to the bone, extending as far as the nasal eminence. The flap thus formed, composed of skin and periosteum, was elevated and a button of bone about one cm. in diameter was removed from the anterior wall of the sinus at a point about one to two lines from the median line and just above the supra-orbital ridge.

Upon opening the sinus it was found filled with thick, fetid pus and granulation tissue. After the removal of the contents of this cavity, the probe revealed extensive disease of its bony walls; there was some softening of its posterior wall near the floor, the partition between the two sinuses was extensively diseased and broken down, and the roof of the orbit was in such a necrotic state that a piece about the size of a dime had to be removed. After the removal of all the diseased bone within the

sinus by means of the curette, the ethmoid bone was next examined and found extensively diseased in its anterior region. With the little finger within the nose as a guide, the curette was passed from the sinus into the nasal chamber and all diseased bone that could be felt was removed, thus leaving a very large communication between the sinus and the nose. The sinus was then irrigated with a solution of bichloride of mercury 1-3,000, its walls touched with a 20 per cent. solution of chloride of zinc and packed with iodoform gauze, one end of which was brought down through the nose to act as a drain. The wound was then closed, the edges of the periosteum being drawn together with catgut, while the external wound was closed with silk sutures, and the whole hermetically sealed with iodoform and collodion.

At the end of the second day the gauze drain was withdrawn through the nose, and through a cannula passed through the nose into the sinus, it was irrigated with a saturated solution of boric acid. The secretions rapidly subsided under daily irrigations and in the course of three weeks they had practically ceased. The stitches were removed on the sixth day, perfect union having been obtained.

The patient was completely relieved of her headaches, her convalescence was rapid and she expressed herself as feeling better than she had felt for several years. At the end of a month from the time of the operation she had sufficiently recovered to leave for York Harbor, where she was to spend the summer. At this time there were no headaches and no secretion coming away when the sinus was irrigated. A rhinoscopic examination showed the nose free from secretion and in otherwise good condition, save from an enlargement of the anterior extremity of the middle turbinal which had not been removed.

July 15th. She contracted a severe head-cold and in the course of twenty-four hours the skin over the left frontal sinus was very red and swollen, the swelling involving the upper and lower lids of both eyes. In consequence of no secretion passing into the nose the pain became excruciating; and as immediate relief was demanded, an opening was made into the sinus by Dr. Sprigg, her family physician, at the seat of the greatest swelling, which was some distance above the supra-orbital ridge, evacuating a large quantity of pus, thus affording considerable relief. The following day she was removed to Boston to be under the care of Dr. Coolidge, to whom I had previously referred her in case of necessity during my absence abroad. The suppuration being so profuse and the passage between the nose and the sinus having closed, thereby preventing drainage through the nose, Dr. Coolidge enlarged the external opening, at the same time making a very free communication between the sinus and the nose. The wound was not closed, but treated by the open method. Although the patient was relieved to some extent of the pain, the suppura-

tion never ceased. When she returned to Washington in October her condition was as follows: There was an opening into the sinus about half an inch above the supra-orbital ridge and a small fistulous tract below this ridge just above the internal canthal ligament, through which pus came in large quantities; there was also a free discharge of pus through the upper wound; but little or none passing into the nose.

A probe passed into the sinus through the external wound showed extensive necrosis of the floor of the cavity, especially that portion in relation with ethmoid cells. It was found impossible to pass a probe from the nose into the sinus, the opening previously made by myself and Dr. Coolridge having closed completely.

The open method of treating the sinus was continued, the cavity being irrigated daily with one or more of the several antiseptic solutions employed, such as hydrogen dioxide, formalin, or a saturated solution of boric acid. In addition a gauze wick was introduced through the external opening to facilitate drainage. This method of treatment was faithfully followed for several months, with the expectation of my being able to reestablish the opening into the nose by means of the curette; but failing in this and in view of the tendency to the closure of the external opening, the patient's condition in the meantime growing worse, it was decided to open the sinus again.

Jan. 7th. Having been prepared for the operation, the eyebrow shaved, she was etherized, an incision was made through the skin and periosteum in the line of the incision over the supra-orbital ridge in the original operation, the flap elevated and the sinus exposed. The upper half of the cavity was filled with firm granulation tissue, while on the most dependent part of the floor pus was found in considerable quantity. After thoroughly cleaning the cavity out, the probe revealed extensive necrosis of the ethmoid bone as well as that portion of the floor of the sinus in relation with it. As much of the diseased ethmoid bone as could be reached by means of a curette passed through the frontal sinus opening, using the little finger within the nose for a guide, was removed. The probe passed not only far back on the affected side, but it could be passed diagonally through to the opposite side without detection of any further diseased bone. It was thought that the probe must have reached the sphenoidal sinuses, although there was no positive means of verifying the belief. After thoroughly irrigating the parts with a solution of bichloride of mercury 1-3,000, and packing the cavity with iodoform gauze, one end of which was drawn out through the nose, the wound was closed as in the original operation.

The night of the operation and the day following, the patient was very ill, complaining of intense pain on top of the head and in the occipital region. During the night and part of the follow-



ing day she was delirious. There was only a slight elevation of the temperature.

Jan. 9th. Mind much clearer, pain in top of the head less, but she still complains of intense pain in the occipital region. The gauze drain was removed and the frontal sinus irrigated with a saturated solution of boric acid through a cannula passed through the nose into the cavity. This was accompanied by a great deal of pain with the frontal region, but no pus was observed in the return flow. The sinus was irrigated daily, but with some difficulty, owing to the presence of the middle turbinal, which interfered with the passage of the cannula, although the anterior extremity of this bone had been removed by Dr. Coolridge and several pieces by myself, prior to this last operation, it still acted as an obstruction. The stitches were removed on the sixth day, good union having been obtained, and firm closure of the fistulous openings above and below the supra-orbital ridge. The patient expressed herself as feeling greatly relieved, all the occipital and frontal pains had disappeared and she seemed to be making a rapid and satisfactory convalescence, although the probe passed into the region of the anterior ethmoid cells still revealed some necrosed bone; there were no sections found in the anterior nasal chamber nor in the post-nasal space, and nothing abnormal was observed by posterior rhinoscopy.

Feb. 10. One month after the operation, when everything seemed to be progressing favorably, she was seized with a violent headache referred to the frontal and temporal regions. This was accompanied by obstinate nausea and vomiting. The temperature, which up to this time had been normal, went up to 100°. On attempting to wash out the frontal sinus the parts had become so swollen it was found impossible to pass the cannula. On using the probe under the middle turbinal an over distended ethmoid cell was evidently penetrated, for a considerable quantity of foul smelling pus made its appearance in the region of the middle meatus on its withdrawal. This gave her some relief, for the violence of the pain subsided, but there was a constant dull headache remaining. She complained of an intense itching of the skin over the left frontal region, which at times became very distressing. This sensation seemed always to be associated with some new invasion of the ethmoid cells.

From this time my efforts were directed to the removal of the diseased ethmoid bone; first removing portions of the middle turbinal, then with the curette and cutting forceps, diseased bone was removed as fast as was compatible with safety. The headaches continued with greater or less severity until about the early part of May, when they increased in intensity, the pain being referred principally to the supra and infra-orbital regions, and in the left eye. As the disease was evidently progressive in character she was put on a course of the iodide of potash, commen-



cing with ten drops of a saturated solution three times a day; it was carried up to the point of tolerance, which was forty drops three times a day, but without the slightest benefit resulting.

June 1st, 1900. Pain in the left eye much worse than it has previously been, photophobia, lachrymation and congestion of the conjunctiva, apparently no deviation of the eyeball from its normal axis. Palpation shows a swelling along the internal portion of the floor of the orbit, extending upward to the internal angle, and very painful to the touch. Ophthalmoscopic examination by Dr. Wilmer showed a pulsation of the ophthalmic veins.

As a result of the consultation it was thought that the ethmoid cells in relation to the inner wall of the orbit were involved, and in order to prevent an orbital abscess an operation was decided to be immediately necessary. The eyebrow was shaved and on the following day, June 2d, she was put under ether anesthesia. An incision commencing at the juncture of the middle and outer third of the supra-orbital ridge was made through the skin and periosteum along the ridge to its internal angle, then curved and carried along the inner border of the nose to within an inch of its tip; the periosteum elevated above and below, thus exposing the contents of the orbit. There was found to be a bony swelling along the inner part of the floor and the inner wall of the orbit, extending some distance backward. The bone was so thin and soft that the weight of a light perforator passed between the trochlea and internal canthal ligament was sufficient to penetrate it, showing that the lateral wall of the orbit about the region of the os planum had become so thin that a little longer delay would probably have resulted in an orbital abscess. A sharp curette was passed through this opening, bringing away some pus and a large quantity of soft and friable bone tissue. All diseased bone that could be detected was removed in this way. It was thought best to explore the frontal sinus, accordingly the periosteum was stripped up sufficiently to expose that cavity thoroughly; it was, however, found filled with firm granulation tissue. Owing to the possibility of infection from the lower wound, the sinus was with some difficulty cleared out; after cleansing the parts a strip of iodoform gauze was passed through the ethmoidal opening into the nose, the periosteal wound closed with catgut and the external wound with silk sutures, the whole sealed with iodoform and collodion and protected by a bandage.

June 3d. Complains of little or no pain this morning, but has been more nauseated than after the previous operations; temperature 99°; considerable swelling of the upper eyelid and face, otherwise doing well.

June 4th. No headache, temperature normal, swelling of the upper lid very much less; removed gauze from the nose and ir-

rigated with a saturated solution of boric acid; complains of intense vertigo and nausea.

June 5th. Swelling of the face and upper eyelid very much diminished; vertigo increasing; no pain; temperature normal; upon irrigating the nose only small particles of secretion brought away.

June 6th. Vertigo still very marked, swelling sufficiently subsided to admit of a thorough inspection of the eye, which was found to be in good condition; complains of photophobia and double vision. These uncomfortable and annoying symptoms continued for several weeks, gradually passing off. Eye kept bandaged to exclude the light. On the sixth day the stitches were removed, the wound having thoroughly healed.

June 12th. Complained this morning of feeling chilly; temperature  $99^{\circ}$ ; evening temperature  $102^{\circ}$ . Examination of the wound shows no swelling nor soreness; but there is some swelling of the middle ethmoid region; no secretions have been brought away by the irrigations.

June 13th. No further chilly sensations; feeling better; temperature, 8 A. M.,  $100$ ; 12 M.,  $100$ ; 4 P. M.,  $99$ ; 8 P. M.,  $99$ . Some pus was brought down by irrigation.

June 14th. Vertigo and diplopia still continue, although to a less degree; secretions coming away freely; morning temperature normal, evening temperature  $99^{\circ}$ . No headache.

June 20th. Decided improvement in the patient's general condition since the last note; vertigo slight, diplopia has disappeared, no photophobia, no pain in or around the eye, which has returned to its normal appearance. Secretions muco-purulent in character, but much less in quantity, coming from the middle ethmoid region. Having improved sufficiently, she was removed to Chevy Chase, a suburb of Washington, for the summer. For the first ten days of her stay in the country her condition continued to improve, but on or about July 1st she contracted a severe attack of membranous colitis, which greatly prostrated her. During the acute illness, which lasted during the month of July and part of August, little or nothing could be done in a surgical way for the relief of her local trouble. The nose was irrigated daily with a boric acid solution, by which means free drainage was maintained. Up to the time of her removal to the country the middle turbinal and the ethmoid cells as far back as the middle of that bone had been completely removed. Although the probe still revealed caries of the ethmoid cells, and the secretions while greatly diminished in quantity still contained pus, the disease did not seem to be active. She was freer from pain in the head than at any time since the relapse in February.

September 12th. To-day she had a violent pressure headache: the secretions have practically ceased; refers the greatest

pain to the occipital region and to the vertex; pressure back of both eyes, but most severe on the left side. A decided swelling is observed for the first time over the left eye near the inner angle of the orbit. Unfortunately no ophthalmoscopic examination was made at this time. Upon examination of the ethmoid bone with a probe a small sinus was discovered, which extended some distance backward. This was enlarged with the curette, which permitted a free flow of secretion with much relief to the patient. The headaches now became quite frequent and were referred principally to the occipital region.

From this time on the remaining middle turbinal and the ethmoid bone were attacked with the cutting forceps and curette.

October 5th. Quite a large bony growth was observed for the first time, triangular in shape, with its base attached to the

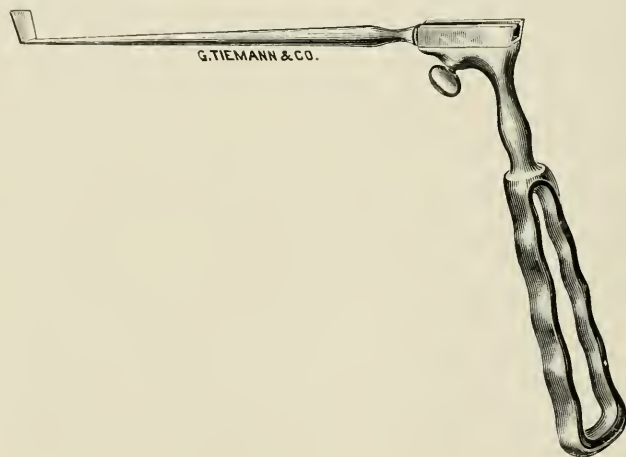


Fig. 1.

middle meatus, extending across the vestibule of the nose. After the removal of this bony obstruction a firm growth, grayish in color, was discovered springing from the ethmoid bone between the middle and superior turbinals and in the region of the posterior ethmoid cells: it was quite firm in consistency and did not bleed readily when touched with the probe. This growth blocked up the upper portion of the nose, pressing firmly against the posterior portion of the vomer, destroying the nutrition of this part of the septum and causing necrosis of this bone. After a partial removal it was found to extend backward and to be attached to the anterior wall of the left sphenoidal sinus.

This cavity was now opened by means of a bony flap being removed from its anterior wall by a peculiar shaped knife made for me by Tiemann & Co., shown in Fig. 1.

This knife is sharpened on two sides, the lower, which can penetrate the cavity, and with the anterior a forward movement can be made, cutting through the anterior wall, then reintroducing it into the cavity at a different angle, a bony flap can be formed, the removal of which leaves quite a large opening in the sinus. After opening the sinus in the above manner it was found filled with thick, foul-smelling pus, the evacuation of which gave the patient the greatest relief. The occipital headaches, which had been almost constant, now ceased for a while.

After the left sphenoidal sinus was exposed, the probe revealed a very extensively diseased condition of the sphenoid bone: the septum between the two sinuses was carious and partly broken down, so that the two cavities communicated and were involved in the suppurative process: the roof of the cavity, at its junction with the nasal septum, as well as its floor, were also in a necrotic state. From time to time this diseased bone has been removed by means of the cutting forceps, giving the patient only temporary relief, for as fast as the growth is removed it forms again, blocking up the opening into the left sphenoidal sinus, which is used to drain both cavities. When the drainage is interfered with the pressure at the back of the eyes becomes very severe, and the headaches, which are referred to the occiput, vertex and frontal regions, become almost unbearable. It has been necessary to cut away the growth about once in ten days or two weeks, but now, as it is growing with greater rapidity, it is necessary to operate oftener.

At the present writing of this paper, May 1, 1901, the condition of the patient is as follows:

Both sphenoidal sinuses are the seat of the suppurative process, nearly the whole of the ethmoid cells on the left side having been removed; the anterior wall of the left sphenoidal cavity, part of the roof and floor, and the partition between the sinuses have been removed; yet, in spite of the extensive bone removal, it is impossible to keep the cavities drained, owing to the location and rapid development of the growth. The indications at present are that it is extending into the deeper parts of the sphenoid bone, while the patient's strength is rapidly failing and her suffering greatly increasing, and it does not seem possible that any but an unfavorable termination of this unfortunate case is to be looked for.

The following is a report of the bacteriological examinations made by Dr. William Gray, of the Army Medical Museum:

On two occasions inoculations from the secretions of the sphenoidal cavities of Mrs. — were made. Each time six agar tubes were used.

Of the first batch of tubes all showed a growth within twenty

hours; the growths consisted of staphylococci pyogenes aureus and albus, the albus predominating. The growth in the tubes was not excessive, several showing the presence of but two or three colonies, while the tubes that contained the largest number of bacteria did not develop more than eight or ten colonies. It was thought at the time that besides the staphylococci there was a diplococcus present, but after repeated transfers this organism also proved to be a staphylococcus.

Of the second batch of six tubes, but three developed any growth, the other three remaining sterile. The growth proved to be the same as in the first lot of tubes, staphylococci.

Toubert, in a paper on the intracranial complications following disease of the sphenoidal sinus, gives full details of two cases which came under his personal observation, together with a summary of twenty-two others collected from various sources. He attributes the exciting cause to infection, sometimes by the bacillus of influenza, but principally by the pneumococcus or diplococcus of pneumonia, which occur both in the pus of the sinus and in that of the meninges, the organisms having made their way to the sphenoidal sinus from the nose, the naso-pharynx, or from another sinus, as for example the ethmoid.

Infection may take place directly in connection with a general disease, such as pneumonia or erysipelas, or indirectly, (1) after febrile diseases, such as typhoid fever and influenza, or (2) after chronic diseases such as syphilis, which tend to produce necrosis of the bone.

It is interesting to note that in my case the first symptom pointing to accessory sinus trouble was the so-called congestion of the brain eight years ago, following pneumonia, and which was nothing more nor less than an acute abscess of the frontal sinus. Nothing having been done for the relief of this condition, the bone eventually became extensively necrosed, the disease steadily progressing until the whole of the corresponding half of the ethmoid, both sphenoidal sinuses and a considerable part of the sphenoid bone itself have been involved in the necrotic process.

The bacteriological examination of these cases is important and should always be made, with the view of determining the cause of this little known affection. In two other cases, both of which terminated fatally, I neglected to have a bacteriological examination made. Both cases have been reported elsewhere,



but a brief reference to them may be of interest in connection with this paper.

In one case both sphenoidal cavities were diseased in consequence of a neglected suppurative disease of the frontal and eth-

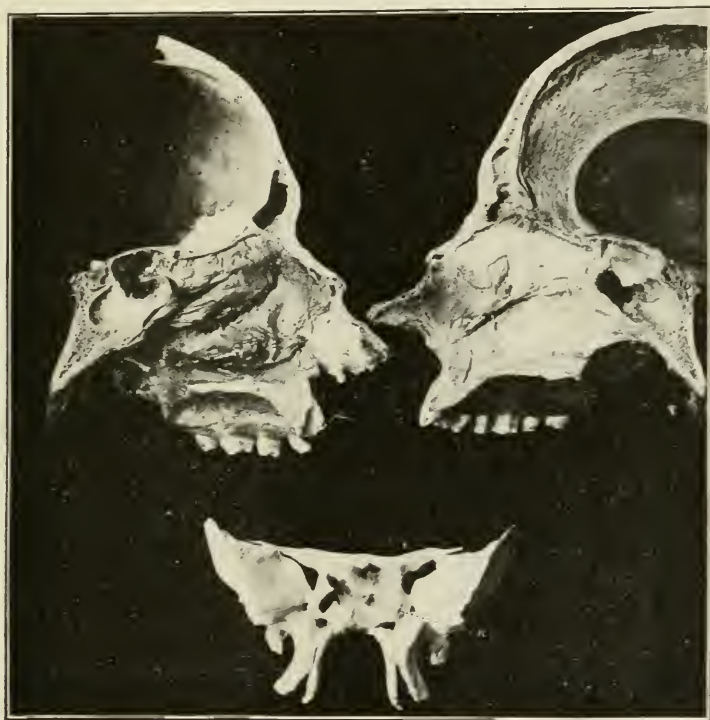


Fig. 2. A photograph of two dry preparations, the upper picture showing a very large right sphenoidal sinus with its foramen located just below the posterior extremity of the superior turbinal, while the opposite half of the sections shows a comparatively small left sphenoidal sinus. The lower picture shows two complete left sphenoidal cavities with one foramen (R) in the lower.

moidal sinuses. The patient died five days after an operation on the frontal sinus, an autopsy showing a meningitis resulting from an unrecognized abscess in the sphenoidal sinuses.

In the second case, a primary abscess of the sphenoidal sinuses



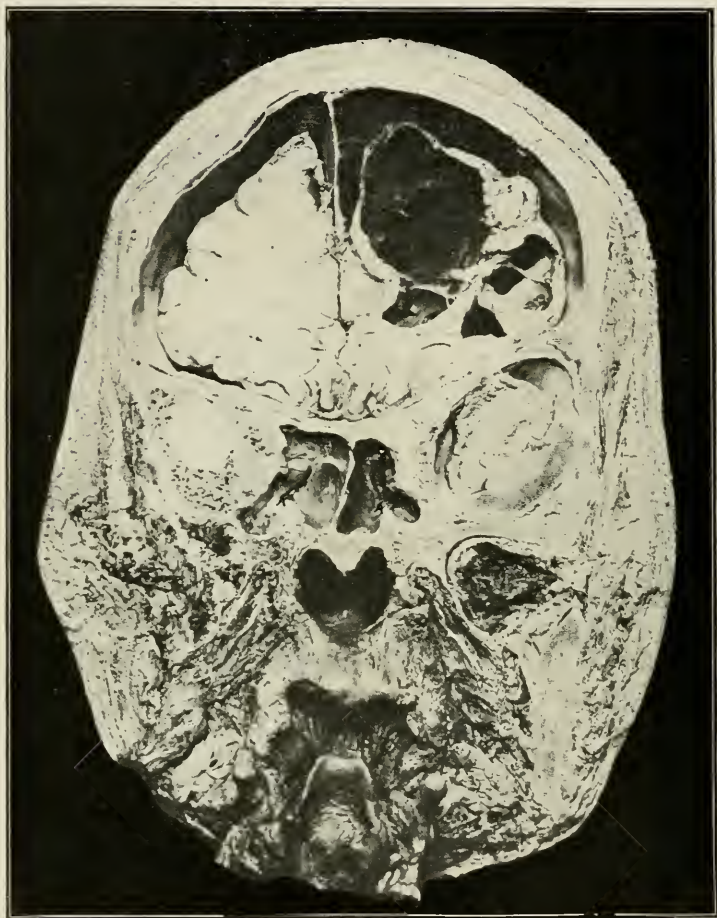


Fig. 3. A photograph of a section made through the posterior third of the sphenoidal cavities, showing the foramina *AA* located about the middle of the anterior wall. The right sinus is well developed, while the left is partially subdivided by an incomplete partition. An additional point of interest in this specimen is a large abscess sac, which occupied nearly the whole of the frontal lobe, and a second sac occupying part of the temporo-sphenoidal lobe.

was successfully opened, but during my absence from the city the patient died of meningitis, he having refused to remain in the hospital, where he could be under observation.

The sphenoidal cavities probably offer greater difficulties in

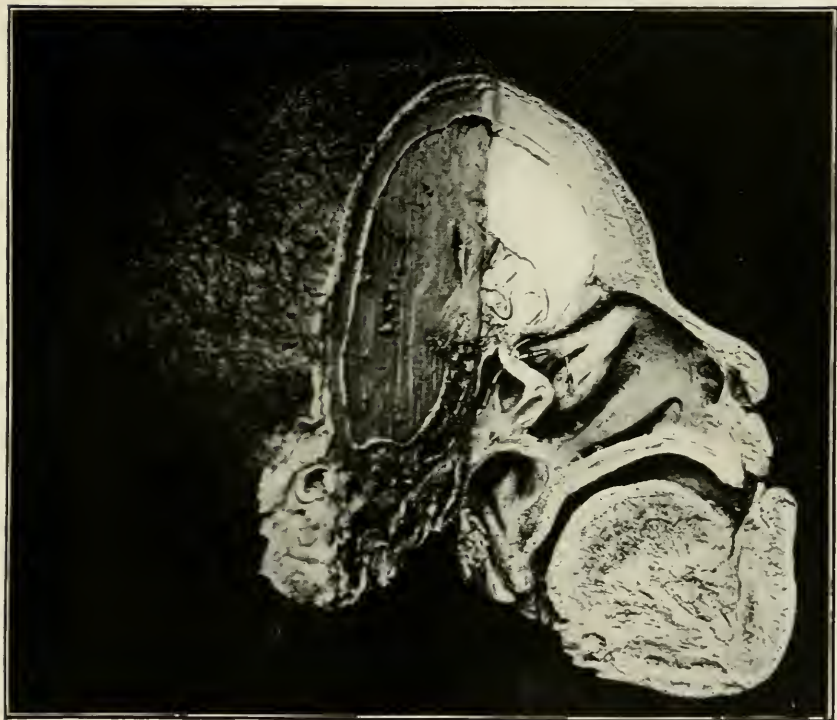


Fig. 4. A photograph of a combined antero-posterior and transverse section showing a very large left sphenoidal cavity with a very thick anterior wall bulging forward across the post-nasal space.

the way of diagnosis and treatment than all the other sinuses, and the prognosis is much more unfavorable, not only on account of the difficulty in keeping the cavities open, but also because



Fig. 5. A photograph of the remaining portion of the section from the above preparation, showing a very small right sphenoidal sinus with its foramen presenting upward instead of forward.

malignant growths are much more frequently associated with them than with the other cavities of the nose. These cavities are subject to the same variations that we find in the other accessory

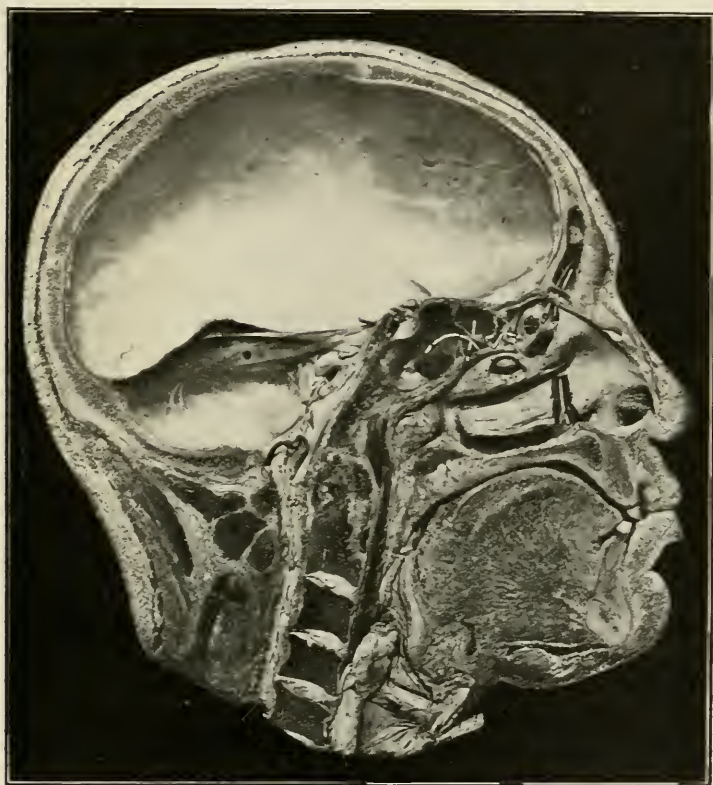


Fig. 6. Shows a section with the middle turbinal partially removed, showing a very large anterior ethmoid cell, the middle ethmoid cell only partially developed, while the posterior ethmoid cell is quite a large cavity. The sphenoidal is unusually large in this specimen. *F* is a wire passing through the sphenoidal opening, *E* the entrance into the posterior ethmoid cell, while *B C D* show three distinct openings into the frontal sinus, *A* is the entrance into the nasal duct.

sinuses. Although little has been done heretofore in bringing out these irregularities, it is very important that they should be em-



phasized, in order that we may be on the lookout for them as a possible factor in cases that do not yield readily to treatment.

By far the best and safest method of opening the sphenoidal sinus is the one before mentioned; that is after removal of the middle turbina, with such a knife as used by Hajek or a modification of it as shown in Fig. 1, a section is made in the anterior wall of the sinus, and with cutting forceps the opening can be enlarged sufficiently to meet the needs of the case. In a very narrow nose this method, however, might be impossible of execution; then that recommended by Jansen<sup>2</sup> at the International Medical Congress at Moscow might be tried. Jansen proposed to utilize the opening made in the maxillary sinus in cases of combined empyema of the accessory cavities, to open at the same time the posterior ethmoid cells, and next the anterior external wall of the sphenoidal sinus. The opening of the sphenoid is thus made easier and larger than by the nose, but it is often difficult and sometimes impossible, as remarked by the author, when the collection of blood is abundant, to distinguish between a large ethmoid cell and the sinus itself. This operation I believe has also been done successfully by Luc.<sup>3</sup> Furet<sup>4</sup> proposes the method of Jansen when the antrum is healthy and has practised it in one case successfully. He concludes that the nasal passages can be utilized in simple cases where the nose is sufficiently straight and large, and the maxillary route is indicated only in the following cases.

1. When the maxillary sinus participates in the inflammation.
2. In all inflammations of the sphenoidal sinus complicated with cerebral symptoms.
3. In all sphenoidal inflammations in subjects with narrow or abnormally formed nasal fossæ.

The new growth in the case I have reported was first discovered about the latter part of September, 1900, and was probably the result of the irritation of the mucous membrane, whose vitality had been lowered by the prolonged inflammation of the adjoining cavities.

A part of the growth was sent to Dr. Jonathan Wright for diagnosis, and the following is his report: "Small, irregular masses of tissue; on microscopical examination prove to be made up of low grade inflammatory tissue, the connective tissue mesh work being filled not only with the products of inflammation, but

with a typical proliferation of epithelium, often arranged in the forms of imperfect tubules and acini. In places there are irregular patches of epithelium and epithelioid cells, blood vessels and true glands being almost absent. In all probability the growth had

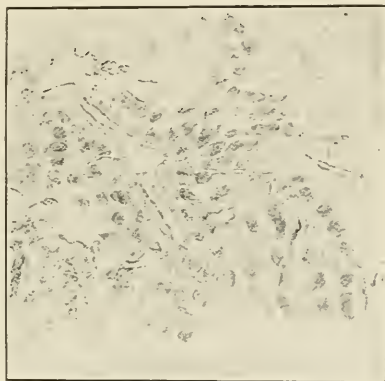


Fig. 7.



Fig. 8.

Figs. 7 and 8 are drawings made from microscopical sections of the growth.

its origin in the glands of the mucosa. It is without doubt a malignant adenoma, and is apparently growing more rapidly than is the rule with these cases."



Pure adenoma is very rare in the nares; some authors, as for instance Bosworth,<sup>5</sup> deny that they ever occur within the nose. He states "that until further clinical evidence of the fact has been established we must conclude that unmixed adenoma does not occur within the nasal cavity." The mixed variety, however, as fibro-adenoma, myxo-adenoma, angeio-adenoma, papillary-adenoma, adeno-sarcoma and adeno-carcinoma, are relatively more frequent.

The principal features of these new growths are their rose or grayish color, of firmer consistency than nasal polypi, rarity of epistaxis and the preservation of a good general condition. These tumors are, according to Tissier,<sup>6</sup> generally benign, but may become malignant.

Upon reviewing the literature of this subject in the library of the Surgeon General, U. S. A., I can find only five cases of unmixed adenoma of the nasal fossæ reported, while of the mixed variety the literature is very much more abundant. Two of the five cases are referred to by Bosworth, viz., those of Gosselin and Puglièse.

Gosselin's<sup>7</sup> case was a man, fifty-three years of age, who came under his observation in 1858: in the previous year, however, he had several polypi removed from right nostril, by Fallin. When he came under Gosselin's care there was stenosis of the right nasal fossa, by a rather large, grayish, soft tumor, extending back into but not adherent to the naso-pharynx. It was attached to the upper and anterior part of the fossa. The growth was removed by external operation, and was apparently successful. Microscopic examination showed the growth to be composed of glandular structures, with abundant epithelial cells. Gosselin refers to two previous similar cases, one at the Hôpital Cochin and one at the Hotel Dieu. This later case was operated upon by Robin. After removal the patient finally died of meningitis, caused by the invasion of the ethmoid and sphenoid.

Puglièse's<sup>8</sup> case was a woman, aged sixty-five; eighteen months previously she noticed a small induration corresponding to the lower part of the left lachrymal sac, simulating a commencing lachrymal tumor. It gradually enlarged, without material pain, causing exophthalmus and divergent strabismus. There was no nasal stenosis, epistaxis or discharge.

Microscopical examination showed it to be adenomatous, with some epitheliomatous degeneration.

The growth originated from the glands of the mucous membrane on the outer wall of the upper part of the nasal fossa; after enlarging it perforated the bone and penetrated into the orbit, the ethmoid cells and maxillary sinuses. It was removed by external operation, which was apparently successful, no recurrence having been reported.

MacKenzie Johnson<sup>11</sup> reports a case of true adenoma of the naso-pharynx, in a boy 13 years of age; there was a fine sessile tumor in the naso-pharynx, pale red, size of a small walnut; it did not bleed, and gave the impression of adenoids. The growth was removed with forceps, and the patient was well within one year. Microscopical examination showed tumor to be a true adenoma, covered by a cylindrical epithelium.

Thomas J. Harris<sup>9</sup> also reports a case of true adenoma of the nose in a man 78 years of age. Patient had been under his care for two years, for nasal growths, which completely filled both nostrils and sprang from the ethmoid. The growths were removed with the snare, and the bases curetted. There was a partial recurrence within a month, then freedom for a year. In November, 1894, there was a further recurrence in the left nostril, with pain and exophthalmus on that side, and the patient died. Microscopical examination showed the growth to be almost pure adenoma, with scattered areas of small round and spindle cells.

H. Eichler<sup>10</sup> related the history of a case of adenoma simulating polyp of the nasal septum. The patient, whose age and sex are not given, was sent to him for nasal obstruction. Examination showed hypertrophy of the mucosa of the lower turbinates, and a polyp of  $1\frac{3}{4}$  by  $\frac{3}{4}$  by  $\frac{1}{2}$  centimeter, attached to the septum on the left side, that was striking on account of its rosy red color. It was removed with a snare. Microscopical examination showed it to be a pure adenoma.

Wright<sup>12</sup> says "that pure adenoma of the nose is almost unknown, although hypertrophy of the glandular structures of the mucosa is occasionally seen carried to such an extent that the question of its inflammatory origin may well be raised."

Through the long and tedious treatment of this case I have been ably assisted by Drs. Sprigg, Hyatt and Wilmer, to whom I must express my most cordial thanks.

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*Discussion on the Papers of Drs. Casselberry, Mayer and Bryan.*

Dr. W. E. CASSELBERRY spoke of empyema in children. Several years ago he had seen a case of unilateral foul nasal discharge, which had resisted all forms of nasal treatment and the removal of adenoids, before an empyema of the sinus had been suspected. This had occurred years ago, before we had been so familiar with the subject of empyema. At that time the idea had obtained that in children of this age, four or five, the maxillary sinus was not sufficiently developed to be the seat of suppurative disease. The case had run along intermittently for two or three years, and then the possibility of an empyema had been recognized. The sinus had been curetted, and recovery had followed. He emphasized the fact that there had been no fistula beneath the eye—simply a unilateral, purulent, foul discharge. This was interesting in connection with the diagnostic point spoken of by Dr. Mayer. He had also reported years ago a case of nasal polypus occurring in a child of ten years. This had also occurred some years ago, before the subject of empyema of the maxillary sinus in children was so well understood. That case had subsequently proved to be an empyema of the maxillary sinus, and the polypus was secondary thereto. With reference to the diagnosis, he would say that one could not rely upon an external fistula: empyema of the maxillary antrum might exist for a number of years with a purulent discharge, usually foul in char-

acter, as the only symptom, making its exit from the nose. Such a discharge in children was, of course, often indicative of a foreign body in the nose, and the differential diagnosis was to be made by a thorough examination.

Dr. E. MAYER said with regard to the question of their being no fistula in the case just reported, that he could easily understand how cases of empyema of the antrum might occur without a fistulous opening, although a fistula was present in every recorded case. Surely the classical work by Mallory, Councilman and Pearce, quoted in the paper, should teach us that empyema of the antrum, as a result of infectious disease in children, is something to be suspected much more frequently than hitherto supposed.

*Paper.*

THE TONSILS FROM A PURELY CLINICAL POINT OF VIEW.

BY FRANCKE H. BOSWORTH, M.D.

It is an ancient teaching, and one, I think, almost universally accepted both by the laity and by the profession, that the faucial tonsil constitutes one of the normal organs of the body in much the same sense as the liver or the kidneys, and that it is endowed with certain important functions in the economy; it follows, therefore, that having important functions to perform, their ablation or extirpation robs the system of these functions with a resulting deleterious influence.

As to whether this teaching be a true one or not I do not intend to make a too positive statement, and yet it seems to me there is ample grounds for questioning this view, in that it seriously hampers us oftentimes in carrying out what seem to me to be clear clinical indications. The anatomists tell us that the tonsil is an almond-shaped organ, situated between the two pillars of the fauces and that its inner face is marked by from seven to twelve openings, which constitute the orifices of a similar number of lacunæ or blind ducts, the organ itself being covered by normal mucous membrane which extends down into the lacunæ. And yet the anatomists even tell us that this is not a constant condition, and that in a large proportion of infants nothing is found

more than a small aggregation of lymphoid bodies containing no lacunæ, and lying beneath the mucous membrane. When we consider the extreme liability in child life to the involvement of the lymphatic bodies in hypertrophic changes, it seems fair to suggest that really the healthy tonsil may be the one above described, viz., one which consists of nothing more than a small aggregation of lymphoid bodies underlying healthy mucous membrane, and containing no lacunæ or blind ducts, and that the almond-shaped body usually described by anatomists is really a morbid growth.

The physiology of the tonsil has long been a subject of painstaking and laborious investigation, the problem being no nearer solution to-day than before. The same perhaps may be said of the whole lymphatic system, which, as we know, is found distributed extensively throughout the whole economy. Curiously enough these lymphatics are found grouped rather extensively at that point of the human system where in the development of fœtal life the hypoblast and the epiblast meet, viz., in the fauces, forming what is oftentimes called the lymphatic ring, and establishing four points where these bodies are aggregated in notable masses, viz., between the two pillars of the fauces, one on either side, forming what are called the faucial tonsils; in the vault of the pharynx, forming what is called Leuschka's tonsil; and in the glosso-epiglottic fossæ at the root of the tongue, forming what is called the lingual tonsil.

Now, as we know, these masses between the faucial pillars have always figured in anatomy as forming normal anatomical and physiological organs of the body.

Since the establishment of our specialty of Laryngology, we occasionally meet somewhat vague descriptions of that mass of lymphatics in the vault of the pharynx, as constituting a normal anatomical and physiological organ of the body under the name of Leuschka's tonsil. These descriptions are rare, very indefinite, and by no means constant in literature. I know of no anatomy or physiology which describes the masses at the root of the tongue in the same sense. Why this should be it is difficult to say, for it seems to me it is a fair conclusion that the masses at the vault of the pharynx and root of the tongue possesses claim to a position as normal organs, equal to those masses between the faucial pillars. The only reason, perhaps, that can be given for



the physiological dignity to which the faucial masses have attained is that they are so much more prone to become the seat of disease action, and were open to direct ocular inspection in this diseased condition, centuries before the others were recognized.

What the function of the lymphatics in the economy may be, I do not propose to discuss. It has always seemed to me, however, from a clinical point of view, that considering the universality of their distribution that they were situated throughout the system for the purpose of arresting or retarding the encroachment of disease germs, thus acting as it were as a sort of police force; and considering, in the light of modern bacteriology, what enormous duties are imposed on these little bodies, it seems easy to understand how much they are liable to suffer in the encounter, and especially is this true of those bodies between the faucial pillars, lying as they do in the sort of eddy which is established by these two muscular folds.

Whether this is the immediate cause of lymphatic hypertrophy I will not discuss, but the almost universality of a certain amount of lymphatic hypertrophy in some part of the body at every age is recognized by us all. That it should so frequently take the special form that it does in the faucial tonsils, viz., in forming deep lacunæ I should regard to a certain degree as adventitious, but these crypts are by no means constant, as we know even in hypertrophy of the tonsils. When they exist we have an organ which lends itself admirably to what constitutes one of its principal activities, that is as a trap for disease germs. It is difficult to understand why Nature should place these sponge-like bodies in a normal throat. I think a far better and clearer understanding of clinical indications would be to regard this mass with its lacunar traps as a diseased body, and in support of this view it is not necessary to recount the very large number of infectious diseases which result from the mechanical entrapping of the disease germ in this sponge-like body. I think this teaching is notably emphasized by the numberless observations published in the last few years of the different germs found lodged in these filthy lacunæ.

Some twenty years ago at a meeting in London I made the observation in debate that practically there are no tonsils in a healthy throat. This observation was received with contemptuous jeers. After twenty years of additional clinical observation, I am disposed to repeat the same remark before the members of this



Society, with a certain amount of curiosity as to how it may be received here. I do not wish to make the observation with absolute positiveness, and yet I repeat it seems to me that if this view were more generally accepted it would make clearer the clinical indications in the treatment of many cases of throat disease. It would remove many supposed objections to operating upon the tonsils, and moreover if such a thing were impressed upon the laity, we would meet with fewer objections to operations of extirpations of tonsils which are absolutely indicated by every clinical symptom. We so often meet with objections on the part of our patients: "The Lord put them there, and why should we remove them?" I usually respond as the only answer to this: "The Lord never put them there. He had nothing to do with the matter; it is a diseased process which practically constitutes a morbid growth or tumor, and should be removed and thoroughly removed, in the same manner as any other tumor, whether it be fibroid, malignant or other." We often hear as an objection to operating, instances quoted of tonsils having been removed and the throat left in a worse condition than before. I have never met a case of this sort in which either the subsequent symptoms were due to some other cause, or that the morbid tissue had only been partially removed. This question of thorough extirpation I might say here (somewhat parenthetically) is one on which much emphasis should be laid, for I think it is a matter within the observation of all of us that a partial extirpation of a tonsil occasionally leaves the throat in as bad if not in a worse condition than before operation. Moreover, I am disposed to think that there is no other diseased condition met with in the fauces which gives rise to morbid symptoms in so large a portion of cases as hypertrophy of these lymphatic bodies, between the faucial pillars.

One word with reference to operative procedures. There has been considerable discussion of late as to the wisdom of using, and the selection of, an anæsthetic. During the past thirty years I have invariably, in young children, insisted upon the use of a general anæsthetic, and my preference has always been for chloroform, the mode of procedure being briefly as follows:

The child being held in the lap of an assistant the anæsthetic is administered until complete insensibility to pain is secured, the stage immediately before profound anæsthesia. One tonsil being removed the child is thrown over on its stomach until bleeding

ceases, when after the administration of a few more whiffs of chloroform, the other mass is removed, the same process being gone through for the adenoid, which in so large a percentage of cases requires removal at the same time. The advantage of operating without profound anæsthesia, of course, is to retain a sufficient amount of reflex sensibility, whereby the supposed dangers of chloroform may be counteracted to a certain extent by the operative procedures in the throat. I desire to make the broad and absolute statement here that in several hundreds of operations which I have done in the last twenty-five years I have never in any instance observed the slightest symptom which would indicate any dangerous tendency or symptom from the use of chloroform anæsthesia.

As the instrument to be used, I will say that for the last ten years I have ceased entirely to cut tonsils with a tonsillotome. No tonsillotome has ever been devised which will fit itself so completely over the growth as to thoroughly extirpate it in every instance. The cold wire snare adapts itself so admirably in every way to the operation that it seems to me it leaves nothing to be desired. The loop can be arranged in such a shape and size as to perfectly fit over the mass and can be slipped between it and the faucial pillars in such a manner as to secure the thorough removal of the growth much more effectually than is possible with the use of the tonsillotome. Furthermore, if the whole mass is not extirpated with the first manipulation, it is a very simple matter to repeat until the faucial pillars drop into their normal position. The danger of hemorrhage, as I have always claimed, does not present especially in operating on children, but in operating on adults a very considerable hemorrhage, which may even reach the dangerous stage, is always to be anticipated when the knife is used. With the snare this danger is practically eliminated, and to one who has met with severe hemorrhage after tonsillotomy this is no slight consideration.

*Paper:*

## RETROGRADE METAMORPHOSIS IN THE FAUCIAL TONSILS.

BY J. L. GOODALE, M.D.

THE object of the following paper is to describe the histology of the retrograde changes occurring in the faucial tonsils. While a general statement of these appearances is given in most text-books of histology and laryngology, I have been unable to find any account which represents the extent of our present information. Within two or three years much has been added to our knowledge of the endothelial and epithelioid cells of the reticulum, while the significance of plasma cells has only recently been a subject for investigation. Our information regarding these cells has been chiefly derived from the study of hypertrophied and inflamed tonsils, lymph glands and other tissues. No investigation has been made, so far as I am aware, regarding their occurrence in tonsils which have experienced retrograde changes. In such tonsils there are several other points of interest which deserve attention. These relate to the changes in the epithelium of the crypts and the alterations in the connective tissue.

In the present study, a series of tonsils was investigated which had been obtained from autopsies where it was possible to remove a considerable portion of the surrounding tissue. The advantage of this is obvious as compared with the simple excision of the tonsil during life, since in the latter case complete removal is seldom possible. The subjects from which the tonsils were obtained ranged from 50 to 65 years of age. Macroscopically, the tonsils averaged 1 cm. by 2 cm. in diameter, and except for the adhesion of the pillars in some instances presented no abnormalities.

Immediately after excision, small portions of the tissue were placed in fixing fluids. Of these, the most suitable for general purposes is Zenker's fluid, as it not only gives the best results, when followed by polychrome methylene blue and eosin, in the study of the germ centers, but is also an excellent fixative for Mallory's triple connective tissue stain. The value of this latter

study of the tonsil cannot be overestimated, as it demonstrates the finer fibrillæ in a manner unapproached by any other stain. Alcohol, as a fixing agent for the cellular structures, was exceedingly unsatisfactory. In all cases parafine embedding was employed.

In all the cases examined the mucous membrane covering the



free surface of the tonsil appeared unusually thick and compact, and showed almost no penetration from polynuclear neutrophiles. Except for this, its general structure did not differ from that usually encountered in childhood. The mucous membrane of the



crypts varied considerably in the different specimens examined. In some instances it resembled that of the young tonsil, being loose in texture, its deficiencies crowded with lymph cells, plasma cells, and polynuclear neutrophiles. In such tonsils the tonsils are comparatively normal in the neighborhood of the crypts, and



show a fairly active proliferation. In other cases the mucous membrane of the crypts is more like that of the free surface of the organ in its compact structure (Fig. III.), and shows but little migration of leucocytes. The follicles in the vicinity are here seen to

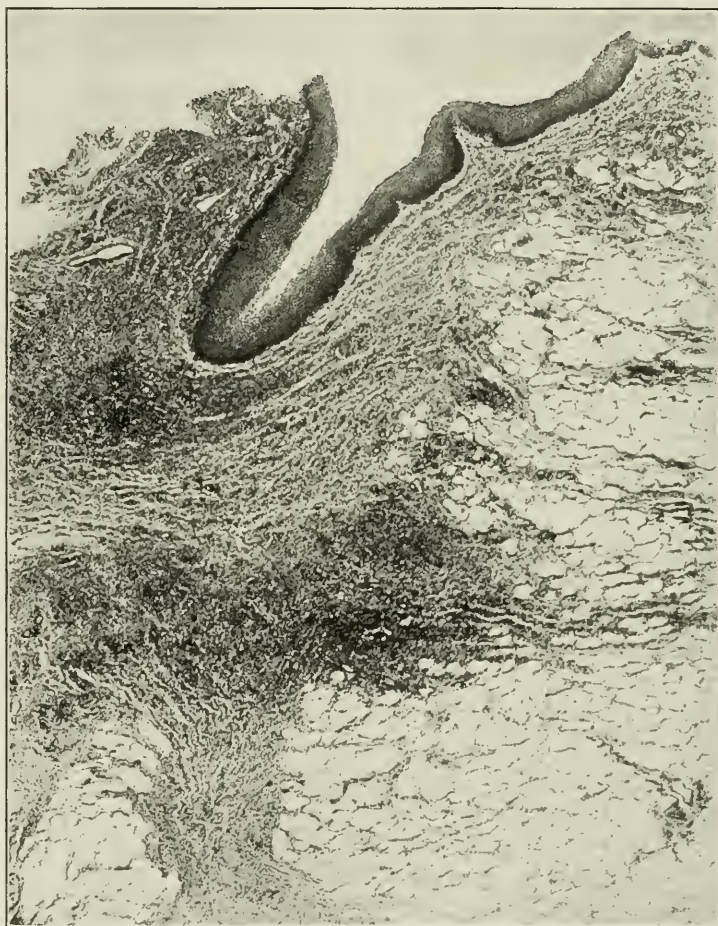
be much smaller than usual, and show little or no evidence of proliferation. The amount of lymphoid tissue, in proportion to the connective tissue, was in all cases relatively less than that found in early life. The sections stained by Mallory's method for connective tissue give the best demonstration of the sclerotic process. The distribution of the two tissues follows in general one of two plans. Either the fibrous hyperplasia predominates in the region of certain of the chief fibrous trabeculae, or is chiefly limited to the vicinity of the capsule at the base of the organ. In the first form, where this sclerosis occurs mainly along the larger fibrous trunks, it is most distinctly marked near the base of the tonsil, but may extend upward even to the mucous membrane of the free surface. It is usually more marked along some of the trabeculae than along others. The connective tissue fibers extend in the sclerosed areas from the primary trunks outward, surrounding the blood vessels with irregular, closely appressed bands, the fibers containing here and there lymphoid cells in the interspaces. As one passes in the direction of the crypts these fibers are seen to be smaller and more loosely woven, but they may be traced directly from the trabeculae to the crypts. The lining endothelium of the connective tissue is much less conspicuous than in the young tonsil, and shows little tendency to proliferate. In the regions occupied by the follicles these connective tissue fibers become extremely delicate and widely separated by masses of lymphoid cells, but may, however, be traced into the center of the follicles. In these areas of sclerosis the follicles are seen to have undergone various degrees of retrograde metamorphosis, as will be later described. Such areas may adjoin on either side areas in which large active follicles occur, essentially similar to those of the young tonsil. It was noted that the follicles in the immediate vicinity of the crypts were the largest and most active, while those more remote from the crypts showed a greater amount of atrophy. Many of the most markedly atrophied follicles were situated immediately below the compact epithelium of the free surface of the organ. In certain portions of the dense tissue in the interior of the tonsil traces may be seen here and there of preëxisting follicles, as indicated by small collections of lymphoid cells, no distinct germ center being visible.

The blood vessels in the sclerosed areas show generally a thickened wall, lined with normal endothelial cells. Sections



stained by Weigert's resorcin-fuchsin method show no apparent change in the elastic tissue of the arteries.

The other variety of sclerosis begins in the vicinity of the base of the tonsil, and extends from this portion upward. The tonsil is divided sharply into two well-defined areas, a lymphoid



area occupying the region adjoining the mucous membrane of the free surface of the tonsil and the connective tissue area, which makes up the rest of the organ in the vicinity of the base. In the most marked example of this sort, from a man 65 years of age,

the site of the tonsil was seen to be occupied for one-fourth of its area with lymphoid tissue, and the remaining three-fourths with connective tissue and fat tissue (Fig. I.). The lymphoid tissue presents a comparatively homogeneous appearance. Scattered about in it, and situated chiefly in the vicinity of the crypts, were follicles, all of extremely small size, with the exception of one or two near the orifice of the crypt (Fig. II.). The capsule at the base is composed of dense tissue, traversed by thick-walled blood vessels. This connective tissue is about 2 mm. in thickness, and separates completely the tonsil from the muscle fibers beneath. Within the capsule the connective tissue becomes of extremely loose texture, the fibers forming a large meshed network, with rounded intercellular spaces containing fat, aggregated into irregular groups, separated by dense bands. The general direction of the fibers occupying this region is parallel with the long axis of the tonsil. In the portion of the connective tissue nearest the lymphoid area it appears possible to trace the method of origin of this network. At intervals a separation is seen to occur between two parallel fibers for a short distance, with the result of producing an oval deficiency between them, which contains fat. Delicate fibrillæ may be seen crossing these spaces in an irregular fashion. These fat spaces are generally arranged in a linear manner. They become larger and more numerous as the capsule of the tonsil is approached, and are there aggregated into a large meshed network.

In both forms of sclerosis, the first indication of retrograde change in the follicles consists in a shrinkage of their endothelial reticulum. This diminishes in size from loss of the endothelial cells, in proportion to the degree of atrophy present, becoming in the more advanced stages hardly recognizable, or disappearing altogether (Fig. IV.). Endothelial proliferation is correspondingly less evident, and many follicles show no mitotic figures. The lymphoid cells surrounding the germ center do not, however, diminish in number at the same rate as the endothelial cells of the reticulum. In follicles where in cross section the endothelial reticulum has been reduced to from six to fifteen cells there usually remains a broad, well-developed ring of lymphoid cells. In these atrophied follicles there appears to be little or no migration of lymphoid cells, although the surrounding lymph channels contain irregular lines of lymphoid cells. These lines do not,

however, follow a definite direction, as is the case with those proceeding from the actively functioning follicles in the vicinity of the crypts. While the greater portion of these tonsils are in a state of inactivity, as shown by the small follicles without proliferating germ centers, a certain amount of function usually remains. This is evidenced by the fact that a few follicles were in all cases found situated near the crypts, of essentially full size, which showed proliferating endothelial cells, epithelioid cells, with



incorporated lymphoid cells, plasma cells and nuclear detritus. These active follicles were always found close to a crypt and generally near its orifice.

A certain amount of light may perhaps be thrown on the nature of these changes by a study of the histological phenomena occurring in an acutely inflamed, partially atrophied tonsil, which was removed during life from a woman 35 years of age. Clin-

ically this tonsil was seen to be about 1 cm. by 2 cm. in transverse section, to be remarkably firm in consistence, covered with a smooth mucous membrane, and showing only a few small crypts. It was slightly redder than normal, and a moderate amount of swelling existed in the peritonsillar region. There had been moderate pain in the throat and constitutional disturbance for several days. The condition was probably a beginning circumtonsillar abscess. After excision of the tonsil the symptoms rapidly disappeared. Histological examination showed evidence of a moderate degree of proliferative inflammation occurring in a tonsil which was the seat of irregular areas of sclerosis. These sclerotic areas are situated in two of the larger fibrous trunks, and extend to the mucous membrane of the free surface. In one of the areas mentioned may be seen a cross section, from ten to twelve follicles, which have undergone various degrees of retrograde metamorphosis. These join on either side areas in which large follicles are situated which are normal except for the proliferative inflammation. In these latter areas the phagocytic epithelioid cells in the follicles are numerous, and are seen to be actively engaged in incorporating other cells and cellular detritus. In those follicles, on the other hand, which are more or less atrophied, yet still preserve a certain amount of their germ center, there is little or no proliferation of the endothelial cells present, and phagocytic cells are almost wholly absent. Many of these atrophied follicles are situated immediately below the compact epithelium of the free surface of the tonsil. It is especially noted that those follicles in the immediate vicinity of the crypts have suffered the least from atrophy and are the most active participants in the acute inflammation, while those follicles which are most remote from the epithelium of the crypts have experienced the greatest amount of atrophy and share but little, or not at all, in the inflammatory process.

As pointed out by the writer in a former paper, the histological alterations in acute proliferative tonsillitis are probably due to the absorption of toxins from the crypts. The infecting bacteria multiply in the crypts as in a culture tube, producing their toxins, which are absorbed by the tissues of the tonsil, giving rise there to endothelial proliferation. Mallory has concluded from his observations that strong toxins cause degeneration or necrosis of cells



and exudation, while dilute or weak toxins produce proliferation and phagocytosis.

These views, if accepted, explain why in an atrophied tonsil the follicles nearest the crypts continue more active than those which are more remote. The contents of the crypts, composed as they are of the fluids of the mouth, detritus and bacteria, may be supposed to constitute a stimulant to endothelial cells, in a manner similar to a weak toxine. This fluid continually enters the tonsillar tissue, and produces proliferation and phagocytosis in the reticulum of the organ. Those endothelial cells which are exposed to the action of this fluid would naturally continue in a state of activity longer than those which are removed from its influence. On this hypothesis, the follicles nearest the crypts would remain larger and more active than those at a distance, and, as just stated, this is actually the case. Furthermore, in these senile tonsils many follicles situated immediately below the compact epithelium of the free surface exhibit more or less advanced atrophy, and as is well known, this *epithelium forms a relatively efficient barrier against the penetration of foreign substances*. In this connection, the writer would recall the histological appearances found in tonsils which contain cheesy accumulations in their crypts. In such tonsils proliferation and phagocytosis is extremely conspicuous. It is reasonable to suppose that the fluids absorbed from the offensive plugs constitute a stronger irritant to the endothelium of the organ than the fluids formed in smaller and better drained crypts.

The results of this investigation show that retrograde metamorphosis in the faucial tonsils begins in the regions where the connective tissue originally predominated, namely, in the trabeculae and fibers of the capsule. It may progress either along the trabeculae, in the form of an irregularly distributed sclerotic process, or in a more homogenous and symmetrical manner, proceeding from the base of the organ towards the mucous membrane of its free periphery. In the sclerosed areas, the endothelial cells of the reticulum exhibit less evidence of proliferation, and become fewer in numbers. Later, those forming the germ center of the follicle entirely disappear, and there is left to represent the follicle merely a heap of lymphoid cells, which progressively decrease in number until finally the former site of the follicle is occupied wholly by connective tissue, in which fat may be deposited. The

follicles most remote from the crypts experience the greatest amount of atrophy, while those nearest the crypts, and those particularly nearest the orifice of the latter, preserve correspondingly best their functional activity.

Figure I.

Section of tonsil from a man 63 years old, stained with hæmatoxylin and eosin, 30 mm. objective, eye piece No. 7. The section is taken nearly from the center of the tonsil at right angles to its base, and parallel with its long axis. Attention is called to the compact epithelium covering its surface, the small amount of adenoid tissue, the very small size of the follicles (with the exception of one near the crypt on the left), to the large amount of fibrous tissue at the base of the adenoid tissue, to the lobules of fat underlying these, and to the sharply marked fibrous capsule which separates the tonsil from the muscles beneath.

Figure II.

A portion of the preceding field is shown under a higher magnification, 20 mm. objective, same eye-piece. The follicles are brought out more clearly, and the contrast in size between the large active follicle lying to the right of the crypt and the very small inactive follicles deeper in the lymphoid tissue, is well shown. The development of the fat masses in the fibrous tissue is mainly below the areas of lymphoid tissue, although in places fat is found a short distance within the lymphoid area proper.

Figure III.

Another portion of the same tonsil, showing the stout epithelium lining the crypt, the small area of lymphoid tissue, containing no evidence of active follicles, large and numerous fat lobules in the connective tissue.

Figure IV.

Section through a small atrophied follicle from preceding case. This is seen in the center of the field as an oval area, consisting of endothelial cells, surrounded by an irregular ring of a few layers of lymphoid cells.

#### *Discussion on Papers of Drs. Bosworth and Goodale.*

Dr. JOHN O. ROE said that he fully agreed with Dr. Bosworth in the statements made in his paper, and also in the position taken by him with reference to the tonsils which he promulgated twenty years ago.



Enlarged tonsils Gerhardt very properly terms physiological wounds, the open crypts being ever ready to take up diseased germs or pathological products that come along. By reason of this fact Dr. Roe believed diseased tonsils to be one of the most prolific causes of enlargement of the cervical lymphatics in children. In his opinion there is no operation more satisfactory nor none that gives more excellent results than the removal of diseased tonsils. There are also no diseased structures about the upper air passages which cause so much disturbance and which render children so susceptible to the infection of contagious diseases as diseased tonsils, the latter forming a splendid nidus for the propagation of all sorts of diseased germs.

Dr. ARTHUR A. BLISS said he did not feel that it was necessary to lay down as a rule that hypertrophied tonsils should be entirely eradicated in every case. There were many instances, he thought, in which the extent of the excision could be regulated. If all of the tonsil were to be removed the snare was probably the best instrument, but if only partial removal were to be done, there was a choice of instruments. In total excision of the tonsil there was a certain risk from the cutting of the tonsillar artery. In partial excision, the severe bleeding was apt to come from a branch of the ascending palatine artery: the bleeding point was well forward near the anterior faucial pillar, and could be controlled easily by a hæmostat or the thermo-cautery. If the tonsillar artery were wounded, and the hemorrhage were severe, the external carotid or facial near its escape from the external carotid, must be tied. Many laryngologists were not sufficiently expert in general surgery to perform this ligation with sufficient rapidity to avert a fatal termination in such a case. The cold snare certainly tended to avoid such hemorrhage.

Dr. R. C. MILES thought the position taken by Dr. Bosworth was probably more generally adopted now than any other, and was becoming more and more widely accepted. In operating upon the tonsil by the use of the cold wire snare general anæsthesia was preferred. He had operated for twenty years without any bad results, but strangely enough he had seen two cases in the last few years in which death had occurred on the table under anæsthetics. One of these, a case of adenoids, had occurred in his own practice, and the other, a sarcomatous faucial tonsil, in the practice of another surgeon. In one case the anæsthetic was ether; in the other it was chloroform. In the case of pedunculated tonsils the guillotine could be used easily under cocain anæsthesia, and would be practically painless. One must use a strong solution applied thoroughly to the tonsils and adjacent parts, an interval of half an hour should be allowed to elapse, then an hypodermic injection of a 1 or 2 per cent. solution of cocain should be used before operating. In the cases in which the tonsils are represented by two large bodies shaped like eggs, and protruding

into the mouth external to the anterior faucial pillars, he had usually experienced a good deal of trouble, and had found it necessary at times to operate a second time. A few weeks ago he had operated upon a young child, under chloroform anæsthesia, upon whom the operation of tonsillotomy had been previously done by an eminent laryngologist, and also by himself; the tonsils were removed with the guillotine and dissected out with punch forceps, and although the forceps passed up deeply some tonsillar tissue was left. At this time the child's heart had failed, and further operating was out of the question. This subject seemed to many a threadbare one, but, in his opinion, the details were far from being settled. Particularly was this true in regard to just what should be taught the general practitioner regarding the operations on the tonsils and adenoids. For the latter, he favored advising them to use the Gottstein curette and not the forceps.

Dr. C. C. RICE said that in the non-inflammatory tonsil of the child it was quite sufficient to excise it even with the pillars of the fauces, and that the ordinary tonsillotome was adequate for this purpose. These tonsils in children, according to his experience, commenced to atrophy at about the twelfth year. Why one should insist upon deep dissections in the ordinary flabby tonsils of children he could not understand. In the case of tonsils of adults which have been the seat of frequent attacks of tonsillitis and quinsy the matter was quite different. Here the tonsils should be thoroughly eradicated, and for this purpose he favored the use of the galvanocautery. In numerous cases a small amount of tissue in the post-nasal space could be removed in a second or two with two sweeps of the curette. On the other hand, no laryngologist would be responsible for the thorough removal of both tonsils and adenoids without etherization, because such an operation could not be done in a few seconds, and the postnasal space must be entered a number of times. The important point about giving an anæsthetic was to always have a competent assistant to administer the anæsthetic.

Dr. PRICE-BROWN said that he was very glad to hear Dr. Bosworth speak so strongly in favor of chloroform, because this was the method so generally used in England, and which he had hitherto followed. In a practice of thirty years he had never seen a fatal case from chloroform anæsthesia. The chloroform should be administered by a competent person by the drop method. He was in doubt as to the advisability of his changing his anæsthetic under these circumstances. It was his practice to have a patient in the recumbent position, and to turn him quickly on one side in order to favor the outflow of blood.

*Paper.*

## CINCHONISM AND ITS EFFECT UPON ARTICULATION AND VOCALIZATION.

BY CARL SEILER, M.D.

IT is by no means my intention to enter into a detailed and lengthy dissertation upon the apparently impossible relation between subjective audition and sound emission, as such an attempt, even in its merest outline, would carry me far beyond, not only the legitimate time for a paper, but even beyond the limit of laryngology and otology, and land me in the as yet unexplored vastnesses of what, for want of a better name, might be called psycho-physiological physics.

All I wish to bring before the Society is a summary of the deductions and quasi conclusions which I have arrived at from a large number of observations, including the tests made on myself and my own personal experiences, of the relation of tinnitus aurium, the aural symptoms of what is generally termed cinchonism, as well as of external, non-subjective noises, upon vocalization and particularly upon articulation, most prominently noticed by the subjects in the pronounciation of certain of the consonants. That it was no easy matter to get definite data in regard to loudness and pitch of the subjective aural sensations in the larger majority of cases can be readily appreciated and also that the difficulty was greatly augmented when it became necessary to determine the loudness and pitch of the external non-subjective noises interfering with articulation. Still by perseverance and an occasional musically-trained subject I now, after more than ten years of attention to the subject, whenever opportunity offered, and with the aid of a complete set of Rudolph Koenig's test tuning forks and rods, feel justified to draw the following conclusions as being reasonably correct.

In the first place I found that the ordinary tinnitus aurium due to middle-ear disease never transgressed the limits of pitch from "dI." (297 vibrations), as the lowest point to the "fII." (704 vibrations), as the highest, as near as it was possible for me

to determine, and that these subjective noises although variable in quality of timbre had no appreciable effect on vocalization or articulation, but that they would invariably and very materially affect the perception of sounds which had the same or nearly the same number of vibrations per second as the subjective noise of the patient.

The subjective noises of so-called cinchonism as produced by the systemic toxic effects of various drugs, such as quinine, salicylate of soda, alcohol, ether and many others, I found to be invariably of a very high pitch, varying from as low as the "g IV." (1,584 vibrations), to as high as the "c V." (3,960 vibrations), and often even higher; and in the few cases of musically educated persons whom I have had the opportunity to examine and who were familiar with aural analysis of sound, inquiry elicited the fact that the noise was composite in character, being composed of a variable number of individual sounds of varying pitch which sometimes were harmoniously blended, thus forming a chord, the fundamental tone of which, however, was always *constant* in its pitch, but its pitch varied with the drug producing the cinchonismal noise and was usually lowest if quinine was the cause the highest when salicylate of soda produced the subjective aural sensations, a fact which I had frequent occasion to verify in my own person.

The third fact which I observed in this connection and which should, by rights, be the first, because it was the one which led me to pay any attention to the subject at all, was, that any composite noise of high pitch, such as is produced by the hissing of escaping steam or the noise produced by rapidly revolving grindstones, etc., not only interfered with the pronunciation of those consonants which, according to the investigations of Helmholtz, Wolf, Seiler and others, have for their characteristic sound (independent of vocal or vowel sound by which they are usually accompanied in articulate speech), a combination of sounds of very high pitch, such as the "th," "s," "sh," "z," sounds and the like consonant sounds of articulate speech, but also caused them to be the most easily obliterated and consequently most difficult to be appreciated and recognized by the ear. This fact which, if attention is called to it, is quite familiar to steam engineers, grinders and others working among machinery, can easily be explained by the well-known acoustic law of interference with each

other of sound waves of the same or nearly the same length; and, as the higher the pitch of two *non-harmonious sounds*, the greater the difference in the number of vibrations allowing interference can be, it is not necessary for a high-pitched noise, such as the hissing of steam, to be in unison with the noise of a consonant the characteristic pitch or position in the musical scale of which is near that of the external noise, for the latter to react upon the former and to make its perception by the ear and production by the organs of articulation difficult if not impossible.

But acoustic or physical laws fail us completely when a subjective, in reality physically non-existing noise, such as that of cinchonism, materially interferes, as it undoubtedly does, with the *pronunciation* of those same consonants of high pitched composite characteristic sounds and even alters the quality and timbre of the high pitched vowel sounds.

I offer this brief summary of facts as I observed them and refrain from any explanation or hypothesis of the, to me, inexplicable but undoubtedly existing influence of a purely subjective and therefore non-externally produced sensation upon a purely physical phenomenon such as vocalization and articulation, but hope that perhaps other and younger investigators may find them of use and be able to turn them to practical account.

## A CASE OF STENOSIS OF THE LARYNX FOLLOWING FRACTURE; OPERATION; RECOVERY.

BY ARTHUR W. WATSON, M.D.

FRACTURE of the larynx is such a rare accident and so often quickly fatal that the cases of stenosis following such injury must be very few. For this reason it is hoped that these notes of a case, although showing no especially remarkable conditions, may be of interest. As so little is said of the later results of fracture of the larynx in works on laryngology and general surgery, and as the writer, in a somewhat hasty review of the later literature, has been unable to find any similar case recorded, no conclusions as to the frequency of such conditions or the results of operative measures for their relief can be drawn.



The patient, W. C. F., a boy of sixteen years, on May 6, 1899, while riding his bicycle, ran into the tail-board of a wagon, striking the neck over the thyroid cartilage, and sustaining a lacerated wound beneath the chin. He went to a nearby hospital, where three stitches were put in the chin cut. He was then allowed to go home. The voice was lost immediately after the accident, and he had cough with bloody expectoration, but no dyspnoea. He had also inability to swallow, the food and fluids regurgitating. Pain was slight. The cough and bloody expectoration lasted three days. When he became able to swallow, food would enter the larynx, causing paroxysms of coughing.

About six weeks after the accident the patient began to have difficulty in breathing, which increased up to July 14th, when he was taken to Dr. Jno. A. Hearst of Germantown, who, on the same day, brought him to me.

The condition as noted at that time was as follows: The patient is pale and anxious looking; skin bathed in sweat, all mucous membranes pale, pulse weak and rapid, breathing labored and stertorous, the slightest exertion producing increased dyspnoea. The voice is reduced to a hoarse whisper. Examination—externally some flattening of the thyroid angle, and a recent scar beneath the chin. Laryngoscopy shows: Adhesion between the ventricular bands to within a short distance of their posterior extremities, leaving a small opening posteriorly. The supra-arytenoids are drawn together and inwards. The vocal cords can not be seen.

It was supposed, from this examination, that the adhesion was the whole cause of the difficulty, and accordingly, under cocaine, the adhesion between the ventricular bands was cut. About one-half was found to be membranous, but anterior to that the knife encountered a mass of dense tissue, filling the anterior part of the larynx. The breathing was only slightly relieved. A few days later an intubation tube was introduced, the largest size of O'Dwyer's set. This tube was kept in the larynx until August 24th, when a larger, hard rubber tube was introduced. This tube was kept in until September 5th, but during that time was frequently expelled. On the last date a still larger metal tube was introduced which proved more satisfactory. It was kept in until October 10th.

But after all this time it was found that no real improvement had been made, as the dyspnoea returned as soon as the tube was removed. It was decided, therefore, to do something more radical. The boy was admitted to the Polyclinic Hospital, and a preliminary tracheotomy was done on October 10th. One week later he was sent home wearing the tracheal tube.

On the 5th of November, the patient having again entered the hospital, the operation of laryngo-fissure was done.

The patient being etherized, an incision was made over the



larynx from the hyoid bone to below the cricoid cartilage. The thyroid cartilage was incised in the median line, but the mucous membrane was divided from within, the knife entering below the vocal cords, great care being taken to make the division accurately between them. When the wings of the thyroid were separated it was found that from the thyroid notch to below the vocal cords the cartilage was about a quarter of an inch thick, the thickened portion extending backward about a third of an inch, pushing the ventricular bands upward and the anterior commissure of the vocal cords backward. By the release of the tissues in front the arytenoids became movable. The redundant cartilage was cut away from the wall of the larynx and then shelled out without injury to the soft parts within. In closing the thyroid, a catgut stitch was passed through the cartilage and through the ends of the vocal cords and tied. The skin wound was sutured. The case did well subsequently. On the day after that of the operation the voice and laryngeal breathing were good, but later the voice was partially lost, and the breathing became less free on account of the swelling. The patient was allowed to go home on November 13th, still wearing the tracheal tube, but kept under observation. After healing of the parts the vocal cords could be seen to move freely. The swelling of the membrane did not entirely subside for some time, so that the tracheal tube was retained, although it was worn corked part of the time. Later, however, after the tube had been corked continuously for about two weeks it was removed, and the tracheal opening allowed to heal. At present, the voice is clear and strong, and the breathing perfectly free, the boy being able to work and otherwise do as he pleases.

*Paper.*

TONSILLOTOMY RASH.

BY WYATT WINGRAVE, M.D.

THE occurrence of a skin eruption following operations, often referred to as "surgical rash," is familiar to all of us, but its association with the removal of tonsils and adenoids is perhaps not so widely recognized that a few notes may not be of interest.

Recent experiences of several instances prompted a reference to my hospital and private records which has revealed 26 cases in the course of seven years. Although relatively to the large num-

ber of operations, this is but a small percentage, I feel from recent experience that they represent but a portion only of those actually occurring, and that a thorough and systematic inquiry would afford evidence of greater prevalence.

It is the custom at our hospital for all patients who are operated upon in the Extern department to attend after a week's interval for examination; and in several instances the parent has reported that the child was kept at home because it had a rash, which was thought to be "something catching." Subsequent investigation, however, in most cases proved its innocence of specificity. In other cases the rash was still visible on the patient, and unattended by constitutional symptoms.

Of the 26 cases, 3, which were in-patients, proved to be scarlet fever, while 1 developed diphtheria. The remainder were simple non-specific cases.

*Character of Rash.*—The eruption generally appears on the second or third day, either papular, roseolar, or erythematous in type. It most frequently attacks neck, chest and abdomen, sometimes extending to face and extremities. The earliest appearance noted is the day following operation, the latest one is the sixth day. Its duration is generally two or three days, but may extend to five days. After reaching its maximum intensity, it rapidly disappears without desquamation, but is sometimes associated with intense itching.

It may occur at any age; the youngest was fourteen months, and the oldest twenty-three years.

With regard to sex, excluding the specific cases, 16 were females and 6 were males.

As a rule, there is but slight constitutional disturbance, and the child does not appear to be any the worse. In those cases which I was able to personally investigate, the temperature was only increased  $1^{\circ}$  to  $2^{\circ}$ F.

Although the incidence of so innocent a complication in our most common operation may not be unfamiliar to many of us, I am not aware of any published references having been made to the subject. It is, however, a matter of some importance, both to us and to the patient, since foreknowledge will help our diagnosis and prevent any undue precipitancy in forming the graver estimate of its nature.

The occurrence of scarlet fever in 3 cases and diphtheria in 1, has however an important practical bearing, inasmuch that the removal of actively inflamed tonsils is advocated by many surgeons.\*

There are distinct advantages in this practice, since the prominence of an inflamed tonsil affords facilities to the guillotine which disappear on subsidence of the inflammation, and there do not appear to be any serious disadvantages. In the absence of any anæsthetic the operation certainly may be more painful, but it most effectually relieves the temporary angina, and the removal is thorough. It may happen that tonsillotomy may be undertaken in the early stage of recognized or unrecognized scarlet fever, diphtheria, or other specific fever, and it is maintained by many eminent specialists that not only no additional risk is involved but that is an expedient course to take.† This may be so if tonsils alone are removed, but one may reasonably doubt the expediency when a large crop of adenoids requires removal in addition, since the formation of so extensive a denuded surface is not unattended with risk.

The incidence of a rash upon any solution in continuity of tissue, operative or accidental, is well known and has been well discussed, but there are a few points associated with this particular operation which may throw some light upon its pathology.

Examination of the blood during the week following the operation has, with few exceptions, afforded me evidence of an increase in number of the mononuclear white corpuscles. This leucocytosis, which rarely lasts beyond the tenth day, may be more than coincidental, yet it is hardly surprising after so great a disturbance of lymphoid structures. The removal of tonsils and adenoids likewise affords a very large area for absorption of toxic matter.

Finally, the rash may be interpreted as one of drug intolerance, since most of the cases were taking the usual prescription of sodium salicylate and pot. bromide.

The occurrence of a rash attending tonsillotomy is, I think, a matter of sufficient interest to justify a few remarks, and I trust that you will accept my apology should your experience in America have made you already familiar with the phenomenon.

\* Lennox Browne, "Diseases of the Nose and Throat," Fifth Ed., p. 346.

† *Idem*, "Diseases of Throat and Nose," Fifth Ed., p. 523.

Paper.

NOTE ON THE USE OF THE ELECTRO-MAGNET FOR  
THE EXTRACTION OF PARAMAGNETIC FOREIGN  
BODIES FROM THE AIR PASSAGES.

BY A. W. DE ROALDES, M.D.

IN an interesting article, published in February, 1901, in the "*Annales des Maladies de l'Oreille, du Larynx*," etc., Dr. J. Garel, of Lyons, relates at length the following observation:

(Résumé.) A child, aged 18 months, swallowed a long French nail, which at first was thought to have slipped down the alimentary tract. In the next two months the little patient's health became undermined by a persistent cough and some pulmonary disturbances which seemed to point to a tubercular lesion of rapid development. With this history and without seeing the child, Dr. Garel, suspecting the presence of the foreign body in the lower air passages, advised the use of the X-rays as the best means to decide the question. A radiography of the thorax revealed the existence of the nail in the right bronchus, lying obliquely, point downward, about the sixth intercostal space. A tracheotomy was decided upon without any other examination, the patient then being in a state of extreme weakness. In collecting a sufficient variety of forceps, Dr. Garel's attention was called by an instrument maker of Lyons, Mr. Souel, to an electro-magnet, manufactured by him for an oculist, for the removal of fragments of iron or steel from the eye, venturing the opinion that the same apparatus might prove serviceable to him in his operation. The suggestion was accepted, although Dr. Garel, as he himself says, pinned more faith to his forceps than to the efficacy of the magnet. The next day, June 19th, a high tracheotomy was quickly performed, the edges of the tracheal wound being held apart by retractors. Dr. Garel, preparatory to using his forceps, brought the point of the magnet to the tracheal opening, as it were, *pro forma*. To the astonishment of all, the nail was dislodged and flew to the magnet. An unexpected and highly successful result was obtained instantaneously, to the great relief of the patient, not to mention the operator, who had worried considerably over the extraction of this foreign body with forceps. It measured fifty-three millimeters in length and was rusty, which was not surprising, having remained two months in the bronchus. Dr. Garel adds further that the distance be-

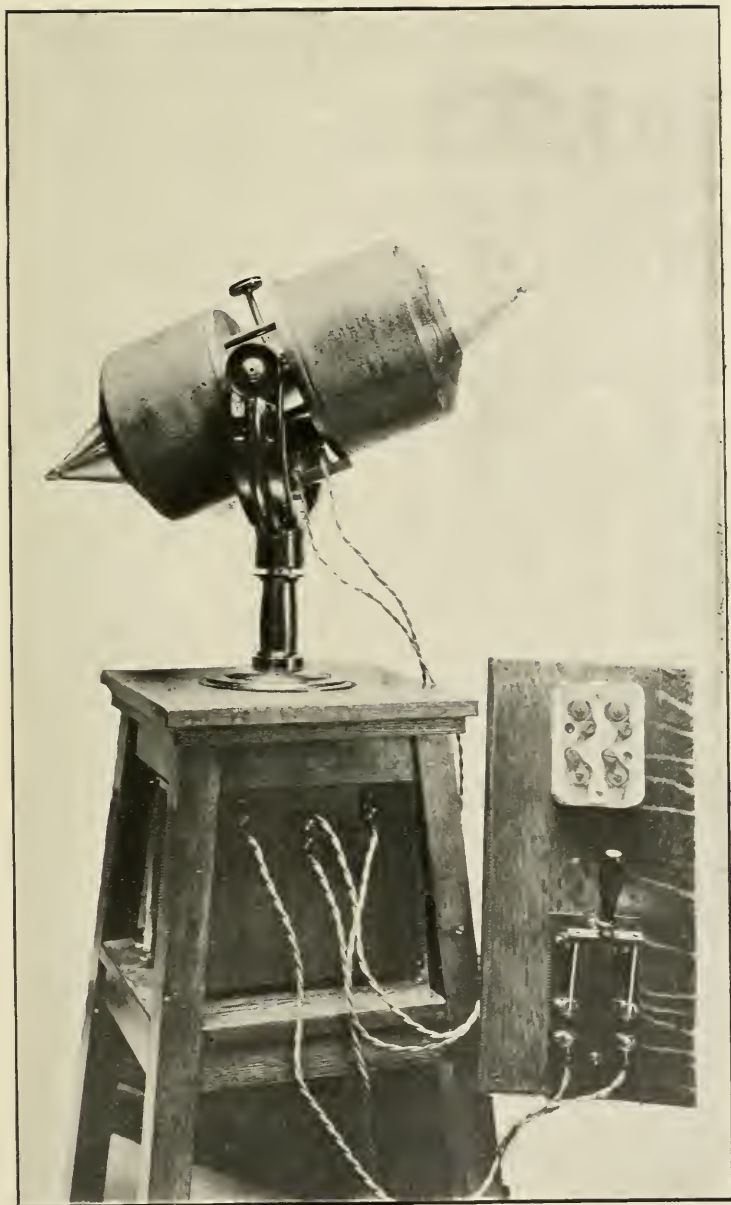
tween the magnet and the nail must have been less than six centimeters.

In reproducing this clinical fact my object is twofold. First, to stimulate the exertions of others in similar cases by giving greater publicity to this new method; second, to establish a claim of priority in the suggestion of its employment. More than a year ago, in a paper read before the Louisiana State Medical Society, April, 1900,\* "On the Management of Foreign Bodies in the Air Passages," after strongly advocating bronchoscopy through a low tracheotomy incision, I remarked incidentally: "As to the metallic bodies that are magnetic, I would suggest the trial of Haab's Giant Electro-Magnet, which, under certain circumstances, might prove of great value, by placing it before the mouth or before the tracheal wound, according to the situation of the foreign body."

My suggestion remained evidently unknown to Dr. Garel, whose practical result was obtained on the advice of Mr. Souel. The first time I thought of using this method for the extraction of paramagnetic foreign bodies from the air passages was during an inspection, several years ago, of one of Haab's Giant Magnets, just put in place at the New York Eye and Ear Infirmary. I was so impressed with the practical results obtained by oculists with this special contrivance in the removal of fragments of iron or steel imbedded or lost in the eye, and of its possible adaptation to the same use in the air passages, that I determined to enrich our hospital armamentarium with this appliance and experiment with it on the first occasion. This desire was strengthened by a recollection of great difficulties encountered by me as far back as 1888, in the case of a child who had inspired a steel button that became lodged at or below the first division of the right bronchus.

I would like to say here that I have searched diligently and failed, as have others, to find any bibliographical indication bearing on this subject. In the absence of a proper case where this procedure could be applied upon the living, less fortunate than our French *confrère*, I have had to content myself with experiments on the cadaver, which are nevertheless worthy of consideration.

\* Transactions Louisiana State Medical Society, 1899, page 96.





These experiments, about thirty in number, were made on the cadaver of adults, with the assistance of Drs. Gordon King, Honier J. Dupuy and L. de Poorter of the staff of the Eye, Ear, Nose and Throat Hospital of New Orleans. Objects of iron or steel of different weights and dimensions, such as the accompanying: a roofing nail (17 grains, 1 in. long), a screw (24 grains,  $\frac{3}{4}$  in. long), a steel button (15 grains,  $\frac{5}{8}$  in. diameter), a pin with glass head, pen, etc., etc., were among the foreign bodies employed.

The magnet used was the Giant Electro-Magnet, as per accompanying cut, the latest improvement on the original of Haab's, and much stronger than Hirschberg's, Johnson's or others, the current being the Edison 110 volts. The zone of attraction for the above mentioned foreign bodies was measured after placing them in a glass tube of about 1 inch diameter and 24 inches long, one-half of which was lined inside with leather, and the other half being a polished surface. This experimental device was adopted as presenting a certain analogy to the tracheo-bronchial passages, the surface of the polished glass and of the leather lining realizing different conditions of friction. Under these circumstances the roofing nail was attracted at  $9\frac{3}{4}$  inches on the polished surface and at 9 on the leather; the glass headed pin at  $12\frac{1}{2}$  inches on glass and  $10\frac{1}{2}$  on leather; the button started at 8 inches, the key and the screw at  $7\frac{1}{2}$ , etc., etc.

Without entering into the details of these numerous experiments, which would be fatiguing and confusing, I will simply divide them for the sake of convenience into four different classes and limit myself to the description of a few more important ones and to such conclusions or personal impressions as they may suggest.

Class A. Experiments (8 in number) with objects in the upper air passages.

The several foreign bodies were placed successively at different distances and positions in the nose, some in the nasopharynx, and all but two were promptly extracted by the magnet placed in front of the nares. The successful result in this region is of minor significance on account of the accessibility of the nasal chambers with ordinary instruments, under proper light, and by the comparative ease with which the expert handles such cases. Failure may ensue when dealing with pointed and sharp

instruments (pin, pen, etc.), that by the blind attraction of the magnet may become fixed in the tissues of a somewhat irregular cavity. Especially should it be remembered when operating on the living that smart resistance of the soft parts and some impaction may be encountered as the result of irritation and inflammatory swelling. In such cases the preliminary use of a suprarenal or cocaine spray should not be overlooked.

Class B. Experiments (3 in number) with foreign bodies placed in larynx.

Foreign bodies in this region either above or below the vocal cords resisted the attraction of the magnet with the point placed in the mouth about an inch and a half from the teeth. The largest size tube of a Leffert's incubating set for laryngeal stenosis in the adult was also put "in situ." A roofing nail placed at the lower end of the lumen of this tube failed to be drawn through it by the magnet into the mouth. I have to acknowledge that these experiments, owing to an ill-adapted device, have been, so far, fruitless, as Haab's magnet, the only kind then at my command, is better suited for the eye and nose than for the larynx and tracheo-bronchial channels.

Class C. Experiments (15 in number) on foreign bodies placed in the trachea and bronchi.

For these a low tracheotomy with an incision one inch long was performed. The foreign bodies (nail, steel button, etc.) were introduced successively through the wound at different distances in the trachea and bronchi. They were removed easily by the magnet placed on a level with the wound, and in one case held three-quarters of an inch from it; therefore, not quite in line with the object. The time limit, so to speak, of the attraction was observed to be slightly lengthened, owing to the resistance of the tissues and to friction, resulting from the fact that the bodies had to slide along the anterior wall of the respiratory channels. Failure ensued when the nail or button was at a greater depth than  $5\frac{1}{4}$  inches from the tracheal incision (two inches below the bifurcation) indicating that the zone of attraction of the magnet had been overreached even when it was placed in the lumen of the trachea. Another failure attended the experiment with a wire picture cord, one extremity of which was in contact with the foreign body, the other closely applied to the magnet at the tracheal wound. The cord was not suffi-

ciently energized to extract the object six inches distant. In order to recover these objects Dr. Gordon King resorted to bronchoscopy by means of the œsophagoscope. Their extraction offered no difficulty with proper light and special forceps.

Class D. Experiments with the electro-magnet applied externally.

No. 1.—The button being inserted in one of the bronchi, the electro-magnet was placed externally against the thorax immediately over the location of the foreign body. The latter was slid along the anterior wall and brought out by a magnet passed over the skin from location of button to tracheal opening.

No. 2.—Similar results attended experiment with button placed in sub-glottic space with magnet moved along the skin of the neck from the larynx to the tracheal incision.

No. 3.—The attempt to propel the button from the trachea to the mouth through the larynx with the magnet applied externally was a failure. It is to be noted, however, that the experimental conditions in this last instance were highly unfavorable on account of the cumbersomeness of the magnet, which rendered difficult its close application to the parts.

Experiments made with the magnet applied externally, although a partial failure, are nevertheless pregnant with a brilliant future. I refer to the possibility, as first suggested by Garel, in his valuable contribution, of removing through the mouth, without a tracheotomy, a foreign body of iron or steel from the bronchi or trachea. In a theoretical discussion of this procedure, the real difficulty foreseen by him is in moving the foreign body through the glottis. There is no doubt but that therein lies an obstacle to overcome. Will general anæsthesia, the position of the patient, and the fluoroscope, as he mentions, be sufficient to render the task certain? For my part, admitting the feasibility of this first step, there is yet an insurmountable difficulty, that of coaxing the foreign body around the buccolaryngeal curve with the magnet applied externally.

A careful study of these difficulties and of the causes of failure, in my experiments, have satisfied me that the most favorable conditions for the success of this method are, first, to place the magnet in the most direct line with the object, and, second, to minimize the distance between the two.

For future experiments through the mouth and tracheal

wound I have had constructed a set of vertebrated cable-probes to be placed in proximity to or in direct contact with the foreign body. They will be energized by the Giant Magnet and will supplement its limitations.

I would further suggest for the recovery of a foreign body without tracheotomy that it be brought up to the larynx by the external application of a magnet, which must hold it there until extracted by another magnet introduced through the mouth and larynx and put in touch with it, or near it. To meet this idea I have accepted two magnets devised by Mr. Jules Buchel, a well known expert electrician of New Orleans, whose mechanical aptitude has often been of much service to me. One of these magnets, which I present herewith, is to be inserted into the air passages; the other, a larger one, is for external application.

The small or laryngeal magnet, which is fastened to the end of a flexible or rigid cable, has a diameter of  $\frac{5}{16}$  inch, susceptible of some reduction if necessary; is about  $1\frac{1}{2}$  inches long and weighs about one-half ounce. With three 16 c. p. lamps it will hold a piece of iron weighing about  $2\frac{1}{4}$  pounds, and with four 16 c.p. lamps the strength is increased to about  $2\frac{1}{2}$  pounds.

This magnet is brought to as high a degree of magnetic saturation as space and the heating effect will permit, and the object in putting it in close proximity or actual contact is to eliminate the weakening effects of distance, which causes the magnetic force to vary inversely as the square of such distance. The larger, or external magnet, is made as large as possible, consistent with facility in handling, is provided with proper handles for manipulating same, and has both ends rounded like a hemisphere, in order to concentrate the magnetic force in the center to one point, and to permit of sliding magnet along in contact with the skin of the patient without injury and with the minimum of friction.

This magnet is also saturated to as high a degree as possible and is provided with a commutator by means of which the current can be alternately applied and removed, so as to give a series of magnetic pulsations for the purpose of facilitating the dislodgment of the foreign body. By means of this magnet, and aided by the pulsating character of the magnetic force, we can, as it were, coax the foreign body from one position to another,

a procedure that might be very difficult, if not impossible, by the use of a uniform magnetic stress.

The incompleteness of these experiments, which should be continued under various conditions, with new and untried mechanical devices, forbids any definite conclusion on the real value of this method without further investigation. With a tracheal wound it is certainly the safest and easiest one, when the pieces of iron or steel are situated within the zone of attraction of the magnet. Conditions may be found, however, when the operator will have to resort to bronchoscopy, which is, after all, the method *par excellence* for removal from the bronchi of foreign bodies in general. It will become an ideal procedure, far surpassing Killian's latest achievements, if by its employment the foreign body can be moved through the glottis and recovered in the mouth without the preliminary tracheotomy. Post-mortem experiments with the Giant Magnet seem to leave little doubt as to the certainty of attracting the extraneous object from the bronchi to the larynx. There remains to be demonstrated how it can be brought into the throat. I trust that an improved technique in the line of my suggestions may solve the problem.

Before closing I must apologize for the length given this paper, which has been announced on the programme as a simple note. My excuse is that my interest in this subject led me into experiments with new devices not originally contemplated.

#### *Discussion.*

Dr. E. MAYER said this was new and original work for which the authors deserved especial commendation.

#### *Paper.*

### CLEFT PALATE AND ITS RELATION TO SPEECH.

BY G. HUDSON-MAKUEN, M.D.

THERE is a popular notion that the tongue is the chief organ of speech and that the sense of taste is located in the palate. When a person is talkative, he is said to have a "long tongue";



when he is caustic in his remarks, "a sharp tongue," and the Biblical reference to the "unruly member" is well understood. Moreover, it is not an uncommon thing to hear it said that certain articles of food and drink "tickle the palate." Physiologically, it would be more accurate to refer to the palate as being the "unruly member" and to regard the tongue as the organ in which is located the sense of taste.

Both the palate and tongue are important organs of speech, but the former is the more important, for not only is it essential in the enunciation of nearly all the elements of speech, but it is also an important factor in the regulation of the resonant chambers of the voice. The purely vocal elements of speech, such as the vowel sounds, may be articulated when the palate is defective, but their resonance is so much impaired that they are scarcely recognizable. It is in the articulation of the consonant sounds, that the palate is most essential.

Of the twenty-three consonant sounds, only two, the "m" and the "n" can be given intelligibly when the palate is not intact, and even in these the resonance is somewhat impaired. All those consonant sounds in the enunciation of which the tongue is a conspicuous factor, the *th*, hard and soft, *s*, *z*, *sh*, *zh*, *t*, *d*, *n*, *l*, *r*, *k*, *g*, *ng*, *h*, *y*, as well as those in which the lips and teeth are used, the *p*, *b*, *m*, *wh*, *w*, *f* and *v*, are impossible to a person with a defective palate. This is true, because in the enunciation of these sounds the palate is necessary to confine the breath to the oral channel and to prevent it from passing up through the nasal chambers.

It will be borne in mind that the consonant sounds are made by impeding the moving column of breath at certain points above the larynx, and the points at which the impediment takes place have been called the stop positions. These have been divided into the anterior, the middle and the posterior stop positions. The anterior one is formed by the lips (in the articulation of the so-called labial sounds, *p*, *b*, *m*, *wh*, *w*), by the lower lip and the teeth (in the articulation of the labio-dentals *f*, *v*) and by the tip of the tongue and the teeth (in the articulation of the linguo-dentals *th'*, *th''*); the middle one by the tongue and the hard palate (in the articulation of the anterior linguo-palatals, *s*, *z*, *sh*, *zh*, *t*, *d*, *n*, *l*, *r*), and the posterior one by the tongue and the soft palate (in the articulation of the posterior



linguo-palatals k, g, ng, h, y). For all these sounds requiring an impediment in the outgoing column of breath, whichever stop position may be used, it is necessary to have a free, normal palate.

The function of the palate in articulation, therefore, is two-fold. In all those sounds in which it does not assist in the formation of the stop position, it serves as an obturator between the nose and pharynx, completing the partition between these two cavities and compelling the outgoing breath to pass through the particular stop position required for the sound. For instance, in the articulation of labials, labio-dentals and linguo-dentals, the sounding breath must pass through the anterior stop position and the palate serves to diverge it in this direction and to prevent it from passing through the nostrils.

In a similar manner, when the hard palate is intact and the middle stop position is used, as in the articulation of the linguo-palatals, the sounding breath must pass through this constricted aperture, and the function of the palate is to prevent it from passing upward through the nostrils. In the use of the posterior stop position which is formed by the junction of the velum palati and the dorsum of the tongue, the soft palate serves a double purpose. Its free border rises against the posterior pharyngeal wall, closing the avenue to the nostrils, and its anterior surface, acting in conjunction with the tongue, forms the stop position for the sound. In the enunciation of these posterior linguo-palatal sounds, a perforation of the hard palate would have little, if any, effect upon the articulation, but it would somewhat modify the vocal resonance.

It will be observed that the tongue and the palate act together in the processes of articulation, and that the palate also serves to prevent the sounding breath from passing through the nostrils and to focus it upon the particular stop position that is being used. The various defects of the palate that interfere with speech are:

First.—Perforations.

Second.—A lack of union between the lateral halves, commonly known as a "cleft."

Third.—Paralysis of the muscles.

A perforation of the palate affects speech to a greater or less degree, according to its location. If it is in the hard palate,

anterior to the stop position which is being used, its effect may be scarcely noticeable, but if it be posterior to the stop position, whether in the hard or soft palate, its effect is very marked, and if the perforation is a large one its effect is similar to a cleft in the palate or a paralysis of the levator muscles.

The characteristic speech of one having a cleft palate is familiar to all, but its physiology may not be so well understood. The impaired resonance of the voice caused by a cleft in the palate is rather more marked than we should expect, and it illustrates how important is every part of these mechanisms to the normal voice. Beyond this impaired resonance, the cleft palate does not materially affect the voice, but the mechanism or physiology of speech is entirely changed. The formation and practical use of the three stop positions above mentioned are impossible in cases in which the palate is cleft. The anterior and middle stop positions may be formed by means of the lips, the teeth, the tongue and the hard palate (unless this be cleft throughout its entire length), but they never are formed, because it is impossible for the patient to focus the vocalized breath at these points when there is a free channel for it to pass up through the cleft and out through the nostrils. The posterior stop position cannot be formed because, as explained above, its formation depends upon a freely movable and normal palate.

The purely vocal sounds, therefore, are the only ones that can be even approximated when the palate is cleft, and the consonant sounds are generally almost entirely unintelligible, and they are made with a totally different mechanism. For the three normal stop positions, the patient endeavors to substitute others further back in the pharynx. For some sounds the base of the tongue and the posterior wall of the pharynx approximate to form the stop position, and for others the lips of the larynx formed by the arytenoid cartilages, the arytenoid and the aryepiglottic folds are used. With such substitutes for the normal stop positions, situated as they are, far back in the throat, it is not surprising that the articulation should be so defective and indistinct.

It will be observed that the three defects of the palate above mentioned have a similar effect upon the character of speech. There is this difference, however. Perforations and paralysis of the musculature of the palate are acquired defects and generally

appear after the development of the faculty of speech, while the cleft palate is congenital and comes before the development of the faculty of speech. In the former two conditions normal speech has merely been interrupted, while in the case of the cleft palate no normal speech has been developed. This explains why the speech of a person with a cleft palate is more defective and less intelligible than the speech of those having perforations or paralyses. The indications for treatment in the latter two conditions are, in the one, to close the perforation either by means of natural tissue or some mechanical contrivance, and, in the other, to restore the normal action of the muscles involved. When this is accomplished the speech generally approximates the normal condition or that condition which obtained before the defect appeared.

In the case of cleft palate, however, where no normal speech preceded the defect, we have a very different condition of affairs. It will be remembered that speech is developed during the first two or three years of child-life. This is called the formative speech period. It is the time during which nature specially provides for the normal development of speech. Children appear to inherit a tendency toward speech development. To such an extent is this true that cases have been reported in which whole sentences have been uttered spontaneously without any preliminary practice.

The more serious forms of defects of speech are those that are acquired during this formative period. It is then that faulty impressions of the elements of speech are stored in the auditory centers of the brain and faulty habits formed in the use of the various mechanisms of speech.

Other things being equal, therefore, all anatomical or structural irregularities having a tendency to impede the normal development of speech during this period should have our most careful attention, and measures for the correction of these conditions should be adopted as early as possible, before the cerebral impressions and peripheral habits are established.

Inasmuch as surgical measures for the closure of the cleft palate are undertaken for the purpose of improving speech, they should be undertaken as early in the formative speech period as the operation can be done. Surgical measures, as a rule, however, give the patient only a little better chance for the develop-

ment of good speech. Even if we were able to furnish the patient with a perfectly normal palate, it is a well known fact that the character of the speech would remain almost unchanged, because, as explained above, the patient has never learned to use the natural mechanisms of speech, but he has been forced to substitute mechanisms that are inadequate to the requirements.

No habits are more difficult to change than habits of speech formation. The fact is that they cannot be changed without special aid and instruction. This is true mainly because the ear of the speaker, having grown accustomed to faulty articulation, does not discriminate between it and the normal articulation, and considerable practice is required to train the ear to make this discrimination and to accustom the organs of speech to respond to the aural demands. The ear must make the discrimination and appreciate good speech before the organs can be trained to produce it.

A perfectly normal palate, however, cannot be made to take the place of a cleft palate by any means at our command. This is true because of a lack of sufficient tissue to close the cleft and, at the same time, to give a freely movable velum palati. However, careful and skilful we may be in uniting the lateral halves, we must reckon upon a considerable tension of the organ, due to cicatricial contraction. This tension, it is true, may be relieved to a great extent in the hard palate by lateral incisions along the alveolar ridge at the time of the operation, but the difficulty arises in the soft palate. Here the muscles, owing to long disuse, are atrophied, and when the edges are coaptated and healing has taken place, the velum is taut, and its different muscles cannot perform their natural functions. In spite of all that we can do, there always remains greater or less space between the velum palati and the posterior pharyngeal wall, which space has the same effect upon the voice and speech as has a perforation of the palate.

As I have intimated above, the space between the velum palati and the posterior pharyngeal wall is due to the fact that after the operation the velum palati is drawn tightly across the upper portion of the fauces and its muscles are almost wholly inactive.

The question arises to what extent we may make the velum looser and more pendent after the operation, and also to what

extent we may render its musculature more active. I have had an opportunity to experiment with a few cases, and the results, although not brilliant, are at least encouraging. The difficult thing during and after the operation is to secure a large enough velum to close the space. If this could be done the development of improved muscle action could be brought about by means of appropriate exercises.

In a case exhibited before the surgical section of the College of Physicians, in Philadelphia, several years ago, I was able to demonstrate the importance of a few minor surgical procedures for the purpose of increasing the available size of the velum and giving it greater freedom of action. The rationale of these measures was published at the time in the *Journal of International Clinics*. They consist:

First.—In separating the adhesions that often exist between the pillars of the palate on either side and the remnant of tonsils.

Second.—In the forcible stretching of the velum with the finger after the division of some of the tense fibers of the palato-glossi and the palato-pharyngeal muscles.

Third.—In the training and development of the velum palati muscles by means of both direct and indirect voluntary exercises. These procedures, simple though they may seem, have resulted in marked improvement of speech in cases following the operation for cleft palate.

### *Paper.*

## A NOTE ON OSTEOPHYTES\* OF THE NASAL CHAMBERS.

BY ALEXANDER W. MAC COY, M.D.

It is some years since the subject of osteophytes in the nasal chambers first began to interest me. During the progress of an operation for deflection of the nasal septum, while I was making explorations in the nasal chambers, I became aware of certain sharp, rough, coral-like deposits situated in certain parts of the

\* Οστέον, = bone, and φυτόν, = plant.



nasal passages. As they proved to be neither necrotic nor rhinolithic aggregations, nor exostoses. I considered them osteophytes. These osseous bodies found in the nasal chambers have the anatomical arrangement and composition of osteophytes. Their formation being arranged in laminated or radiated structure, such anatomical arrangement determining the fitness of the name.

I have neglected to investigate the literature on this subject, having found only one plate where such bodies in the nasal chambers were illustrated.\* If any of my fellows can give me instances from the writings of others in which osteophytes of the nasal chambers have been mentioned, I shall be glad to have the information.

To enable one to determine definitely the existence and location of osteophytes, a *digital* exploration of the nasal chambers is necessary. Some of us can remember a paper by Dr. Harrison Allen, in which he advocated *digital* manipulation of the anterior regions of the middle turbinated bodies for certain diseased conditions present. Following this suggestion, I have, for some years, used the little finger as an intelligent exploratory probe. In all my operations for deflection of the nasal septum I have found it necessary in such cases to use the finger far back in the nasal cavities to enable me to get a clear idea of the trend of the septum and also of its thickness. While exploring in this manner I have found in many instances these bony concretions which I have named osteophytes.

The clinical fact is interesting that bony deposits do, in a certain number of cases, exist in the nasal chambers without definite anatomical relation to the normal osseous formations.

The presence of osteophytes in the nasal cavities materially interferes with the success of an operation for nasal deflection by preventing free respiration and drainage, and, especially, when they are large, by hindering complete manipulation of the septum after the incisions have been completed.

Osteophytes generally are to be found well back in the nasal chambers, situated underneath the lower turbinated bone, on the bony septum and on the floor of the nose. In size they vary from a sharp spicula to a small irregular mass. While formu-

\*Zukerkandl, *Anatomie der Nasenhöhle.* Table I., Fig. II. Description, page 187.



lating these notes a young woman came under my care who was a subject of osteophytes in various parts of her body. Large masses were present on her tibia, as well as on the lower end of radius. The subject consulted me for deflected septum. An operation had been performed upon her some time before for deflected septum, but it had been unsuccessful. Examination showed a marked deflection of the triangular cartilage associated with deformity of the lateral cartilages. In the triangular cartilage plaques of bony tissue could easily be felt, which were undoubtedly osteophytes. After the second operation there was troublesome bleeding which was not controlled by the tubes, but required tamponing. This incident was, evidently, the result of the interstitial change over the cartilage involving the coats of the blood vessels and preventing their contraction. The results of the second operation were most satisfactory, and after a lapse of over a year the alignment of the septal wall is perfect. In several other cases of osteophytes present in cases of deflection of the nasal septum coming under observation, the bony concretions were well back in the nasal passages and were broken off and removed during the operation for deflection. I recall one case in a young woman where the osteophytic deposit was near the posterior naris, where it could barely be reached by the tip of the little finger. If this bony mass had not been discovered complete restoration of the respiratory function of that side would not have resulted, as was the case after the osteophytes had been removed and the deflection corrected.

### *Summary.*

1. Under an anæsthetic, with the little finger as an intelligent probe, certain osseous structures foreign to normal nasal conditions may be found.

2. That these osseous masses are osteophytes, having the anatomical structure of such bodies.

3. That osteophytes clinically are *new* conditions to be considered and studied.

4. That in operations for deflection of the nasal septum lack of complete success may result from their presence.

5. That osteophytes are loose in structure and readily removed by proper instruments.

*Paper.*

## ŒSOPHAGEAL TUMOR OBSTRUCTING THE LARYNX.

BY FREDERIC C. COBB, M.D.

THE case which I report to-day is one of interest, not only because of the peculiar effect of the growth on respiration but also because it is, in my experience, unique.

The patient, a woman, aged forty-five, well nourished but rather anæmic in appearance, entered the hospital October 25th, giving the following history: Seventeen years ago she swallowed a peach stone which seemed to lodge in the throat, but passed on a few days later with relief to the symptoms. Since then, however, she has had difficulty in swallowing solid food. This may be explained by the fact that her attention was called by the accident to her dysphagia. There has been no pain, but a series of what she called strangling attacks. She was often awakened at night by a sudden sense of asphyxia and choking, which was finally relieved only by a powerful expiratory effort. Such efforts always relieved the dyspnoea at once, the breathing became normal, and no hoarseness, pain, or signs of laryngeal irritation followed these attacks.

Between paroxysms, except for the inconvenience in swallowing solid food, she seemed perfectly well.

About a year ago she sought professional advice, and a tumor was seen and removal advised. Not feeling confidence in the physician, she came to the hospital for relief.

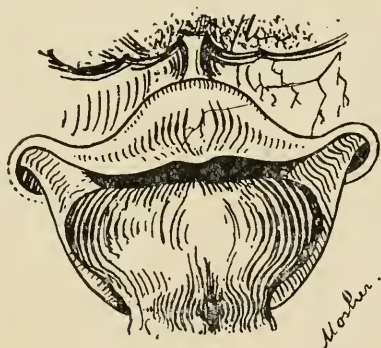
Examination of the throat showed at first nothing remarkable. The larynx, arytenoids, epiglottis, and base of the tongue were quite normal. While we were asking ourselves whether the case was not one of hysteria, a slight gagging action caused by the rather long examination at once threw a large growth from the œsophagus upward and forward into the larynx and filled the cavity completely, so that the false and true cords, arytenoids and side walls of the larynx were completely hidden from view. The growth was covered with glistening epithelium, in color differing little, if any, from the normal mucous membrane of the throat. The tumor was smooth, rounded and elongated, and its pedicle quite covered the arytenoids. Only a moment, however, could be given to the examination, as the patient became asphyxiated in her attempts to draw air through the tightly corked larynx.

A severe choking spell resulted, followed by a sudden and violent cough, and the larynx, again examined, showed no signs

of any growth, and the breathing was quite regular and quiet. This was repeated several times, the growth moving from its bed in the œsophagus into its place in the larynx with the accuracy and speed of a well-oiled machine. The act of gagging always drove it upward and into the larynx, while a cough and a slight swallowing action brought it back into the œsophagus.

Removal of the growth was effected as follows: The patient was made to gag, thus throwing the tumor upward, and as it fell into the larynx it was seized by a tenaculum and lifted a little from its bed in the larynx to allow breathing. A Hooper-snare and écraseur, which had been passed over the tenaculum, was then rapidly pushed down upon the tumor and made to encircle it, and the wire tightened around the pedicle by the écraseur so as to cut it off.

As the wire grew tighter, the breathing became more obstructed, and removal of the growth was necessarily rapid. No



hemorrhage resulted, however, and the tumor, still attached to the tenaculum, was lifted from the throat without difficulty and quite whole.

A large defect of the mucous membrane of the tumor showed how broad had been its attachment to the œsophagus. It was a polyp, as shown by the following description.

"Microscopical examination of material removed from tumor shows the tumor to be covered with epithelium. Its interior consists chiefly of loosely arranged connective tissue, together with some fat tissue and blood vessels.

At several points there are collections of lymph-adenoid tissue.

The tumor is to be regarded as a polyp.

(Signed) D. H. WRIGHT."

Dubois, in 1818, saw a case very similar to the one I report,

in which the tumor appeared in the pharynx on gagging and was seized and a ligature passed around the pedicle, but before the growth could be removed it disappeared again in the œsophagus.

Three days after the patient was found dead in bed with the tumor impacted in the larynx, the pedicle having sloughed off.

### Discussion.

DR. E. L. SHURLY said that he had now under his care a case upon which he expected to operate, which was very similar to this one except that the growth was not pedunculated. The tumor was apparently a fibroma situated between the œsophagus and the larynx. Although movable, it created no subjective symptoms, except a desire to swallow too frequently. He had thought of using electrolysis, but probably would do a pharyngotomy if the patient would consent, and the electric current produced no beneficial effect.

DR. H. L. SWAIN exhibited a tumor removed by him from a woman who had come complaining of a feeling of a foreign body in the throat and of some difficulty in the chewing. On examination, he had found a tumor, which the patient said she had first seen the day before in the mouth. It was a growth originating in the posterior and middle turbinates, and hung down back of palate into the mouth.

### Paper.

## FOUR CASES OF TUMORS.

BY JAMES E. NEWCOMB, M.D.

DURING the past year four interesting cases of tumors have come under the writer's observation and are deemed by him worthy of record.

CASE I. *Osteo-Sarcoma of Inferior Turbinate*.—A. R., colored, aged forty-one, came to the Roosevelt Hospital Out-Patient Department, September 25, 1900. He stated that for some four months he had had stoppage of the right naris, constant and increasing. There had been neither pain nor hemorrhage. At times there had been a moderate post-nasal discharge. He was stout and well built, but somewhat asthmatic and emphysematous.

Examination of the right naris revealed what was apparently a bony adhesion between the inferior turbinate and the septum, beginning about three-quarters of an inch from the vestibule

and running backward for half an inch. The obstruction was removed by trephining, and there was no unusual bleeding. Healing occurred promptly, and for some time the patient could breathe easily through that side. In a few weeks, however, he returned with the same symptoms as originally noted, and examination showed a re-formation of the bony mass, which was much larger than before. With the trephine, a considerable core of tissue was removed and submitted to Dr. Jonathan Wright, of whose courtesy in this and the following cases I would here make most grateful acknowledgement. His report was as follows:

"No. 856. The sub-epithelial tissue of the mucosa is entirely



Fig. 1. Osteosarcoma of Inferior Turbinate.

made up of spindle-celled fibrous connective tissue with newly-formed capillaries running through it. The tendency to crescent shapes in the arrangement of the cells presents the familiar picture of a spindle-celled fibro-sarcoma. In places there is a proliferation of cells which apparently spring from the endothelium. In the deeper layers (Fig. 1) bony tissues of apparently new formation may be seen with a lining of osteoblasts (Fig. 2) along the edges of the scattered areas. The sarcoma formation fills the interstices of the bony tissue, and is quite as characteristic there as elsewhere.

"In places a double row of osteoblasts may be seen which have apparently extruded the lime salts between the rows, and this has



not yet assumed the formation of bone, and it appears more or less amorphous. There can, therefore, be no doubt in this case

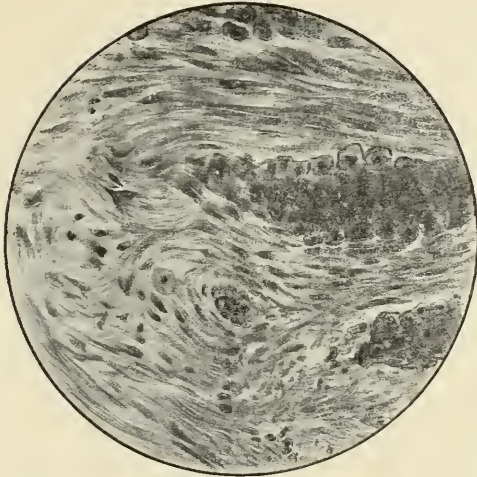


Fig. 2. The Same as Fig. 1, High Power.

that we have to do with a true osteo-sarcoma and not with a sarcoma secondarily involving subjacent bone."

In view of the nature of the growth the patient was urged to enter the surgical service of the hospital with reference to a more radical intervention than was possible in the Out-Patient Department. This he agreed to do, but failed to return and has been lost sight of.

CASE 2. *True Papilloma of the Nasal Septum*.—J. T., merchant, American, aged fifty-five years, was seen in consultation with Dr. F. M. Crandall for severe epistaxis. The nasal septum was strongly bulged to the right and presented on its convexity a large erosion from which the blood came. Pure silver nitrate was applied, and there was no further bleeding except in very slight amount the second day after. During the systematic examination of the nose I discovered a small cauliflower-like mass on the left side of the septum at its top, just at the junction with the ala. It had given no symptoms and the patient was unaware of its existence. It was removed without incident, and proved to be a true papilloma. (Fig. 3.)

Dr. Wright's report was as follows: "The growth is chiefly a proliferation of epithelial cells which partake somewhat of the characters of both the pavement and epithelial varieties. It is



supported both on the surface and dipping down into the tissue by a delicate network of connective tissue digitations with a



Fig. 3. Fibroma Papillare of Nose.

central blood vessel, the whole presenting a typical picture of the so-called papilloma or fibroma papillare.

The question of nasal papilloma has been thoroughly discussed at various meetings of this Association, and the ground need not be re-traversed here. The case is reported on account of the rarity of true nasal papilloma. Arrowsmith of Brooklyn reported in 1897 (*Laryngoscope*, November, 1897, page 283) a case of this nature and stated that he was able to find in literature up to that time but twenty-nine instances of true papilloma of the nose, and that in some cases of the series the diagnosis was by no means certain. I have been able to find nine additional cases recorded since the date of Arrowsmith's paper, and the list is herewith appended:

Borgoni, *Gior. Ital. di Lar.*, No. 1, 1899, p. 1.

Yearsley, *Jour. Laryngol.*, Vol. xiii, 1898, p. 303.

Douglass, *N. Y. Med. Jour.*, Jan. 7th, 1899, p. 6.

D'Aguano, "Arch. Ital. di Otol.," Vol. iv, 1896, p. 99.

Reale, *Arch. Ital. di Laringol.*, Vol. xx, 1900, p. 57.

McKinney, *N. Y. Med. Jour.*, March 4, 1899, p. 290.

Williams, "Diseases of the Nose and Throat," 1895. (Two cases.)

Noquet, *Rev. hebdom. de Laryngol.*, Sept. 18, 1897, p. 1121.

CASE 3. *Sarcoma of Branchial Cleft*.—G. A. D., carpenter, American, aged 65 years, came to the out-patient department of the Roosevelt Hospital March 7, 1901, complaining of a swelling in the throat. The notes of the case are taken from the records of the first surgical division of the hospital, service of Dr. Robert F. Weir. The patient was a moderate user of alcohol, had had lumbago and some catarrh of the throat, but had been otherwise well until two years before coming under observation. There was no history of syphilis.

Two years ago he noticed a swelling on the right side of the palate and a soreness in the gums of the same side. The swelling gradually increased with a continuance of the soreness till one year ago, when it was lanced and a fluid escaped, of thin consistency and clear in hue. Since that time he has had no pain. After the lancing the swelling gradually increased for six months, when it was again lanced, and this operation has been repeated several times since. No change in the character of the fluid has been noted. The swelling began near the middle line of the soft palate and never entirely disappeared after lancing, but gradually spread to the side of the mouth and somewhat forward and backward. At first it was supposed by his physician to be some sort of quinsy. Speech gradually became muffled and indistinct, and there was some limitation in movement of the jaws. No lumps were noted on the side of the neck. The appetite had been poor for two years, and he had lost ten pounds in weight. There were some palpitation and dyspnea on exertion. The heart was normal, but the lungs somewhat emphysematous.

Examination of the throat revealed the soft palate pushed well over toward the left side by a tumor occupying the right side, extending from opposite the last molar teeth upward and inward to beyond the middle line, downward to the floor of the mouth and backward into the pharynx. It was tense, elastic and smooth, with one or two harder spots on its surface. It could also be felt just behind the angle of the jaw and fluctuation was transmitted from pressure on the inside to the finger on the outside of the mouth. No enlarged glands were discovered, either in the neck or on the floor of the mouth. There was slight tenderness over the cornu of the hyoid bone on the right side.

On March 16th Dr. Weir operated as follows: An incision was made from half an inch below the lobe of the right ear down along the middle of the sterno-cleido-mastoid muscle to the level of the thyroid cartilage. A second incision was made from the margin of the jaw one-half inch from the median line to meet the first opposite the hyoid bone, through skin, fascia and platysma till the muscular planes were reached. The digastric and stylo-hyoid muscles were exposed. The tumor was felt above the muscles, running up beneath the jaw, and the tissues were

incised down on to it. The mass was of a bluish color and felt cystic. Blunt dissection with the finger was carried all around it and the tissues freed from it. It was found to reach upward almost to the base of the skull. It was separated from the muscular structures of the pharynx and soft palate, care being taken not to break through the buccal mucosa, to which the sac wall was attached. In this way the tumor was shelled out. It was about the size of a mandarin orange, and on one portion of the wall was a solid mass looking in shape and size like a tonsil. In process of removal a portion of the wall of the sac was punctured and a bloody fluid escaped. The progress of the case toward recovery was uneventful. The mass removed was sent to the laboratory of the Columbia University Medical School for examination. The report returned was "telangiectatic sarcoma of the branchial cleft with hyaline degeneration; lymph nodes hyperplastic; no tonsillar tissue."

My thanks are due to Dr. Weir for courtesies rendered in connection with the case.

CASE 4. *Angio-Fibroma of the Nose*.—J. K., Irish-American, aged 20 years, was referred to me by Dr. F. R. Oastler, April 29, 1901. His family and previous history contained nothing bearing on his present condition. For seven months he had complained of nasal stoppage alternating from side to side, but finally settling and becoming permanent on the left side. Examination with the nasal speculum showed what was apparently an ordinary nasal polyp hanging from the middle turbinate. The post-nasal mirror, however, revealed a mass in the naso-pharynx, reaching back from the choanæ, but apparently blocking only the left. On attempted removal of the mass visible anteriorly with the cold wire snare, the growth proved to be so hard that the wire would not cut through it and pulled out of the snare. On a second attempt the wire actually broke. The bleeding was very free, but was checked with gauze packing. The next day, with the same instrument, a piece was removed and sent to Dr. Wright. On this occasion the bleeding was excessive and was checked with some difficulty. This patient has been advised to submit to radical intervention, but thus far has refused his consent.

Dr. Wright reported on the growth as follows: "No. 914. An irregular fragment of tissue hardened in alcohol of gradually increased strength, mounted in celloidin, cut and stained with hæmatoxylin-cosin, shows in some areas a structure at first glance resembling an ordinary œdematous polyp. Fig. IV. There is, however, even in these places much more fibrous tissue than usual, but it has undergone a hyaloid change, the outlines of the fibres being broken, irregular, strongly refractive of light and taking the

eosin stain deeply. In the field from which the drawing is taken there is a dense ovoid fibrous nodule plainly discernible. In its vicinity, which the drawing includes, the fibrous tissue has retained its outlines more distinctly. Throughout are to be seen numerous vascular channels, enough to warrant the term "angi-



Fig. 4. Angiofibroma of Nose.

omatous." They are lined with a layer of endothelial cells, the other part of the walls of the vessels being the fibrous tissue itself. Many of the nuclei of these endothelia are seen under a higher power to be swollen and projecting into the lumen. In the areas where the fibrous tissue is broken there are large numbers of mono-nuclear round cells. The epithelium of the surface is of the modified columnar variety without cilia. No glands are to be seen and the new Weigert stain does not reveal any elastic fibres.

"There are no evidences of malignancy, but from the history I should suspect that the piece removed is not characteristic of the whole. Whatever else the rest of the growth may show, I should expect it to be vascular and fibrous. I see nothing in the clinical history to warrant any other diagnosis than the findings of the histological examination—*i.e.*, an angiomatous fibroma."

Such cases are extremely rare. The one in question has come under observation so recently that I have not had time to look up the literature of the subject. Dr. Wright informs me that he has knowledge of only one other similar case, namely, that submitted to him by Dr. C. H. Knight, and which is published in the Man-

hattan Hospital reports for January, 1895. In this latter case the growth was small and movable, being attached to the posterior end of the middle turbinal. Microscopically it was covered by columnar epithelium and was made up exclusively of homogeneous bundles of curling elastic fibers.

The exact origin of the growth in my own case I have thus far been unable to determine. It apparently springs from the general region of the middle turbinate, but more definitely than this I cannot now say. One other gentleman who saw the case before I did reported that the post-nasal prolongation pulsated. I could not determine this at the times of my own examinations.

### *Paper.*

## ASYMMETRY OF THE NASAL CAVITIES.

BY A. COOLIDGE, JR., M.D.

IN this community at least, asymmetry of the nasal passages, to a greater or less degree, is so common that it might almost be considered the rule rather than the exception. It is found in those persons who practically never suffer from any disturbance of nasal function, as well as in the patients in our clinics. It has been shown by Harrison Allen that asymmetry of the nasal passages may exist without deflection of the septum, but in the great majority of cases a deviation of the septum is the most prominent feature of the asymmetry. The etiology of these deviations, the forms which they may take, their frequency among different races, have been so often and so completely described that I need simply refer to papers by Ingals, Delavan, Bosworth, MacKenzie, Harrison Allen and Roe, in the Transactions of this Association, and to the works of Morrell McKenzie, Welcker, Ziem, Stoker, Rosenthal, Sedziac, McDonald, Collier, and especially Zuckerkandl.

In the literature of the subject of deviations of the septum and of asymmetry of the nasal fossæ are frequent references to changes in the shape of the turbinated bodies, commonly found in connection with these deviations. Of these, the most noticeable is an enlargement of the turbinates opposite the concavity of the septum. Considering the large amount that has been



written about the asymmetries of the septum, it is perhaps strange that more attention has not been given to these coincident asymmetries of the other intra-nasal structures. It is commonly observed that in cases of deflection of the septum, the turbinated body opposite a concavity is enlarged, the one opposite the convexity is small. This readjustment is formed partly by changes in size or in shape of the bones, and completed by the soft parts. Not only is the turbinated body as a whole enlarged, or contracted, but localized projections from the septum, as a spur or ridge, may be accompanied by a localized depression in the turbinate opposite to it. By examination of skulls it is evident that these changes are not confined to the turbinates, but often include the ethmoid cells, and sometimes the walls of the maxillary antra.

The etiology of these asymmetries has received the attention of several writers with varying results. In brief, the causes assigned come under one of three heads: First, that the deviation of the septum is primary, and the accompanying changes in the turbinates are due either to changes brought about by the inspired air current, or to pressure on the turbinate. Second, that deviation of the septum is secondary, caused by a primary change in the shape of the turbinates, and third, that both the deflected septum and the asymmetrical turbinates and outer wall are due to a common asymmetrical development. The enlarged turbinate is sometimes referred to as an accidental pathological hypertrophy, but often it is looked upon as compensatory, as helping to fill up a cavity which would otherwise be too open.

Nineteen years ago Delavan read before this Association a paper on "The Question of Hypertrophy of the Osseous Structure of the Turbinated Bodies," in which he discussed the hypertrophy of bone as well as soft parts, especially in connection with deflected septa. I do not know that there is to-day in all that has since appeared a better argument on that subject. He points out the peculiar intimate relations between the mucous membrane of the turbinated body and the bone, and concludes that "the conditions favorable to the hypertrophy of the turbinated bone would seem to be (1) unusual space in the nasal fossæ; (2) long continued hyperæmia of the structures investing the bone; (3) the existence of the above conditions during the period of greatest constructive activity."

Bosworth says: "It is necessary for the development of these



hypertrophic changes that air should pass through the fossa. We therefore find it an invariable rule that the greatest extent of hypertrophy develops on that side which is most open, for in no case of a deflected septum is the extra width of one passage competent to supply the deficiency of the other."

Bryan, while following Bosworth's view of the influence of the air tension in producing hypertrophy, protests that it seems overdrawn. Greville McDonald considers that there is both a true hypertrophy and an engorgement of the inferior turbinated body, and that it would appear to be a physiological attempt to compensate for the abnormal width of the fossa, and should not be lightly interfered with.

Lennox Browne regards the hypertrophy as compensatory rather than as simply pathological. He says: "Deflections, while causing stenosis of the meatus into which they protrude, naturally increase the potency of the opposite side; but increase of function is apt to render the turbinated bodies on this open side liable to compensatory hypertrophy. This secondary overgrowth or vascular turgesence may place to such an extent that stenosis will be produced, which will demand treatment; but it often happens that a deviated septum having been rectified, the compensatory hypertrophy of the turbinates of the opposite side will spontaneously undergo partial and sufficient resolution."

Roe points out that as the air in respiration should be equally divided between the two sides, the hypertrophy may be a compensation of Nature for this extra work. He says: "The hyper-nutrition has been caused by the irritation consequent upon the excessive amount of air passing through the unobstructed passage."

Ziem, in 1883, traced a connection between unilateral nasal obstruction and nasal and facial asymmetry. By obstructing one nasal passage in young animals, he concluded that the restriction of respiration retards, and functional activity increases, the development of the nasal structures. During the last few years, renewed attention has been directed towards the influence of a restriction of the normal air current on the development of the bones of the face and nasal passages. It has long been very commonly accepted that adenoid hypertrophy in the vault, by restricting respiration, is the principal cause of certain peculiarities in the development of the facial bones. This has, to a greater

or less extent, been doubted or denied, especially in the last five years, by Fraenkel, Siebenmann and Grossheinz, who conclude that the high arch and narrowed face are together forms of skull development, independent of nasal stenosis. As far as normal development is dependent upon normal function, we should expect asymmetrical development in cases of unilateral obstruction to respiration.

An interesting study is offered by certain reported cases of congenital occlusion of the posterior nares by a bony plate. In some of these cases the occlusion was unilateral, in others bilateral. The patients had lived since birth with absolutely no passage of air through one or both nasal passages.

An extreme advocate of the influence of the air current as the causative factor in abnormal development of these bones should expect to find symmetry, but extreme high palate in cases of bilateral occlusion and marked asymmetry where the occlusion was unilateral. That such is seldom the case shows that other elements must be considered. In most of the reported cases, although the facial and nasal index have been carefully measured, I have not been able to find very satisfactory descriptions of the relations of the turbinates to the deflections of the septum. I have myself seen two cases of choanal occlusion, one bilateral, the other unilateral.

The first case, bilateral, has been reported by Clark. A girl eighteen years of age, had been unable to breathe through the nose at all since birth, on account of the complete occlusion of both posterior nares by bony plates. The septum was markedly deflected to the left, forming a concavity in the right nasal chamber. The right lower turbinated bone was enlarged and projected towards the concavity. On the left side there was a ridge on the septum and a small and retracted turbinated body.

The second case was a Swedish girl, a domestic, eighteen years of age. I first saw her in September, 1897. She had never been able to breathe through the right nostril. She breathed easily through the left side, and was not obliged to open her mouth except on exertion. The posterior rhinoscopic mirror showed a normal choana on the left; on the right was a smooth surface with no visible line separating it from the vault or from the septum. This was a bony plate which I subsequently removed. There was no marked high arching of the palate, nor facial asymmetry. The left nasal cavity was normal, except that the septum was deflected to a moderate extent into this side, with a corresponding concavity in the occluded right side. The lower

turbinate in the left side was retracted, leaving good space for respiration. In the right side the lower turbinate bulged towards the concavity, to an extent which made it slightly difficult to reach the obstruction with straight instruments. The soft parts of the turbinated body were somewhat pale and collapsed, but the bone in general followed the curve of the septum.

Haag has collected the reports of 44 cases of occlusion of the choanæ, of which 20 were bilateral and 16 right-sided and 8 left-sided. In only 3 of the unilateral cases was there marked facial asymmetry. In one of these the septum was straight, and the nasal passages were of equal size. In 5 of the unilateral cases, the septum deviates towards the occluded side. In the others, it is either normal or not mentioned. In 1 bilateral case there was facial asymmetry, and in at least 2, deviation of the septum. Subsequently, Morf and Baurowicz have reported cases with the same conclusions. In many of the cases reported the turbinates in the obstructed nasal cavities were normal, except that they appeared pale.

These cases tend to prove that the influence of the respiratory air current, or functional activity, on the development or on pathological changes in shape of the intra-nasal structures, is at least limited. In a case reported by Dr. C. H. Knight, in 1888, and in similar ones by Schoetz, Anton, Simon, of unilateral occlusion, the concave side and the large turbinate were found on the unobstructed side. Here it might be argued that the hypertrophy was caused by the air current, but in most of them the deflection was slight, and the single nasal passage admitted sufficient air for nasal respiration. In my case the septum was deflected towards the unobstructed side.

That the adjustment of the turbinates may be due to the increased or diminished space in the nasal passage has already been referred to. A temporarily engorged turbinated body might be compressed by a convexity of the septum or by a spur sufficiently to affect its growth, or in the concave side, meeting no resistance, it might be stimulated to increased growth. This might be communicated to the ethmoid cells, so that they also take part in the process. If we accept this as a sufficient explanation, we must acknowledge that the ethmoid and turbinated bones are especially endowed with a very sensitive nutritive adaptability.

Baumgarten, Woakes, Seiler, and others have suggested that

the deviation of the septum may be secondary to the enlargement of the turbinates. This view seems to have many arguments against it. It is hard to see why the turbinated bones of the two sides should so act in harmony: neither is it likely that a part of a lower turbinated bone receding from a spur should be the cause and not the effect of the spur. Also the septum is especially liable to deformity anterior to the turbinated bones, where the external nasal walls are symmetrical and unyielding. Cases of atrophic rhinitis may present deviations, although the type of face in which ozoena most frequently occurs is that in which asymmetry of the fossæ is least common. That an abnormally large middle turbinate may deflect the septum, and this in turn cause a retraction of the middle turbinate and ethmoid cells of the opposite side, is suggested by Zuckerkandl in connection with one of his plates.

It has also been suggested by Welcker, Ziem, Schaus, and others that neither of the deformities are secondary to the other, but that both are the result of a general asymmetry of the whole region. Bosworth, commenting on the observation of Schaus, speaks of "scoliosis, as it were, of the whole face." Ingals, in 1882, showed a relationship between deviations of the external nose and of the septum. These irregularities either first appear or are much increased during the growth of the intra-nasal structures at about the time of puberty. Walsham says briefly: "The vomer is pushed downwards and forwards by the rostrum of the sphenoid, carrying with it the perpendicular plate of the ethmoid, together with the nasal bones and the external table of the frontal, to which these are attached. If anything interferes with this forward extension, it will cause deviation of the septum."

Whatever the mechanism may be by which one intra-nasal structure is modified to fit another, there seems to be no doubt but that Nature has some method by which the air-carrying capacity of the two sides can be kept approximately equal. The following, from Sir James Paget, quoted by Delavan, seems appropriate here: "Hypertrophy of bone presents itself in many interesting cases. It is usually a secondary process, ensuing in consequence of change in a part with which some bone is intimately connected. Just as in their natural development and growth the bones of the skull are formed in adaptation to the brain, and those of the limbs are framed to a fitness of the action of the muscles, so in disease they submit in their nutrition to adapt themselves to the more

active parts." As the function of the nose is to transmit and modify air, should we not expect to find the bones adapting themselves to this function?

The delicate physiological balance of the nasal organ is well known. The size and shape of the air-carrying passages in the nose are of the greatest importance for its proper physiological functions. This physiological balance would be entirely destroyed by a deviation of the septum unless a corresponding anatomical balance were established. As can be seen on a cross section through symmetrical nasal chambers, even a slight deflection of the septum would open one passage and narrow the other, so that a large proportion of the air would go through one side. May we not assume then that if asymmetry is present in one structure, asymmetry of neighboring structures must be looked upon as physiological rather than as pathological? In other words, these secondary changes subtract from rather than add to the departure from typically perfect conditions.

In a nasal cavity in which this adjustment has not taken place, where for instance a turbinate opposite a concavity is small, leaving a wide passage, there is always present some pathological change, or at least a disturbance of function. Also, in the opposite or narrowed cavity, unless the turbinate recedes, there must necessarily be an appreciable obstruction to the passage of air. The greater the deviation, the more the nasal passages become defective as an organ for respiration. Compensatory shrinking is limited on the convex side, and the hypertrophy of the concave side often becomes excessive. In front of the turbinates, where the cartilaginous septum may bend towards an unyielding nasal process of the superior maxilla, there can be no readjustment, and a sufficient deflection of the septal cartilage causes a unilateral obstruction perfectly obvious to the patient. Many cases of obstruction requiring operative interference, and most of the methods for straightening the septum come under this head. The object of these operations is to open a passage into the nasal cavity proper.

So well is the function maintained that most persons with deviating septa, provided the deviation is not so far forward as to block the passage anterior to the turbinates, are unable to tell which nasal cavity has the greater capacity, and no one, surely,



is surprised to find many asymmetrical nasal passages in persons who never have the slightest trouble with their noses.

Turning briefly to the practical bearing of these large turbinates where, on account of obstruction to breathing, or for other cause it is advisable to straighten the passages, we are told by some of the writers whom I have quoted, that the large turbinate should be reduced before the septum is straightened, by others that Nature's process of readjustment will be sufficient to take care of the redundancy of the turbinate. My belief is that there is truth in both assertions, each in its proper case. To one rule of treatment I think that there will be no question. A turbinated body should be judged by the distance between it and the septum, and not by its absolute size.

In closing, I would present the following propositions for discussion:

1. In cases of deviation of the septum, the common asymmetries of the other intra-nasal structures should be classed as physiological compensatory changes.
2. As a rule, these changes in the turbinated bodies and ethmoid bone are not due to increase or diminution of the air current. Neither is the deflection of the septum often secondary to asymmetrical turbinates.
3. Whatever may be the mechanism which underlies this adjustment, the ethmoid and the turbinated bones are especially endowed with nutritive adaptability, and in consequence are able to minimize the disturbance which a deflecting septum would produce. Slight deflections are often rendered entirely innocuous, more extensive ones partially so.
4. The entrance into the nasal cavities proper cannot share in this readjustment, and here a deflection of the cartilage of the septum soon becomes obstructive.

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### Discussion.

Dr. ARTHUR A. BLISS said it had always seemed to him that in asymmetry of the nasal chambers one was apt to leave out of account the element of the development of the palatal processes of the superior maxilla, and the effect they must have on the proper position of the septum itself. It did not seem to him that there should be any one predominating cause for such deflections. In a large number of cases the cause was traumatism in early childhood, but where there was the peculiar narrow head of the Anglo-Saxon type, a head which appears as though it had been almost compressed, and which gives an exceedingly prominent upper jaw and exceedingly narrow nasal passages, the palatal processes of the superior maxilia form a Gothic arch instead of the rounded arch. The upward thrust of these palatal processes during the years of development must press upon the nasal septum, causing it to be pressed upwards against the base of the skull. Of course, the base of the skull during the years of development is undergoing modifications of stress, with more or less pressure downward. This was even more marked in cases in which there was more or less bone degeneration, as in subjects of rachitis, but even in normal individuals this type was

not by any means uncommon. The bridge being subject to pressure from above and below must yield and be deflected. In the closed side, the one in which there is contact between the mucous surfaces, a catarrhal condition must soon be established, and vaso-motor changes must result and cause on the other side either a vaso-motor paresis of the entire mucous membrane, giving the boggy lower turbinate, or hyperplasia of that structure, with increase in size of the turbinate. He thought this was one element which must be taken into account in searching for the causes of these marked deflections of the septum. They could not all be traced to traumatism. In a large class of cases they were the result of an irregular development in the nasal floor and in the base of the skull above.

Dr. EMIL MAYER said that we often fail to note the conformation of the nasal septum. A horizontal incision through the septum does not reveal an even width, but a great widening as we approach the superior maxilla at the base of the septum, where it is broadest. It was interesting to note the development of a deviation. He had seen such cases where a deviation was forming, and these were all associated with posterior obstructions, as adenoids and the like. The removal of these would do much toward preventing further deviation. Regarding redundancy of the turbinates into the cavity, its occurrence seemed to him to be perfectly explainable by the loss of atmospheric pressure. It was quite natural that the great cavity with air in plenty, but not enough to keep the membranes held up, should permit of the hypertrophic changes. This had been shown very remarkably in a number of cases which he had followed very carefully subsequent to operations for the relief of deviations of the cartilaginous septum. He had made it a rule that no matter how large a turbinated body seemed to be, and there was a deviation of the cartilaginous septum, to pay no attention to this condition of enlargement until some time after the deviation had been corrected; and he had been surprised at how little had been required subsequently; in fact, it was difficult to recall a single case where this had required treatment subsequently. This could be readily explained by considering the existence of a proper current of air in the nose. It was very easy for hypertrophy to occur on the side presenting the least resistance. In connection with the cases recorded in the paper of a bony plate, he could himself recall a young lady having a similar condition. Here, with the exception of some nasal sound to her speaking voice and occasional attacks of acute rhinitis, nothing was complained of. This young woman had an enormous exostosis of the bony septum, requiring several applications of the trephine before he could clear it out thoroughly, yet in spite of this she was a beautiful singer. Of course, she had been able to sing with much more ease since the operation.

Dr. E. L. SHURLEY thought the cases considered in the paper could be divided into two classes, viz.: (1) Those which are post-natal and accidental, due to pathological changes, and (2) those which are evolutionary or devolutionary. There could be no doubt that we are very artificial animals and asymmetrical in form. This is shown not only in our eyes and ears, but in other parts of our bodies. It is almost impossible to find a perfectly symmetrical man or woman among Caucasians. Another fact which perhaps often passes unnoticed is the effect of the increasing difficulty in parturition experienced by the higher classes. It was well known that the labors are protracted, difficult and perplexing among these people, so that instead of being a physiological process it is fast becoming a pathological one. Again, there are fashions and fads in obstetrics as in other departments of medicine. Of late years it has become a fashion to relieve the mother in labor artificially, so that the modern obstetrician often proceeds to deliver the woman under an anæsthetic very soon after dilatation of the os takes place. This practice must have its influence on the soft tissues of the child. The evolution of the cerebrum in the modern child must also exert an influence. All of these things seemed to him to conspire in a natural way toward producing deviation in any part of the body, including the head. Probably the nasal cavities afforded a place of least resistance to these factors.

Dr. D. BRYSON DELAVAN said that in his paper, referred to by the reader and presented some years ago, he had intended to draw attention to the subject in order to interest others in it and thus stimulate investigation. Great complexity of view had been held regarding the origin of these troubles. All who had had the opportunity of studying the nasal cavities of young children, and of watching the same children during the years of their active development, would agree that vast changes take place. Conditions which when first seen were apparently not abnormal, later on might become much exaggerated. No subject of greater importance could be presented, since the reasons for these changes were not sufficiently well understood. The speaker believed that the causes which produced them were to be found not far away, and that careful study and sound sense would explain most of them. In his opinion deficient air supply was the secret of much nasal obstruction, and that if patients could be taken in hand sufficiently early in life, the fact recognized that the nasal passages were not performing their functions properly, and this condition remedied by the proper admission of air, the abnormalities ordinarily observed later would be prevented. For example, the whole general nutrition of the nasal cavities and with it their internal contour, was often markedly improved by the removal of an obstructing lymphoid hypertrophy at the vault of the pharynx. The speaker compli-

mented the high character of the work presented by the reader of the paper, and expressed the hope that he would continue his valuable investigations.

Dr. H. L. Swain said that it must be evident that many and varied processes must be at work in these cases. We could not ignore the fact that forces outside of the nasal passages proper were very potent in influencing the shape of the latter. The tremendous differences observed in the nasal cavities and in the head were very suggestive. In this connection Bosworth's term "scoliosis" seemed to him quite appropriate. The forces contributing to the enlargement of the turbinated bodies seemed to him solely the outcome of the narrowing of one side and the variations of pressure thereby produced.

Dr. COOLIDGE, in closing, said that he had not intended to go into the subject of the etiology of deflected septa. He believed the causes of asymmetry were various, some functional and others developmental. If the head while plastic were bent we should expect all parts to bend, but we should expect one nasal cavity to become highly occluded; this is not what is found. There must be some factor at work other than simple accident when we find with deviations of the septum such perfect readjustment that the patient experiences no difficulty in breathing through the nose. He had not intended to refer to cases in which there was contact, but to cases in which there was more or less deviation of the septum, and yet in spite of this no functional disturbance within the nose. In cases of bilateral occlusion of the posterior nares, we know that there has been absolutely no air through either nostril at any time, and hence that any asymmetry present cannot be due to causes connected with the respiratory air current.

*Paper.*

THE SUPRA-LABIAL OPERATION (DR. HARRISON ALLEN'S) FOR DEFLECTION OF THE NASAL SEPTUM.

BY ARTHUR AMES BLISS, A.M., M.D.

THE text for this paper, in addition to its title, might be *the anterior nasal spine, or maxillary crest, in septal deflections*. The deflections of the nasal septum, which cause such occlusion of the passages as to require operative interference, involve most



commonly that portion of the septum on a plane with the nasal processes of the superior maxillæ. This area is immediately above the anterior nasal spine or maxillary crest. The displacement of the septum, at this point, may vary in degree from a slight deflection from the median line to actual contact between the septum and the outer wall of the nose. The outer wall of the nose, in this area, is formed by the anterior part of the lower turbinated body, inner margin of the "vestibule" formed by the sharply defined and projecting angle of the nasal process of the superior maxilla and the inner surface of the ala of the nostril. A bend of the septum at this point will very generally command the position assumed by the triangular cartilage in its vertical plane, beyond the plane of the face, while the curve, in less degree, may extend inward along the junction of the vomer and triangular cartilage, or may involve the vomer itself in the general displacement. In a large number of cases the extreme degree of deflection is well above the nasal and vestibular floor, and presents a well defined and projecting angle or curve made by the upper and lower segments of the bend, forming a projecting "overhang" above the nasal floor. Such a very common deformity is readily corrected if the septal bend is rounded and rather high above the nasal and vestibular floor, by the well known operation of Dr. Morris Asch. If the bend be more sharply angular, and the angle is placed still nearer the nasal floor, the flap operation with beveled edges, devised by Dr. Arthur Watson of Philadelphia, is, in the writer's experience, a more satisfactory method for replacement. But there exists a third class and a very well defined class of cases in which no "overhang" exists, but the displaced septum presents a relatively straight wall, which extends to and into the nasal and vestibular floor, the extreme point of deflection being above the anterior nasal spine. In such cases the spine is itself involved in the bend, and often presents much hyperplasia of tissue or an exostosis on the side of extreme deflection. It happens not infrequently, in these cases, that the anterior part of the vomer, along its upper margin, is also turned or bent over, forming an element in the septal deflection, and carrying with it that part of the triangular cartilage to which it is attached. Such a deflection may be a simple vertical displacement of the septum, but it is more apt to present two planes, one vertical, one horizontal, but both

planes meeting in the extreme point of deflection at, or just above, the anterior nasal spine. The anatomical structure of the septum favors the formation of deflections at this very point. The vomer, firmly buttressed by its posterior and superior wings to the body of the sphenoid bone, implanted securely in the median line along the nasal floor, braced anteriorly against the maxillary crest, is well protected from disturbance. The perpendicular plate of the ethmoid is much less secure. Thin in substance, blending with the structure of the cartilaginous septum, its most fixed points are at the cranial base and at its attachment to the vomer. The nasal bones, however, act as a shield to it from crushing blows, yet the force that bends the septal cartilage will, by reason of the close attachment and relationship between the triangular cartilage and the perpendicular ethmoidal plate, cause the latter to be involved in a greater or less degree in the resulting septal deflection. The triangular cartilage itself is the most varying and movable structure of the septum, and its bends are the most important element in producing the nasal stenosis which requires a resection operation. The large, free area of this cartilage lies just above the anterior nasal spine, to which it is attached at its inferior margin. This is its final point of bony attachment before it projects freely beyond the plane of the face. Any force acting from without, which tends to twist or bend the triangular cartilage in a vertical plane, will produce a powerful wrenching or twisting at the nearest point of bony attachment, the anterior nasal spine. To a much less degree it will affect the anterior upper margin of the vomer. The effect will be a wrenching of the cartilage from its bony attachment and displacement to one side or the other, according to the direction of the line of force producing the shock. At the point of rupture between the cartilaginous septum and its anterior inferior bony attachments, a certain amount of hyperplasia of bone and cartilage is developed during the subsequent healing, which leaves a permanent thickening. Now, in the cases where a straight or but slightly curved deflection of the septum occurs, above the anterior nasal spine, and without an "overhang," there is not only this thickening of the bone, but an actual bend of the spine itself to the narrowed side of the nose. This displacement of the spine, with its accompanying thickening, changes the nasal and vestibular floor to a mere fissure between the convex surface

of the deflected septum and the outer wall of the occluded nostril. To open this fissure, to restore the nasal and vestibular floor to a form resembling the normal passage, and to replace such a septum in the median line, you must flank the point of fixation which holds the inferior border of the nasal septum in its abnormal position. To accomplish this, you must detach the septum through the anterior nasal spine itself, below the soft tissues in the nasal floor.

This was the object aimed at by Dr. Harrison Allen when he devised his supra-labial operation. In the course of an extensive study of the skull, Dr. Allen had examined a great number of human crania of all races. Among various deformities of the nasal septum presented, he had observed, in frequent instances, traces of this low deflection with its attendant bending and hyperostosis of the anterior nasal spine. Supplementing this experience in anatomical museums with his clinical experience in practice, it occurred to him that the effective method of operation in this special class of septal deflections was by division through or immediately over the maxillary crest. This is the pin which fixes the part. Once divided there the anterior part of the septum becomes freely movable.

The instruments required are few and simple. A small, sharp-pointed bistoury is needed to divide the frenum of the upper lip. A small, strongly made chisel,  $\frac{1}{4}$  to  $\frac{3}{8}$  of an inch in breadth at its cutting surface, is then passed through this wound and carefully pushed upwards, in the median line, until the maxillary crest is reached. Its shank is then raised, so that the cutting surface points directly against this crest, facing inward, and very slightly downwards or upwards, according to the height of the vestibular floor in its relation to the floor of the nose. A few light blows of a hammer drive the chisel through the anterior nasal spine, as far as the naso-palatine foramen. If the operator has been careful to direct the chisel so as completely to divide the maxillary crest, a finger introduced into the occluded nostril will, at once, force the septum over as far as it is desired to carry it.

A rubber tube splint is now placed in what has been the occluded nostril. This is to be continued in use about as long as required after an Asch operation. A strip of gauze constantly wet with clear cold water is laid over the patient's upper lip and

a second strip across the bridge of the nose. This cold water dressing is continued for one or two days. The patient remains in bed during this length of time, having one of the many alkaline and antiseptic sprays used about every two hours, through the open nostril, about the entrance of the rubber tube and about the upper teeth and gums. The operation is, of course, done under light etherization. Hæmorrhage is very slight, and, provided the cold water dressings are used, there is seldom very marked swelling of the upper lip. Any ridges that exist along the line of attachment between the vomer and triangular cartilage can be removed at the time of the septal replacement, or, later, under cocaine anæsthesia. In instances where the premaxilla is large, with high floor, which elevates the vestibular floor much above the general floor of the nasal passages, the chisel will sometimes penetrate through into the nasal chambers. Very frequently, after pushing the septum into its new position, a rough line of bone will be felt by the finger, marking the point where the chisel has divided the maxillary crest at the point of attachment. All such surfaces are protected during the course of healing by the dressings used for holding the septum in its new position.

Here is an operation based on a rational line of procedure, the result of careful clinical and anatomical study, which is simple in plan, easily and quickly executed, and is attended with very slight reaction. In cases presenting the form of septal deflection in which it is applicable, the results, in the writer's experience, have never failed to be lasting and satisfactory. It supplements the more commonly-used surgical methods, and yet reaches a large class of cases more effectively than does any other form of operation known to the writer.

In spite of the high scientific and professional standing of the originator of this method, and in spite of the advantages it offers for the correction of the peculiar septal deformity I have described, the supra-labial operation of Dr. Harrison Allen is comparatively unknown. It is not even mentioned in the text-books on nasal diseases and their treatment. It is a surgical procedure of too great value to be thus ignored and to be forgotten after a few surgeons who have proven its usefulness by long experience have passed away.

*Discussion.*

Dr. EMIL MAYER wished to ask whether these cases were similar to those generally looked upon as dislocation of the columnar end.

Dr. C. H. KNIGHT inquired whether the septum, having been replaced in the vertical line, the maxillary crest, which protrudes after the operation, needs any subsequent attention.

Dr. BLISS replied that in many cases dislocation of the columnar end would be found, but he had referred to a much larger dislocation than this, and the existence of the columnar dislocation was not the main reason for the operation. In some cases there was a large exostosis. It was necessary here to use the Bosworth saw and remove a certain amount of tissue, but in the majority of cases this was not necessary.

*Paper.*

## SOME CASES OF PARALYSIS OF THE RIGHT VOCAL CORD.

BY JOHN W. FARLOW, M.D.

THERE are many points in the pathology of the nervous affections of the larynx which are not well understood, and we occasionally come across conditions of the vocal cords which cause much speculation as to their causation and significance. In a general way, it may be stated that functional, hysterical or nervous paralysis is bilateral, symmetrical and of the adductor muscles, while unilateral paralysis of the abductors is significant of some central or peripheral affection of the inferior laryngeal nerve. To this general rule there are undoubtedly exceptions, and I will give a few points in the history of four such cases:

CASE I.—Miss T., 21 years of age, strong and in perfect health, consulted me in January, 1894, for a slight affection of the nose and some spots of pharyngo-mycosis on the tonsils. The voice was normal and there was no dyspnoea even on exertion. The right vocal cord was motionless in the median line, otherwise the larynx was normal. A month later the cord at times moved fairly well and then again but little. This condition continued during March and April. On July 14th she thought her cord was not moving well, judging, perhaps, from her voice. As



a matter of fact, the cord was merely a little sluggish in its movement. On November 12th the cord could not be moved from the median line, but two weeks later it began to move well again. In April, 1895, there was once more complete fixation of the right cord, which lasted for some time, and in November good movement was once more established. During all this time there were no laryngeal symptoms and there was no departure from robust health.

CASE II.—Mr. H., 19 years old, consulted me in February, 1896, for slight post-nasal catarrh. The larynx was merely somewhat congested. In April, 1897, the right cord did not move from the median line, which condition lasted for several months. On May 12th the right ary-epiglottic fold hung more forward than before. In July the cord was still immovable. The patient was perfectly well and strong and was able to play five sets of tennis against the strongest players in America, and win. In December, 1897, six months later, the right cord moved fairly well, but its arytenoid cartilage passed in front of the left in phonation. This condition exists to the present time. He has never noticed any difference in his "wind" or in his ability to use his voice between the times when his cord is fixed in the median line and when it moves freely.

CASE III.—Mrs. R., 55 years of age, seen in April, 1898. She complained of occasional hoarseness. I found some pharyngitis, a long uvula and the larynx rather redder than normal and the right cord fixed in the median line. In December the same condition was noted. In April, 1899, there was slight movement of the cord, but in November I was unable to detect any motion, nor has there been any improvement up to the present time, in spite of treatment. There are no symptoms referable to the larynx.

CASE IV.—Mr. N., 54 years of age, a clergyman, seen in October, 1900. He always had a strong, clear voice. Ten days before I saw him he became very hoarse, but had no coryza, pain, secretion or cough. The right half of the larynx was fixed in the median line, but there was no redness or swelling to be seen. His voice was very weak and husky. In spite of treatment and rest of the larynx, the appearances continued the same for many months. The voice gradually improved, and he wrote me recently that he spoke nearly as well as ever, although my last examination, made but a short time before, showed just as complete fixation and lack of motion as when I first saw him. I was entirely unable to tell by looking at his larynx whether his voice was improving or not.

In all the above cases careful search failed to show any cause for the laryngeal paralysis. The young lady had periods of alternate ability and inability to move her right cord and finally

recovered entirely. The young man had a paralysis lasting many months, after which the cord moved well, but the arytenoid passed in front of its fellow in phonation. Both these patients had no trouble with voice or respiration.

The elder lady, in Case III., had a voice that was not clear or strong, and her paralysis has lasted over two years. The clergyman has practically recovered his voice, while his cord still remains motionless in the median line.

If such cases as the above can occur occasionally, it seems strange that we do not find them *more* frequently.

### *Discussion.*

Dr. D. BRYSON DELAVAN said that in a number of instances he had been greatly puzzled by cases of apparent right abductor paralysis. Sometimes the case was one of true paralysis, and sometimes one of ankylosis. He had had three patients under observation in whom a severe attack of laryngeal diphtheria seemed to have originated the condition. In one of them, a lady of about fifty, who had suffered some twenty years before from a severe attack of laryngeal diphtheria, he had made examinations from time to time for the past ten years, and had noted no change in the position of the right side of the larynx. He had seen two other similar cases, also in women, but in younger subjects, in which, up to date, the paralysis had been permanent. He had also a case of fixation of the larynx, due to the results of a very severe typhoid ulceration, especially marked on the right side. In another case, following a severe phlegmonous acute inflammation of the pharynx, especially marked on the right side, there was complete loss of motion of the right side of the larynx, the vocal bands being in the cadaveric position. The most careful examinations had failed to demonstrate the presence of any general cause or of any thoracic lesion through which pressure could have been exerted upon the right recurrent laryngeal nerve. He thought these cases were rather more common than might be supposed, for the reason that sometimes the vocal disability was so slight as not to call special attention to it. However, in most of his cases of this kind the vocal disability had been considerable, and at times serious. He thought it necessary to distinguish carefully between a true condition of paralysis and one of ankylosis, inasmuch as the pathological lesions sometimes causing the former were of such serious character.

Dr. H. L. SWAIN said that he had had a case of paralysis of the right vocal cord, due to an aneurism of the subclavian, as

subsequently proved by autopsy. The diagnosis had been made during life. The left vocal cord had shown no paralysis.

Dr. W. E. CASSELBERRY said that he had under observation for about three years a case of complete paralysis of the right vocal cord with slightly impaired movement of the left vocal cord. When first seen this case had presented suggestions of syphilis. There was quite pronounced dyspnea, as he was suffering, as it subsequently turned out, from an acute laryngitis, and there was at the moment considerable swelling of the arytenoid eminences, together with the cord paralysis. This subsided in several weeks, and the right arytenoid eminence assumed the "fallen in" position indicative of paralysis. The case had puzzled him considerably for more than a year. A careful search had been made for aneurism, but no really definite aneurismal signs were present. On visiting Berlin the patient had been referred to Krause, who had diagnosed aneurism of the arch of the aorta, involving probably the subclavian. Subsequently, the speaker said, he had had a radiograph made, which seemed to indicate an abnormality in connection with the arch of the aorta, but was not definitely satisfactory owing to the very thick-set build of the thorax.

Dr. PRICE-BROWN reported a case which had come under his observation last winter. As he had been ill at the time it had been referred to Dr. McDonough of Toronto, and the latter had pronounced it to be a sessile papilloma of the vocal cord on the right side. Subsequently he had examined the lady, and had found a very large papilloma in the position of the right ventricular band, with complete paralysis of the right vocal cord. The growth filled in the larynx, so that merely a slit was left on the opposite side, producing a good deal of laryngeal stenosis. The woman had been reduced in weight to ninety-six pounds. He could not apply a snare or forceps, and hence had resorted to the electro-cautery. Several cutting operations had been done in this way, and by this means he had removed considerable of the growth. He was under the impression that thyrotomy would be required in order to complete the operation, but on his return, some months later, he found that the patient had increased ten pounds in weight, and he decided to continue to use the electro-cautery. This he did on alternate days for two weeks, and on intervening days used the curette. At the end of that time there was almost complete return of the power of the right cord, so that there could be no doubt that the entire difficulty in movement was owing to the obstruction produced by the growth itself. The patient went home a few weeks later in very fair condition, with the natural voice somewhat restored and the growth practically removed.

Dr. W. K. SIMPSON suggested that in these cases the rheumatic element should not be forgotten. He had had one or two

experiences which had impressed this very firmly upon his mind.

Dr. FARLOW, in closing, said that in the first case he had been unable to assign any cause; there had been no rheumatic diathesis and no ankylosis, for the cord moved at times. In none of the cases had there been any syphilis. Three of the cases had been followed for a period of four years, yet there had been no history of tuberculosis, either in the larynx or lungs. The fact that the first two cases had recovered would point to some transitory condition as a cause, though he was unable to state exactly what was this cause. He had found treatment of very little avail.

### *Paper.*

## A REPORT OF A METHOD OF LOCAL TREATMENT EMPLOYED TO ERADICATE THE SUSCEPTIBILITY OF THE NASAL MUCOUS MEMBRANE TO HAY FEVER.

BY CLARENCE C. RICE, M.D.

IN considering the possibilities of ever obtaining an efficient remedy which will control the distressing attacks which are known by the name of hay fever, spring or summer fever, June colds, nervous coryza, sympathetic coryza and many other names, it must first be accurately determined which *one* of the several etiological factors, if there be several, plays the most important rôle in the production of this peculiar disturbance to the nasal mucous membrane.

Granted that the vegetable pollens are the essential external irritants, and it can hardly be disputed that since by far the great majority of these nervous coryzas occur at the time of the year when the various pollens are abroad in the air, it can hardly be doubted that these are competent to produce the particular kind of nasal irritation to which authors have given the various names we have mentioned.

It would hardly strengthen this paper to quote largely the different opinions of investigators, observers and authors, for they seem very generally agreed that this peculiar nervous irritability of the mucous membrane is chiefly present at that season

of the year when the pollen of many forms of vegetation may be inhaled into the nasal passages.

It is far more difficult to place upon a material basis the exact amount of influence which the so-called *nervous temperament* of the individual may exert in the production of this peculiar nasal disorder.

It is easy enough perhaps in classifying our cases of nervous coryza to place them all under the type of "nervous subjects," but, for that matter, who is not nervous? The truth is, that we can all recall many people, sufferers from hay fever, who are phlegmatic in temperament, and many others who are not in any way nervous beyond the average degree.

We believe this matter of nervous temperament, which is given by so many authors as the most important predisposing cause in the production of hay fever is a very subtle influence and but little understood. If outbreaks of nervous coryza depended chiefly upon the existence of general nervousness, sedatives like the bromides should largely control them, which we do not find to be the case.

When we say that *heredity* is a strong predisposing cause, we are stating something which is much more tangible, and when we find this condition actually present in the history of our patient we accept it as an etiological factor with much greater confidence. I cannot say that in examining the cases of hay fever which have come under my observation, I have found more than 10 per cent. in whom hereditary causes seemed to have been evidently present, and I believe that even in this percentage of the cases, if they were more carefully analyzed, it would be found that heredity is of less rather than of more importance in the production of nervous coryzas.

There is no doubt in my mind that when once a patient has suffered from any peculiar spring or summer influenza and the disorder has been named "hay fever," that the *habit* of recurrence is most easily formed. The amount of dread and fear, which hay fever patients entertain as the special time of the year approaches is known to all observers.

We think of no disorder which, reasonably, would be more amenable to influences exerted through the channel of mental therapeutics than the so-called "nervous coryzas."

We have no sort of doubt but that at the proper time of year



these nervous outbreaks may be occasioned by many external irritants, such as any variety of pollen, dust, great heat, strong sunshine, etc., and it is more than possible that this nasal disorder can be produced by the sight of even a good artificial substitute of that form of vegetation which the patient most fears. I speak of this only to bring out the fact that the so-called *nervous temperament*, as a predisposing cause, is a most subtle factor and one concerning which I believe very little is known.

Such treatment as the administration of infusions, decoctions or tinctures of the various forms of vegetable products, the pollen of which produce nervous coryza, if of any benefit, would seem to be so only through the channel of mental therapeutics.

We are very properly accustomed to consider as a third cause in the production of this disease the many abnormalities which may be found not only in the nasal passages of patients who suffer from hay fever, but in the nostrils of people generally who consult a rhinologist.

No one can claim that *there is any special form of chronic nasal disease* which is peculiar to hay fever sufferers. The anæmic œdematous swellings in the nostrils of hay fever sufferers are the result, not the cause, of sympathetic coryza.

If in any large percentage of people who suffer from hay fever any peculiar type of nasal disturbance could always be found, the etiology of this disease would be absolutely certain, but we find to our discouragement that hay fever sufferers very frequently possess no pathological conditions which are in any way peculiar, and many of them have quite normal nasal passages.

No matter what the principal factor in the causation of hay fever may be, experience would teach us that there is great hope of preventing the recurrence of nervous coryza in those cases in which the nasal passages have been kept in a chronic state of congestion and irritation by *a large amount of permanent abnormality of nasal tissues*.

If a patient presents himself with a history of periodical coryza occurring at the time of abundant vegetation, and the nostrils are almost entirely obstructed either with a large middle turbinate, or filled with myxomatous tissue, or closed with a septum which touches the turbinated side, we are confident that the removal of such obstruction will naturally so diminish the

irritation and congestion as to leave the nostrils much less susceptible to external irritants of all kinds.

We may say, therefore, that the prognosis of cure bears a very certain relation to the amount of permanent nasal obstruction which is present. I dare say we all remember those most satisfactory cases of nervous coryzas occurring only at hay fever periods, which presented such marked nasal obstruction that we felt from the very first moment of examination that the judicious treatment of the nasal passages would cure the nasal disturbance. Unfortunately, and we know this view is not entertained by all writers, we have found that in at least 75 per cent. of all patients suffering from summer coryza, there exists no larger degree of nasal growth or obstruction than is found in the ordinary patient who consults the rhinologist for the relief of common catarrhal symptoms. Not finding, therefore, adequate nasal pathology for the existence of nervous coryza, observers have been compelled to rely on the theory or belief that there must exist in the nasal passages of hay fever sufferers the so-called "sensitive areas" which have been prominently mentioned in nearly all descriptions of this disease, certain circumscribed locations in the nasal passages which are especially susceptible to external irritants.

It perhaps can hardly be conclusively demonstrated that these particular areas are more sensitive than other portions of the nasal passages, but observers have felt that it was sufficient proof, because contact with them with a probe produced such quick and violent reflex phenomena as sneezing, coughing, lachrymation, etc. Looking at this matter in a general way, it cannot be doubted that the nasal mucous surface of many people is much more sensitive, or to state it more properly, much more easily affected and irritated by external agents than the mucous membrane of others.

We believe it is true that people who suffer from periodical nervous coryzas are much more easily disturbed in their nasal passages, even during the *quiescent* period, than are the larger number of people who never suffer from nervous catarrhs, and whose nostrils are not unduly sensitive. We have found in treating this peculiar class of patients during the winter that local applications caused sneezing and colds in the head much more readily than in the ordinary individual.

We believe, therefore, that this unusual sensitiveness of the nasal passages is the most important predisposing cause in the production of nervous coryzas. We see no reason for quoting from the experience of others on this point, because we believe it is a proposition very generally conceded by observers.

Speaking now of the best method to eradicate nasal susceptibility to external irritants, it is unnecessary to advise such surgical measures as will suffice to put the nasal passages in as normal a condition as possible, for all are agreed as to the desirability of this. After all osseous hypertrophied have been surgically removed, soft tissue enlargements should be shrunk with acids or cauterized and undue sensitiveness destroyed in the same way. The great temporary relief which was afforded to hay fever sufferers by the use of cocaine, in judicious solutions, gave hope of this being the long-wished for remedy, but the benefit from this drug has proven so transient and so many ill effects easily follow its unwise use, that the rhinologist has been disappointed in the dependence he first placed upon its administration.

We think the local application of eucaine is a much better means of relief, and we feel that in the future more credit will be given to this alkaloid, and that it will be more generally employed. Just now, when the mind of everybody is considering the value of the suprarenal extract, it seems hardly necessary to enlarge upon its benefits. Its local effects are wonderful. It certainly gives the patient a large degree of relief if persistently employed, but we feel that a larger step will be attained when some method of therapeutics, some line of local nasal treatment is devised, by which the nasal passages can be put in such a condition that they no longer will be susceptible to the external irritants which produce the peculiar nasal outbreaks known as "sympathetic coryza."

We are all familiar with the type of cases which so closely resemble in symptomatology the nervous coryza which is known as hay fever, but which occurs independently of that time of year. They are essentially nervous coryzas, in contradistinction to a simple catarrhal rhinitis, and since they are so closely akin to hay fever in symptoms and pathology, the condition has been designated by some writer as false hay fever.

My attention was directed long ago to this type of cases,

occurring, as I have said, at any time during the year. Careful examinations were made to discover if there were any *constant* nasal pathological condition which was accountable for the reflex symptoms, but usually only the ordinary catarrhal changes were present, and after these abnormalities were corrected there still remained the over-sensitive mucous membrane, which became intumescent or œdematous, and which transuded serum abundantly, accompanied by sneezing and lachrymation, whenever the mucous membrane was exposed to the slightest extra irritation. We do not recall that this condition was usually found in people who presented any special degree of general nervousness. There seemed to be present in the individual only a remarkably sensitive nasal mucous membrane. Attempts were made to eradicate this sensitiveness by applying some form of the galvano-cautery to the most swollen, sensitive areas and much was accomplished, and after many points of the nasal passages had been attacked it seemed wise to discontinue their use. While this treatment undoubtedly greatly diminished the nasal sensitiveness, we have not found that it controlled the nasal irritability sufficiently to render it immune to the external agents which provoke hay fever and summer catarrhs.

It has not seemed wise to hope that the use of cocain, eucaine or suprarenal extract would effect a permanent cure. The use of these three agents has been confined almost entirely to the hay fever period, for it has not been found that if these drugs were applied in solution to the nasal passages during the entire quiescent period the patient would thereby receive immunity from hay fever irritation.

We have long felt that there must be some method discovered by which a particularly sensitive mucous membrane, a membrane over-susceptible to every external irritation, could be made to lose its sensitiveness, and to become so tolerant of outside influences that it would no longer be excited into such reflex phenomena as œdematous closure, transudation of serum and sneezing. The principle underlying the plan of treatment which I have followed with more or less success during the past few years is to compel a mucous surface to lose its sensitiveness or to make it tolerant by frequently repeated frictional rubbings. It is necessary to continue such rubbing of the mucous membrane until it is no longer excited by these applications, daily for two weeks,

three time a week for several weeks, and twice weekly for two months before the usual time of the outbreak of the nervous coryza. Treatment should therefore be commenced three months before the date of the hay fever attack.

I had noticed that rubbing the mucous surface thoroughly, a method of treatment at first employed in the treatment of atrophic rhinitis, not only made the surface smooth, but after a time it whitened it, as though the frictional rubbings destroyed the capillaries, and increased the sub-mucous connective tissue. It occurred to me that such friction of the mucous surface would not only wear out peripheral irritability, but would also wear down peripheral nerve fibers, contract the surface blood supply and convert the intumescent overlying turbinated tissue into a firm, compact, connective tissue covering which would not be easily affected by any external irritant.

That such a result can be obtained in the nasal passages by painstaking friction of the entire mucous surface of both nostrils for a period of three or four months, I am confident to be true in many cases.

The considerable amount of time required is discouraging to the patient, and the first applications to the nasal mucous membrane are not only somewhat painful, but they cause sneezing and sometimes simple coryzas which continue for weeks. The rubbing is persisted in, however, in spite of coryzas, and after a little time the acute catarrhal symptoms disappear, the mucous membrane becomes more and more tolerant of the rubbing, less pain is produced, sneezing is less frequent, the patient does not suffer with a fresh coryza with every atmospheric change, and instead of a puffy and red mucous surface we find a firm white one. I am not positive that there are any one or two drugs which are better than all others in obtaining this effect upon the nasal mucous membrane. I commenced by using a solution of iodol and ether, ʒj to ʒj, but changed this to the following solution:

- |    |  |        |
|----|--|--------|
| R  | Alumnol.....                                     | grs. x |
|    | Eucaïne .....                                    | grs. v |
|    | Boro formalin .....                              | ʒii    |
|    | Aquæ destil .....                                | ad ʒj  |
| M. | Sig. Apply vigorously with cotton on applicator. |        |



I have felt that it was wise to add a trifle of eucaine, 1 per cent., to diminish pain and to lessen the acute coryzas which are likely to follow the first applications.

The medications have been applied with an applicator and cotton. In the beginning the mucous surfaces have been gently rubbed, but with every succeeding application the lining membrane has been more and more vigorously massaged. I believe that the *mechanical friction* accomplishes much more than does any medical effect of the medicine used. It is simply a matter of rubbing or polishing the mucous surface until it becomes smooth and compact and insensible to external irritants.

I have followed this method of treatment during the last three or four years, and almost invariably it has been found that after the mucous membrane has been massaged ten or twelve times the surface has been so tolerant of contact that little reflex phenomena are produced by rubbing. It seems reasonable to hope that if a mucous membrane can be made tolerant of such applications that it can also be put in such a condition as to be insensible to those special influences which produce nervous coryzas.

If any benefit is to be given the patient through the channel of mental therapeutics, nothing could be more assuring to them than to realize that their nasal mucous surface has by this rubbing treatment become so changed in character as no longer to be sensitive to any external irritant.

### *Discussion.*

Dr. W. K. SIMPSON said he hoped this treatment would prove an aid in the management of cases of hay fever. He would like to know whether Dr. Rice had seen any prophylactic effect from this method in the treatment of *true* hay fever.

Dr. F. H. BOSWORTH expressed the wish that some one would teach us how to treat hay fever. He had understood that the treatment just advocated was specially applicable to perennial hay fever, or, as he called it, "nasal hydrorrhea." He must take exception to the statement about the neurotic temperament. The patient might not be nervous in the ordinary acceptance of that term, yet an individual suffering from any of the forms of hay fever is intensely neurotic. The essential pathological change in hay fever, in his opinion, was a vaso-motor paresis. All recognized the essential importance of removing any morbid conditions existing in the nose, but that was not all; an effort must be made to cure the neurotic habit. There was a vaso-motor paresis oc-

curring in the periodical cases from the action of the pollen in the atmosphere. In the perennial cases the irritation was of a nature not well understood, but it was probably of central origin. The removal of the sensitiveness of the nasal mucous membrane was not sufficient unless it was coupled with treatment for improving the neurotic temperament. He would like to ask what is accomplished by massage of the nasal mucous membrane: does it reduce the calibre of the capillaries? He was inclined to think that the muscular fibres of the capillaries might be stimulated by this massage treatment, and might thus explain the results. Many years ago throat specialists had made use of much machinery, and this seemed to be a step back to those days.

Dr. E. MAYER said that the title of the paper was misleading and that the author had merely suggested that a certain mode of treatment should be used. He would like to know just how many cases had been subjected to this treatment, and how many had had their hay fever aborted.

Dr. E. L. SHURLEY thought one should keep constantly in mind the fact that this disorder is a neurosis, and that the vasomotor paresis is only incidental. In the line of recent experiments on the neurons, especially those experiments of Professor Huber, of Ann Arbor, and others, valuable suggestions were afforded. Huber had shown that the ultimate protoplasm of the nerve, which is in many instances identical with the muscle corpuscle, is capable of changing its volume and density under certain conditions. This change had been observed in animals and along with it certain changes in the surrounding capillaries. The speaker said it had occurred to him that these physiological experiments might throw some light on the nature of neurotic coryza. Professor Huber had applied various agents to these nerve ends, and at the speaker's request had made applications of sulphate of copper, nitrate of silver and some other substances to the nerve fibers. It was found that nitrate of silver seemed to have almost a selective action on the neurons or nerve endings. All of this points to the possibility of some application being discovered which would—through changing in the form of the ultimate protoplasm of the nerve, or of the protecting epithelium or endothelium of the part—enable us to secure positive results from local treatment. He was in accord with the reader of the paper in his statement that the main treatment should be general. A large number of cases are met with at all times of the year, and apparently dependent upon all sorts of neurotic disturbances, which show conclusively that the radical cure of them depends mainly upon a rational general treatment of the individual.

Dr. JOHN O. ROE said that the influence of the neurotic condition in the production of hay fever may be regarded as unquestionable, but he had not failed to find in any well pronounced

case of hay fever a local or inciting cause. Dr. Rice has stated that he had found many sufferers from hay fever with anatomically normal nostrils, but this has not been my own experience. A careful examination of the nose he personally had found to reveal in every case some local disturbance which accentuates the general neurotic condition. No matter how neurotic the individual, unless there is some local cause to produce this local manifestation, the person is not susceptible to hay fever. Formerly it was supposed that this local cause was located most frequently about the lower turbinates: at first in the anterior portion, and later Dr. J. N. McKenzie discovered a sensitive area in the posterior portion of the inferior turbinate that excited the reflex disturbances. In some cases this is found to be true, but in a large majority of cases he had found the principal portion of the intra-nasal disturbance to be located in the upper portion of the nasal chambers, usually in the region of the middle turbinate, and it is for this reason that the local cause in the nose is so often overlooked.

In regard to the nasal massage advocated by Dr. Rice, it is very similar to the method of vibratory massage of the nasal passages advocated many years ago.

Dr. A. W. DE ROALDES said: "If I understand him well, in order to eradicate the susceptibility of the nasal mucous membrane to hay fever, our colleague, Dr. Rice, is employing a method, which bears a great analogy, to certain forms of massage. In a general way, the influence of systematic friction on the circulation and nutrition of the parts, cannot be denied. In the naso-pharynx and throat, I am still a believer in the efficacy of intelligent rubbing, with or without the use of a topical agent, especially in the chronic forms of catarrh, accompanied with dryness of the parts, atrophic patches, scabby formations, etc. This treatment by massage, necessarily a long one, should be entrusted to the patient, after proper training. Thus may be obtained, at times, the relief of unpleasant symptoms, and a diminished liability to recurrences of sub-acute attacks. In cases of hay fever, however, my experience with massage has been disappointing: I have had to abandon it, as well as many other forms of intra-nasal intervention, limiting myself to the clearest operative indications, especially when dealing with neurasthenic patients. In this last class of cases I have allied myself, long ago, with those who depend more upon the general treatment.

"Apocryphos of this, I think it well to mention to you the views of one of our corresponding Fellows, Dr. Marcel Natier, who by reason of a long connection, as laryngologist, with the service of Professor DeJérine, at La Salpêtrière, has had great facilities for observing neurotic patients. He considers rhinorrhea, vaso-motor rhinitis, and other nervous disturbances, as polymorphous ex-

pressions of one general, morbid, entity—namely, neurasthenia. Imbued with this etiological conception, he lays little stress on local treatment, but strongly advocates a general treatment of the neurasthenia. Thus were obtained very successful results, in fourteen personal observations, which are reported in detail by him, in an interesting study on rhinorrhea. According to the writer, these neurasthenic patients are all treated on the following lines:

"First, milk diet; second, avoidance of constipation; third, rest, as absolute as possible, in the horizontal position; fourth, hydropathy; fifth, respiratory gymnastics. In including the latter in his method of treatment, Dr. Natier has met an indication, furnished by the fact that all of these neurotic patients were found to breathe very insufficiently. This is shown by a series of very interesting traces of the respiration in each case, for which the observer merits our compliments, as they verify graphically a new symptomatic element."

Dr. W. E. CASSELBERRY asked what was the probable duration of the cures effected by Dr. Rice's method.

Dr. RICE closed the discussion. He said that he certainly had not cured all his cases of hay fever by this method. He had commenced this treatment in cases which are akin to hay fever, and which occur at various times in the year. After having burned them with chromic acid and the galvano-cautery, he had formed the habit of rubbing them very vigorously day after day, and had noted a diminished sensitiveness which he had attributed largely to the mechanical attrition. In these cases of nervous coryza he had had encouraging results from the massage treatment. He could not give the results in the treatment of many cases of hay fever. In three or four of these the degree of benefit observed had been quite marked. There could be no doubt about the change in the tissues which can be effected by perseveringly rubbing the nasal mucous membrane. He had first noticed this in cases of atrophic rhinitis, and where it had been done with the object of making the mucous membrane moist and smooth. He was inclined to believe that prolonged and thorough massage treatment would make the nasal mucous membrane very much less sensitive to those sources of irritation which give rise to hay fever.

This massaging was recommended after all proper surgical measures had been used to remove nasal abnormalities.

*Paper.*

## VOCAL NODULES.

BY CHARLES H. KNIGHT, M.D.

OF the various names given to this pathological condition, that selected for the title of this paper seems the most appropriate. It has already been applied by Elsberg and a few others to certain anatomical formations in the larynx, but confusion is not likely to arise, since its use in the latter sense has not been generally adopted. The term "singers' nodules" implies a professional factor by no means always present. A large proportion of these cases in my experience have been in those who use the voice in singing but little or not at all. "Chorditis tuberosa" suggests an inflammatory origin, whereas marked hyperemia even is rather an exceptional feature. "Trachoma of the vocal bands" and "pachydermia laryngis" are terms used to designate processes histologically allied to "vocal nodules," but very different in their clinical aspects.

It is impossible for me to add anything to the admirable picture of this interesting disease drawn by F. I. Knight in a paper on "Singers' Nodes," read before this Association in 1894, and by C. C. Rice, in a paper entitled "Chorditis Tuberosa," read in 1890. In the contributions to the literature of the subject during the past year it may be noticed that Rosenberg reverts to the idea first propounded by B. Fraenkel, that these nodes are of glandular origin, in spite of the fact that sections of the tumors by Rice, Kanthack and others prove beyond question that they are composed of hyperplastic tissue. In the opinion of Chiari mucous glands are very seldom met with in their constitution, while Garel and Bernard, in a study of 144 cases and numerous sections, found not the slightest trace of glandular elements. The observers just quoted agree that they are more common in women than in men and that they are not infrequent in children. One of T. Morris Murray's cases was only seven years of age. As to the greater prevalence of the condition in women the chivalrous explanation has been offered by Chiari that they make more ef-



fort than men to produce a pure and pleasing quality of tone. The confusion and disagreement prevailing as regards nomenclature and pathology apply to nearly every question bearing on this subject, partly, it is believed, in consequence of failure to clearly differentiate the lesion. For example, the relation of vocal nodules to tuberculosis is still undetermined. In the discussions at our meetings we find arrayed against the tubercular origin of the lesion, or its special association with tuberculosis, French, Delavan, F. I. Knight and Rice, while Daly has always met with it, "with one or two exceptions, in patients with tuberculous tendencies, either inherited or acquired." Jonathan Wright expresses the opinion that "in exceptional instances there seemed to be a diathesis, particularly among phthisical patients," and Simpson believes that while the nodes are not necessarily tubercular "a tubercular subject would be more disposed to their formation." In my own observation the connection between vocal nodules and tuberculosis is purely accidental.

The opportunity to study a vocal nodule developing almost under one's eye is not often given, but has come to me within a few months and has suggested several perplexing questions. My patient is a lady approaching middle life who never sings except occasionally in service on Sunday, but who is a good deal of a talker. She came to me originally for a laryngitis, and the most noticeable thing about her voice in addition to its huskiness was a very pronounced "throaty" quality. In the laryngoscopic mirror were seen the usual appearances of a chronic laryngitis, and the epiglottis was buried in a mass of lymphoid hyperplasia extending across the base of the tongue. Treatment consisted of destruction of the lymphoid tissue, at repeated sittings, with the electric cautery and sprays to the larynx of alumnol, twenty grains to the ounce of water. This was followed by decided improvement and the patient went through the summer very comfortably. In the latter part of September she caught cold and had a slight cough for a week or so. During this attack she sang in church one Sunday under circumstances which particularly excited her interest and emotions. Her voice became hoarse and did not regain its smoothness with recovery from the cold. When the larynx was examined, three weeks later, a small nodule could be seen projecting from the upper surface of the left vocal band, at the junction of the anterior and middle thirds. The margin

of the band was free. Both cords were muddy, but there was no special hyperemia. The voice was hoarse, rattling and throaty, especially where the change from chest to head register takes place. (G. A.) The larynx was very intolerant, even under strong applications of cocaine, so that it did not seem judicious to attempt any radical interference.

Rest of the voice, inhalations twice daily of a solution of menthol in albolene, five grains to the ounce, and spraying the larynx every other day with a watery solution of alumnol, twenty grains to the ounce, was the course of treatment followed for several months without much change. At times it seemed as though the nodule were shrinking and occasionally around it would appear quite an area of hyperemia. Almost always the latter phenomenon could be traced to some indiscretion in diet, as to exposure, or in the use of the voice. Finally, at my suggestion, a course of elocution was begun with a professional voice trainer, who has had considerable success in correcting bad habits of speech. The method used is similar in many respects to the system of vocal exercises advocated by Curtis in the treatment of vocal nodules. The latter may be briefly described as follows: The first point insisted upon is a correct method of breathing. The upper ribs are raised, the chin is depressed and respiration carried on by the diaphragm and lower ribs. An effort is made to focus tones in the face, producing them, as it is expressed, *dans le masque*. The word or syllable used is "ma" or "mau," the "m" being formed, of course, while the lips are closed. The muscles of the pharynx and neck are thus supposed to be completely relaxed and the vocal bands to be in a state of greatest possible tension. A peculiar tickling vibration of the lips against the incisor teeth can be felt during the humming "m" sound, provided the muscles about the mouth are properly relaxed. Most remarkable results from the practice of these vocal gymnastics are claimed in various laryngeal derangements due to misuse or fatigue of the voice. I suspect that the exercises are substantially nothing more than a modified rest as compared with ordinary vocalization, and the expression "vocal massage," sometimes used to describe them, seems to me a gross misapplication of the term.

The treatment of vocal nodules is divided by Capart into hygienic, medical and operative. Nearly every observer refers

to the possibility of their spontaneous disappearance under prolonged rest, but Capart avers that he has never seen the slightest benefit from rest except as regards a concomitant inflammation of the larynx. Sprays and insufflations of astringents and antiseptics he looks upon as useless, and chemical caustics, like nitrate of silver and chromic acid, he discards on account of the risk of their diffusion. Ablation of the growth with a fine delicate forceps, and if that is impracticable its destruction with the galvanocautery, are recommended. He warns against the use of so-called "punch" forceps, lest an excessive amount of tissue be removed and the voice be irreparably damaged, but on the other hand offers some reassurance by recalling the experience of Labus with what he calls "decortication" of the cord. Vocal rest, especially after operation, change of method in singing, and possibly climatic influences, may contribute to a cure. The difficulty of enforcing absolute silence in these cases can seldom be overcome. The delicacy and patience required for endolaryngeal manipulations, with a view to restoring or improving the function of the larynx, lead one to hesitate in adopting operative methods. It may be urged that in any case the voice is impaired and cannot be made much worse by damage to the cord in attempts at removal, and from this point of view doubtless some would be persuaded to submit to operation and take the chances.

The decided benefit in certain cases of inoperable malignant disease following ligation of arteries supplying the affected region led to the reflection that analogous effects might be obtained with that powerful ischæmic, suprarenal extract. Accordingly, daily instillations of adrenalin chloride, one to five thousand, were made in the present case for a period of three weeks. In the meantime the vocal exercises were continued. The improvement in the voice is apparent both to the patient and her auditors. The nodule itself has certainly shrunk to some extent, so that we feel encouraged to persevere with this line of treatment.

In view of the tediousness and disappointment attending the treatment of vocal nodules, it would be a satisfaction if we might discover their cause and thus be enabled to adopt preventive measures. Laryngeal lesions and vocal defects due to some disease or deformity of the accessory organs of speech are usually remediable. In the production of the so-called "throaty" voice the extrinsic muscles of the larynx, especially those attached to

the hyoid bone, are brought into action. It is easy for any one to demonstrate this upon himself by placing the fingers in the hyoid region during tone formation. The result of this muscular action is a dragging down of the hyoid bone, the base of the tongue and the epiglottis, in consequence of which the sound waves are repressed within the larynx and fail to reach the resonating chambers. The causes leading to the formation of throaty tones are, first, a misconception on the part of the voice-user that the quality of tone is thereby improved; second, a strain or tiring of the intrinsic muscles of the larynx due to faulty vocal method, which demands the help of the extrinsic muscles; and, finally, a mechanical obstacle to the emission of the voice at some part of the upper air track. The first is most prevalent among the uncultured and those unfamiliar with pure musical tones. The second is unhappily common and may be ascribed in part to the ubiquity of ignorant self-constituted voice trainers. Most conspicuous among the third of the causes enumerated must be mentioned lymphoid hyperplasia at the base of the tongue, hypertrophy of the lingual tonsil. The last was most graphically illustrated in my case. It should not be inferred that the throaty voice is responsible for all vocal nodules, or inevitably creates them. Were such the case those curious anomalies would be the most frequent of laryngeal lesions. But, in my opinion, *misuse* of the voice is a much more probable element than *overuse*. In a recent paper on this subject, Krause maintains that the misuse of the voice productive of nodes occurs in singing and not in speaking. Furthermore, he says that the "throaty" voice is due to an effort to overcome a lack of tension of the vocal cords whose elasticity is impaired by the nodular development within their structure. With apparent inconsistency he adds that the increased tension of the vocal bands gives rise to a pachydermia, first in the region of the nodule, then at the vocal processes, and finally in the interarytenoid commissure. In other words, the node causes diminished tension; an effort to increase tension causes the node. As to the relative frequency with which the singing and the speaking voice suffer from this lesion, it seems to me that *à priori* we might expect the latter to be first to succumb under stress, such as would be involved in talking to a deaf person, in a large auditorium, in the open air, or against a loud noise, for the simple reason that the range of the speaking voice

is much more restricted than that of the singing voice. The former is generally limited to two or three notes of the scale; the latter often extends over more than two octaves. Hence much less variation in the motility of different segments of the vocal bands occurs in the former than in the latter. It is possible that an inquiry into the mechanism of the vocal bands may throw some light on the etiology of these nodules. It is found that some anatomists, Morris and others, call attention to the fact that the thyro-arytenoid muscle distributes fibres to the margin of the cord, which act in a manner analogous to that of the stop-finger on a violin string, limiting vibration to one portion of the band. Is it not conceivable that contraction of certain bundles of these fibres with too much vigor or excessive frequency may lead to hyperemia, tissue building, hyperplasia at their point of attachment on the surface of the band? Or possibly a minute localized hæmorrhage may take place and subsequently undergo organization. It would seem reasonable to suppose that the constant tugging upon these fibres in the production of a certain tone might induce an effort of Nature to fortify the region of their insertion by throwing out new tissue, or that an effusion of blood might follow a rupture due to sudden and violent muscular contraction. The idea that attrition of the vocal bands might be held accountable as an exciting cause has always seemed to me untenable for the reason that during phonation space must remain between the bands in order to permit the blast of air to escape, and hence there can be no friction. Moreover, the node often has its origin, as in my case, not on the margin but on the upper surface of the band. In the translation of Joal's work on "Respiration in Singing," Wolfenden asserts that the nodules are produced by attrition resulting from the so-called *coup de glotte*, "which cannot be made without bringing the vocal cords in contact." "Contact" is very different from "attrition." The former, even to a forcible degree, must be admitted in the production of the "stroke of the glottis," but it is impossible to suppose under any circumstances an actual rubbing together of the vocal bands in such a way as to cause structural changes. If the theory suggested above be correct, the obvious conclusion is that a faulty method of phonation is generally induced by some anomaly in the upper air track and can be overcome only by restoring the latter to a normal condition. In ex-



cising or destroying the nodule we remove the result and not the main cause of the difficulty.

### *Discussion.*

Dr. C. C. RICE said that this paper was the best that he had heard on this subject. He had always felt that the title "singers' nodules" pretty accurately described this condition. He had been rather surprised to hear the author make the statement that he had seen this lesion frequently in persons who do not sing, for this certainly had not been his own experience. The cases that he had seen had uniformly been in professional singers. Almost invariably it had occurred in the "light opera" singers, as distinguished from the "grand opera" singers. Possibly this might be because the former were obliged to use the voice every night, while the grand opera singer uses the voice much less frequently and probably also more skilfully. He had watched these nodules carefully in many well-known light opera singers. He did not think nasal or pharyngeal trouble had been present in his cases to any prominent degree. He recalled one case in which there had been a good deal of lingual thickening, and this he had removed. He had lately felt that syphilis might perhaps be a predisposing cause, although at the time latent so far as the observation of the physician was concerned. With this in view he had given iodide of potassium. In one of his cases, that of a young woman, there had been a syphilitic history, although no active syphilis was present. He felt sure this was almost exclusively a singer's trouble, and produced more by overuse of the voice than by a bad use of the same. Just how the lesion was produced was certainly very difficult to say. He had seen the nodules disappear as a result of proper vocal exercises. In one case, that of a singer of considerable reputation, the nodule was reduced greatly in size under the training of a very intelligent voice teacher, although she continued singing all the time. The vocal training had consisted in securing a complete filling of the chest, thus having a tremendous amount of respiratory power behind the proper placing of the voice. He thought proper vocalization was perhaps a better means of reducing these nodules than total rest, for he had seen singers rest their voices for weeks without much reduction of the nodule. Many of these persons have a much better singing voice than speaking voice. He had lately had a few cases which had done well under treatment with chromic acid. One of these was a lady who rested her voice for three or four weeks in order to secure the best results from the treatment. He had used the galvano-cautery with less success than chromic acid. The application of the latter had been made very carefully under cocain directly to the nodule, using so little chromic acid that there was scarcely any diffusion; nevertheless he could not be

sure as to whether he had applied too much or too little. In this particular case, in spite of this uncertainty, the vocal cord had undergone perfect repair, and the benefit had been so great that he now felt pretty sanguine about the removal of these nodules with chromic acid. The question was rather how long these nodules would remain away. Of course, these persons, if not taught by a competent voice trainer, would continue their old habits of singing, and the probability was in favor of the redevelopment of the nodules.

Dr. W. K. SIMPSON said that this was a subject upon which there was evidently considerable diversity of opinion. The term "vocal nodule" seemed to him to be applied to a number of lesions in the larynx. If it were a definite tumor one should be able to obtain a positive knowledge of its nature. He had come to look upon certain of them as a transitory lesion resulting from overuse of the voice. It had been a matter of great interest to him, and at times of wonder, to note on one day what appeared to be a nodule and on the next day be unable to find this same lesion at the same place. The reader of the paper had very properly emphasized the occurrence of hypertrophy at the base of the tongue as one of the factors in overuse of the voice. He hardly knew anything which would improve a singer's voice more than the removal of this lymphoid tissue when present in any considerable quantity. Such an operation not only changes the character of the singing, giving a free, open tone, but enables the person to sing with much less effort. One should not forget the predisposing causes. According to his experience, these nodules are more apt to occur in persons whose physical condition was not up to the standard.

Dr. H. L. WAGNER said that he had been deeply interested in the paper and in the discussion of it. In his own clinic for defective speech, in San Francisco, he had had an opportunity to observe some cases of nodules in those who did not sing. He had ascribed this condition to the anemic state of the patient, thus bearing out what had just been said by the last speaker. There could be no doubt about the occurrence of these nodules in others than singers. From his work in the clinic he was satisfied that overuse of the voice meant misuse, because when the voice was overused certain muscles would be brought into play which would not otherwise be used. In the treatment of these cases he had made use of chromic acid, as well as of other applications, and had come to the conclusion that each case requires a different treatment.

Dr. J. W. FARLOW said that his experience had been similar to that of the last speaker, for he had seen more such nodules among non-singers than among professional singers. He had seen nodules in a child of nine years, who was not specially talkative. He had never been able to discover any relation be-

tween these nodules and tuberculosis. He also agreed with Dr. Wagner regarding their very variable response to therapeutics. One case was mentioned in which two very large nodes existed, and in his own mind he had made an unfavorable prognosis, yet the use of an astringent spray and the avoidance of talking had caused a complete disappearance of the nodules. However, he did not look upon this treatment as a precedent for other cases, as this same treatment employed in other cases had yielded very unsatisfactory results. It had always seemed to him that anything which produced a throaty voice, or which tended to make a throat expel some resisting mass, tended to the development of these nodes. Secretion often tended to form on the vocal cords at the nodal point—the junction of the anterior and middle thirds of the cord. There was certainly some anatomical reason for this point being one especially selected. It would probably be many years before we could feel that we understood this subject, and the more contributions to its literature the broader the view one would obtain of this perplexing matter. He could not at all agree with Dr. Rice, that these nodules were specially connected with the use of the singing voice.

Dr. KNIGHT, in closing the discussion, said that a good deal had been written and said about "nodal points" of the vocal bands, which seemed to him erroneous because the vocal band was not at all comparable to a string fixed at its two extremities. It was for this reason that he had suggested the theory that the nodules might result from a peculiar distribution of certain muscular fibres. Overuse of the voice was certainly very common without the production of nodes, and he was sure that misuse of the voice could almost always be traced to some lesion of the upper air tract, which compels the employment of muscles in an artificial or improper way.

### *Paper.*

## A STUDY OF THE PROPER APPLICATION OF INTUBATION IN CHRONIC STENOSIS OF THE LARYNX.

BY WILLIAM KELLY SIMPSON, M.D.

ALTHOUGH the subject of intubation in chronic or adult stenosis of the larynx has received considerable attention since its first introduction by Dr. O'Dwyer, in 1887, and although there is a gradual accumulative experience, still I think there are still some

points to be considered and emphasized in order to give the operation its proper position and to aid us in properly determining a choice of operation between intubation and tracheotomy when the necessity arises. Intubation for chronic stenosis is not an operation of such daily occurrence that its various points of technique and application are the common property of all, but it is an operation which in my judgment should only be undertaken either by one who has had experience or by one who has a due regard for the emergencies and accidents that may occur. I know of no operation within the scope of laryngology that will test our judgment more keenly than the choice between intubation and tracheotomy in an acute or an engrafted attack of stenosis, especially where there is but little time to act and where the life of the patient may depend on our judgment.

In order to bring the subject under a general head for consideration, we must include under the general term of adult or chronic stenosis all those instances of obstruction other than diphtheritic croup of childhood, at whatever age they may occur, or whether they are acute in their onset or exacerbations of already existing conditions. In other words, all cases of non-diphtheritic origin. This will obviate the necessity of a minute classification of the various well known causes of laryngeal stenosis and allow us to discuss the salient features from a general point of view.

It is not easy to make an exact classification of the cases of so-called chronic stenosis wherein we may wish to invoke the aid of intubation, but the following three groups will, I think, meet the requirements in a more or less definite manner, each type necessarily having its modifications, which only serves to emphasize the necessity of a complete understanding:

1. Gradual stenosis of a more or less long-standing nature, not of a necessity, however, demanding an immediate operation.
2. Acute stenosis calling for immediate relief, either primary in its nature or engrafted on, or an exacerbation of an already existing condition.
3. Where we wish to produce sufficient dilatation to dispense with the wearing of a tracheal cannula, thereby establishing respiration through the normal channel.

These three groups are not always arbitrary in their division, and one may at times merge into another, especially as far as the

first and second are concerned, for we must *always remember that all cases of laryngeal or tracheal stenosis, however gradual, may, at any moment, take upon themselves a sudden exacerbation.*

Before going further into any detailed discussion of the adaptability of intubation in the foregoing types of cases and the principles guiding the performance of the same, let me say that the fundamental, underlying consideration which should always guide us is a *proper diagnosis*. This cannot be too strongly emphasized, for I think that the failures and the disappointments which may have overtaken us have been largely due to a lack of appreciation of the exact nature of the case in hand. This discrimination includes, among other things, not only an appreciation of the original cause, but also the nature and location of the swelling, density of the tissue involved, whether or not there be ulceration, and whether the immediate condition of the patient is such as to permit of the extra exertion necessary for a proper diagnostic and operative manipulation. No one for a moment should think of performing intubation in this class of cases without a previous laryngeal examination, and if a complete examination cannot be made and we cannot come to a fairly accurate conclusion as to both the cause and nature of the obstruction, the operation should give way to tracheotomy, with a view to using intubation subsequently. Bearing on this point is another important factor, that of always being prepared to do a tracheotomy in the event of failure of intubation.

It is in this class of cases where intubation in comparison with tracheotomy is put to its strongest test, and those of us who may be its strongest advocates must not be too much prejudiced in its favor that we cannot see its impracticability in certain cases, remembering that no one operation is infallible or without its limitations.

In order to emphasize the importance of some of the foregoing points, I will mention two hitherto unpublished cases occurring in my practice:

The first, a female child of 9 years, who gave a history of attacks of spasmodic croup dating back for two years previous to my seeing her; these attacks, at first being infrequent, gradually became more frequent until the breathing was continuously croupy, with croupy cough and aphonia and repeated suffocative attacks, so that when she first came under my observation her whole condition had become one of continued increased severity



for the previous five weeks. I was able to make a complete laryngeal examination, which revealed nothing of an inflammatory nature; the vocal cords, however, were practically stationary in the median line with an entire absence of abduction, leaving but the faintest elliptical intercordsal space. There had been no bloody expectoration and no expulsion of any fragments of tissue, and there was no sign of glandular enlargement. Examination of the chest was negative, excepting for the meager entrance of air. The diagnosis resolved itself as probably one of bilateral abductor paralysis or a possible binding down of the cords by subcordal webs, adhesions or thickening. Her condition becoming alarming, intubation was performed; the tube in passing gave the sensation of going through rather dense tissue, the feeling being somewhat of a tearing nature. No relief following the introduction of the tube it was removed with the intention of doing a tracheotomy, when the child suddenly jumped up from the chair, ran into an adjoining room and fell exhausted on the floor in a fit of suffocation, which terminated fatally in a few moments, despite all efforts at tracheotomy and artificial respiration. Numerous attempts were made to insert the tracheotomy tube, but it was impossible to force it through the obstruction, the trachea seeming to be very small indeed and filled with a mass of tissue, presumably extensive papillomata. No autopsy was held, leaving the exact diagnosis somewhat a matter of conjecture. Disastrous as the outcome was in this case, it has served as an emphatic lesson never to rely entirely on intubation in an immediate condition unless you are sure of your diagnosis. I do not think in this case a simple tracheotomy would have answered; perhaps nothing but opening the entire trachea and removing the occluding contents, surely a condition which could not have been foreseen.

The second case, seen in consultation, fortunately not so disastrous in its outcome, was a man of about 40, who gave a history of an acute increasing stenosis of two days' standing, possibly of specific nature. He had had a similar attack in a minor degree some time previous; he was perfectly well in the interval; the present attack was accompanied with other angina symptoms of painful and difficult swallowing and thick, husky voice; his condition was extreme, it being necessary to keep up a constant inhalation of oxygen. It was almost an impossibility to make an examination, as any attempt whatever at manipulation caused a marked increase in symptoms. However, by dint of careful perseverance, it was found that the obstruction was in the superior portion of the larynx, including the area about the epiglottis; the epiglottis was dense, swollen and deformed to the finger's touch, the aspect having the suggestion of a dense phlegmon, during a severe attack of dyspnea, a small adult intubation tube was successfully introduced, which gave relief while the tube was held in the

larynx, but owing to the deformed epiglottis and the conformity of the tissue about it, it was impossible to cause the head of the tube to be retained without holding it in place. As long as it was held the patient breathed well, but it was immediately expelled as soon as the finger was removed, and his severe symptoms returned, in an extreme degree. A rapid tracheotomy was performed by the attending physician, and after long attempts at artificial respiration breathing was restored, and the patient made an uneventful recovery, dispensing with the tracheal tube in about a week. Depending on intubation alone, without the aid of tracheotomy, this patient certainly would have succumbed.

Perhaps it is in the third class of case, namely, where we wish to dispense with the tracheal cannula, that intubation has its most positive application in adult stenosis, being closely allied in this respect to the first type. It is here that we come into direct comparison with the other and older methods of dilatation. An intubation tube has the advantage of being able to be worn for an indefinite length of time, thus producing a constant degree of absorbing pressure, which is the main point to be gained, and there is an opportunity offered for altering the size and conformation of the tubes to meet the changing conditions. It has been proven by many cases that an intubation tube *may* be worn indefinitely with a comparative degree of comfort, the patients, in most cases, learning to adjust themselves to the new method of breathing.

With the tracheotomy tube *in situ* we have ample time and opportunity to study the type of the stenosis and to make sufficient trial with variably sized and shaped tubes to meet the condition, and this with the minimum amount of suffocation or exhaustion. It may be feasible in the beginning to make an explorative introduction with either a Schroeter tube or a laryngeal sound of some kind, but I have always held and still do hold to the opinion that if a Schroeter tube can be passed an intubation tube of the same or larger caliber can be as well passed and be retained, when we then get the advantage of a continued pressure without subjecting the patient to repeated and oftentimes ineffectual results of temporary dilatation. The matter of deglutition in some instances becomes a troublesome factor, but by no means in all cases, and as a rule patients learn to feed themselves. When this trouble exists we may resort to feeding the patients in the Casselberry position, or through a glass tube, with the head over

the edge of the bed or by means of a stomach tube. It is also sometimes practicable at stated intervals to remove the intubation tube to allow the feeding of the patient. It is frequently the case that intubation may not be performed as the primary operation, depending on it only for secondary dilatation after the performance of tracheotomy. Under these circumstances it is well to perform the tracheotomy as high up as possible, as it is much easier for the subsequent introduction and retention of the intubation tube than when the tracheal opening is low down and possibly beyond the reach of the end of the intubation tube. Also intubation should be subsequently performed as soon as consistent after the tracheotomy, in order to avoid the secondary stricture which is liable to occur at the superior margin of the tracheotomy wound, which sometimes has to be liberated before the intubation tube can be properly introduced; also the longer a tracheotomy tube remains in an adult larynx the more difficult does it become to reach the larynx with the guiding intubation finger and tube, as the tracheotomy prevents the larynx from rising on phonation; this difficulty is increased in a very tall patient, where the larynx is naturally beyond the control of the introducing finger.

One of the former objections and perplexities of intubation in adult cases was the uncertainty as to the retention of the tube for any length of time and the dangers of its being rejected in a fit of coughing; this objection, however, has been remarkably well obviated by a recent suggestion and modification of Dr. John Rogers of New York (see Figs. 1 and 2), consisting of a retaining arm which is screwed at right angles in a threaded opening in front of the intubation tube at the site of the tracheal opening, and then prevented from unscrewing while in position by having a small plug or pin inserted in a groove on the upper surface of the arm; thus the tube is easily retained, resisting all efforts at expulsion, and at the same time the device may be easily removed at the will of the patient or operator and the tube subsequently removed in the usual manner. It might be thought at first that there was a considerable danger from the plugging up of the tube by retained secretions, but this rarely happens in adult cases; and if there be any tendency in that direction steam inhalations may at times be used or the tube removed from time to time for the purpose of cleansing.

Fig. 1 represents an adult hard rubber tube complete, with the projecting retaining arm, as suggested by Dr. John Rogers.

Fig. 2 represents the dissected portions, *C* being the threaded hard rubber arm which is screwed in the opening of the intubation tube; *E*, metal retention pin fitting in the groove on the upper surface of *C*, which, by projecting a short distance in the intubation tube, prevents the arm from moving either way of the thread; *D*, metal cap which is screwed over the end of *C* after the pin *E* has been placed in the groove, thus retaining the arm in a permanent position. The method of finding the point in the

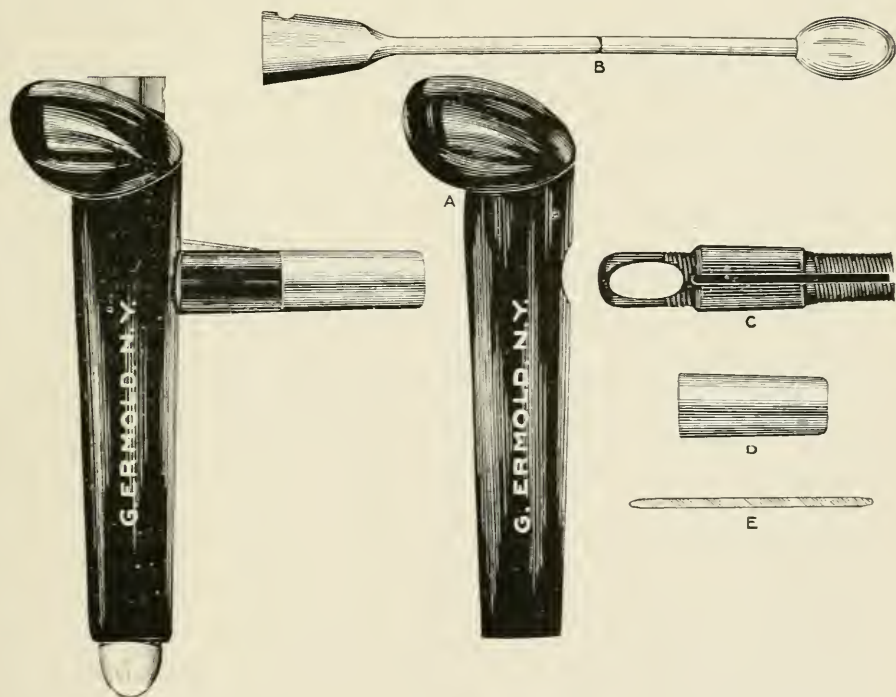


FIG. 1.

FIG. 2.

intubation tube for the insertion of the arm is as follows: The intubation tube having been placed in the larynx after the tracheotomy tube has been removed, a mark is made on the intubation tube through the tracheotomy wound, either by a fine hot stiff metal probe, which burns a permanent marking, or by scratching the tube with the point of a stiff hand instrument; then the intubation tube is removed and the instrument maker fits the

threaded arm at the point of the marking. In the *Journal of the American Medical Association*, June, 1900, Dr. Emil Mayer of New York describes a hollow introducing handle, which is continuous with the intubation tube, a most valuable device for intubation in certain cases, which has for its object the prevention of the cutting off of the air during the operation.

In conclusion, I may say that I have not gone into detail of the various points of technique of intubation, as they have been fully described by myself and other writers; but I have endeavored simply to emphasize a few points which an increasing experience suggests, bearing in mind that while intubation in the various phases of adult stenosis is always a tempting procedure and often very brilliant in its results, it must be approached with a due regard for its peculiar fitness.

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#### *Discussion.*

Dr. E. MAYER said he had been very much interested in this subject, and had given a good deal of thought to some of the problems involved. He then showed an instrument which he had devised for use in a case of stenosis due to gunshot wound. He made use of the same O'Dwyer tube with the retention tube at a right angle. The tube is introduced by means of a large hollow instrument, which possesses the very great advantage of supplying air to the patient during the whole operation of intubation, a most important point in the adult. The instrument was probably not applicable to membranous cases, but certainly for cases of chronic stenosis it seemed to him of some value. It should be remembered that metal intubation tubes cannot be worn for a long time, but hard rubber ones may be. Mention was made of a case of chronic stenosis in which, after two months, the intubation tube had been dispensed with and the patient had been made perfectly comfortable. Regarding the technique, the speaker said that in adults this operation must always be done with the guidance of the mirror, and after the throat has been fully cocaineized. The patient should be in the upright position. The instant the intubation tube is seen to be in the larynx the mirror should be dropped, even at the risk of breaking it.

Dr. C. H. KNIGHT said that he now had under his care at the Manhattan Hospital a child between 2 and 3 years of age, wearing a tube very similar in its construction to that just presented by Dr. Mayer, but, of course, much smaller. The child had been originally intubated for diphtheria, a year and a half ago. The tube had been withdrawn after a time, but immediately stenosis



had recurred without apparent cause, and it had been necessary to perform tracheotomy at once. Since then the trachea tube had been worn. The child was brought to the hospital by her parents in the hope of having her relieved of the trachea tube. It was therefore decided to split the larynx, find and remove, if possible, the cause of the laryngeal stenosis and insert an intubation tube. But the latter was expelled after a few hours, and it became necessary to use a tube with a retaining pin similar to that already exhibited, which answered the purpose perfectly. The cause of the stenosis was found to be a cicatricial band beneath the vocal bands, whether due to the lower end of the intubation tube or to a diphtheritic ulcerative process, he was unable to say.

Dr. W. E. CASSELBERRY said he would like to emphasize what had been already brought out by the reader of the paper and by Dr. Mayer with reference to the difficulties of intubation in adults who were already unconscious or moribund: in other words, those in which the surgeon had had no opportunity to make an examination of the larynx with a mirror, and so was ignorant of the exact difficulties to be encountered. This condition was more apt to be encountered in connection with acute œdema of the larynx, but it was also found in cases of chronic stenosis of the larynx resulting from syphilis, papilloma and other causes. These were neglected cases, and often came to the surgeon with an acute exacerbation and *in extremis*. He had met with such cases on two or three occasions, all in adults. The patient had usually been found in bed in an apparently moribund condition, and the problem presented had been to decide between intubation and tracheotomy. Intubation having become popularized because of its use in children in diphtheria, it would be found that the general practitioner would be almost always in favor of trying that procedure before attempting tracheotomy, being of the opinion that even under these conditions it was an easy procedure. In a good sized adult it was usually impossible with the finger to reach the larynx: the finger would only just touch the epiglottis, but would not be able to control it. These patients are breathing stertorously and are in such a condition that the mere introduction of the finger would greatly aggravate the dyspnoea and the general condition. In all of his cases of this kind intubation had failed and the immediate performance of tracheotomy had been demanded.

He had, therefore, determined to follow the advice laid down in this paper, as he considered it sound. In cases of acute exacerbation of chronic stenosis, and in strange cases in which the true condition was not known, he would at once perform tracheotomy without running the risk of aggravating the condition by efforts at intubation. He was pleased to hear high tracheotomy advocated in this paper. There had been a good deal of confusion as to the relative merits of high and low tracheotomy.

With the former there was a possible disadvantage of cicatricial stenosis if the tube were worn any length of time, and this should, of course, be avoided. A high tracheotomy, on the other hand, was much easier to do in emergency cases, and if it could be definitely determined that, for one reason or another, it was the better operation, it would be well to know it. He could readily understand that low tracheotomy if followed by the intubation tube would be inconvenient, because the lower end of the intubation tube would persistently come out through the tracheotomy opening. It might not be out of place to refresh our minds upon the method of feeding in intubation cases, the method which he had described many years ago. For a number of years after the introduction of intubation by Dr. O'Dwyer, much difficulty had been experienced in feeding these children. Fluids had been avoided for fear of schluckpneumonie, and it had apparently not occurred to any one to invert the patient. The suggestion made by him at that time was simply to feed these patients in a dorsal position, with the head and shoulders downward, usually on the lap of the nurse. Not only the head, but the shoulders of the patient, should be pendant. It had first occurred to him to turn these patients absolutely upside down, but it was soon apparent that this extreme position was unnecessary. It was, however, necessary to get both the shoulders and the head well downward in order that the pharyngeal muscles might not still propel fluids up into the trachea and give rise to trouble. Some of the failures reported from this method of feeding he believed were the result of not having employed the exact position described. There was no tendency to congestion of the brain, as might at first be thought. After one or two efforts the child, if permitted to get thirsty first, would readily take fluids in this position. It was equally applicable to adults, the patient lying on a sofa with the head pendant and almost touching the floor. He would like to ask with reference to the exact anatomical site for the high operation when the purpose was to use intubation subsequently.

Dr. H. L. SWAIN said that he had been much interested in a case of chronic stenosis under treatment in New Haven for the last few months, seen by himself and Dr. Wright, who had had a sudden call to do intubation at West Haven. The speaker said he had seen the case the morning before, and it had appeared to be one of bilateral adductor paralysis, the cords being in the median position, and the simple elliptical opening being present. In spite of this the patient had been breathing fairly well, and stated that he had been breathing this way for nearly two months, though he had had an attack of aggravated dyspnoea the day before. Some hours later Dr. Wright had been called and had intubated. Then the problem had been as to the best method of getting the cords apart. He had had no previous experience with this class of cases. He was glad to be able to say that the patient

was now getting along without any tube, not having worn it for four weeks. He was perfectly comfortable, but the cords were only a small fraction of an inch apart. He would like to know how long one of these tubes had been worn without the production of granulation tissue or the signs of pressure from ulceration; also whether or not in this case it would be advisable to continue stretching the cords apart by the occasional insertion of the tube; also what Dr. Simpson's experience had been in taking care of the granulation tissue where it had been produced by the wearing of the tube? In one case he had succeeded by applying a paste containing nitrate of silver to the tube and then inserting the tube into the larynx. This had effectually cauterized the granulations.

Dr. SIMPSON closed the discussion. In reply to Dr. Casselberry's query as to the anatomical site of the high operation, he said that it should be done just below the cricoid, possibly not including the first ring, but not cutting the cricoid itself. As to the case of retained intubation tube referred to by Dr. Knight, he would say that it was not known yet what was the cause of the retention in this class of cases. Dr. O'Dwyer, before his death, had studied this subject most carefully and had written a classical article upon it, yet we did not really know the cause. It was not due to post-diphtheritic paralysis, or to the formation of granulations. The latter was a *secondary* cause in a certain number of cases in which an intubation tube had been worn for a certain length of time. The only direct cause that Dr. O'Dwyer had found in a given case was in a patient who had died after having worn an intubation tube for a number of weeks. In that case death resulted before the house surgeon could reintroduce the tube, the tube having been out only an hour or two. At the autopsy there was found an absolute destruction of the cricoid cartilage, a falling in, it was thought, as a result of the type of diphtheria in this case. This was the only case he knew of in which there was an absolute knowledge of the cause. Relative to Dr. Swain's question, he would suggest the wearing of an intubation tube for a long time, a year if possible. It would be perfectly safe for the patient to be allowed to go out during the winter, still wearing the tube. He had known an intubation tube to be worn continuously for four months without producing ulceration or granulation tissue. Such accidents do not occur in adult cases, but only in the soft diphtheritic cases in children. Nothing could demonstrate more perfectly the difference between a high and a low tracheotomy than the two tubes presented this morning by Dr. Mayer and himself. It had been found exceedingly difficult to introduce the tube in the case in which low tracheotomy had been done, because the intubation tube would persist in projecting through the tracheotomy wound.

*Paper.*

## ON THE USE OF A. C. E. MIXTURE AND ETHYL BROMIDE IN OPERATIONS FOR ADENOID VEGETATIONS.

BY J. W. GLEITSMANN, M.D.

WHEN I was requested by our honored President, in January, to state my experience as to ethyl bromide anæsthesia before this Association, I was under the impression that I was expected to make some short remarks on the subject in conjunction with a presentation by Dr. French. Communicating with the doctor, I learned that, in addition to his demonstration, he was also to speak on other narcotizing agents for the same operation, and that a general discussion would follow our essays. He kindly suggested that I mention also the administration of the A. C. E. mixture, with which he was less familiar, and although I have almost completely discarded it now, I accepted his suggestion.

Before entering upon the subject properly, permit me to state that I took to both anæsthetics in an entirely empirical way—I may almost say adopted them for the sake of expediency, and made no more scientific observations than those which practice required for their safe application. This was also the reason why I hesitated so long and was more or less reluctant to yield to our President's invitation. Besides, I was so fully under the impression that everybody was thoroughly familiar with the advantages of ethyl bromide that I was somewhat surprised to be led to believe that I could present in this subject something of interest and value to at least some few of you.

When I said before that I adopted both agents originally more for the sake of expediency than for scientific reasons, I may remark that I had to appear twice within a very short period, in 1886, at a coroner's jury, when two colleagues of high standing were accused of having caused death by administration of chloroform at operations. The annoyance of such proceedings, and especially the difficulty of clearing our colleague and the hospital in one case, made it apparent to me that it was useless to expose

myself to such vexations and undergo such trials. I cannot state any further reasons why I turned to the A. C. E. mixture instead of to ether pure and simple at that time, but believe it was the lessened liability of employing chloroform in the small quantity contained in the compound and its somewhat more rapid action than that of ether alone. Whatever may be the opinion and experience of others, I was fortunate enough not to have a single serious accident with it, and have employed it later on, after 1894, on much rarer occasions with the same result. After the year mentioned I commenced with ethyl bromide, induced to do so by the statements of Moritz Schmidt, in the first edition of his text-book. Since 1894 I have used ethyl bromide almost to the exclusion of anything else, and have tried to extend its usefulness also to cases in which I had until quite recently used the A. C. E. mixture.

About the latter, in my belief, nothing new or interesting can be said, as you all are familiar with its effects, the length of time required for bringing on, and for the patient to awaken from the narcosis. It has been my habit, to which I adhere up to the present time, in the few isolated cases I give it, to administer the mixture to the child lying on a couch, by one of my assistants, until thoroughly under its influence; then, by carefully raising it, it is handed to the other assistant, seated in a solid chair and operated upon in the upright position. I never knew, until quite recently, that Dr. French advocated this same position for operations for adenoid vegetations, and it gave me great pleasure to learn that we both agree so well on this point. The only accident I had with the A. C. E. mixture was an attack of suspended respiration when the child was brought to the chair to be operated upon, from which it was quickly revived by the usual methods of resuscitation and the operation performed. The cause of the collapse was the tight band of a skirt which had not been removed, as the child, being claimed by the parents to be extremely nervous, was undressed and narcotized in another room, to save it the excitement of seeing the operator. Since that time I have rigorously insisted that the undressing of the child be supervised by one of my assistants in my presence, and I had no more accidents of this kind.

In this connection it may be in place to say a few words about assistance—at least the manner in which I proceed in operating.



Although I take it for granted that the subject of our discussion is not if an anæsthetic shall be employed at all, but which one we find safest and most useful, I must say here that I use an anæsthetic almost invariably for several reasons, and the exceptions are insignificantly few, only once in a while in grown-up, courageous children with a small mass of the growth in the middle of the nasopharynx, and amount to not more than two in a hundred cases. I give anæsthesia, especially since employing ethyl bromide, in my dispensary and clinical, as well as in my private practice, the small loss of time being more than outweighed by the possibility of making the operation thorough, by saving the little patient pain and shock and thereby not losing his confidence, which may become an important factor if in the future other manipulations be necessary. The assistants I employ in private practice are the same for many years past, and they, by their repeated experience, have acquired such a technique and dexterity in undressing the child, in narcotizing, holding the child in the proper position and making the necessary movements of the head which I deem expedient and advisable, that I have to exert very little or no supervision at all and can give my whole attention to the operation. I am free to confess that it is due as much to their faithfulness and efficiency as to my own doings that I never had a fatal or even alarming accident in the large number of cases I operated upon. I have in late years even dispensed with the services of the family physician, who, for courtesy's sake, had to be invited to be present and whom I then requested to attend to minor details. I feel the difference very keenly when I have to operate at one of the hospitals with which I am connected, where the assistants shift every three months, and where, in consequence, the operation is more laborious and not as quickly and smoothly performed. As also the manner and method of operating is no topic of our discussion, I shall mention only briefly that I have, without a single exception, made all my operations in the upright position, that I never hesitated to operate the severest case in the manner indicated, in my office; that I have never sent a child with adenoids to the hospital for the purpose of operating alone, and that I operate children at their parents' house only at their request or for extrinsic reasons.

As said before, I adopted ethyl bromide in 1894, and, becom-

ing more satisfied with it the longer I used it, have employed it lately also in cases where I gave A. C. E. mixture formerly, viz.: when I operate at the parents' house. It was probably merely from force of habit that I adhered to the A. C. E. mixture on such occasions, and I was very glad to notice the delight of the parents when the child woke up from the narcosis so quickly after ethyl bromide. It was primarily the desire to have an agent which did not compel the child to remain so long at my office to get over the narcosis that made me change from A. C. E. to ethyl bromide for office practice, and as much as I encouraged the parents formerly, for the above reason, to have the operation done at their house, I now rather advise them to bring the child to my office, thereby saving a great deal of time. My highest record is seven operations in one day—two at my private office and five at my clinic, which latter could not have been accomplished with any other anæsthetic in the time at my disposal.

I confined my researches of the literature to the publications quoted in the sixteen volumes of Semon's *Centralblatt* from 1884 to 1900, but shall not weary you with their enumeration. I further saw no mention of the subject in the Transactions of our Association, but found that three of our members, Drs. Roaides,<sup>1</sup> Hardie,<sup>2</sup> and myself,<sup>3</sup> had spoken or written about ethyl bromide, and that a fourth member, Dr. Hinkel,<sup>4</sup> had reported to this Association a death from chloroform in adenoid operation. On April 11, 1894, a meeting of the London Laryngological Society was held to discuss the choice of an anæsthetic in operations for adenoids, called on account of the unpleasant number of deaths from chloroform having occurred of late in England. Although about one dozen publications on ethyl bromide had appeared up to that time, I did not see it once mentioned in the original report contained in the *British Medical Journal* of the same year,<sup>5</sup> and the same holds good in a much latter series of American essays on selections of anæsthetics in surgery (*Journ of Amer. Med. Assoc.*, March 24, 1900). Shortly before the English meeting, Dr. E. Meyer gave at length his views and experience in 250 cases before the Berlin Laryngological Society,<sup>6</sup> followed by a similar discussion by several gentlemen. On the basis of 250 cases, Meyer claims that the agent in doses from 10 to 15 grms. is harmless, that anæsthesia takes place within 25 to 60 seconds, and lasts 1½ to 2½ minutes without unpleasant after-effects. Graßower

warns against its use in anæmic children, while Rosenberg the last speaker, saw no danger even in delicate and very young children. Hardie also considers it contra-indicated in nervous, timid children. Hardie, in his excellent essay, quoting from Morgenthau, writes further on the physiological effect of the drug, saying that the cardiac alterations are much less than in chloroform narcosis, and that the bromide has only a slightly depressant action on the heart. He gives the death rate from bromide to be 2 in 7541 cases, 1, however, occurring in Billroth's clinic in a patient with heart disease, which could, without unfairness, be excluded. Roaldes's paper is very thorough, goes back to the year of its discovery, 1829, by Serullas, and he states its advantages and disadvantages very concisely. As to the latter, its action on the glandular system, exciting hypersecretion, and its tendency to produce muscular contractions, never interfered in any of my cases. That it is unsuited for prolonged operations, and that an absolute purity of the drug is required, is a matter of course. Roaldes prefers the preparation of Merck & Co., and I can only corroborate his statement to the fullest extent, as after several trials I have come to use the preparation of the above firm exclusively.

About the degree of the anæsthesia to be reached, and consequently the quantity of the drug used to produce it, the authors differ somewhat. Texier,<sup>7</sup> for instance, being afraid of unpleasant effects, advises against a complete narcosis, and operates in the stage of analgesia preceding it. He never gives more than 5 to 10 grms. to children of 8 to 15 years of age, and leaves the mask *in situ* 15 to 35 seconds—never longer than 40 seconds. But I believe the majority of operators follow the example of Moritz Schmidt,<sup>8</sup> who prefers complete anæsthesia, and begins with pouring 10 grms. into an impermeable mask. When bromide is gradually added, narcosis takes place within 2 minutes, but although generally less than 30 grms. are required, he had the same experience in exceptional cases, like myself, that 40 grms. were necessary to produce complete anæsthesia. Schmidt, in his second edition, enumerates 5 deaths from ethyl bromide, but believes them due to cardiac complications. As far as my individual experience goes I never had a serious nor alarming accident at the many operations I performed. I regret not to be able to give you accurate statistical data, but inquiries at the three insti-

tutions with which I am connected, and questioning my private assistants, I can safely say that the number of 500 operations under ethyl bromide narcosis is rather under than overestimating the aggregate. Among these I had only two cases where the narcosis had to be interrupted for a short time, on account of irregularity of respiration; in one case, a secondary hemorrhage occurred several hours later at the child's home, controlled by the family physician; and once I had a case of sepsis, manifesting itself in an inflammation of the knee and ankle-joint, which kept the child ill for four weeks, and was wrongly attributed by the father to an undue pressure against the knee by one of my assistants while holding the child in the proper position.

I conclude by giving you, in as condensed form as possible, my method of operating, from which the experience of years has taught me not to deviate, if the result is not to be jeopardized or unnecessary annoyance caused to the operator.

As stated before, I use an anæsthetic, and now ethyl bromide in such a preponderance of cases that the exceptions can be disregarded. Further, I employ always two assistants, and in my private cases one always holds the child in position, the other giving the bromide, and later holding and steadying the child's head. Formerly, when operating in the hospitals to which I am attached and in the parent's house, I did so with diffused daylight, seating the child opposite and near the window of a well-lighted room, but found lately that in a dark room, with the reflected light from a head mirror, I could overlook the field of the operation better, and I now make my arrangements accordingly. After the child has been brought to the room, all the constricting garments removed under the supervision of one of the assistants the heart examined, and a loose gown thrown over it, it is handed to the other assistant, seated on a solid chair, and the narcosis begun. The mask I use is intended to and does exclude the air almost completely, and is tightly pressed over the child's nose and mouth. Merck's 1-ounce glass tubes serve the purpose admirably, giving very little waste; and the administration is continued under control of the pulse until the muscular tonus is abolished. The introduction of Denhard's mouth-gag at this period generally rouses the child somewhat from its stupor, into which it soon relapses after a few more whiffs of the bromide. The narcosis is now deep enough, and will last sufficiently long to allow,

with a moderate amount of dexterity, the removal of both tonsils, and of the adenoid vegetations, if such be necessary. I have no iron-clad rule laid down for myself, which of the two I remove first, if both be present; but I am guided by the condition of the individual case. The vegetations I removed in years gone by, alone with the post-nasal forceps which bear my name, then with the curette (Gottstein's model) exclusively; but finding that I had by the latter method a few recurrences of the growth, I now use first the forceps, removing the larger part of the masses, and then with the curette the remaining ridges. So far, I am satisfied with the result obtained in this manner. As a rule, I do not make all these manipulations without an interruption. After tonsillotomy, I assure myself if there is no undue bleeding, and if such, arrest it by manual pressure with a napkin dipped in weak carbolic solution sufficiently, before commencing with the adenoids. For the latter, I enter the nasopharynx four or five times with the forceps without changing the child's position, but then my assistants are trained at the moment of request to lower the child's head rapidly to such an extent that the pelvis is a little higher than the head, which allows a free outflow of the blood from nose and mouth into a suitable vessel without entering the larynx. Here it may be remarked that, when entering the nasopharynx with the forceps or curette, the child being under complete narcosis and manifesting no signs of pain, not all reflex is abolished, the pharyngeal muscles contract slightly and respiration is momentarily suspended, the same as when we examine the larynx of a refractory patient who is not yet trained. Whilst the child is in this lowered position, I make a digital examination, to see if anything and what has still to be removed; the child is raised again, and forceps or curette once more applied. Seldom more than two or three introductions of the instrument are necessary, interrupted by lowering the child for the outflow of blood; and when convinced that the nasopharynx is clear, the mouth-gag is removed, the child laid on a couch and left there until sufficiently recovered to be taken home. In the majority of cases it cannot be prevented that some blood runs down into the lower pharynx and reaches the stomach, which is proven by the vomiting of blood when children recover from the narcosis and change their recumbent position. But I never witnessed the inflow of blood into the larynx or trachea; cough, or any subsequent pulmonary symptoms never



having occurred in my practice. I cannot give a positive explanation for the fortunate absence of this complication; it may be the slight recumbent position of the child leaning against the chest of the assistant during the operation, which makes the blood flow along the posterior pharyngeal wall; but in my opinion the quick lowering of the child's head plays the more important part.

I was perfectly aware that I could not relate anything new or of importance to you, but I shall be perfectly content if some of my remarks will assist you to make the operation with greater comfort to yourselves and with satisfactory results to your patients.

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*Paper.*GENERAL ANÆSTHESIA IN OPERATION UPON THE  
NOSE AND THROAT—NITROUS OXID, CHLORO-  
FORM AND ETHER.

BY F. E. HOPKINS, M.D.

I REGRET with you that Dr. French is unable to be present and take his part in this discussion, for, from his large experience and wide observation, he could contribute much of interest and value. The short time left me to fill the gap caused by his absence has made it possible to consider these three agents from the clinical point of view only. Perhaps this method would be the better in any event, as it would savor of presumption to offer you a review of the physiological action of these anæsthetics, and to attempt to deduce from this theoretical reasons for preferring one rather than another.

Nitrous oxid gas is not generally used by surgeons in this country, though largely employed in England. At a meeting of the British Laryngological, Rhinological and Otological Association, in April, 1897, when the subject of operation for adenoids was under consideration, the question of anæsthesia was discussed, and the majority of the members stated that they made use of gas, or gas followed by ether<sup>1</sup>. This more common use of nitrous oxid gas in England may be due to a reaction from chloroform. Ether never has been used as freely as with us, and when it was finally determined that chloroform involved too great risk, attention was turned to nitrous oxid gas as well as to ether. From lack of personal experience I have no right to pass judgment upon the use of gas, though it would seem that the time of unconsciousness is too short to permit of thorough clearing of the nasopharynx in some cases. Buxton<sup>2</sup> says that the time which elapses from the removal of the face piece to the recovery of consciousness may vary from thirty seconds to one minute; too short an interval for the removal of adenoids, as the patient is apt to recover consciousness before the operation is completed. Yet the fact that this method of inducing anæsthesia has the sanc-

tion of good men is quite sufficient to determine the point of its usefulness. It is a safe anæsthetic and not disagreeable to the patient in the taking nor in its after effects. However, aside from the brevity of the period of unconsciousness, there are disadvantages attending its use, some of which are referred to by A. Wilson<sup>3</sup> as follows: "Nitrous oxid is unirritating, pleasant to take, quick in its action, recovery from it is rapid, it is quite safe, and can be given with the patient in a sitting position. It, however, possesses decided disadvantages. The duration of anæsthesia (especially in children) is very short, and a good deal of muscular spasm is produced, especially in young subjects. The duration of the anæsthesia is always uncertain, and with hæmorrhage going on from the pharynx it is dangerous to re-apply the inhaler. In addition, the deep gasping inspirations which occur on the return of consciousness introduce another element of risk, viz.: that the blood or detached fragments of adenoids may be drawn into the pharynx. The author remarks that the dread of pharyngeal hæmorrhage, when the patient is unconscious, is absolutely without foundation. In hæmorrhage, however profuse, from the pharynx during an operation, the patient, if placed in a proper position, is infinitely safer when completely anesthetized than when semi-conscious or actually conscious. With a semi-anæsthetized or just conscious patient there is fright, struggling, irregular respiration and coughing; blood is drawn into the larynx, coughing and spasm set up, and breathing greatly hindered, while it is difficult or impossible to deal with the hæmorrhage. It is an absolute disadvantage that the patient should recover consciousness while hæmorrhage is going on, and especially when there are any loose growths in the pharynx. In view of the above mentioned facts, nitrous oxid alone is not adapted as a routine anæsthetic for post-nasal adenoids." With adults or children old enough not to be alarmed by the apparatus, the author employs nitrous oxid first followed by ether.

The danger attending the administration of chloroform to patients with adenoids was so forcibly presented to this Association by Dr. Hinkel<sup>4</sup> in 1898 that it is unnecessary at this time to do more than allude to some of the strong points he then made. He quoted the observations of the Vienna pathologists, who showed that sufferers from adenoids frequently belong to an abnormal constitutional type, which renders them peculiarly sus-

ceptible to chloroform narcosis—the habitus lymphaticus, so-called. You will recall that he referred to eighteen cases of death from chloroform given to children who were to be operated upon for the removal of tonsils and adenoids, and well says that the general use of chloroform in these operations is inadmissible. Death from chloroform often occurs with little warning and sometimes at the beginning of anæsthesia. One is impressed by the fact that all the advocates of the use of chloroform insist that it must be given by a careful and trained anæsthetist, whose one care must be the watching of the patient, an admission of the danger involved. My personal experience with chloroform has been very limited. One of our ablest local practitioners received his post-graduate training in Vienna and brought home with him a strong prejudice in favor of chloroform. He is one of the most careful anæsthetists who assists me. At the first I protested against the use of chloroform, but he gave it with such painstaking care, the children came under its influence so easily, the attendant discomforts were so much less than with ether, that, after seeing him administer it a few times, I could but be pleased with the results. About four years ago, however, we had an experience which neither of us care to repeat. Chloroform had been given and the operation was nearly completed, when, without warning, the patient ceased breathing. After an interval which seemed interminable, and after vigorous efforts toward resuscitation, respiration was restored. The doctor has not proposed chloroform in any case he has since brought me, nor have I since operated under chloroform anæsthesia. For some time statements have appeared regarding the danger of giving chloroform to children. This is so contrary to the long accepted belief as to merit attention. Dr. John A. Wyeth<sup>5</sup> has said: "In children ether is in general the safer anæsthetic." He had been taught that chloroform was the better anæsthetic in this class of cases, but he had learned that in children under 12 years of age chloroform was not so safe as ether. He had seen death occur in a child of 10 years without a single danger signal and when not more than one drachm of chloroform had been administered by an expert. Chloroform was especially dangerous in children who were poorly nourished or weakened by any dyscrasia. Particular care was necessary when the child struggled and made deep and rapid inspirations.

W. I. McCardie and C. F. Marshall,<sup>6</sup> in considering the main physiological differences between the child and the adult, which concern the induction of anæsthesia, lay stress upon the fact that the administration of anæsthetics, especially chloroform, is by no means so free from danger in childhood as is generally supposed. They also consider the question of the best anæsthetics to employ in the various operations performed on children. Chloroform is never free from danger, and it is better to use as a routine anæsthetic ether, A. C. E. mixture, or a mixture of two parts ether to one of chloroform. Nitrous oxid followed by ether is recommended for older children. It should never be followed by chloroform. Goldan<sup>7</sup> remarks: "A few words regarding operations in children for removal of tonsils and adenoids may not be out of place. Where chloroform is used it should be replaced with ether before beginning the operation. Ether is certainly far safer, particularly in this class of patients, throughout the narcosis.

At the completion of the operation, by inverting the patient and turning him to one side, blood will flow from the mouth and nostrils, instead of into the trachea. Breathing frequently stops at the completion of the operation, because of the anæsthetic and more or less insufflation of blood into the larynx. If ether is employed dangerous symptoms are averted. Chloroform is particularly dangerous, because, even after its discontinuance, there is a residual quantity of vapor in the air passages. As soon as bleeding occurs, respiration is impaired, this residual chloroform is absorbed and acts as an overdose, and circulatory depression, evidenced by pallor and absence of the pulse results, the breathing in these instances being shallow and gasping. In the treatment of these cases artificial respiration should be performed with the patient upon the side (not upon the back), the head extended, and the patient inverted." Chloroform during its administration has so many more possibilities of danger than ether, and serious conditions arise with so little warning and so many fatalities have been charged against it, that the surgeon who uses it must offer his own justification.

Ether is the only anæsthetic with which I have had any considerable experience. While in a good many cases conditions have arisen which for a time seemed alarming, because of collapse due to the anæsthetic, yet there always seemed something



left to work upon, and efforts toward restoring the patient were successful. I have had no serious after-effects from ether, and it is quite fair to say that the inference deducible from this is not wholly that of limited experience. I have not had the advantage of being able to call upon a trained anæsthetist, but have made it a rule to ask the physician sending me the patient to give the ether. It is not necessary here to defend or explain this rule; it is sufficient to state the fact. This has given me quite a varied experience in methods of administering ether. I have seen such tact and skill used that the little patient seemed hypnotized and inhaled the ether without the slightest struggle or excitement. One man etherized three patients with the contents of one small can, another wasted four such cans, and even then the patient was not ready for operation. On one occasion I waited forty-five minutes for the doctor to anæsthetize the child. Under all these varying conditions the patient was safe. Admitting the element of safety with ether, we have yet to object to the almost invariable resistance which it arouses on the part of the patient at the beginning, and the distressing nausea which so often follows its administration. An anæsthetic is desired which will give the safety of ether and eliminate its unpleasant features.

I wish in passing to mention a method of giving ether, which, could it be safely and easily followed, would be a great convenience in operations about the face and throat. The method is that of rectal etherization. To quote from Buxton\*: "This form of etherization was used as early as 1847. I have now used the method pretty extensively and find it to answer admirably for operations about the mouth, nose and post-buccal cavities, for intra- and extra-laryngeal operations, for staphylo-rhaphy and for operations for relief of empyema. For the removal of the tongue, for excision of the jaw or jaws, and for plastic operations about the face, the method gives greater facilities and freedom to the operator than any other plan I have tried. Mr. Appleby recommends the method also for prolonged dental operations. The advantages claimed are (1) less ether is used, (2) recovery is more rapid, (3) after-effects are less severe, (4) the stage of excitement is lessened or abrogated. Its disadvantages are: the greater length of time the patient usually takes to become ready for operation. Although this objection is

not applicable to all cases, I have found it expedient to shorten the time of induction by giving ether or chloroform in the usual manner through the air passages and trusting to rectal etherization for the maintenance of anæsthesia. Besides saving time this plan lessens the actual quantity of ether required, and so minimizes the chance of deleterious after-effects, and also preserves the patient from the discomforts of the induction when performed by rectal etherization, although Dr. Wanschier says some of his patients having been anæsthetized first by the usual method and subsequently by the rectum, preferred the latter. Dr. Bernard Stedman employed rectal etherization in a series of cases, adopting my method, and has reported most favorably upon it. In some cases it is alleged that severe meteorism, diarrhoea, and even melæna have followed the use of ether by the rectum. Unquestionably the method requires the greatest care and some experience before a uniformly happy result can be expected, and the anæsthetist must remember that carelessness in permitting too rapid an evolution of the vapor will lead to grave suffering if not to danger. The usual signs of anæsthesia are present, and so nothing need be said about them. As a rule, children go under more rapidly than adults when ether is given by the rectum, but the time occupied in inducing complete anæsthesia varies within wide limits. I have succeeded in three minutes and have had to wait fifteen or thirty minutes. Dr. Stimson informs me that American surgeons have had several fatalities in employing this method. I have met with grave complications which, although in part due to the physical condition of the patients, were undoubtedly not wholly independent of the irritation caused in the intestines by the entrance of ether vapour."

Bennett<sup>9</sup> pronounces nitrous oxid almost an ideal agent for the production of anæsthesia, though not for its maintenance. It is pleasant to inhale, rapid in action, free from irritating or stimulating effects, and is the safest anæsthetic known. Used to precede ether, a form of anæsthesia is obtained which is exceedingly satisfactory. The patient, at the beginning, is spared any knowledge of ether used, none being administered until unconsciousness is produced by the gas. There is no coughing, no choking, no stage of excitement and little or no mucus. When ether is begun it can be pushed to complete anæsthesia within two or three minutes. A. H. Miller<sup>10</sup> advocates the commencement

of anæsthesia with nitrous oxid, and as soon as anæsthesia is complete the removal of the inhaler and the substitution of the ether cone. He has notes of 160 cases in which no one has been conscious when the change was made or has experienced anything disagreeable from the anæsthetic. The average time required in his cases for anæsthesia has been three minutes.

Drs. Brown and Kelly of Baltimore<sup>11</sup> report of this method that "the advantages have been so distinct to the patient, the surgeon and the anæsthetizer that we feel that the use of older methods, that is, the administration of ether alone or of chloroform alone, or of the A. C. E. mixture, should give place to this newer and more effective mode. To the patient these advantages are: the rapidity with which he or she becomes anæsthetized, the freedom from all unpleasant symptoms during the process of anæsthetization, and the distinct diminution in the after-symptoms, especially as regards nausea; to the surgeon the great advantage is the shortening of time; to the anæsthetizer the advantages are obviously a combination of the two preceding. To these advantages must be added the much diminished quantity of ether employed and the much shorter time required by the patient to recover entirely from the effects of the anæsthetic. The possible disadvantages of the method are cyanosis during the administration of the nitrous oxid, the increased secretion of mucus, and any untoward post-operative effects which may be shown to be directly referable to the use of the nitrous oxid. As to the cyanosis, while in a certain proportion of cases a slight degree of cyanosis seems inevitable, yet without doubt this largely depends upon the skill of the anæsthetizer and his experience, so that we have found that the presence or the degree of cyanosis is distinctly diminishing with our constantly increasing experience with the method; in many cases it is wanting altogether, in others it is present in only a very slight degree, while in a very few—and these last are constantly diminishing in number—is the cyanosis marked. Of course only constant experience in the mixing of the nitrous oxid and the air will bring about the ideal anæsthetization, but we feel sure that many of the symptoms of asphyxia may be eliminated in the hands of those who are constantly using the method. It was found that loss of consciousness from the use of nitrous-oxid gas was produced in from one to two and a half minutes, and complete anæsthesia in from two to

five minutes. The cases, however, were all women, and therefore easier to anæsthetize than the average of general hospital patients. In all of these cases, except the nephropexy, the nausea after operation was slight, and in some cases practically absent altogether. In our experience the method has seemed to possess so many advantages to the patient, operator and anæsthetist, and so few disadvantages to any of these, that it has become an indispensable part of our operative technic; and that it has proved satisfactory can be easily judged from the fact that after over 200 anæsthetizations with the method, our faith in it, instead of diminishing with experience, has increased a hundredfold. Dr. Bennett's inhaler is used and his method followed."

Dr. Gibney<sup>12</sup> makes similar report of use of nitrous oxid and ether at the Hospital for Ruptured and Crippled, New York. He refers to the dread of ether and says that in the combination no unpleasant results whatever have been experienced. There is absence of the disagreeable choking sensation, and the struggling, even in the most timid children. He says the method has been used for twenty years in England. According to his personal observation there is no stage of excitement, and above all things very little ether is used. The method is used in other hospitals, and much satisfaction is expressed with the saving of time and the saving of ether. This saving of ether is a cardinal point, not as a matter of economy, but because it means a relatively small quantity of ether for the individual patient.

In the choice of an anæsthetic we are spared many of the perplexities of the general surgeon, since we are not called upon to operate in emergencies, for example, in cases of serious disease of the thorax, as empyema, nor in acute febrile disease as pleurisy or pyæmia. On choice of an anæsthetic, Buxton<sup>13</sup> recommends that for all brief operations, both in dentistry and general surgery, nitrous oxid should be given. It can be given to infants and elderly people as well as adults. In all conditions in which any respiratory difficulty exists, as in cyanosis and in asthenic states, it is well to give it in combination with oxygen; but when that method for any reason cannot be pursued, nitrous oxid with air gives, in skilled hands, almost as good a result. He further says that ether, either in succession to nitrous oxid after Clover's method, or given by itself, is the best and safest anæsthetic, alike

for children and adults, and should be adopted as the routine practice.

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*Discussion on Papers of Drs. Gleitsmann and Hopkins.*

Dr. J. N. MACKENZIE said that he had been using ethyl bromide in private and hospital practice since 1887, having been led to do so by the writings and experience of his friend, Dr. J. Chisholm, of Baltimore, who deserved great credit for having called renewed attention to this anæsthetic. Although he had not himself ever had an accident, the drug was not altogether free from danger. This, he thought, could be eliminated by giving a small quantity of stimulant before anæsthetization and giving the drug absolutely free from admixture of air.

Dr. W. E. CASSELLBERRY said that he had had some recent experience with the combination of nitrous oxide and ether, and as practically nothing had appeared in American literature on this subject, as applied to tonsillar and adenoid operations, he would say a few words on this topic. For the last fifteen years his usual method of operating on adenoids alone or on adenoids and hypertrophy of the tonsils, had been to administer first a few drops of the A. C. E. mixture to avoid the unpleasant stage of excitation of ether, and then to follow this by ether and maintain the anæsthesia throughout by ether. The operation was done in the sitting position, which had first been described by Hooper. This combination had given entire satisfaction in a long series of cases. There had not been any complications or accidents. In private practice, especially, it was the best combination. He had used bromide of ethyl in office practice and in dispensary prac-



tice quite largely, especially in those cases in which only adenoids or only hypertrophied tonsils were to be removed. It was satisfactory in many cases, but he had found it somewhat unreliable, failing sometimes to anæsthetize perfectly an excitable child, and for this reason he had found it inexpedient to use it in private practice.

Nitrous oxide gas was the safest of anæsthetics for brief operations in institution practice. Not finding it entirely satisfactory under all circumstances, because of the brevity of the anæsthesia he had followed it very recently by ether in order to lengthen the period of anæsthesia. There was nothing new about this combination, but simply its adaptation to throat procedures. The purpose, of course, of the combination was to lessen the amount of ether used, to abbreviate the duration of ether anæsthesia and hasten the resuscitation of the patient and lessen the inconvenience of ether anæsthesia, while not diminishing its safety. The apparatus which had been employed almost everywhere had been an inhaler of the closed type, that is to say, of the Clover, Hewitt, Ormsby or Bennett type. He had not found this type so satisfactory in throat operations, because during the bleeding periods one could maintain inhalation of ether by using an open cone, meanwhile letting the patient bleed into it. His plan was to administer the nitrous oxide at first by an ordinary White dental inhaler. This took two or three minutes, and was characterized by the usual semi-asphyxia. When the anæsthesia was nearly complete he removed the dental inhaler and substituted an open cone made with a towel and paper and having one end loosely closed with cotton. At the time of this substitution of the ether cone for the gas inhaler there was apt to be a momentary lull in the respiration, but no more than common when adding fresh ether. In a very short time the cyanosis would disappear and the child would be ready for operation. From that time on ether anæsthesia was used in the same way as if ether had been employed from the start. In his own cases he had usually taken about five minutes for the combined operation on both tonsils and adenoids. In the course of five minutes more the child would commence to revive, and in about one hour would be ready to leave the institution. He had not used this method in private practice because the apparatus was cumbersome.

Dr. E. MAYER said with regard to the use of the combination of gas and ether that men like Bennett, of New York, have a very convenient method of using it, making it entirely suitable for private practice. An ordinary dress-suit case contains all the needful apparatus. Cyanosis never appears when this method of anæsthesia is properly conducted. It had been used for some time in the New York Eye and Ear Infirmary, where the anæsthetizer had been very competent. As a matter of fact, the giving of an anæsthetic had become a specialty. He now uses the

combination of gas and ether in all his cases in private practice, and the operation could be done without any undue haste, yet the patient would not regain consciousness until the operation had been completed. He would like to know if there was any element of danger in having a substance so inflammable as bromide of ethyl anywhere near a gas light, a point of some importance where artificial illumination is advised, as by Dr. Gleitsmann. For the incision of an abscess of the neck recently a gentleman had been anæsthetized about one hour after his dinner, only half a drachm of the chloride of ethyl being used. He became unconscious in one minute, the incision was made, and in two minutes more he was conscious, and was smoking his cigar after another five minutes. Dr. Mayer said that he had previously made an enthusiastic report in favor of the Schleich mixtures. He still thought it an admirable anæsthetic, but when almost every eminent surgeon in the land refused to use it he did not feel that he was justified in employing it in the face of such opposition. Dr. Bates had shown that suprarenal extract or five drops of a 1 to 1,000 solution of adrenalin chloride was very effective in combating collapse occurring in connection with anæsthesia.

Dr. A. W. DE ROALDES said that he wished to preface his remarks by the broad statement that he would care very little for chloroform, ether or any other anæsthetic, except nitrous oxide gas, if he could have a sealed tube of bromide of ethyl in his possession when called to operate upon adenoids or hypertrophied tonsils. His enthusiasm of ten years ago, when he had first reported 200 cases of this kind anæsthetized by bromide of ethyl, had only increased since that time. Now, he could say that over 5,000 such cases had been operated upon, and he had only seen unpleasant effects two or three times from this anæsthetic; and even in these instances the symptoms were nothing like so urgent as with chloroform. For one year he had operated without any anæsthetic, for two years with chloroform, and since then with bromide of ethyl. The latter had the great advantage that if used properly it is so fugitive in its action that the child wakes up just exactly at the moment when his co-operation is desired in removing the blood. If the head were inclined forward in the manner described by Dr. Gleitsmann, there should be no fear of blood entering the larynx or fear of asphyxia. The bromide of ethyl was not an irritant to the nasal mucus membrane, and did not give rise to some of the unpleasant effects occasionally observed in connection with the first whiffs of chloroform, *i.e.*, the bad effect of chloroform upon the heart. Of course, there was no known anæsthetic which might not be dangerous under certain circumstances, but certainly bromide of ethyl and nitrous oxide were the safest anæsthetics. He preferred the bromide of ethyl to nitrous oxide, because its action was a little less fugitive,

thus enabling one to perform an adenotomy and tonsillotomy which might not be possible with nitrous oxide gas. There was no objection after removing the adenoids or the tonsil to administering a little more of the anæsthetic if this were desirable. The bromide of ethyl was not inflammable; hence could be used with perfect safety near a flame. It was most important to use pure bromide of ethyl which had been preserved in a sealed tube. As to the rapidity of its action, he wished to say that time and again he had done a dozen adenoid operations or tonsillotomies in sixty minutes, thus giving about five minutes to each case, including the time required for anæsthetization. There was no necessity for producing deep anæsthesia. The bromide of ethyl is a rapid analgesic, and the moment contracture of the masseter muscle ensues one knows that this stage is not well adapted for such operations. This period of contracture must be avoided, and if it occurs a few whiffs of air must be given before operating. It was remarkable how these patients often maintain enough consciousness to answer a question, and yet are sufficiently anæsthetized for the operation. No one would think of pushing the bromide of ethyl to the point of complete anæsthesia for such operations; it was entirely useless.

Dr. J. W. FARLOW said he had often used nitrous oxide in private practice with great satisfaction in cases of adenoid disease in children upwards of 8 years of age. He went with the patient to the office of a dentist, who was an expert in the administration of gas. By having all the details carefully attended to in advance, it was possible to operate very quickly, yet thoroughly, and without any of the disagreeable after-effects of ether and practically without danger.

Dr. W. K. SIMPSON said that the mere fact that any anæsthetic used was attended by some danger should lead one to stop to think if there were not many cases in which adenoid and tonsil operations might not be done without any anæsthetic. In his experience the number of cases in which an anæsthetic was not necessary was steadily growing. He saw no reason whatever for ever using an anæsthetic for the removal of the tonsils alone; the giving of the anæsthetic produces as much shock as the operation causes pain. Without an anæsthetic he felt confident the tonsils could be better removed, because of the reflex action which brings the tonsils up into better position; and also the hæmorrhage can be better controlled when the patient is not under an anæsthetic.

Dr. D. BRYSON DELAVAN thought it very important that the statement just made should not be allowed to go out without some discussion. Whatever the anæsthetic might be, it was too late to say that we should not use anæsthesia in these operations; there was far too much and too strong testimony in favor of it. The use of anæsthesia in the removal of adenoids had been first

proposed and practised by Sir Morell Mackenzie, who mentions the fact in his well-known work published in 1884. Definite information upon the subject was brought to this country by the late Dr. Franklin H. Hooper, in 1888. Since that time the whole weight of the profession had been in favor of anæsthesia for these operations, unless when performed upon infants or well grown adolescents and adults. Outside of Germany this view had been upheld, almost without a dissenting voice, by the best authorities in England, the United States and most of the greater countries of Europe. The free use of a drug so uncertain in its action upon the heart as cocaine for the purpose of obtaining local anæsthesia in children, he regarded as highly objectionable.

Dr. H. L. WAGNER mentioned a simple test to determine whether or not the bromide of ethyl is good. A good preparation can be told by an ethereal or strawberry smell. After a time, even in a sealed glass tube, it may be converted into another chemical compound having a smell resembling that of onion. This odor test should always be applied before using the bromide of ethyl as an anæsthetic. He himself had had a large experience also with the rectal administration of ether. The Russian surgeon Pirogoff had first advocated this method in 1847. It will be found a very safe and reliable way of administering ether and will allow the surgeon complete control of the field of operations on the face, nose and throat. They had abandoned the method at his clinic because of the frequent neglect of patients to properly evacuate the bowels before operation. In private practice and for any large operation it was certainly a most admirable method of administering ether.

Dr. GLEITSMANN, in closing the discussion, said that he was one of those who believed in the use of anæsthesia for these operations, especially for adenoid operations. The quality of the bromide of ethyl was most important. He had never had any trouble with Merck's preparation. The question as to the inflammability of bromide of ethyl had already been answered.

*Paper.*

## EPIPHARYNGEAL LYMPHO-SARCOMA IN A BOY.

BY HENRY L. WAGNER, M.D.

As regards epipharyngeal sarcomata our literature is scanty. The disease itself seems to have fallen under the observation of comparatively few writers, among whom Stoerck may be mentioned as having devoted special study to these neoplasms. Very rarely has the disease been found among children.

The interest in the following case arises largely from the fact that the pre-existing epipharyngeal tonsil must have been transformed into a small round-celled sarcoma.

The history of the case is as follows:

Some six months ago, Master V. A., 17 years old, whose father is suffering from locomotor-ataxia and whose mother is dead, consulted his physician, Dr. A. L. Sobey (who kindly furnished me with the following data), about his condition. The young patient was anæmic, a stutterer, a mouth-breather, and somewhat deaf. He also showed signs of rickets and had been failing in health for some time, although he was still able to attend school. He complained especially of chilliness, general weakness, and headaches, including a pain in his neck. General treatment somewhat improved his health, but soon after this seeming convalescence he began to fail again, expectorating incessantly a serous sputum tinged lightly with blood. About this time his temperature was 102 F. and his pulse 96. He now complained of a pain in the region of his stomach, and the headaches increased so in severity that even sleep was impaired. Various methods for the alleviation of his suffering were resorted to, but, with the exception of reducing his temperature to the normal, with comparatively little success. As the spitting of blood increased, accompanied with a flow of pure blood from the left nostril, the attending physician concluded that these indications pointed to the fact that the trouble had its seat in the naso-pharynx, and called the writer in consultation.

We found the nose normal, though the mucous membranes were very anæmic. The mouth showed a high palatal arch, and in the epipharynx we found a growth as big as a hen's egg, stretching from one side to the other and obstructing the posterior portion of the nose. At various places to the left of the growth,



blood was oozing. The growth was neither lobulated nor soft to the touch of the probe, as sarcomata are said to be in this region, but, on the contrary, its surface was perfectly round and smooth, and its texture very dense. From the differential diagnosis we were led to conclude that we had here not to deal with a benign adenoid growth, but with one of a malignant type. We thought it advisable first to check the bleeding, and this we were able to do with the aid of suprarenal capsule extract, combined with menthol-glymol. The headaches decreased in their intensity sufficiently to allow the patient to hold his head erect and to sleep somewhat. The pulse and temperature were now both normal. Twelve hours later, however, paralysis of the left eye (abducens paralysis) with concomitant ptosis set in, clearly indicating that the morbid process had already invaded the brain. The microscopical analysis of a portion of the tumor, which was excised for the purpose, gave the following results: Surface epithelium normal. Normal lymphoid cells lying in a reticulum. Collections of layer cells mingled with an intercellular substance, these cells being round, spindle, and polymorphous in shape. Many thin-walled blood-vessels, some hæmorrhage into tissues. Cellular elements very abundant in proportion to intercellular substance.

Diagnosis: Small, round-cell sarcoma of lymphoid tissue.

DR. L. NELSON.

Hæmorrhage after the excision of the piece of growth was quite free, but soon stopped. The patient now began to eat better and to sleep a great deal. Then appeared on the left side of the neck a swelling of the submaxillary glands which, however, soon subsided. Owing to the unfavorable prognosis (with or without radical operation) given to the family, the services of the writer here terminated. Numerous other consultants, who were called in later, confirmed the diagnosis already made, with the exception of one colleague who regarded the growth as benign, and treated it with caustics. I have since learned that the temporary relief accompanying the latter treatment was astonishing, as the chilliness seemed entirely to disappear. Unfortunately, however, an otitis media purulenta set in soon after, the morbid condition of the eye persisted, and the patient grew steadily duller and weaker, and died about six weeks ago.

## Paper.

## A RADIOGRAPHIC STUDY.

(Showing an impacted metallic disc in the cesophagus.)

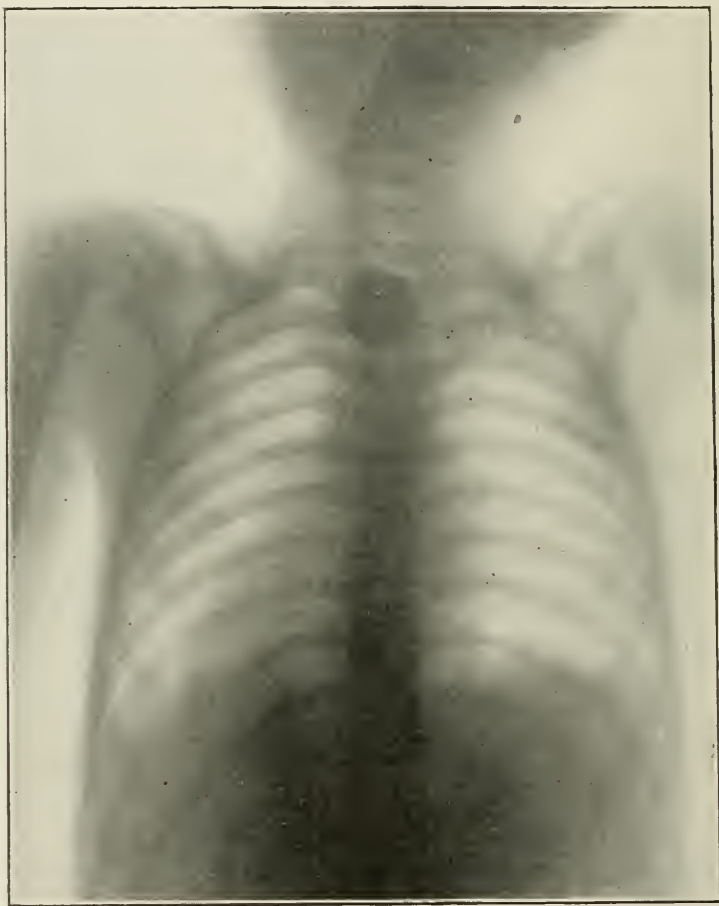
BY HENRY L. WAGNER, M.D.

A BOY, 5 years old, was brought one morning to our poly-clinic by his mother, who stated that he had swallowed a brass "telephone check" some two hours previously. On learning from him what had occurred, she resorted to a remedy which she had previously used with success upon an older boy, under similar circumstances, viz.: that of lifting him up by the heels and holding him thus suspended, head downwards, until the swallowed coin was ejected. In the present instance, however, this treatment did not have the desired effect, and the boy was brought to the clinic.

On his arrival, the young patient showed intense cyanosis and dyspnoea. By means of radiography, the check was at once located in the lower portion of the regio colli mediana, but whether in the œsophagus or in the trachea could not definitely be ascertained by the photograph. By means of the laryngoscope, the surgeon of the clinic definitely located the check impacted in the muscular folds of the œsophagus. The radiograph disclosed the presence of a disc considerably larger than a telephone check, but as the statement of the mother seemed positive on this point, the increase in size was accounted for upon the hypothesis that the photographic image was enlarged by the diffused shadow of the object itself. Acting upon this supposition, a special diet was ordered in the hope that the disturbing body might be forced to take its course through the normal alimentary canal. On the other hand, should the cyanosis and dyspnoea persist, the patient was counselled to report promptly to the clinic in order that the check might be extracted by the writer, to whom the patient had been referred by the examining surgeon.

Late in the afternoon of the same day, the mother again visited the clinic. She reported that her child had attempted to take food and had seemed to swallow it, but that after each attempt a spell of vomiting ensued, during which all the food so taken was vomited: that the boy had constantly complained of a metallic taste and of an incessant "pain in the neck (somewhat above the sternum) and in the stomach," (reflex action) and had at last vomited—not a telephone check—but a brass disc considerably larger, which she brought as *corpus delicti*.

On the following morning the boy's condition was perfectly normal. Comparing the diameter of his neck, which was found to be three inches, with that of the disc, which was fully as large



as a twenty-five-cent piece, it immediately became evident that it could never have passed the cesophagus.

It is of interest to note that in the radiograph, the metallic body was very little enlarged by its own diffuse shadow.

#### *Discussion.*

DR. JOHN EDWIN RHODIS reported a case in which a radiograph had proved very useful. The patient was a child,

and there was a history of it having swallowed a penny while playing on the floor. The symptoms had been only a disinclination to swallow, especially solid food. The family physician brought the child for examination and operation. A fluoroscope had been used, and it had been found that the penny had been impacted in the œsophagus about opposite the second costal cartilage. A mark was made upon the chest, and a radiograph was taken and used as a guide. Under chloroform, the penny could not be felt with the œsophageal forceps, but when the instrument had reached the point indicated by the mark, the blades were opened and the foreign body was easily caught and extracted.

Dr. D. BRYSON DELEVAN reported a case occurring in a colored infant, 5 months old, at the McDonough Hospital, New York City, who had swallowed a nickel five-cent piece. A good laryngoscopic view of the pharynx and larynx had been obtained, but it had failed to demonstrate the foreign body. The condition of the child having rapidly become alarming, a radiograph was taken, and this had demonstrated the presence of the coin in the œsophagus, about opposite the fourth rib. The coin had been promptly extracted, by means of the old-fashioned coin-extractor, by Dr. W. T. Bull. The patient recovered.

Dr. JONATHAN WRIGHT said that it might be of interest to remind the members of a procedure of a Brooklyn surgeon for extracting such a body. The latter had lodged in the œsophagus, and the image was thrown upon a fluoroscope screen at the time of the operation, so that the surgeon was able to follow the point of the forceps during the operation, and so grasp and extract the object. This seemed to him a very valuable suggestion, and well worth being remembered.

Dr. A. W. DE ROALDES said that in the œsophagoscope one would find an instrument which, in some cases, would prove of great value, almost as much so as the nasal speculum. He did not mean to advocate this method as one to be uniformly used, but in suitable cases it was hard to imagine how exceedingly useful it was. He knew of cases in which foreign bodies had been repeatedly reached with forceps through the œsophagoscope, locating them quite easily. He mentioned this in order to urge a more general use of this instrument in the examination of the œsophagus for pathological conditions, and as an aid in the removal, under the guidance of the eye, of some foreign bodies.

Dr. WAGNER said that he had presented the case because of the fact that the shadow had not given an exaggerated view of the size of the object. It was quite common for this exaggeration to occur in cases in which the fluoroscope was placed in a certain wrong position. It was absolutely necessary, therefore, to place the fluoroscope at a certain angle. It was very important in such

similar cases to note the measurement of the œsophagus in order to determine the possibility of the foreign body to pass into the stomach.

*Paper.*

REFLEX EPILEPSY FROM NASAL DISEASE SUCCESSFULLY TREATED BY THE REMOVAL OF THE INTRA-NASAL CAUSE.\*

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BY JOHN O. ROE, M.D.

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IN STUDYING the etiology of epilepsy we are more and more thoroughly convinced that its cause frequently resides in some peripheral portion of the body, and produces its effects by exciting the nerve centers to undue activity through a reflex influence.

From the earliest observance of the malady it was recognized that various impressions made through the senses, such as the inhalation of irritating substances or of different odors; would cause convulsive disturbances, and also that convulsions were sometimes excited by injuries or diseased conditions of remote portions of the body. It was, however, generally believed that this effect was caused by sympathetic excitation of a previously existing disease of the brain, until Brown-Sequard, by a series of carefully conducted experiments on animals, showed that epilepsy could be produced by the artificial irritation of the peripheral nerves in almost any part of the body.

Epilepsy, although appearing in a great variety of forms, is generally considered under two main divisions termed *petit mal* and *grand mal*, according to the extent or severity of the attack. In the former the loss of consciousness is momentary and the motor spasm light; whereas, in the latter the period of unconsciousness is more or less prolonged, and the motor spasm involves the whole or a greater portion of the muscular system. *Petit mal*, therefore, is regarded as partial epilepsy and analogous to Jacksonian epilepsy, in which the motor disturbances are observed to originate in, or be confined to, some particular portion of the body. It is also regarded as a progressive form of the dis-



turbance, the danger being that it may become *grand mal*, or general epilepsy.

The status epilepticus therefore, cannot be considered a distinct disease, but in many cases merely the climax of a neurosis brought about by a long continued predisposing influence or by an excitant in the form of a localized irritation. The influence of localized peripheral irritation upon the central nervous system, much like that of a grounded electric wire, is to lower the general vitality, to diminish the inhibitory or controlling force of the system and to produce an explosive disturbance wherever short circuits in the system, so to speak, happen to occur. This analogy is seen to be more complete when we remember the fact that cerebral anæmia predisposes to epileptiform seizures, while hyperæmia does not.

The pathology of epilepsy, as a recent writer observes, is as yet an unwritten chapter in the history of the disease. This is accounted for by the fact that the exciting causes of the affection are exceedingly numerous, that they are usually found in some portion of the body outside of the brain and regarded as independent diseases. In some cases the cause may lie hidden and undiscovered in some deep-lying organ; in other cases it may be found in organs or parts readily accessible and therefore perfectly ascertainable when the nature of the local trouble and its relation to the neurotic disturbance is thoroughly understood.

Notwithstanding the numerous cases reported where epilepsy has been cured by the removal or cure of diseased conditions of nearly every organ and portion of the body, many persons afflicted with epilepsy at the present time are allowed to be classed as incurable, without adequate investigation as to the relation of diseases of peripheral organs to the general or central disturbance, simply because there are not sufficient outward manifestations to direct attention to the local conditions, or to the relationship between the two.

To illustrate the important rôle that nasal diseases frequently play in the production of epileptiform convulsions, I herewith report a few well pronounced cases that have come under my observation:

CASE I.—Miss M., aged 23, was brought to me by her family physician, Dr. Townsend, of Bergen, N. Y., July 30, 1889. Her case presented the following history:

One morning, in February, 1888, she was found just recovering from a convulsive attack. Dr. Townsend was immediately summoned. She was supposed to have fainted, but no one being present at the time the nature of the attack could not be made out. She was then well nourished, had good color, and all her functions, so far as could be ascertained, were normal. Suspecting that Miss M. had had a convulsion, Dr. Townsend instructed her parents to watch her closely. After the girl had had three similar attacks alone, the fourth attack was observed by her mother, who described to the doctor the phenomena so well that there remained no doubt in his mind as to the true nature of the malady. It appeared that the patient was aware for many minutes previous that an attack was coming on and could call her mother who, in this instance, reached her before any convulsive effort had taken place. From March, 1888, to January, 1889, her attacks increased in frequency, from one in two weeks to two and sometimes three a week. On considering the long interval of consciousness after an attack was felt to be coming on before the stage of rigidity and unconsciousness occurred, the doctor thought that the case might be one of focal epilepsy. He therefore took her to an oculist for an examination of her eyes, but nothing abnormal was discovered.

The doctor then took her to his own residence, and as the attacks nearly always occurred at night, and after one nap, he had her sleep in an adjoining room, that he might watch her more closely. About five minutes before the attack occurred she would begin to experience the premonitory sensations and call him, and he would go almost immediately to her. At no time during nearly two months that he had her under observation and the occurrence of a dozen seizures, could he discover the slightest rigidity of any muscles or set of muscles, fingers, or toes, in advance of the general muscular convulsion. He therefore gave up the supposition that it was a case of Jacksonian epilepsy. The case was, therefore, unquestionably one of typical general epilepsy attended by nearly all the customary phenomena. There was the condition of cataleptic convulsive movements of all the muscles, frothing at the mouth, biting of the tongue, and a period of unconsciousness, followed by a condition of languor.

A complete history of the patient was gone into by the doctor. He could learn of no case of convulsion of any kind having occurred in any member of the family on either side. He found, however, that she had experienced, one and two years before, two falls, one from a horse and one from a step-ladder. He could not learn, though, that there was any interval of unconsciousness after either fall, nor could he discover any mark or asymmetry of the cranium, nor that she had any disease or lesions about her, with one exception—she had suffered from nasal ca-

tarrh for quite a long time with marked nasal obstruction. For the purpose of investigating the latter condition, the doctor brought her to me for an examination. There was found considerable inferior turbinated hypertrophy, and in the right nostril there was an exostosis of the middle turbinated bone which pressed firmly against the septum. Pressure against this region with the probe produced the sensations which she experienced just previous to the occurrence of an epileptic seizure.

The nasal obstructions and internasal pressure were, therefore, removed without delay. For some time before I saw her she had become very restless, with much mental depression, particularly for a time after each attack. This condition speedily disappeared after the removal of the internasal abnormality and the convulsions ceased. After the parts were entirely healed the doctor continued to watch the patient carefully for any return of the convulsions, and about nine months later she began to experience some discomfort about her nose and the premonitory sensations she had experienced during her previous attacks. Dr. Townsend accordingly at once brought her to me for an examination, and I found a mass of granular tissue occupying the site of the old exostosis and pressing against the septum. The removal of this tissue ended the disturbance and she has had no epileptic seizures to the present time, or up to five or six months ago, when I last saw her. Two years of this time, five and six years ago, she was employed as a nurse in the wards of Craig Colony for Epileptics, at Sonyea, N. Y., so that if the influence of suggestion could have any effect upon her she certainly would have had a relapse.

CASE II.—E. V., aged 15, was referred to me by our well known neurologist, Dr. Angell, of Rochester, N. Y., May, 1898, for an examination of his nose to determine if possible the cause of a convulsive condition termed *petit mal*, which he had had nearly three years. This condition of momentary unconsciousness was very slight when first observed, lasting but a moment and occurring four or five times a day. These attacks, however, gradually increased in frequency until he was having twenty-five or thirty "spells," as they were called, during the twenty-four hours. There were no convulsive movements, and he never fell down, there being simply this momentary suspension of consciousness. Four years before, while skating, he fell on the ice, striking on his nose and bruising it badly. Nothing was done about it or thought of it until afterward it was noticed that his nose was crooked and he could not freely breathe through it. An examination of his nose showed a marked distortion of the end to the right and deflection of the osseo cartilaginous portions to the left. A spur projected from the right side of the osseous portion of the septum with osseous infiltration of the left ethmoid

region. The anterior end of both middle turbinated bodies were enlarged, pressing against the sæptum.

Pressure with the probe against the upper region of the nose would cause headache and at once bring on a "spell." The relation of this condition of the nose to the *petit mal* was so apparent that the work of putting the nose in a normal condition was at once begun. The extent of the abnormality and the sensitive condition of the boy made the work difficult. As the intra-nasal pressure was removed, however, the attacks began to diminish in frequency until at the end of about four months they disappeared entirely. About three months later he began to experience some headache and an occasional attack. An examination of his nose revealed some granular tissue again causing some intra-nasal pressure. After its removal he experienced no further difficulty, and the following year he resumed his studies in school, was entirely well and leading his class.

During the year 1899 he remained entirely well, but during the spring of 1900 began to have occasional attacks once in two or three months of *grand mal* or general epileptic convulsions. This was attributed to a general neurasthenic condition in consequence of overstudy in school. On an examination of his nasal passages at this time there had been considerable filling in of bony tissue or a recurrent exostosis of the left ethmoid region causing some pressure against the sæptum. The removal of this condition lessened the frequency of the attacks, and he was much better during his summer vacation, when he led more of an outdoor life. During the past year he has pursued his collegiate studies, from which he could not readily be deterred, owing to his great desire to finish his course and graduate, and during this time he has had about once in two or three months, a moderate attack.

[Since this paper was written the young man has joined an engineer corps and, leading an outdoor life, his health has much improved, and he has had no further seizures.]

Notwithstanding the fact that the removal of the intra-nasal pressure did not at once and permanently remove the tendency to epileptic seizures, there can be no question of its influence as the principal exciting cause of the disturbance which followed as a very direct result of the nasal injury, and had not the intra-nasal pressure, the direct result of this injury, been removed there was no possibility of any improvement in his condition or cessation of the seizures.

CASE III.—A boy 8 years old was referred to me by his family physician in May, 1895, on account of a well marked throat and nose trouble associated with *petit mal*, or incomplete epilepsy, from which he had been suffering for about six months. The attacks at first were slight and infrequent, but gradually increased in frequency until he was having at the time I saw him from ten

to fifteen daily. The attacks were very similar to the early attacks of the patient in the case just reported. An examination of his nose showed well marked nasal obstruction from inferior turbinated hypertrophy and an intra-nasal pressure in the upper portion of the nasal passages in the ethmoid region. He had met with no injury and no cause could be assigned for this condition except frequent colds, to which he had been subject since childhood. Attention was at once given to this nasal condition, and on the removal of the intra-nasal pressure the attacks began to subside and soon ceased altogether, his general health improved, and when I last heard from him, about two years ago, he was entirely well and had had no return of the attacks.

CASE IV.—Miss W., aged 15, was referred to me by her family physician, May 20, 1898, on account of an irritation about her throat and some nasal disturbance. The previous year her health had not been good, and she had had some hæmoptysis at frequent intervals. The following winter she spent in Southern Pines, North Carolina, with much benefit to her general health. Ten days before I saw her she began to have epileptic attacks, there being sometimes three seizures during the twenty-four hours. She was placed on thirty grains of bromide potassium daily, which reduced the attacks to one in two days and caused them to be much lighter, which was the condition at the time I saw her. The evening previous to the day I saw her the attack lasted three-quarters of an hour, with more or less rigidity of hands and feet and some opisthotonos, the attack, however, leaving her feeling quite well. Her general health was fair. There was no constipation. Menstruation was regular and there was no dysmenorrhœa. An examination of her throat revealed considerable irritation about the fauces. In her nose there was marked hypertrophy of the turbinated tissues with exostosis of the middle turbinated bodies and considerable intra-nasal pressure in the upper portion of both nasal cavities. The necessary attention was given to the throat as well as to the nose, and the intra-nasal pressure removed, requiring operations on both sides. Chloroform anæsthesia was necessary, for the reason that when this sensitive area in the upper portion of each nasal cavity was touched, even after cocaineization, a severe convulsion would at once be produced. After the removal of this intra-nasal pressure, which was somewhat difficult of accomplishment, the attacks subsided, none occurring for six weeks. A severe one occurred at this time which was thought to have been the result of undue excitement. At intervals of about six weeks after this, attacks of increasing mildness took place for about six months, when they ceased altogether. As she lived at a distance from Rochester, she was cared for by her family physician. Her general health continued fair until the early part of last year she contracted phthisis and steadily failed until she died, about three months ago.



CASE V.—Mr. T., aged 46, was referred to me by his attending physician, February 9, 1899, on account of a nasal obstruction from which he had suffered for several years. An examination showed deviation of the osseo-cartilaginous portion of the septum to the right and marked enlargement of the left middle turbinated body filling the upper portion of the cavity and pressing firmly against the *sæptum*. There was also a large enchondroma on the right side of the *sæptum*, opposite the middle turbinated body. There was general engorgement of the whole nasal cavity with very marked sensitiveness of the upper portion. The slightest touch of this part with a silver probe would excite violent sneezing. For ten years he had had occasional slight nocturnal convulsions, one in two or three months, which had increased in frequency until they occurred once in two or three weeks. The previous June he had the first attack that occurred in daytime, when he fell down and bit his tongue severely.

After the removal of the intra-nasal pressure and obstruction his general health improved and the attacks steadily lessened in frequency and in strength until now they are very light and occur about once in four months, the "epileptic habit" slowly disappearing.

CASE VI.—Claire McC., aged 16, was referred to me by Dr. Angell, March 29, 1895.

For four years he had had a muscular twitching and nervous irritability, tired easily and had some impediment in speaking, aggravated by fatigue. When one year old he had a convulsion which was ascribed to teething. These convulsions continued at intervals of from three to four months, associated with a marked general nervous irritability that was very pronounced when I saw him.

When 11 years old he acquired from the hired man the habit of chewing tobacco, which was continued for two or three years. To this his increased nervous irritability was ascribed. He was also a constant mouth breather and this was associated most of the time with more or less snuffles.

An examination showed deviation of the central portion of the *sæptum* to the left, associated with middle turbinated hypertrophy causing marked intra-nasal pressure and extreme sensitiveness of the nasal passages.

These abnormal conditions were removed, when he began to improve in every way. The nervous irritability subsided and the convulsions disappeared.

Dr. Angell reports that he saw the boy a short time ago, and that he was enjoying most excellent health.

CASE VII.—The following case is the most marked and the most interesting one that I have seen, and illustrates very clearly the influence of local abnormal conditions of the nose on the general system.

A little girl, eleven and one-half years old, was brought to me December 4, 1900, also by Dr. Angell, for an examination of the nose and throat.

She presented a history of prolonged irritability and obstruction of the nasal passages, and Dr. Angell was desirous of determining the relation of this condition to the very frequent and severe epileptic seizures with which she had been afflicted since she was six years old. Her family history was excellent and entirely free from convulsive disorders. She was born July 15, 1889, after a hard labor of twelve hours. She was nearly suffocated, was black in the face when born, and it was with considerable difficulty that she was resuscitated. She was nursed by the mother until eighteen months old and was apparently quite well and hearty, although she suffered from constipation and was unusually wakeful. At the age of two years and four months she had acute catarrh of the stomach with frequent passages and severe vomiting spells from which she very slowly recovered. At the age of three and one-half years she had capillary bronchitis. The following spring she had measles and whooping cough mildly, leaving no séquelle. Two and one-half years later she had another attack of gastritis associated with a constant pain in the region of the naval and in the left leg. In the early part of August, 1895, she took a severe cold in the head which excited a great deal of sneezing and irritation about the eyes. For three or four days she seemed listless, with no inclination to eat or play. Shortly, she developed more or less fever, her temperature going up to 105°. Soon after she began to manifest a spasmodic jerking and about half an hour after this she was seized with a severe convulsion which lasted over an hour, and which left her looking deathly pale.

Following this attack, her nervous symptoms became quite pronounced and she acquired a habit of constantly pulling at the sleeve of her dress. She was restless, could not sit or stand still a moment, and was wakeful nearly all night. She also had much disturbance about the abdomen leading to a suspicion of worms, but none were discovered.

Seven weeks after the first convulsion she had the second, and after that they began to increase in frequency, as follows: Nov. 15, 1895, five weeks later, the third occurred; Dec. 22nd, two convulsions; Feb. 2, 1896, one light one; Feb. 8th, one; Feb. 17th, one; Feb. 23rd, one; Feb. 29th, one; March 1st, one; March 4th, one; and March 11th, she had twenty-nine; March 12th, seventeen; March 13th, twenty; March 17th, eleven; March 18th, eighteen; March 19th, ten; March 20th, twenty-four; March 21st, twenty-seven; March 22nd, twenty-nine.

During the following three months the convulsions continued almost daily, until May 7, 1896, when there was a remission of the attacks until the 23rd. She then had them daily until the 25th,

frequently as many as twenty in a day, when there was a remission of six days. They then began again and continued many in a day, until the 15th of June, when there was a remission until the 30th. They then occurred at intervals. June 30th, July 7th, July 10th, 12th, and July 13th, when she had a very severe one. She then had a remission until August 17th, then, on September 15th, 21st, 22d, October 3, 7, 8, 9, 1896.

The attacks continued with periodical remissions until December 17th, 1896, when, during a severe convulsion, the left side became almost completely paralyzed, involving the larynx, causing aphonia. This condition was followed by much twitching of the muscles. On December 26th, during a severe convulsion, she had well-marked opisthotonos. She partially recovered from the paralysis, but during subsequent convulsions this side was more involved than the right, and has been the weaker side since.

It is to be noted that during the first year the convulsions appeared more or less in series of about ten days each, when there would be a remission of the attack for three or four days. This remittant character of the seizures continued more or less to the time I saw her, varying in number from one to five or six to thirty and forty during twenty-four hours, but at no time had she been free from the seizures longer than a week or ten days at a time, except in July and August, 1896, when she went six weeks without a seizure. This, however, was ascribed to the use of bromides which she was taking at the time in sufficient quantity (about 80 grs. daily) to almost daze her.

It is also to be noted that she has been during each summer since her convulsions began, subject to hay fever coming on in August and lasting until frost came, which very greatly increased the frequency and the violence of the seizures during this period.

During the greater portion of the time since her seizures began she lived in Collingwood, Canada, for it was noticed that the convulsions were very much less frequent and less severe while there than in Rochester. This was ascribed to the greater dryness of the atmosphere.

During her illness she was seen by many of the leading physicians and neurologists of Rochester, Toronto and New York, who seemed to be quite unanimous in the opinion that it was a case of reflex epilepsy from gastro-intestinal catarrh. Some thought that possibly the trouble might have resulted from the apnoea, or from a cerebral hæmorrhage caused by forceps injury during delivery. The line of treatment mainly pursued had been the use of the bromides of all forms, in as large quantities as she could endure, together with tonics, fresh air and general supporting treatment. Special attention was also given to the gastro-intestinal disturbance which it would appear was very much aggravated by the use of the bromides.

Notwithstanding all that was done for her, the attacks dur-

ing the past four years had, on an average, grown more frequent and more severe with no prospect of improvement. When I saw her she was fairly well nourished, as well as could be expected under the circumstances. She walked with a limping gait and a drooping of the head forward and to the left, owing to a slightly defective development of the left side there was also considerable lack of mental development although when aroused and her attention especially directed to familiar subjects, she showed a naturally quick intellect. She had been a mouth breather since infancy.

On examination I found both nasal passages almost completely occluded by very large inferior and middle turbinated bodies with very marked intra-nasal pressure in the ethmoid region, particularly on the right side. She also had enlarged and diseased tonsils and the posterior nares was filled with adenoids.

I advised that these abnormal conditions be removed as speedily as her general condition would permit. The operation first performed was for the removal of the adenoids which was followed by a cessation of the seizures for a week. She then began to have one or two seizures a day, but which were very slight, and December 10th and 15th the inferior turbinates were cauterized with linear incisions to remove the condition of extreme vascularity. Later on the tonsils were removed.

On January 2d I operated in the right ethmoid region, removing a considerable quantity of osseous infiltration. This was followed by a complete cessation of the convulsions for sixteen days, then she had a mild one daily for four days. From January 23d to February 2, 1901, she had from ten to twenty daily, due evidently to a so-called bilious condition, for as soon as this condition was corrected the seizures ceased, and she had no attacks from February 2d to April 13th, a period of ten weeks, when she had from two to six attacks daily for four days. This recurrence of the attacks was associated with and unquestionably due to another bilious disturbance. The left ethmoid region was now operated upon, and from that time to the present she has remained entirely free from epileptic seizures.

During the past three months she has shown marked improvement in every way, beginning to run and play with other children, which she could not or would not do before; her limping gait is disappearing with the increased development of the left side; she carries her head more erect, her mind is growing more active and her improvement in every way is very noticeable to the most casual observer.

During this period she has been taking most of the time about fifteen grains of bromide of sodium daily. This has been mixed with her food in the place of salt, so as to cause less gastric disturbance. These small doses of bromide have been thought ad-

visible by Dr. Angell and me to help steady the nervous system until the effect of this prolonged irritability has disappeared.

[According to a recent report the patient, who is in Canada for the summer, is doing very well, has no convulsions and has remained entirely free from hay fever which usually begins as a "rose cold" in June.]

There can be no question as to the influence of this intra-nasal pressure and irritation in the production of the epilepsy and this general neurotic condition, nor can the lessening of the seizures be in any way ascribed to the continued use of the bromide, from the fact that the patient was steadily getting worse when five times the quantity of bromide that she is now taking was administered daily.

This case is a remarkable one: first in the ability of the child to withstand the immense number of convulsions with which she was seized during these five years, it being estimated from careful records kept by the family that she could not have had less than five thousand during this time; second, as illustrating the influence of intra-nasal obstruction and intra-nasal pressure on her mentality and in the production of this neurotic condition; third, the response of the system to the removal of these local conditions as shown by the almost immediate arrest of the convulsions and the marked general improvement in every way.

When we consider the intimate and direct relation of the nose to the brain it is not surprising that abnormal conditions of the nasal cavity should so readily lead to disturbance in the nerve centers.

The effect, as shown by Ziem, of arresting the growth of one side of the brain in young animals by occluding the nostril on that side is well known. The effect of nasal obstruction and mouth breathing upon the mental development of children is also well known to rhinologists, as well as the general lassitude, dullness and incapacity for mental work or mental effort in adults suffering from the same condition. It is, therefore, not surprising that long continued nasal irritation should in many cases culminate in that gravest of all neurotic manifestations, epilepsy, and the cases which I have cited illustrate the importance of a thorough and a careful investigation of the nasal cavities in all such cases where the exciting cause is obscure, even though the relation between the two is not self-evident.



## Discussion.

Dr. ARTHUR A. BLISS said that this interesting report should encourage others to make careful observations and undertake similar treatment in such cases at least of epilepsy. The general practitioner, and frequently the neurologist, would probably hesitate to receive this statement regarding the possibility of such reflex origin of epilepsy, yet when one considers the relation of the nerve of Cotunnus to Meckel's ganglion; then, from the latter, by the Vidian nerve to the cervical sympathetic and carotid plexus; also to the pharyngeal plexus of veins, the effect of intra-nasal pressure on the cerebral circulation was obvious. He had had only one case bearing on this question. The patient was a business man of about 45, who had been sent to him by an oculist because of the occurrence of epilepsy of the *petit mal* type. There were deflection of the septum and enlargement of the turbinates. Without anticipating any great relief of the epilepsy it was advised that the contact points be removed by a resection of the septum. The patient declined such extensive operation, and only permitted cauterization of the turbinated bodies at the points of contact with the septum. Strangely enough, the seizures ceased after this treatment, and have not returned.

Dr. JOHN N. MACKENZIE said that the subject was of exceeding great interest, if for no other reason, from a purely historical standpoint. The association of epileptoid seizures, or even true epilepsy, with some form of irritation in or about the nasal passages, or peculiar susceptibility on the part of certain individuals to be thrown into epileptic convulsions through the application of some forms of matter to the nasal mucous membrane, seems to have been familiar from the earliest times. We learn from Aretæus, for example, that the gagate stone (a species of hard coal or jet) was utilized by the ancients as a test for epilepsy: for when applied to the nostrils the sufferer was thrown into epileptiform convulsions. Pliny also alludes to this test and to the power of the smell arising from burning goat's horns or deer's antlers in accomplishing the same result. According to him, the secundines of a she-ass, placed under the nostrils, will effectively dispel the fit. It is also a curious fact that, among the ancients, Avicenna regarded sneezing itself as a mild form of epilepsy (*epilepsia levis*), and that a similar opinion was entertained long afterward by the learned Fernelius. In the seventeenth century Salmuth called attention to the fact that paroxysms of epilepsy are often resolved by the eruption of blood from the nose. Several centuries ago it seems to have been an accepted fact that the odor of, or emanation from, certain plants, notably the rue, are capable of provoking attacks. Schenck, of Grafenberg, on the other hand, relates the case of a rustic who was delivered from the disease by the odor of the *ruta sylvestris*. The relation of odors to epi-

lepsy was also discussed by Van Helmont, who explained the relationship by the doctrine of the Archæus, the fantastic theory with which his name is inseparably linked in medical history. Portal, too, in the early part of the century just gone, refers to the relationship and quotes a case cured by the fumes of cinnabar given with other intention.

In regard to the closing remarks of the author of the paper, it is also an interesting fact that the influence exerted upon the mental faculties and general health and the incapacity for vigorous intellectual endeavor wrought by catarrhal affections seem also to have been fully recognized by the ancients. The Greek verb *κορυζᾶω* (to have a coryza) signified in a figurative sense to be dull or stupid. Cicero alluded to the heavy feeling or depression following catarrh, and Horace exclaims that the philosopher is the king of kings until his catarrh begins to trouble him.

Dr. A. W. Watson, of Philadelphia, mentioned a case coming under his notice some years ago. A boy about 15 years of age, who had the milder form of epilepsy, was referred to him by a neurologist of Philadelphia. Examination of the nose revealed an atrophic rhinitis with crusts. As the result of treatment the nose was kept clean for a long time, six months or more, and during this period the patient was entirely free from epileptic attacks. Afterwards the boy neglected his nose and failed to report for treatment, but later again came under observation on account of a return of the seizures. Again after cleansing of the nose the attacks ceased. In this case the aura was referred to the left side of the nose, and on examination a hard crust was always found at a corresponding point inside.

Dr. A. W. DE ROALDES spoke of a case in which he had had occasion to extract a small pebble from the ear of a man. This had been wholly forgotten by the patient, but on seeing the foreign body he recalled the fact that he had put it in his ear fourteen years previously. He had been subject to epileptiform attacks at irregular intervals. After the removal of the pebble he had remained a year without an attack, and had only had two such seizures since then. It would be interesting to know whether epileptic seizures had been retarded or cut short in other instances after the removal of a foreign body from the ear.

Dr. ROE, in closing, said that he had been much interested in the discussion that had been brought out and particularly in the learned and lucid remarks by Dr. Mackenzie, showing the interest manifested by the ancients in the manifestations of this obscure and interesting affection.

With reference to the institution for epileptics, Dr. Roe said a great mistake is made in overlooking or neglecting to investigate more thoroughly the many local conditions that are so frequently found to excite general epileptiform manifestations.

*Paper.*

## THE TREATMENT OF NASO-PHARYNGEAL FIBROMATA.

BY D. BRYSON DELAVAN, M.D.

To the late Rufus P. Lincoln belongs the credit of having introduced into this country a surgical procedure of great value. I refer to the application of electricity, for the removal of various new growths of the nasal and the naso-pharyngeal region, first practically suggested by Voltolini and Michel. Before the appearance of Voltolini's article the universal custom had been, not to extirpate these growths through the nasal passages, but to perform what was called a "preliminary operation," by means of which more or less free access could be gained to the site of the tumor. Many distinguished French surgeons, as well as others, have devised original operations for this purpose, the procedures varying from a simple splitting of the soft palate, up to resection of the hard palate, and even to complete extirpation of the superior maxillary bone. It will readily be seen that the preliminary operation was a severe measure, dealing as it did with highly important anatomical structures, the latter peculiarly rich in blood supply, and located at the very center of the most important ganglia of the nervous system. Such an operation in itself was enough to produce much shock and loss of blood. The actual removal of the growth was a matter of proverbial difficulty and danger, while the means used for its extraction were often crude, and the extreme vascularity of the tumor itself frequently gave rise to hemorrhage so sudden, violent and uncontrollable, as to cause the patient to die upon the table. Anyone who has witnessed many such operations of the surgeons of fifteen or more years ago, will recognize the truth of the above. If the patient recovered from the immediate effect of the operation, he was apt to succumb to secondary complications and at the best recovery was slow.

HISTORICAL SUMMARY.—Operation for the removal of naso-pharyngeal tumors dates back to the beginning of the eighteenth century and was then practised by Manne, followed by Morand, Nannoni and others. Many cases were reported during the cen-

tury, removed both by the natural passages and by splitting the soft palate.

In the nineteenth century surgeons began to go through bony tissue. Syme resected the upper jaw in 1832. Flaubert did the same in 1840. Nelaton resected the hard palate. Many cases followed in which there was practised preliminary resection of the nose and superior maxilla, by Chassaignac, Langenbeck, Huguier, Demarquay and Ollier.

These operations were frequently unsuccessful.

Nelaton also introduced electrolysis, and was followed by others.

In 1836 Koehler, of Warsaw, removed a very large tumor by ligature, and in 1858 another with the galvano-caustic snare. And then Paul Le Brun operated by resection of the nose in 1864. In the same year Maisonneuve split the soft palate without injuring the uvula. Mickulicz reported two cases in 1883 by Gussenbauer's method. In 1884 Rydygier described all the known methods. All the foregoing, beginning with Koehler were published in Polish, including a case by Baracz, in 1888.

Modifications of the above mentioned operations have been devised by Adelman, Dolbeau, Guyon, Vallet, Pean, Roux, Anandale and others.

In 1878 Bensch, representing Vollolini, collected the notes of ninety-four cases. Elsewhere the authors speak of 124 cases.

In 1891 Hansberg (*Monatsch für Ohrenheilkunde*) reported the case of a large mass removed in five sittings with Kühn's forceps.

Fatal cases following curettage have been cited by Deguise, Verneuil and Dumenil.

Dieffenbach successfully cut away these tumors with a curved knife.

Albert Stromeyer and König made use of wire snares.

Bruns removed hard fibromata by electrolysis, using in one case 130 applications. In an inaugural dissertation by Meggi, 1891, a series of 32 fibromata was cited, (originally by Groenbeck) 17 of which were cured by electrolysis.

Fortunately the introduction of the rules of asepsis, improved surgical technique, and more skillful after care, have eliminated many dangers from these cases, and the decrease in the mortality attending them has in recent years been very great. The mutila-

tion finally resulting from the preliminary operation however was and still continues to be another serious objection to its employment. Even in cases where no actual loss of important parts was incurred, healing was accompanied by the development of deforming scars, by the injury of valuable muscles and nerves and the impairment of various useful functions. In the excitement of the operation itself, the obscuration of the base of the growth by blood and by defective illumination and the urgent necessity for rapid work, thorough removal of the diseased tissue was difficult. Recurrences, therefore, were frequent.

With the high rates of mortality from these operations we are not surprised to find that relatively few of them have been placed on record.

That the preliminary operation was sometimes performed unnecessarily has been often proved. It was in some cases moreover particularly clumsy in conception.

The chief aim of the Voltolini method was to do away with the highly objectionable preliminary operation. Incidentally, however, several other advantages of importance to the success of the operation were gained. Its principal features may be summarized as follows:

(1) Departing entirely from former usage Voltolini reached the site of the tumor through the natural passages.

(2) In suitable cases his first attempt was to reduce the size and vascularity of the growth by means of electrolysis, applied as near as possible at its base.

(3) In finally removing the growth, he surrounded its base with the loop of a galvano-caustic ecraseur.

(4) He succeeded in causing the loop of the ecraseur to pass in all cases entirely through the base of the growth, controlling its progress at will.

(5) By the use of the incandescent wire, properly regulated, hemorrhage was in many cases absolutely done away with. Where it occurred the amount of blood lost was trivial.

(6) The cauterant action of the loop was not limited to the tumor itself. The base of the growth was deeply affected by it, and remnants of diseased tissue so completely destroyed as in many cases to render its removal radical and complete.

The advantages of the operation above described are obvious and most important.



(1) The dangerous preliminary operation was made unnecessary. The patient was therefore saved the shock and hemorrhage resulting from it, and, during the performance of the operation, the surgeon was saved much loss of valuable time to the patient and the expenditure of energy and responsibility to himself.

The secondary and the ultimate results of the preliminary operation were abolished and, what was of great importance, subsequent local treatment of the base of the growth was, if necessary, made easily possible through the natural passages. Hitherto recurrence had in many cases required a repetition of the preliminary operation, with all of its distressing effects upon a patient already demoralized by disease, by suffering and by the disappointment of former failure.

(2) Instead of tearing away piecemeal, or otherwise forcible removing the tumor through the natural passages as at present practised by Doyen and other French surgeons, the galvanocautic loop was carried to its base, and thus the least amount of injury was done the growth itself, while the division of the pedicle was effected as near as possible to healthy tissue. This point is important when the vascularity of the growths in question on the one hand, and their tendency to recurrence on the other is remembered. While excellent final results have been gained through the natural passages by the process of evulsion, by forceps or by removal with the curette or the cold snare, it is expressly stated in a number of reports of such operations that "hemorrhage was severe." My own experience corroborates this.

(3) By reason of the large amounts of fibrous tissue contained in the growths under discussion their division is a matter of peculiar difficulty. The ordinary cold wire loop is commonly of insufficient strength to pass through them, while the ecraseurs of the type used for ordinary nasal operations are not to be considered. The attempted use of such inadequate means will generally be followed either by breaking of the wire, refusal of the screw of the instrument to advance, or by severe injury to the ecraseur itself. When the latter consists in splitting of the end of the cannula by the wire the situation becomes one of serious danger to the patient, as the advance of the screw causes the free end of the cannula to be thrust indefinitely forward, to the peril of the adjacent parts.

In view of the above facts, it would appear that in comparison with former methods, Voltolini's is theoretically ideal.

While the method of Voltolini is adapted in certain cases to the removal of several other types of growths it is especially valuable in the treatment of fibromata.

In order to fully appreciate the necessities in attempted extirpation of naso-pharyngeal fibromata, it is essential that the characteristics of this growth be thoroughly understood. Such a tumor may arise from any part of the upper and posterior walls of the pharyngeal cavity. This area includes the base of the skull and the anterior surface of the cervical vertebrae. The favorite point of attachment appears to be at the base of the skull. The tumors are commonly pedunculated, but the pedicle is likely to be of considerable size. Most important of all, the latter is not attached to the soft parts, but is firmly incorporated with the periosteum and the bone. The substance of the tumor itself is very rich in fibrous tissue. In consequence of this, two especial difficulties are encountered in its removal. First, as with all fibromata, it is not only vascular, but the vessels when cut close with difficulty and serious bleeding is apt to result. Secondly, the substance of the growth is excessively dense, so much indeed that ordinary instruments are not strong enough to divide it. The peculiarity of its attachment also is such as to demand extraordinary thoroughness in its removal. The method introduced by Voltolini and Michel consists essentially first in attempts to reduce the volume of the growth and to cut off as much as possible of its blood supply by electrolysis: subsequently to remove the mass, either by evulsion with strong forceps, or by means of the galvano-caustic snare. The latter method is in most cases undoubtedly best.

With regard to electrolysis there are two ways by which it may be applied: First, by the unipolar method. Second, by the bipolar method. In the use of the unipolar method, progress is slow, and the application of the electrolytic current is apt to be painful. Patients sometimes suffer severely from it. The bipolar method is less painful to the patient, and more rapid and positive in its destructive effects, although its use is also attended with considerable pain. Küttner and others recommend a current of decided strength, namely from 80 to 340 milleampères.

In my own experience such a current as the latter has been far too powerful nor do I see how it could be endured by the ma-

jority of patients without the use of a general anesthetic. If the growth of the tumor has been sufficiently slow to warrant a little delay, the electrolytic treatment should be employed in order to gain the results which are so much to be desired from it. As long as its application is evidently being attended with success in the direction of reducing the size of the mass, it should be continued, at least to a point where a maximum amount of shrinkage has been secured; following this the growth should be removed by the incandescent loop as already stated. The number of applications of the electrolytic needles required to effect a cure will vary, not only with the dimensions of the growth, but with its histological character, the disparity between certain cases being remarkable.

The advantage of the cautery loop over the cold wire snare is evident, and lies in the fact that notwithstanding the toughness of the fibrous tissue through which the wire must pass it can be made to progress at the will of the operator. If the proper degree of heat is applied, bleeding is almost sure to be prevented. In view of this, care must be taken not to allow the snare to become too hot. It should be kept at such a temperature, that it will make its way slowly and steadily through the base of the growth.

The shock of this operation is almost nothing. Following the removal of the growth the site must be carefully watched, and all remaining fibrous tissue removed with the galvanic cautery, or by electrolysis, and great care taken that the slightest sign of recurrence be immediately recognized and treated.

In the attachment of the snare to the pedicle the exercise of great ingenuity is possible, and various devices have been suggested to aid in the performance of this somewhat difficult manœuvre. Upon the skillful and accurate adjustment of the loop to the base of the growth a considerable portion of the success of the operation will of course depend. When the tumor is easily reached and the growth is a single pear-shaped mass, very little trouble will be experienced. But in cases of a more complex nature, where the base is large and where excessive prolongations have taken place into the nasal cavities and the adjacent sinuses, encircling the pedicle with the wire may be almost impossible. Even in such cases however the exercise of great judgment and skill in the application of this method have produced brilliant results.

While to Voltolini belongs the credit of having brought this procedure prominently before the surgical world it is to Dr. Lin-

coln that we not only owe its practical introduction to this country, but also the perfecting of methods and the suggesting of new means and devices which place him high among authorities in this department.

It is unfortunate that the results of this work have not been fully appreciated by the surgical profession even to-day. The appearance of the first published cases was greeted with incredulity, and the method with outspoken opposition.

For some time past it has been apparent that the method of Voltolini was not receiving due attention.

In order to place the question fairly before the surgical world, and to settle its merits upon the basis of actual fact it has been my desire to make a summarized account of all available cases operated upon by both methods, old and new, with the intention of establishing distinctly their relative value and of securing for the new system its true position in surgery.

Entering upon the work with the full expectation of easily securing a fairly complete summary I have been surprised and disappointed at the result, and instead of presenting a series of complete and final deductions the material will be found to be far from satisfactory.

In studying this department of the subject several reasons will be apparent why no reliable statistics of operation in nasopharyngeal tumors have already been published. Thus, notwithstanding a somewhat extensive literature, it does not appear that any author has collected and tabulated all the reported cases, even for limited periods of time, excepting Lincoln, whose classic article published in these transactions in 1886 gives the histories of 74 carefully reported cases, together with a general summary of them.

Bensch, in 1878 found 124 cases definitely reported; he makes no attempt to tabulate this material from the point of view of treatment and permanent results: and since his day no one apparently has either collected the statistics anew, or tried to build on his foundation. Occasionally a series of cases is published to illustrate the results of some special method of treatment. The most pretentious, as far as we know, being that of Normand in 1893, who collected notes of thirty-seven cases of electrolytic treatment, with 62 per cent. permanent cures.

The reasons for the neglect under which this subject suffers

at the hands of the statistician, are not difficult to surmise. A number may be cited.

There is a natural difficulty in deciding as to the nature of the subject matter. In the narrow sense of the term, a naso-pharyngeal tumor is one that takes its origin from the basilar apophysis of the skull. At least this seems to be the type. But upon reviewing the cases, the tumors described appear to have a very promiscuous origin, many having been simple nasal polypi at the start, while others originate in the pterygoid fossa, from the upper cervical vertebræ, and indeed from every conceivable locality in the neighborhood of the naso-pharynx, from which they encroach upon the latter. While these various growths may be clinically the same in their local and general effects, there must necessarily be a wide difference in the manner of treatment, since it is the pedicle which must be attacked.

oscopy and intranasal surgery than formerly. The older generations of operators had to guess at the locality of the pedicle, and the numerous barbarous methods of intervention were based apparently upon a desire to discover it at all hazards. But even to-day it would perhaps be illogical to tabulate in the same series tumors which originate in so many different localities. Lincoln and others have radically cured growths which originated far to the side of the median line, invading the cavities of one side of the face, and producing unilateral external deformity, by simple division and treatment of the pedicle. In any case it would not be very instructive to compare the resections of the old surgeons with modern rhinological methods, however just a comparison might have been between old direct and indirect methods. Electrolysis and other methods were successfully performed by Nelaton and others before the day of rhinoscopy, but we note that the palate was often divided to insert the needles. Since rhinoscopy not only favored the application of instruments to the pedicle, and enabled the operator to locate the latter, but also provided for early diagnosis of tumors before they had attained such immense dimensions, it appears advisable to discard all cases for statistical purposes found in the pre-rhinoscopic period. However, it is by no means easy to state just when this epoch occurred.

Mackenzie, writing in 1884, announced his belief that a "new era was at hand in the treatment of these growths." The general



use of the rhinoscope and the electric cautery would largely do away with the severe "preliminary operation" of the past.

Lincoln is mentioned as a pioneer of the new method.

Other objections to comparisons between old and new methods lie in the fact that the former prevailed in pre-antiseptic days, Listerism coming into use at about the same time as rhinoscopic surgery. Since there has been some reaction against operating by the natural passages, certain operators like Annandale having gone back to the artificial route, there would appear to be abundant opportunity for comparison between recent series of cases.

(2) An equally valid obstacle to wholesale statistics in this field is the quality of the tumor, which varies so extensively, and the difficulty of forming criteria between dangerous and innocent growths. Formerly recurrence was so feared that the wound was often left open for a time. Yet some authors assure us that malignance does not lie in recurrence. An innocent tumor may reproduce itself repeatedly. The real danger lies in the fact that the tumor may attain a sufficient size to compress important

This question is less significant in these days of expert rhinstructures. We often read of cases of very large tumors in which only sufficient tissue was cut away to relieve the patient's symptoms, yet there was no attempt at recrudescence of the stump. When an undoubted sarcoma is invading the tissues from the region of the naso-pharynx, resection of the face would perhaps be the indication of choice; yet prior to operation a diagnosis is not always possible.

These two elements, the great variety in origin and the diversity in the nature of the tumors have doubtless conspired to prevent the collection of wholesale statistics.

(3) A third element which also goes far to invalidate statistics is the scanty information as to permanent results. Nowhere do we find that even a small number of cases have been systematically followed up for several years.

In the modern study of cancer of the uterus and larynx, the greatest pains have been taken to determine the degree of permanence of results. The reverse is true of naso-pharyngeal tumors. Statistics which give no hint of final results are of course useless.

(4) A fourth element, which doubtless has discouraged the attempt to collect and tabulate cases, is the vast number of unreported operations which have been performed for these tumors.

While Bensch only had full notes of 124 cases, he knew that this figure was absurdly small. According to him, Dzondi alone had operated 40 times, and Wutzer had to his credit a series of 20 resections of the face or palate. "No surgeon of any prominence but had operated at least several times," it was said by Nelaton. In the face of this multitude of cases, it would seem hardly worth while to make a table of a few observations.

(5) The great number of different methods of operation which have been done for these tumors tends to interfere with statistics. In general, this law holds good in surgery. Where there are a dozen different methods for doing the same thing it weakens statistics: as in cancer of the rectum, where a dozen or more plans of operating make statistics of little value.

(6) Again, many of the cases reported in the last twenty years are only to be found in remote theses and provincial journals which do not come into general circulation. To get complete statistics, these publications must be procured and studied.

In what is virtually a pioneer attempt to collect statistics in this field, it has been difficult to decide as to criteria.

With regard to the period covered, the absence of any foundation to build upon, has made it expedient to begin at the present day and proceed backwards. Our studies have thus far covered but one decennium; namely, the space between 1891 and 1901. A small number of cases in this statistical material were operated upon before 1891, but published after that date; but a far greater number operated upon since 1891, have been unavailable for one reason or another; so that the total number of cases collected—in round numbers 120—is certainly not too large, and, in fact, might have been greatly increased by personal correspondence, and by including cases alluded to in series. Thus, Dr. Ingals speaks of "eight cases in which he used Lincoln's method with good results," and similar general statements are sufficiently common. Naturally, we have used only material which has been accompanied in some way, by personal data, description of tumor, etc., so that the said material could be available for tabulation. Any other course would only make possible repetition of cases a source of fallacy.

As to the character of the tumor it was found to be well nigh impossible to draw a hard and fast line for statistical purposes. On one hand, we sought to exclude all cases of myxoma

which were derived from the nasal mucosa. The same with highly malignant growths, concerning the precise origin of which no definite data could be determined.

We sought to restrict the material, as far as possible, to tumors which arose from or very near to the base of the skull. And many apparently typical growths were excluded because of origin from the turbinates, pterygoid fossa, etc.

On the other hand, the conception of the so-called typical basilar fibroma, firm, with broad base and frequently presenting secondary adhesions, almost peculiar to young males, was found to be too narrow for a statistical criterion; because such growths occur undoubtedly at all times of life, and in females as well as males. Soft tumors, with slender pedicle, may originate from the vault of the pharynx as well as from the nasal fossæ, and while their removal may be a task of the simplest character, they may contain a recurrent or sarcomatous element which would not sanction their exclusion from the category of pernicious growths.

It is not difficult to perceive that our standards must necessarily be arbitrary.

In the material thus far compiled, we find records of 70 cases operated upon by the natural passages, and 45 by artificial routes. Since the cases are nominally compiled to determine something as to the relative advantages of the direct and indirect methods of operations, it may be contended that many of these 70 cases of direct route, intervention could not have been serious enough to make a choice of routes necessary. But in theory, not many surgeons would take the trouble to report a case of simple forceps extraction of a finely pedunculated tumor of the naso-pharynx, and, in fact, we find few such simple cases in our notes, not more than 5 of the 70 cases of intervention by natural passages. In 2 of these cases the tumors were very large, but came away accidentally upon being grasped with forceps, to the surprise of the operators.

This proportion of cases of easily removable growths, say ten per cent. at the most, is more than offset by the fact that in several of the operations by artificial passages, the tumor was of insignificant dimensions; while on the other hand, several others were of such character that the most radical intervention was doubtless justifiable. All in all, it appears to be putting it conservatively to state that, all things being equal, at least 5

operations by natural passages are performed to 3 of the more radical species; and this in view of the fact that not much technical skill is required to operate artificially, while both ingenuity and dexterity are required for intervention by the natural route.

If the natural route is displacing the artificial for the same conditions, the question arises, "why has it not more completely supplanted it?" This question is partly answered by statistics. In the first place, the French surgeons have shown an extraordinary conservation in adhering to the traditional methods of Chassaignac, Ollier, Verneuil, and others. During the past decade, not less than 13 cases have been reported in which Parisian surgeons of the most progressive type, including Quenn, Tuffier, and others, have practiced resection of the palate or face for naso-pharyngeal growths of only moderate severity. A Russian surgeon has, during the same period, practiced Ollier's resection of the nose for the same class of cases no less than seven times. These 20 cases represent almost one-half of the material we have compiled. In all these 20 cases the artificial route appears to have been adopted, not from choice or necessity, but purely from tradition or custom. The patients thus operated upon were presumably peasants in whom facial deformity was not a matter of relative importance.

Since Doyen adopted the natural route several years ago, not less than a dozen cases have been reported by French surgeons in which this author's method has brought about the removal of serious growths of the naso-pharyngeal region. The series of cases operated upon by Doyen and his followers, is certainly on a par in regard to seriousness with the cases of preliminary resection practiced by Picquet, Berger, Verneuil, Tuffier, Quenn, Calot, and others, while the ultimate results are at least as good.

The distinct disadvantages of Doyen's method as compared with Voltolini's have already been alluded to.

The remaining 25 cases of operations by artificial route (after eliminating 20 cases in which tradition furnished the only motive for resection), teach but little. In a certain number there appears to have been no especial reason for selecting the artificial route except precedent—as in 2 cases which were operated on in India. It might be safe to state that of the 45 "preliminary operations" for naso-pharyngeal fibromata, etc., no less than 30, or two-thirds, were undertaken on purely traditional grounds, there being no

evidence that any choice was made between the direct and the indirect method.

In the remaining cases, there may have been some apparently valid reason for electing to operate by an artificial route. Either the particular patient had had an unfavorable experience with the direct method, and was willing to submit to the more radical intervention, or the operator himself had decided that the natural route did not give sufficient access. Thus, at the meeting of the American Laryngological Association for 1896, three or four of the members appeared to be considerably discouraged by their results with the natural route. They expressed themselves in this vein at about the same time that Doyen had come to the conclusion that "he had never seen a naso-pharyngeal growth that could not be removed by the natural route." These inverted views expressed by the specialist on the one hand, and general surgeon on the other, show the perplexity inherent in the subject. Both views are reactionary, for the general surgeon would naturally favor preliminary operation in selected cases, while the rhinologist would not.

In reviewing our tables, the truth of the statements already made regarding the statistics of this subject will be apparent. Altogether the most striking fact which they convey is, that in the reporting of cases, even the most eminent surgeons are often guilty of great carelessness. In the series before us this feature is a lamentable one. From the cases here tabulated, much might have been learned if each operator had clearly stated the whole truth.

Moreover, such statements as:

"Operation successful."

"Patient made good recovery."

"Well in two weeks."

"Scar imperceptible."

"Results excellent."

and the like, not only teach nothing as to the ultimate outcome of the case, but lay the reporter open to at least a suspicion of doubt as to his good faith. For, unfortunately, there seems to be an inevitable tendency to the suppression of bad results. The published cases, taken as they occur scattered here and there in literature, are apt to represent the better side of a given operation. How many failures the reporter may have had he does



not state and it seems to be requiring too much to expect that he will.

The disease, naso-pharyngeal fibroma, is relatively rare. In the aggregate, however, a large number of patients have been operated upon it in all parts of the civilized world, and our leading surgeons have it in their power to publish collections of cases, the combined results of which would be of the highest value. The same is true of the surgeons of other countries, notably of England.

It is probable that no man of the present time has done so much to perpetuate the older principles of operation than Mr. Annandale. A number of years have elapsed since his method was first proposed, and so many surgeons have become his ardent followers, that cases complete as to history, must have been accumulated in sufficient quantity to offer substantial proof as to its value. It is impossible ever to establish the truth until all of the facts are at hand. But as it is chimerical to hope that all operators will report all of their cases, the only safe course for the statistician would seem to lie in the suggestion that in dealing with this work only the operations of men who have reported all of their cases, good and bad alike, should be considered.

Whatever else may be shown by our statistics, they certainly prove that even the most severe cases clinically are amenable to treatment by the natural passages. In support of this statement, the late Dr. Stokes, of Ireland, in discussing a case in which a large tumor had been removed by the above method, said: "Some years ago, a growth of this sort would have been removed only after serious intervention." Doyen says: "I have never seen a naso-pharyngeal fibroma which could not be removed through the natural passages." Certainly, no testimony could be stronger than this latter statement, coming as it does from a Parisian, a thorough surgeon, and a man of exceptional experience.

It may justly be said that since the days of the older French surgeons, great advances have been made in surgical technique, and that operations then dangerous and severe have been deprived of most of their terrors: that antiseptic, better methods of operation, and of after-care, have vastly improved the percentage of success in this particular class of cases.

The statistic of twenty years ago show a much higher rate

of mortality than those of to-day. The statistics of operation through the natural passages, however, show practically no mortality at all.

Even if the results of preliminary intervention were to become equally good with those obtained by the method of Doyen, the latter would still have far greater advantage in that by it, preliminary operation is altogether avoided. What shall be said of the pre-eminent value of the Voltolini method, by which the disadvantages of both the ancient method and that of Doyen are completely overcome? The theoretical advantages of the Voltolini method are obvious, and its absolute superiority would be established if it were proved equally successful with other plans of treatment. As a matter of fact, our statistics show it to be actually superior. Why then, have the electrical methods not become more universally accepted, in view of their brilliant practical results?

Several possible explanations may be given in answer to this question, somewhere among which the truth is likely to be found. (1) Adherence to tradition. This begets in the surgeon an unwillingness to accept innovation, partly through a conscientious desire to deal as far as possible with certainties in the management of his patient, avoiding on the one hand the appearance of rashness, and on the other employing the means with which he is the most familiar, and partly through a genuine and sometimes unfortunate lack of personal independence. Thus the pupils of many of the originators of special surgical procedures have too often been content to follow their distinguished leader, without the fair exercise of their own good judgment, thus retarding true scientific progress.

(2) There can be no question that, in the successful management of the electrical method, the operator must possess an extraordinary degree of special skill. Moreover, he must not only be most expert in the manipulation of the instruments used in the nasal and pharyngeal cavities, but also an accomplished surgeon and a good anatomist. The success obtained by Voltolini and Lincoln was doubtless largely due to their unexampled dexterity as well as to their possession of the other qualifications mentioned.

(3) General unfamiliarity with electrical therapeutics is another reason why Voltolini's views were not at first received with greater enthusiasm, and while the knowledge of this department

of science has in recent years become widely diffused, the teachings of Voltolini have meanwhile passed from public view.

(4) In certain cases it has been found difficult to gain the patients continued approval of electrolysis, both by reason of the pain caused by it (No. 47, II.), and by the occasional slowness of its action (No. 8, 22, II.). While general anæsthesia in every way facilitates the removal of a growth by means of the galvanocaustic loop, in the application of electrolysis it has not generally been employed. In the experience of myself and many others this objection has sometimes proved a serious one.

The discovery of a relatively painless method of applying electrolysis is very desirable.

It will be noted that in the number of electrolytic applications required to effect a cure, great disparity exists (Nos. 6, 7, and 8, 22, II.). This may be due (1) to the peculiar structure of the growth as well as to its relative size. (2) To the manner in which the electrical current is applied. More careful observations are needed to show under what conditions of vascularity and development of the growth the method is likely to prove most successful. The same is true with regard to the technical management of the current. In the recording of successful cases, the details of this feature cannot be too minutely and fully set down.

Our tables show that the average age is 18.5 years and that 82.5 per cent. are males. The greatest age found is sixty years, while of six cases over forty years old four were women.

The universal experience with regard to naso-pharyngeal fibromata is to the effect that these growths are most commonly found in adolescent boys; also, that they show a predisposition to increase in size, or to recur for a certain period of time, after which their tendency is to disappear.

To a far less degree the same is true of certain growths of the sarcomatous type occurring in similar subjects. It has more than once been found that such growths, having several times recurred and been operated upon, have at last ceased to reproduce themselves. In certain cases, therefore, the best judgment seems to indicate that, as long as the progress of the development of the growth is being controlled, the general condition of the patient meanwhile not being seriously affected, radical surgical measures for the removal of the tumor are not called for.

The younger the patient the longer the time in which the

tumor is likely to increase in size. The larger the growth, the greater the obstruction and injury it may cause. The more vascular, the greater the tendency to the frequent and severe bleedings which are characteristic of it.

The older the patient, other things being equal, the greater his power of resistance and the larger the diameters of the cavities containing the diseased mass.

Prompt interference, therefore, would seem to be indicated in young subjects in whom a vascular growth, given to serious attacks of bleeding and causing symptoms of obstruction and pressure, is evidently increasing in size or showing persistence in other objectionable features.

Since there can be no question that these growths have spontaneously disappeared in early manhood, advantage may be taken in suitable cases of this fact to the effect of postponing severe measures or of selecting the less radical procedures in the event of treatment being undertaken. Continued improvement under treatment in a patient approaching the end of the progressive period of the disease is often equivalent to actual cure. Even if recurrence should take place, the relative mildness of the disease and the reliability of the galvano-electric treatment places the patient in the best possible position for relief.

The acceptance of this fact would greatly improve the statistics of the Voltolini method, for if to the thirty-eight cases could be added the cases improved as, under the circumstances of the improvement it would seem fair to do, we find a result of 96 *per cent.*

Since the preparation of our tables we have found the article of Naab (*Beitrag zur Klin. Chirur.*, 1898) in which he reports five cases operated upon in Czerney's Clinic by old-fashioned, severe methods, with one death. This would materially change our statistics, but would not affect the proposition that such severe measures are uncalled for.

Finally, in preparing the tables the matter has been presented as nearly as possible as found in the original records, in the hope that the exhibition which it gives of bad history writing might be a spur to greater accuracy in this direction.

TABLE NO. I. OPERATIONS: PRELIMINARY INTERVENTION.

Case	Author.	Reference.	Sex	Age	Diagnosis.	Treatment.	Result.	Remarks.
1	Picquet.	Soc. de Chir., '94, xx., 807.			Fibr.	Resect. pal.	Recur.	Second hem. Later cured by Galv.-Caut.
2	"	" " " "			"	" "		
3	"	" " " " " "			Sar.	" sup. max.		
4	"	Bull. Med., '93, 355.	M	17	Tumor at base of skull.	Trach.		
5	Verneuil.	Soc. de Chir., '94, xxx., 06	"	11	Fibr.	Resect. sup. max.	C.	Tumor very vascular. Well at 2 yrs.
6	"	" " " "	"	20	"	Resect. sup. max.	C.	Operated side of face did not attain full development. Much permanent disfigurement.
7	"	Bull. Med., '93, 355.	"	20	"	Resect. pal.		
8	Nelaton.	Soc. de Chir., '94.	"	14	"	Galv.-caus. loop.		
9	Calot.	" " " " " "	"	20	"	" cautery.		
10	Guérin.	" " " " " "	"	20	"	Resect. pal.		
11	Tuffier.	" " " " " "	"	19	"	Galv.-caut.		
12	Quénu.	" " " " " "	"	30	"	" "		
13	V. Campenhout.	La Clinique, '92, 473.	F	16	" Soft tumor."	Resect. nose (Ollier).	Recur.	" Site of incision hardly visible."
14	Walsham.	St. Bart. Hosp. Rep., '92, 69.	M	12	Fibr.	" pal.	Recur.	Death.
15	Anandale.	Lancet, '94, 398.	"	22	?	" sup. max.		" Scar hardly perceptible."
16	Bowlby.	" " " " " "	"	19	Fibr.-Ang.	Lig. carot. Trach'y.		" Results excellent throughout."
17	"	" " " " " "	"	21	"	Resect. sup. max.		
18	Thomson.	Dublin Jour. Med. Sci., '94, 258.	"	15	" Growth naso-phar."	Div. soft pal.	C.	Well at 14 mos.
19	Wyeth.	N. Y. Med. Rec., June 1, '95.	"	"	" Vasc. tum."	Ecras'r.	C.	" "
						" Enucleation.		" "
						Resect. pal.		" Well at 14 mos.
						" sup. max.		" "
						lig. carot.		" "
						" nose.		" Excellent recovery."
						" facial bones.		





TABLE NO. II. OPERATIONS: NATURAL PASSAGES.

Case	Author.	Reference.	Sex	Age	Diagnosis.	Treatment.	Result.	Remarks.
1	Doyen.	Arch. Int. de Lar., '97, 250.	M	15	Fibr.	Eversion (Doyen's rasp.).	C	Naso-phar., nose and Max. Sin. involved.
2	"	" " " "	"	14	"	"		Hemor. severe.
3	"	" " " "	"	16	Fibr.-An.	"		D. "has never seen a naso-phar. fibr.; he could not extract thro' natural passages."
4	Delié.	Ann. des Mal. de l'or., '99, 333.	"		Fibr.	"		No details.
5	"	" " " "	"		"	"		"
6	"	" " " "	"		"	"		"
7	Lichtwitz.	Arch. Int. de Lar., '98.	F	20	"	Pedicle div. thro' nasal pass.	C	Well at 15 mos.
8	"	" " " "	M	16	"	Eversion (Lange's hook).	C	Well at 18 mos.
9	"	" " " "	F	30	"	" (forceps).	Imp.	Treated for 2 yrs.; not wholly removed.
10	Normand.	Arch. d'Elect. Med., '93, Vol. I	M	13	"	Electrolysis.	C	Cure complete.
11	"	" " " "	"	20	"	" (Bi-pol).	C	
12	Debatsieux.	Acad. Roy. de Med. Belg., '92, 228.	"	16	"	Doyen's meth.	C	
13	"	" " " "	"	14	"	"	C	
14	Wagnier.	Rev. de Lar.	F	23	"	Galv. caust. loop.		Well at 2 1/2 yrs.
15	"	" " " "	"	32	"	Eversion.	C	No details.
16	"	" " " "	"	9	Fibr.-Myx.	Galv. caust. loop.		"
17	Broca.	Gaz. Heb. de Med., '97, 37.	M	8	Myx.	Snare.		"
18	Boval.	Rev. de Lar., '92, 521.	"	20	Fibr.	Galv. caust. loop.		"
19	Capart.	Int. Cent. f. Lar., 1X., 520.	"	8	"	Electroly.		"
20	Chibret.	Cong. Fr. de Chir., '98, 12.	"	20	"	Galv. caust.	Recur.	
21	Frankel.	Deut. Med. Woch., '92, 505.	"	50	"	Forceps.	C	
22	Gaudier.	Echo Med. du Nord., '97, 339.	F	50	"	Curette.		
23	Isch.	Cong. Fr. de Chir., '97, 268.	M	13	"	Doyen's meth.		Secondary op. for recur, "Op. a success."
24	Jousset.	Echo Med. du Nord., '98, 128.	"	14	"	"	C	"Perfect result."
25	Rochet.	Gaz. des Hop., '97, 1322.	"	"	"	Eversion.		No details.
26	Booth.	Int. Clinics, '94, 339.	"	"	"	Snare.		"
27	Cheatham.	N.Y. St. Med. Rep., Feb., '95.	F	"	"	"		Op. a failure.
28	Casselberry.	Trans. Am. Lar. Ass'n, '96, 161.	"	"	"	"		No details.
29	Dunn.	Clinique, '96, 620.	"	50	"	Galv. caust. loop.		

30	Dunn.	Clinique, '96, 620.	M	21 Fibr.	Snare.	No details.
31	"	"	22 "	"	Forceps, Caut.	Recur. in 10 mos.
32	Ingals.	Int. Clinics, '91, 336.	"	39 Fibr.-Sar.	Curette.	Has op. 6 times similarly with good results.
33	"	"	"	"	Galv.-caust. loop.	
34	"	"	"	Fibr.	"	
35	Lincoln.	N. Y. Med. Jour., '96, 383.	"	11 "	"	Partly destroyed by inject. Lactic Ac.
36	Loeb.	" " " '94, 261.	"	19 Fibr.-An.	"	
37	Nann.	Ann. of Otol., '98, 291.	"	13 Fibr.	Voltolini's method.	Well at 4 yrs.
38	Nichols.	Jour. Oph. Ot. & Lar., '96, 13.	"	34 "	Electrolysis.	Final removal with scissors.
39	De Roaldes.	Tr. Am. Lar. Ass'n, '96, 102.	"	"	Evsulsion.	No details.
40	Shields.	"	"	"	Snare.	Failure.
41	"	N. Y. Med. Jour., '96, 354.	M	23 "	Galv.-Caut. loop.	Still under treat.
42	Street.	"	F	48 "	Electrolysis.	
43	Thorner.	Jour. Op. Ot. & Lar., '97, 74.	M	34 Fibr.-Myx.	Snare.	Weight of t. 1 1/2 oz.
44	Woodson.	Cin. Lancet Clin., '98, 363.	"	30 "	"	3 recurrences; t. then spontaneously disappeared.
45	"	Ala. Med. Age, '97, 257.	"	18 Fibr.	Galv.-caust. loop.	
46	Baumgarten	"	"	12 "	Snare and forceps.	Treatment refused because of pain.
47	Gerber.	Int. Cent. f. Lar., '95.	"	15 "	Electrolysis.	
48	Hausberg.	Deut. Med. Woch., '94, 116.	"	30 "	Forceps.	Remnant after op. spontan. disap. in 2 yrs.
49	Hirschberg.	Mon. f. Ohrenheil., '91, 46.	"	26 "	" Galv.-caust.	Well at 3 yrs.
50	Kijewski	" Lar., '95.	"	18 "	Snare; curette.	
51	and Woblewski.	"	F	13 "	"	Rem'd by snare 2 yrs. before. Recur. Final cure. Well at 5 yrs.
52	"	"	M	30 "	Forceps.	Well at 4 yrs.
53	"	"	"	24 "	Snare.	
54	"	"	"	50 "	Forceps.	Recur.
55	"	"	"	22 Sar.	Snare; forceps.	
56	"	"	"	65 Fibr.-Ad.	Curette; "	
57	"	"	"	20 Fibr.	"	Well at 5 yrs.
58	"	"	"	18 Sar.	"	Well at 7 mos.
59	Kittner.	"	"	12 Fibr.	Electrolysis. (25 ap.)	
60	Van Leyden.	Mon. f. Ohrenheil., '97, 456.	F	70 Sar.	Forceps.	Well at 2 yrs.
61	Kothenacker.	" " " 153.	"	28 Fibr.	"	Large t. removed thro' r. nasal pass.
62	Thudicum.	Lancet, '91, 246.	M	24 "	Galv.-caust.	Well at 3 yrs.
63	"	"	"	17 "	Galv.-caust. loop.	
64	"	"	"	16 "	"	
65	"	"	"	"	"	

TABLE NO. II. OPERATIONS; NATURAL PASSAGES.—(Continued.)

Author.	Reference.	Sex & Age	Diagnosis.	Treatment.	Result.	Remarks.
66 Thudicum.	Lancet, '91, 246.					
67 Shield.	Practitioner, '94.	F 36	Fibr.	Galv.-caust.	C	No details.
68 "	" "	M 29	Fibr.-Myx.	Curette.		"
69 McBride.	Med. Chron., '95, 340.	F 12	Fibr.	Snare.	C	Ped. very small.
70 Watson.	Pr. Lond. Med. Soc., '91, 444.	" 16	"	Forceps.	C	No details.
71 Woods.	Dub. Jour. Med. Sci., 94, 250.	M 24	"	" snare.		
72 Oldright.	Can. Pract., '92.	" 14	Fibr.-Myx.	Galv.-Caust. loop.		
73 Nihill.	Austr. Med. Jour.	" 25	"	Snare.		
74 Lincoln.	Unpub.	" 32	Fibr.-An. Sar.	Forceps; Galv.-caust.	C	Profuse hemor. No details.
						Unique examp. Two bros. Growths identical in histol., location and age of pt. at time of appearance. In case No. 74 hemor. severe.
75 "	"	" 32	Fibr.-Sar.	Snare;	C	
76 Smith, A. H.	"	" 17	Fibr.	Evulsion.	C	
77 Picquet.	Soc. de Chir., '94, xx., 807.	"	"	Galv.-caut.	C	See Case No. 1, Table I.

TABLE NO. III. CASES COLLECTED BY OTHERS.

	No.	Sex.	Age.	Diagnosis.	Treatment.	Result.	Remarks.
Personal Cases of Kijewski and Wroblewski, Prior to 1891.	1	M	20	Fibr.	Evulsion.	C	Profuse hemor.
	2	"	30	"	"	C	"
	3	"	24	"	Snare.	C	"
	4	"	18	"	Curette.	C	"
	5	"	12	"	"	C	"
	6	F	13	"	"	C	"
	7	"	43	"	"		
	8	M	25	"	Galv.-Caut. loop.		
	9	"	13	"	Radical operations.		
	10	"	65	Fibr.-Ad.	Evulsion.	D	Persist. recur. Final op. fatal.
	11	"	50	"	"		
	12	"	46	Ad.	Curette.	D	Recur.
	13	F	42	Sar.	"	D	"
	14	M	18	"	"		
	15	"	20	"	"	D	" Immediate result good."
Cases treated by Electrolysis. Collected by Normand. Arch d'Elect. Med., 1893, Vol. I.:	1	M	19	Fibr.	Electrolysis.	C	In 3 mos.
	2	"	"	"	"	C	In 8 mos.
	3	"	"	"	"	C	Still under treatment.
	4	"	"	"	"	I	In 9 mos.
	5	"	"	"	"	C	In 5 séances.
	6	"	1 1/2	"	"	C	In 6 "
	7	"	19	"	"	C	In 130 "
	8	"	30	"	"	C	In 10 "
	9	"	"	"	"	C	No result.
	10	"	"	Fibr.-Sar.	"		No details.
	11	"	"	Fibr.	"		In 3 mos.
	12	"	"	"	"	C	
	13	"	"	"	"	C	
	14	"	"	"	"	C	
	15	"	"	"	"	C	In 3 mos.
Reported by Nelaton.....	1	M	19	Fibr.	Electrolysis.	C	In 3 mos.
	2	"	"	"	"	C	In 8 mos.
	3	"	"	"	"	C	Still under treatment.
	4	"	"	"	"	I	In 9 mos.
	5	"	"	"	"	C	In 5 séances.
" Ciniselli.....	6	"	1 1/2	"	"	C	In 6 "
	7	"	19	"	"	C	In 130 "
	8	"	30	"	"	C	In 10 "
	9	"	"	"	"	C	No result.
	10	"	"	Fibr.-Sar.	"		No details.
" Guyon.....	11	"	"	Fibr.	"		In 3 mos.
	12	"	"	"	"	C	
	13	"	"	"	"	C	
	14	"	"	"	"	C	
	15	"	"	"	"	C	In 3 mos.
" De Rossi.....	1	M	19	Fibr.	Electrolysis.	C	In 3 mos.
	2	"	"	"	"	C	In 8 mos.
	3	"	"	"	"	C	Still under treatment.
	4	"	"	"	"	I	In 9 mos.
	5	"	"	"	"	C	In 5 séances.



TABLE NO. III. CASES COLLECTED BY OTHERS.—(Continued.)

	No.	Sex.	$\frac{d}{2}$ $\frac{S}{2}$ $\sqrt{V}$	Diagnosis.	Treatment.	Result.	Remarks.
Reported by Capart .....	16			Fibr.	Electroly.	C	Still under treatment.
"	17			Fibr.-Sar.	"		Failure. No result.
"	18			Fibr.	"		
"	19	M	19	"	"	C	In 53 séances.
"	20	"	18	"	"	C	In 31 "
"	21	"	19	"	"	C	In 90 "
"	22	"	18	"	"	C	In 47 "
"	23	"	20	"	"	C	Much improved.
"	24	"	8	"	"	I	"
"	25	"	18	"	Galv.-Caut. loop.	I	"
"	26	F	14	"	"		No details.
"	27	"	34	"	"		"
"	28	"	15	"	Electroly.; Galv.-Caut. loop.		Died from intercur. dis.
"	29			Fibr.-Sar.	"	C	
"	30	M	18	Fibr.	"	C	
"	31	"	20	"	"		
"	32	"	13	"	(Bi-po).	I	Greatly improved.

TABLE NO. IV. GENERAL SUMMARY OF TABLES I., II. AND III.

	Total Cases.	Minus Cases with results not given.	Complete histories.	Cured.	Imp.	Died.	Failure.	Hemor.	Recur.
By Preliminary operation....	30	—17	—13	7=54 per cent.		3=23 per cent.		3=23 per cent.	5=41 per cent.
By the Natural Passages....	48	—19	—29	25=86 "		25=52 per cent.		5=16.9 "	1=2 "
Surgical.....	48	—19	—29	25=86 "		25=52 per cent.		5=16.9 "	1=2 "
Electrical.....	85	—11	—47	45=96 "		1=2 "		1=2 "	1=2 "

TABLE VI. GENERAL SUMMARY OF OPERATIONS; NATURAL PASSAGES.

FIBROMA.					SARCOMA.					MISCELLANEOUS.					
	Cure.	Imp.	Fail.	N. R.	Total.	Cure.	Imp.	Fail.	N. R.	Total.		Cure.	Fail.	N. R.	Total.
Kijewski.....	5		1	3	9			3	3	6	Fibro-sarcoma .....	2	4	1	7
Normand.....	20	2		5	27			1		1	" Angioma.....	1		1	2
Delavan.....	32	2	2	23	59	2		1		3	Adenoma.....		1	2	3
											Fibro-Myxoma.....	1		4	5
Total.....	57	4	3	31	95	2		5	3	10		4	5	8	17

TABLE V. ANALYSIS OF METHODS.

	Total Cases.	Less Cases results not given.	Total complete histories.	Cured.	Improved.	Died.	Failure.	Hemorrhage.	Recurrence.
Resection palate.....	9	—3	=6	3				1	3
“ Sup. Max.....	10	—4	=6	4		2		1	1
“ nose.....	11	—10	=1			1		1	1
Total.....	30		13	7		3		3	5
Evulsion.....	27	—9	=18	16				3	
Cold Snare.....	21	—10	=11	9			2	2	
Total.....	48	—19	=29	25			2	5	
Electrolysis.....	34	—3	=31	23	7		1		
Galvano-Caut. loop.....	15	—8	=7	7					
“ with Electrolysis..	1	—0	=1	1					
Galvano-Caut.....	4	—0	=4	3					1
“ with Evulsion.....	4	—0	=4	4					
Total.....	58	—11	=47	38	7		1		1

With regard to the treatment of growths other than fibromata it must be confessed that the histories of those of a sarcomatous or of an adenomatous nature are not favorable. Not a few cases, on the other hand, have come under the writer's observation in which a cure has been effected without radical operation. These cases have without doubt been peculiar, and are not to be taken as contradicting the prevailing opinion that sarcoma is a dangerous growth and should be radically extirpated. The histological differences, however, between the appearances of inflammatory action in a fibroma and of true sarcoma have often misled the microscopist, while all sarcomata are by no means equally active and dangerous. In this particular department our statistics, although meagre, are highly suggestive.

### *Discussion.*

DR. A. W. DE ROALDES asked what the author meant by the

preliminary operation ; did he mean a surgical operation in contradistinction to the electrolytic current?

DR. H. L. SWAIN said that he was deeply interested in this paper because he now had under treatment a most difficult case, one in which it had been very hard for him to decide what was best to do. The speaker then exhibited a tumor which, he said, could hardly have been successfully treated by electrolysis, unless possibly over a period of many years. This tumor was large and calcareous in structure. The case brought out the necessity for various resources for the treatment of these cases. He had operated with Dr. Farlow's snare, and it had been very easy to put stout piano wire around the tumor, but the wire, both number 5 and 7, had promptly broken, and it had also torn out the sides of the tube which holds the wire. Dr. Verdi, who was assisting him, happened to have with him a strong pair of placental forceps. The palate was hooked forward, and then the growth grasped with the placental forceps and removed by twisting. A histological examination of the growth showed it to be made up almost wholly of calcareous matter, but without any bone cells.

DR. DELAVAN closed the discussion. He said that by the term "preliminary operation," he referred to such procedures as those of Annandale and others by which direct access to the site of the tumor was gained. There were two distinct electrical methods for reducing the size of the growths under discussion, one by electrolysis, and the other by the incandescent snare. What Voltolini and Michel and Lincoln had recommended, was both of these. The importance of the use of the galvano-caustic snare was urged by them ; first, because the dense tissues of which the fibroma was composed were successfully divided by it, and secondly, the cauterization prevented bleeding, a most important matter in these cases. The caustic action of the loop also destroyed a considerable part of the remnant of the growth after the body of it had been removed. He had been talking of a specific procedure, known as the *Voltolini method*, and was opposed, in general, to attempts at removing these growths with the cold wire snare. Dr. Lincoln was a man of pre-eminent ability as a surgeon, yet he had found it essential to success in certain instances to make use of the incandescent snare. The speaker hoped this method would be revived, and used in appropriate cases

*Paper.*ACUTE EDEMA OF THE UVULA, PALATE, PHARYNX  
AND EPIGLOTTIS, FOLLOWING THE EXCESSIVE  
APPLICATION OF ADRENAL SOLUTION, PRE-  
SERVED WITH CHLORETONE.

BY SOLOMON SOLIS COHEN, M.D., PHILADELPHIA.

THE following report of an isolated observation may be of interest, in view of the wide and increasing use of the various preparations of the adrenal gland; which, as one of the pioneers in these therapeutic applications I have employed freely and still employ freely with the confidence born of repeated demonstration.

Rev. Father X. has been under my care for a number of years for recurring attacks of asthma. The patient is stout and plethoric, although active mentally and physically. In addition to asthma he was troubled with hoarseness and, at times, difficulty in phonation. When first seen, examination of the heart revealed no structural change, but somewhat feeble action; examination of the lungs elicited the usual phenomena of spasmodic asthma; examination of the nose disclosed no significant abnormality of structure, but considerable general congestion and slight turgescence of the middle and lower turbinates. Examination of the larynx showed thyro-arytenoid paresis of slight degree, and what at first sight appeared to be two papillomata symmetrically located on the two vocal bands posteriorly at their insertions into the arytenoids. The larynx was congested throughout. Spraying with adrenal solution, made extemporaneously, reduced the congestion, and it was seen that the apparent papillomata were simply circumscribed, boggy relaxations of the mucous membrane. These retained their pink color, though the hue was of lessened intensity. The diagnosis was confirmed by Dr. J. Solis Cohen, who, later, saw the patient in consultation. Under treatment, which included appropriate general medication, the application of astringent solutions locally, faradaic applications over the larynx externally, and the use of adrenal extract internally, the patient improved rapidly. Recurrences of asthmatic paroxysms became less and less



frequent, the voice became stronger and clearer, complete approximation of the vocal bands was made, the protuberances having become much smaller and the right passing under the left in phonation. The patient, who had been working very hard, establishing a new school in his parish, in addition to his ordinary priestly duties, was advised to take a long vacation. He made a winter cruise to the Mediterranean regions, returning thoroughly well, except for the condition of his larynx. He was now placed under the care of a teacher of vocal exercise, and continued to improve in all respects except that after prolonged use of the voice in church services or upon pastoral visitations, and occasionally after exposure to cold and wet, the larynx would become intensely congested, and asthmatic symptoms would recur, though not with such severity as to warrant calling them attacks of asthma. In order to ward off such recurrences, the patient was given a solution of adrenal substance in glycerine and water, prepared by Mr. F. E. Morgan, the well-known pharmacist of Philadelphia, and instructed to use it as a spray, more or less constantly, preceding the spray of zinc sulphocarbolate in rosewater that he was using twice daily; which he did with good results. When Messrs. Parke, Davis & Company placed upon the market their solution of suprarenal substance preserved with chloretone, this was substituted for the glycerin extract formerly used. One night I was called in haste, being told that Father X. had a very severe attack of asthma and could scarcely get his breath. The appearance of the patient was different from that presented in ordinary attacks. The face was very much flushed, but dusky; the breathing was evidently painful, and there was slight inspiratory stridor; asthmatic râles were not evident, though the stridor made in the larynx was heard over the chest. Upon examination the uvula was seen to be swollen to about three times its ordinary size, evidently much distended with fluid. In color it was nearly white. The palate and half arches and a portion of the posterior wall of the pharynx were likewise markedly edematous, and there was slight edema of the epiglottis. The interior of the larynx, fortunately, was clear. The patient stated that he had gone through a period of very great use of the voice, that his throat and nose had begun to feel uncomfortable and that he had sprayed the pharynx and naso-pharynx very vigorously and for a prolonged period, possibly three or five minutes, with the suprarenal-chloretone

solution. No effect upon the heart seemed to have been caused by the application. The uvula and palate were scarified in several places, but little fluid exuded, and scarcely a drop of blood. It was not deemed necessary to scarify the epiglottis. The patient was advised to keep at rest, a drastic purge was given, and gargling with luke warm water aromatized with toilet vinegar was advised. In about an hour, whether spontaneously or otherwise, the edema began to subside sufficiently to permit of greater ease in breathing; if, indeed, the visible edema was the direct cause of the difficulty, and not merely an indication of a general condition of the respiratory mucous membrane, which subsided with it. In about an hour more the patient was feeling very comfortable, and I felt warranted in leaving him. Traces of the edema of the uvula were visible for three or four days later.

While I am of the opinion that the condition described was due to the effect upon the blood vessels of an overdose of suprarenal solution, and possibly to the concomitant influence of the chloretone, I have not felt justified in making any experiments to determine the point. The patient was instructed to go back to his old preparation, and to use it with moderation, since which time no further bad symptoms have occurred. The solution to which I have referred is not that of adrenalin chlorid now available, but the extract of suprarenal substance with chloretone which was previously placed upon the market. I have used the adrenalin chlorid solution as prepared by Messrs. Parke, Davis & Company with considerable satisfaction in the treatment of hay fever and other relaxing conditions, and in various strengths, from 1:1,000 to 1:5,000, and have observed no ill result either from this or from the chloretone accompanying it.

## NEW INSTRUMENTS, APPARATUS AND SPECIMENS.

DURING the sessions of the Congress the following New Instruments and Specimens were presented:

Dr. BIRKETT presented a transluminating instrument for simultaneous illumination of both frontal sinuses.

Dr. WAGNER presented a laryngeal forceps which had been made by a blacksmith living off in the mountains. The instrument was ingeniously constructed and was of considerable interest. Dr. Wagner also presented photographs representing some work done by his assistant in a research on the nature of cancer. These photographs showed certain bodies supposed by his assistant to be the amebæ of cancer. The investigator himself was now dying, having been infected with cancer while conducting this study. It was very interesting to note the mode of division of the spores.

*Dr. French's Operating Chair.*

Dr. JONATHAN WRIGHT exhibited this chair, in the absence of Dr. French. The chair is of the aseptic type, and being constructed of bicycle tubing it is both light and durable. The height of the back is readily adjustable for adults or children, and the top of the back is of such a shape as to furnish a convenient head-rest. The seat is covered with rubber. The chair was designed to be used by those who prefer to operate on adenoids with the patient in the upright position.

Dr. WRIGHT also exhibited a guarded electrode for use in cauterizing the inferior turbinate.

*Specimens.*

Dr. J. W. FARLOW, of Boston, presented two specimens. The first had been taken from a man who had suffered a good deal of pain in his throat for some time, and had suddenly felt something in his mouth, like a "bullet." Examination showed a tonsillith, which had been extruded from the left tonsil.

The other specimen was a large, ragged piece of glass extracted from a man who had come to him complaining of a disagreeable feeling in his mouth, which he attributed to pressure of his tongue. On the left side of the hard palate were numerous ex-coriations and abrasions. After a great deal of questioning, the man produced from his pocket the specimen exhibited, a piece of glass (See Fig.) which he said he placed in his mouth day after day so as to prevent the disagreeable sensations which, he said, resulted from the pressure of his tongue against the roof of the mouth. The man was referred to an alienist for examination as to his mental condition.



## BUSINESS MEETING.

THE Twenty-third Annual Congress of the American Laryngological Association convened at Dwight Hall, Yale University, New Haven, Conn., Monday, May 27, 1901. The Association was called to order at 10.15 A.M. by the President, Dr. Swain. During the sessions of the Congress, the following Fellows were registered:

H. S. BIRKETT, Montreal, Canada.  
A. A. BLISS, Philadelphia, Pa.  
F. H. BOSWORTH, New York City.  
J. H. BRYAN, Washington, D. C.  
W. E. CASSELBERRY, Chicago, Ill.  
J. PAYSON CLARK, Boston, Mass.  
F. C. COBB, Boston, Mass.  
A. COOLIDGE, JR., Boston, Mass.  
T. A. DE BLOIS, Boston, Mass.  
D. BRYSON DELAVAN, New York City.  
E. T. DICKERMAN, Chicago, Ill.  
J. W. FARLOW, Boston, Mass.  
W. J. FREEMAN, Philadelphia, Pa.  
RICHARD FROTHINGHAM, New York City.  
J. W. GLEITSMANN, New York City.  
J. L. GOODALE, Boston, Mass.  
J. H. HARTMAN, Baltimore, Md.  
U. G. HITCHCOCK, New York City.  
F. E. HOPKINS, Springfield, Mass.  
FRANCK HYATT, Washington, D. C.  
F. L. IVES, New York City.  
SAMUEL JOHNSTON, Baltimore, Md.  
GORDON KING, New Orleans, La.  
C. H. KNIGHT, New York City.  
S. W. LANGMAID, Boston, Mass.  
G. A. LELAND, Boston, Mass.  
J. N. MACKENZIE, Baltimore, Md.  
G. H. MAKUEN, Philadelphia, Pa.  
EMIL MAYER, New York City.  
J. F. MCKERNON, New York City.  
R. C. MYLES, New York City.  
J. E. NEWCOMB, New York City.  
J. PRICE-BROWN, Toronto, Canada.



J. E. RHODES, Chicago, Ill.  
C. C. RICE, New York City.  
A. W. DE ROALDES, New Orleans, La.  
J. O. ROE, Rochester, N. Y.  
E. L. SHURLY, Detroit, Mich.  
W. K. SIMPSON, New York City.  
H. L. SWAIN, New Haven, Conn.  
S. O. VAN DER POEL, New York City.  
H. L. WAGNER, San Francisco, Cal.  
A. W. WATSON, Philadelphia, Pa.  
M. R. WARD, Pittsburg, Pa.  
JONATHAN WRIGHT, Brooklyn, N. Y.

After the roll-call an address of welcome was delivered by Arthur T. Hadley, LL.D., President of Yale University. This was followed by the Annual Address of the President of the Association. After the reading of the papers assigned for the morning, the Association went into executive session. The first order of business was the election of new members. The following were the nominees:

J. PRICE-BROWN, M.D., Toronto, Canada, proposed by Drs. Roe and Wagner. Title of thesis, "Diseases of the Nose and Throat."

EDWARD T. DICKERMAN, M.D., Chicago, Ill., proposed by Drs. Casselberry and Brown. Title of thesis, "The Anatomy of the Naso-Frontal Passage from a Clinical Standpoint."

WALTER J. FREEMAN, M.D., Philadelphia, Pa., proposed by Drs. Bliss and C. H. Knight. Title of thesis, "The Nasal Septum."

FRANCK HYATT, M.D., Washington, D. C., proposed by Drs. Murray and Bliss. Title of thesis, "Etiology and Pathology of Ethmoidal Disease, with Report of a Case of Suppurative Ethmoiditis."

GORDON KING, M.D., New Orleans, La., proposed by Drs. Shurley and Casselberry. Title of thesis, "The Bucco-Antral Route in Neurectomy for Relief of Tic Douloureux."

ROBERT C. MYLES, M.D., New York City, proposed by Drs. Casselberry and Roe. Thesis, "The Faucial Tonsils, their Functions, Diseases and Treatment, with report of original investigations concerning the so-called adhesion of the tonsils to the Faucial Pillars, and certain Basal and Basi-Lateral Pathological Conditions."

The following candidates were recommended for election to Corresponding Fellowship:

Dr. MORITZ SCHMIDT, Frankfort-on-Main, Germany, proposed by Drs. Gleitsmann and French.

Dr. MARCEL NATIER, Paris, France, proposed by Drs. Roaldes and Newcomb.

Dr. DUNDAS GRANT, London, England, proposed by Drs. C. H. Knight and Swain.

Dr. WYATT WINGRAVE, London, England, proposed by Drs. Swain and French.

Dr. MAYO COLLIER, London, England, proposed by Drs. Bliss and Newcomb.

The election was held by ballot, and the tellers, Drs. Hopkins and Coolidge, announced that all the candidates had been chosen.

Drs. C. H. Knight and Simpson were appointed a Committee to audit the accounts of the Treasurer.

The election of a Committee to nominate officers for the following year resulted in the choice of the following: Drs. W. E. Casselberry, J. N. Mackenzie, D. Bryson Delavan, C. H. Knight and W. K. Simpson.

At the conclusion of the reading of papers at the afternoon session, the Association adjourned to the Yale Psychological Laboratory, where Professor Edward W. Scripture delivered an illustrated lecture on "Speech Curves; a Study in Phonetics." At the conclusion of the lecture a vote of thanks was extended to Professor Scripture for his able and interesting address. In the evening a reception was given in Alumni Hall, Yale University, in honor of the visiting Fellows and their ladies by the President of the University and the President of the Association.

At the business meeting of the second day the following reports were read and approved:

*Secretary's Report.*

In accordance with custom, the Secretary herewith presents the bound volume of Transactions for the year 1900. The work has just been completed, and it was found impossible to distribute the copies to members before the opening of the present Congress. Such distribution will be made, however, in the course of a few days.

As the matter of publication of future volumes will come up for discussion under the head of new business, no further allusion is made to the matter here.

Since the last Congress two Active Fellows, Dr. D. N. Rankin and Dr. R. P. Lincoln, have died. There have also been two resignations, those of Dr. J. E. Boylan and Dr. Beverly Robinson. This leaves our active membership (including candidates chosen at the present Congress), numbering 72.

During the year two meetings of the Council have been held, and the minutes of these will now be read.

The Secretary would report that arrangements have been made with the Association of Medical Librarians whereby the

institutions they represent will receive copies of the Transactions; also that arrangements have been effected with the Bureau of International Exchanges of the Smithsonian Institute at Washington, whereby the distribution of copies going to foreign countries will be attended with less expense than heretofore.

Respectfully submitted,

JAMES E. NEWCOMB, *Secretary.*

*Treasurer's Report, 1900-1901.*

*Receipts.*

Balance from 1900 account.....	\$286.56
Dues for 1899.....	15.00
Dues for 1900.....	60.00
Dues for 1901.....	310.00
Sale of Transactions, 1879-1898.....	27.50
Sale of Transactions, 1899.....	21.50
Refund from Dr. Clark.....	1.00
Cash, Dr. Newcomb.....	.30

*Disbursements.*

	\$721.86
Committee XIII. International Congress.....	\$ 25.00
Transactions 1899, D. Appleton Co.....	131.48
Transactions 1900, Lux Printing Co.....	7.50
Stationery, postage, printing, etc.....	66.00
Stenographer at Washington.....	100.00
Printing programmes.....	28.75
Postage on programmes.....	4.00
Miscellaneous.....	5.09

\$367.82

Total receipts.....	\$721.86
Total disbursements.....	367.82

Leaving balance to new account of.....	\$354.04
Assets—Cash in Treasury.....	\$354.04
Postage.....	9.38
Unpaid dues.....	40.00

Total assets.....	\$403.42
Liabilities due Treasurer.....	5.20
Bill for Transactions, 1900.....	208.17

Total liabilities.....	\$213.37
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Audited and found correct.

(Signed)

C. H. KNIGHT,

W. K. SIMPSON,

*New Haven, Conn., May 28, 1901.*

*Auditing Committee.*

*Report of the Librarian.*

The Librarian has to report that since the last meeting seven bound volumes and ninety-five pamphlets have been added to the Library and have been deposited in the Surgeon-General's library at Washington.

*Respectfully submitted,*

J. H. BRYAN, *Librarian.*

The matter of the amendment to the constitution, proposed by Dr. Wright, was then brought up. The amendment read as follows:

"The Secretary, when directed by the Council, shall send to each member of the Association a list of names of those laryngologists (in this country) whom they consider suitable for membership in the Association so far as their moral character is concerned. Upon the sheet containing this list shall be printed a request that the members shall indicate by a mark the name of the man they wish to be nominated for membership. The list submitted shall contain at least three names for each vacancy which the Council wishes to fill. A stamped envelope, on which is printed the name and address of the Secretary, shall accompany the list. The sealed answers received by the Secretary shall be opened by him and by another appointed by the President at the session, when the names for the election of new members are to be voted on. The name or names, according as there is one or more vacancies to be filled, having the greatest number of marks in its favor, shall be submitted as a nomination for membership. In case of a tie on any one name, no nomination shall be made for that vacancy. No vote shall count which does not include expressions of opinion as to all vacancies declared open by the Council."

On motion it was voted to lay the amendment on the table and further voted to make no change at the present time in the manner of electing members. Dr. Mayer submitted an amendment covering the same ground and said that he would bring the matter up at the next Congress.

The Secretary read a letter from the *New York Medical Journal*, stating that it wished to discontinue the publication of the papers read before the Association; also a letter from *The Laryngoscope*, submitting a proposition looking to the publication of the papers presented at this Congress. The Secretary stated that the matter had been considered at a special meeting of the Council, held the evening previous to the opening of the present Congress, and that it is the recommendation of the Council that for the coming year the Association publish its own

Transactions, giving to individual members reading papers the right to publish the same in any journal they may desire.

On motion, the recommendation of the Council was adopted and the Secretary was empowered to carry out the plan proposed.

In regard to the matter of recommending candidates for membership to the Council, it was voted that the Secretary shall send notice to the members one month previous to the meeting of the Council, requesting them to submit the names of any gentlemen they may consider eligible for membership, together with such personal endorsement as they may see fit; furthermore, that the Secretary should send each member a list of names of candidates now before the Council.

Dr. Casselberry, the Chairman of the Nominating Committee, presented the following report: For officers for the ensuing year:

*President*—Dr. JOHN W. FARLOW, of Boston.

*First Vice-President*—Dr. J. W. Gleitsmann, New York.

*Second Vice-President*—Dr. D. Braden Kyle, Philadelphia.

*Secretary and Treasurer*—Dr. JAMES E. NEWCOMB, New York.

*Librarian*—Dr. JOSEPH H. BRYAN, Washington.

*Member of the Council*—Dr. HENRY L. SWAIN, New Haven.

Delegate to the Executive Committee of the Triennial Congress of American Congress of Physicians and Surgeons, Dr. W. K. Simpson, New York; alternate, Dr. G. Hudson-Makuen, Philadelphia.

Place of Meeting for 1902, Boston, Mass.

At the close of the scientific session of the third day a message of congratulation was read from Dr. Guy Hinsdale, the Secretary of the American Climatological Association, and the Secretary was directed to reply to the same.

The report of the Nominating Committee was re-read, and on motion the Secretary was instructed to cast the ballot of the Association for the officers whose names had been duly presented, which he did, and they were declared elected.

The President appointed Drs. Delavan and Wagner a committee to escort the President-elect to the chair. The retiring President then presented Dr. Farlow as the President for the coming year. On taking the chair Dr. Farlow thanked the Association for the honor conferred upon him.

The following resolutions were adopted:

*Voted*, That it is the sense of the Association that we prefer not to participate in the general dinner of the Triennial Congress in 1903, that year being the twenty-fifth anniversary of the founding of the Association, and that our delegate be instructed to so inform the Executive Committee, to which he is accredited.

*Voted*, That the thanks of the Association be and hereby are



extended to Dr. and Mrs. Swain for hospitalities extended during the sessions of the present Congress.

*Voted*, That the thanks of the Association be extended to the retiring President for the able and impartial manner in which he has discharged the duties of his office.

*Voted*, That the thanks of the Association be and hereby are extended to President Hadley for extending to the Association the courtesies of the University, and to the Treasurer, Mr. Morris F. Tyler, for his kindness in granting the use of Dwight and Alumni Halls.

There being no further business, on motion the Association adjourned.

JAMES E. NEWCOMB, *Secretary*.

## OBITUARY.

WILLIAM H. DALY.

By the death of Dr. William H. Daly, which occurred at his home in Pittsburg, June 9th, 1901, the medical profession has lost an earnest and able member; the country and the community a loyal, enterprising and valued citizen; his family and kindred a fond and devoted member; and his intimate associates a genial, large-hearted and steadfast friend.

Dr. William Hudson Daly was born at Blairsville, Indiana County, Pa., Sept. 11, 1842, and was the son of Thomas and Helen Daly. His father was of Scotch descent, but a native of Ireland; his mother was of an ancient Scottish family. His parents died when he was but seventeen years of age, after which he went to Richmond, Va., where he lived until the outbreak of the civil war, when he enlisted in the Confederate army as a private in Company B, 15th Virginia Volunteers, and participated in most all the early battles from Big Bethel to Lees Mills, where he was taken prisoner by the Federal troops.

Soon after he took the oath of allegiance to the Union cause, went to Philadelphia under government orders to take a course in the Jefferson Medical College, during the years 1863 and 1864, and served as medical cadet in the Germantown Hospital. Later he was appointed assistant surgeon in the United States Army and was assigned to duty in the Army Hospital at Whitehall. From that place he was transferred to Savannah, Ga., for service in the general army hospitals, being subsequently appointed post surgeon and stationed, for active service, at Hilton Head, S. C.

In August, 1865, he was stationed at Jacksonville, Fla., and in company with other medical officers took charge of the last five thousand prisoners released from Andersonville prison and continued to serve actively until the cessation of hostilities and the disbanding of the army.

After the close of the war he continued his medical studies in the University of Michigan and graduated from the medical department in 1866. He then took up the practice of medicine in Pittsburg and continued it until the time of his death. He soon acquired a large practice, attained a leading position among his confreres, and in recognition of his attainments was called to numerous important and public positions.

In 1868 he was appointed physician to the Reform School of Pennsylvania and served in that capacity eight years until the removal of that institution from Allegheny.

From 1879 until 1887 he was appointed general surgeon of the Pittsburg and Lake Erie Railroad. He was a senior physician to the Western Pennsylvania Hospital from the time of its organization and consulting throat-surgeon to the Pittsburg Free Dispensary. At the outbreak of the Spanish-American war he was appointed chief surgeon with the rank of major of the United States Volunteers and assigned to duty on the staff of Lieut. General Nelson A. Miles. He served through the Porto Rican campaign, and at its close took charge of one of the largest returning transports.

It was during this campaign that he exposed the fraudulent transaction of the commissary department, known as the "embalmed beef" scandal, which became the subject of official investigation.

In 1878-1879 he spent a year in Europe taking special courses and attending the various hospitals of London, Paris, Berlin and Vienna, studying diseases of the nose, throat and ear, since which time he has made a specialty of and confined his practice mainly to this department, in which he attained eminence, both in this country and in Europe.

As an evidence of his interest and high standing in medicine he was elected to active membership in nearly all the national societies of this country and in some European societies. He was a member of the Allegheny County and State Medical Society of Pennsylvania, the American Medical Association, the Association of Military Surgeons of the United States, the Mississippi Valley Medical Association, the Tri-State Medical Society, the American Social Science Association and was chairman of the Health Department. He was also a member of the British Medical Asso-

ciation. Of the special societies he was a member of the American Laryngological Association, the American Climatological Association, the American Laryngological, Rhinological and Otological Society, and was a corresponding member of the British Laryngological, Rhinological and Otological Society, and of the Société Française d'Otologie et de Laryngologie et de Rhinologie. He was also a member of the Eighth International Medical Congress held in Copenhagen, Denmark, in 1884, and did signal service at that meeting in upholding the status of laryngology in America in a paper on that subject. He was also a member of the Ninth International Medical Congress held in Washington in 1887.

Dr. Daly has also been honored by many of the societies to which he belonged. For ten consecutive years he was recording secretary of the Allegheny County Medical Society, and was afterwards elected president of that body, and also president of the Medical Society of the State of Pennsylvania.

He organized and became the first chairman of the section of Laryngology of the American Medical Association, and was sent three times by that association as a delegate to the British Medical Association.

In 1887 he was elected chairman of the section of Laryngology of the Ninth International Medical Congress held in Washington in August, 1887. He organized this section and carried it through most successfully at a time when, owing to uncalled for dissensions in the ranks, it had been abandoned by the previous appointees to that position.

In 1896 he was elected president of the American Laryngological Association; in 1897 president of the Laryngological, Rhinological and Otological Society, and the same year he was elected chairman of the Health Section of the American Social Science Association.

Dr. Daly's contributions to medical literature were numerous and always of a high order showing marked originality of thought and the positiveness of his convictions, as may be seen by the numerous articles read before this association and preserved in permanent form in its Transactions. He was among the pioneers of Laryngology in this country and was the first to call attention to the clinical relations between hay fever and nasal disease. He

was also interested in many allied and collateral branches of medicine, as shown by his interest in the American Public Health Association; and it was from clinical observations made by him during his hunting trips of the fact that all persons who avoided drinking the water in malarial districts escaped malarial infection, that led him to believe, long before the plasmodium was found, that malaria was due to a germ and transmitted in the water and not caused by a contamination of the atmosphere.

Dr. Daly was exceedingly fond of outdoor sports, of hunting, fishing and travel, and frequently contributed to the press most interesting articles describing his observations and experiences.

It was his custom every year during the hunting season to take trips West or South where game was particularly abundant, and it was on one of these hunting trips that he became acquainted with General Nelson A. Miles, who ever afterward was his steadfast friend. The story of their meeting is a somewhat interesting one. One day while Dr. Daly was in camp in the Big Horn Mountains, during an expedition for elk hunting, a man came tearing over the range asking for a physician to go to a camp many miles away to attend a sick girl. The rider was William F. Cody, better known as Buffalo Bill, and the father of the girl was General Miles. Dr. Daly went and brought the patient safely out of her illness, and the bond of friendship formed between General Miles and himself during the days he remained in the camp was followed by many hunting expeditions together afterwards and continued to the time of his death.

Dr. Daly was a member of the Duquesne Club and also of the Sportsmen's Club of Pittsburg, and an active member and part owner of the Revels Island Rod and Gun Club on the Virginia coast.

Dr. Daly was possessed of a fine physique and commanding presence which, with great force of character, strong will power, great determination and perseverance made him a conspicuous figure wherever he was. He was also possessed of a sturdy manhood, a high sense of honor and a courageous loyalty to whatever he believed to be his duty and to whatever he regarded as right.

In addition to the high standing of Dr. Daly in the medical profession he enjoyed, together with his estimable wife, a high social position. This followed naturally from his marked social



characteristics, for with his friends he was always a hale fellow well met, with ready wit and a great fund of anecdotes which made him a conspicuous central figure in every social gathering.

Dr. Daly was married to Athalia, the eldest daughter of James M. Cooper, a prominent steel manufacturer of Pittsburg, and a member of one of the oldest families, June 22d, 1869. Two children were born to them, but both died during infancy—James Cooper Daly at the age of four years, in April, 1874, and William Theodore Daly at the age of eleven months, in 1877.

Dr. Daly was of an affectionate nature and his home ties were very dear to him. During the many trips Dr. Daly and the writer had together he would frequently refer to his little Jimmie, repeating the cunning remarks made by the child while just learning to talk; in fact he could scarcely see a child that did not attract him and cause him to refer to the little ones he had lost. His saddest blow, however, was the death of Mrs. Daly, who had been his constant companion for many years, which occurred somewhat suddenly November 22, 1899, at Sioux City, Iowa, where she had gone to accompany Dr. Daly on a hunting trip.

The Doctor was very devoted to Mrs. Daly, and in his will, which he had made four months before he died, he left almost his entire fortune, about a quarter of a million dollars, to found a home in Pittsburg for working girls and women as a memorial, to be known as "The Athalia Daly Home."

Since Mrs. Daly's death Dr. Daly had been exceedingly lonely, which, together with insomnia, undoubtedly contributed much to the circumstances leading to his death.

He had suffered from insomnia, more or less, since 1875. During a European trip in 1874, to attend the International Medical Congress at Copenhagen, the writer, who was with him constantly during this trip, noticed frequently an unnatural irritability of temperament which culminated the following winter in insomnia and a nervous condition that gave his friends much alarm. With absolute quiet and passing about twelve of the twenty-four hours in bed, he slowly recovered and the following year he was quite himself again. But from that time insomnia was the thing from which he mostly suffered and from which he could only escape by keeping very early hours. Notwithstanding this he

enjoyed general good health and would be considered by every one to be in fine physical condition.

Last winter, however, he was attacked with the grip very severely, causing great nervous depression and marked irritability of the laryno-bronchial mucous membrane. When he had partly recovered from this he accompanied the writer on a trip to Bermuda. While in that mild climate, together with local treatment, he very greatly improved. The general effects of the grip, however, were so slow to disappear that he spent about three weeks in Atlantic City last spring to recuperate from its effects. In a letter from him to the writer about a week before his death he wrote that he thought he had mastered the grip, but it had left him very nervous, and it was undoubtedly this nervous condition coupled with the grief over the loss of Mrs. Daly and his loneliness since that time that made him, in an unguarded moment, doubtless after a sleepless night, yield to the sudden impulse which induced him to shoot himself in the head with a revolver, in his bath room just after he had left his bed on Sunday morning about seven o'clock. That this act was entirely unpremeditated and not in any manner due, as some thought, to financial losses cannot be questioned.

He had spent the evening before with friends in a most cheerful manner; several engagements had been made for the next day and the following week he was to spend with the writer in Rochester. Soon after he was to go on a hunting trip with a Pittsburg friend, and had planned a trip to Europe with his brother, Mr. T. L. Daly of Gibsonton, Pa., during the summer.

His obsequies, conducted by the pastor of the Calvary Episcopal Church, to which he and his wife belonged, simple, but most impressive, took place from his home, 6211 Howe street, on June 11th, 1901, a beautiful summer afternoon, in the presence of his family and devoted friends.

He was buried in the family plot near his wife in Allegheny Cemetery with their two children between them, as he had requested in his will made several months before and there with devoted affection his friends bedecked his grave with flowers and tears and said their sad good-bye.

JOHN O. ROE.

DAVID NEVIN RANKIN, A.M., M.D.

DAVID NEVIN RANKIN was born in Shippensburg, Cumberland County, Pennsylvania, in 1834. He graduated from the Jefferson Medical College in Philadelphia, in 1854. Shortly after graduation he removed to Pittsburgh, in which city and vicinity he spent his professional life. He died in Allegheny January 1, 1901.

Dr. Rankin's life was one of great activity and usefulness to the community in which he lived. For thirty-five years he was surgeon to the Western Penitentiary; was a member of several of the International Medical Congresses, and at the Ninth Congress, held in Washington, D. C., was secretary of the Section on Laryngology; was a member of the American Medical Association, of the Association of American Physicians and Surgeons, Pennsylvania State Medical Society, Allegheny County Medical Society, and at one time served as vice-president of the Pittsburgh Obstetrical Society. He was also associate physician of the Throat and Chest Department of the Pittsburgh Free Dispensary.

During the civil war he served as surgeon in the regular army and was in charge at different times of several large hospitals. During his civil practice he was examiner for several of the largest life insurance companies, to whose interests he brought a zealous activity and praiseworthy fidelity.

He became a member of this Association in 1882, and during the term of his membership read papers at three different Congresses. While he was not in attendance during most of the recent meetings his interest in the work of the Association was unabated, and he punctually met every obligation devolving upon him. His name was an honor to our roll of membership, and his courteous bearing, manly character and the wide experience coming from his many and varied professional activities all united to make him a valued friend. He has illustrated by his long and useful life the highest type of character of the medical practitioner.

To his family the Association tenders its deepest sympathy.

J. E. N.

## ACTIVE FELLOWS.

1902.

## ELECTED.

1878. ASCH, MORRIS J., 5 West 30th St., New York.  
 1880. BEAN, C. E., Germania Life Bldg., St. Paul, Minn.  
 1803. BIRKETT, HERBERT S., 123 Stanley St., Montreal.  
 1893. BLISS, ARTHUR AMES, 117 South 20th St., Philadelphia, Pa.  
 1878. BOSWORTH, FRANCKE H., 41 Park Ave. New York.  
 1892. BROWN, M. R., 34 Washington St., Chicago, Ill.  
 1891. BRYAN, J. H., 818 17th St., Washington, D. C.  
 1889. CASSELBERRY, WILLIAM E., 34 Washington St., Chicago, Ill.  
 1882. CHAPMAN, S. H., 193 Church St., New Haven, Conn.  
 1896. CHAPPELL, W. F., 7 East 55th St., New York.  
 1897. CLARK, J. PAYSON, 409 Marlborough St., Boston, Mass.  
 1899. COBB, FREDERIC C., 11 Marlborough St., Boston, Mass.  
 1878. COHEN, J. SOLIS-, 1824 Chestnut St., Philadelphia, Pa.  
 1884. COHEN, S. SOLIS-, 1525 Walnut St., Philadelphia, Pa.  
 1893. COOLIDGE, A., JR., 613 Beacon St., Boston, Mass.  
 1882. DE BLOIS, THOMAS AMORY, 48 Gloucester St., Boston, Mass.  
 1881. DELAVAN, D. BRYSON, 1 East 33d St., New York.  
 1901. DICKERMAN, E. T., 103 State St., Chicago, Ill.  
 1892. FARLOW, J. W., 234 Clarendon St., Boston, Mass.  
 1901. FREEMAN, W. T., 1720 Locust St., Philadelphia, Pa.  
 1879. FRENCH, THOMAS R., 150 Joralemon St., Brooklyn, N. Y.  
 1897. FROTHINGHAM, RICHARD, 60 W. 55th St., New York.  
 1878. GLASGOW, WM. C., 2847 Washington Ave., St. Louis, Mo.  
 1880. GLEITSMANN, J. W., 46 East 25th St., New York.  
 1898. GOODALE, J. L., 397 Beacon St., Boston, Mass.  
 1896. HARDIE, T. MELVILLE, 34 Washington St., Chicago, Ill.  
 1878. HARTMAN, J. H., 5 West Franklin St., Baltimore, Md.  
 1888. HINKEL, F. WHITEHILL, 412 Franklin St., Buffalo, N. Y.  
 1881. HITCHCOCK, URBAN G., 51 West 29th St., New York.  
 1893. HOPE, GEORGE B., 133 West 72d St., New York.  
 1895. HOPKINS, F. E., Springfield, Mass.  
 1895. HUBBARD, THOS., 205 Ontario St., Toledo, O.  
 1901. HYATT, FRANCK, 1022 14th St. N. W., Washington, D. C.  
 1878. INGALS, E. FLETCHER, 36 Washington St., Chicago, Ill.  
 1882. IVES, FRANK L., 117 East 30th St., New York.

1901. FREEMAN, W. J., 1720 Locust St., Philadelphia, Pa.

1878. JOHNSTON, SAMUEL, 204 West Monument St., Baltimore, Md.
1901. KING GORDON, 624 Gravier St., New Orleans, La.
1885. KNIGHT, CHARLES H., 147 West 57th St., New York.
1878. KNIGHT, FREDERICK I., 195 Beacon St., Boston, Mass.
1898. KYLE, D. BRADEN, 1517 Walnut St., Philadelphia, Pa.
1880. LANGMAID, SAMUEL W., 373 Boylston St., Boston, Mass.
1878. LEFFERTS, GEORGE MOREWOOD, 212 Madison Ave., N. Y.
1894. LELAND, GEORGE A., 669 Boylston St., Boston, Mass.
1897. LOGAN, JAMES E., 1208 Wyandotte St., Kansas City, Mo.
1888. LOWMAN, JOHN H., 441 Prospect St., Cleveland, O.
1886. MACCOY, ALEXANDER, W., 1338 Walnut St., Phila., Pa.
1883. MACKENZIE, JOHN N., 605 Washington Place, Baltimore, Md.
1898. MAKUEN, G. HUDSON, 1419 Walnut St., Philadelphia, Pa.
1896. MAYER, EMIL, 25 East 77th St., New York.
1899. MCKERNON, J. F., 62 West 52d St., New York.
1892. MURRAY, T. MORRIS, 17th and H Sts., Washington, D. C.
1901. MYLES R. C., 46 West 38th St., New York.
1893. NEWCOMB, JAMES E., 118 West 69th St., New York.
1892. PORCHER, W. PEYRE, 99 Meeting St., Charleston, S. C.
1878. PORTER, WILLIAM, 3886 Washington Ave., St. Louis, Mo.
1901. PRICE-BROWN, J., 37 Carlton St., Toronto, Canada.
1897. RHODES, J. EDWIN, 36 Washington St., Chicago, Ill.
1884. RICE, CLARENCE C., 123 East 19th St., New York.
1893. ROALDES, A. W. DE, 624 Gravier St., New Orleans, La.
1879. ROE, JOHN O., 28 Clinton Ave. North, Rochester, N. Y.
1879. SEILER, CARL, 203 Jefferson Ave., Scranton, Pa.
1878. SHURLY, E. L., 32 Adams Ave W., Detroit, Mich.
1892. SIMPSON, W. K., 952 Lexington Ave., New York.
1889. SWAIN, H. L., 232 York St., New Haven, Conn.
1892. THRASHER, A. B., The Groton, 7th and Race Sts., Cincinnati, O.
1888. VAN DER POEL, S. OAKLEY, 47 E. 25th St., New York.
1892. WAGNER, HENRY L., 522 Sutter St., San Francisco, Cal.
1892. WATSON, A. W., 126 South 18th St., Philadelphia, Pa.
1896. WARD, M. R., 611 Penn. Ave., Pittsburgh, Pa.
1896. WOOLLEN, G. V., 20 West Ohio St., Indianapolis, Ind.
1890. WRIGHT, JONATHAN, 73 Reichen St., Brooklyn, N. Y.

## HONORARY FELLOW.

1880. GARCIA, MANUEL, 1 Bentinck St., Manchester Square, London, England.



CORRESPONDING FELLOWS.

1892. BROWNE, LENNOX, 15 Mansfield St., Portland Place W., London, England.
1880. BRUNS, PAUL, Tübingen, Würtemberg, Germany.
1896. CHIARI, OTTO KAR, Bellariastrasse 12, Vienna, Austria.
1901. COLLIER, MAYO, 133 Harley St. W., Cavendish Square, London, England.
1890. DE LA SOTA Y LASTRA, R., 7 Calle de Torqueros, Seville, Spain.
1893. DESVERNINE, C. M., Cuba 52, Havana, Cuba.
1887. GOUGUENHEIM, A., 73 Boul. Hausmann, Paris, France.
1901. GRANT DUNDAS, 18 Cavendish Square W., London, England.
1894. HOLDEN, E., 13 Central Ave., Newark, N. J.
1892. KRAUSE, H., Neustädt, Kirch-Strasse 13, Berlin, Germany.
1881. LABUS, CARLO, Via St. Andrea 8, Milan, Italy.
1897. LUC, H., 54 Rue de Varenne, Paris, France.
1896. MACDONALD, GREVILLE, 85 Harley St., London W., England.
1894. MACINTYRE, JOHN, 179 Bath St., Glasgow, Scotland.
1892. MASSEI, F., 4 Piazza Municipio, Naples, Italy.
1887. MOURE, E. J., 25 Cour du Jardin-Public, Bordeaux, France.
1896. MYGIND, HOLGER, 31 Havnegade, Copenhagen, Denmark.
1901. NATIER, MARCEL, 12 rue de Caumartin, Paris France.
1894. SAJOUS, C. E., 2043 Walnut St., Philadelphia, Pa.
1896. SCHMIEGELOW, ERNST, 18 Nørregade, Copenhagen, Denmark.
1881. SCHROETTER, LEOPOLD V., Schwartzenberg-Strasse 8, Vienna, Austria.
1881. SEMON, FELIX, 39 Wimpole St., Cavendish Square, London, England.
1901. WINGRAVE, WYATT, 11 Devonshire St., Portland Place, London, England.
1894. WOLFENDEN, R. NORRIS, Rougemont, Seaford, Sussex, England.
1901. SCHMIDT, MORITZ, Sachsenhausen, Schaumainkai, 15, Frankfurt, Germany.

PAST MEMBERS.

*Honorary Fellow.*

- \*1881. Sir Morell Mackenzie, London, England.

*Corresponding Fellows.*

- \*1880. Wilhelm Meyer, Copenhagen, Denmark.
- \*1881. Pugin Thorton, London, England.
- \*1881. R. Voltolini, Breslau, Germany.
- \*1880. W. McNeil Whistler, London, England.

*Active Fellows.*

- \*1880. Harrison Allen, Philadelphia, Pa.
- 1895. J. E. Boylan, Cincinnati, O.
- \*1883. C. W. Chamberlain, Hartford, Conn.
- 1880. E. W. Cushing, Boston, Mass.
- 1878. Ephraim Cutter, Boston, Mass.
- \*1880. W. H. Daly, Pittsburgh, Pa.
- \*1878. F. H. Davis, Chicago, Ill.
- \*1878. Frank Donaldson, Baltimore, Md.
- 1886. Frank Donaldson, Jr., Baltimore, Md.
- \*1879. J. H. Douglas, New York.
- \*1879. W. F. Duncan, New York.
- \*1878. Louis Elsberg, New York.
- †1879. Edgar Holden, Newark, N. J.
- \*1882. Franklin H. Hooper, Boston, Mass.
- \*1878. Hosmer A. Johnson, Chicago, Ill.
- \*1879. Woolsey Johnston, New York.
- \*1880. William C. Jarvis, New York, N. Y.
- 1879. R. H. Keallhofer, St. Louis, Mo.
- \*1878. Rufus P. Lincoln, New York, N. Y.
- 1881. G. W. Major, Montreal, Canada.
- 1879. Charles McBurney, New York, N. Y.
- 1885. H. Clinton McSherry, Baltimore, Md.
- \*1881. E. C. Morgan, Washington, D. C.
- \*1886. J. C. Mulhall, St. Louis, Mo.
- 1881. H. Mynter, Buffalo, N. Y.
- \*1895. J. E. H. Nichols, New York.
- 1879. H. K. C. Oliver, Boston, Mass.
- 1894. William H. Park, New York, N. Y.
- \*1880. D. N. Rankin, Allegheny, Pa.
- 1881. J. M. Robertson, Detroit, Mich.
- 1878. Beverly Robinson, New York.
- \*1878. T. F. Rumbold, St. Louis, Mo.
- †1880. Charles E. Sajous, Paris, France.
- \*1893. Charles M. Shields, Richmond, Va.
- 1879. Andrew H. Smith, New York.
- 1879. Bernhardt Tauber, Cincinnati, O.
- \*1899. Max Thorner, Cincinnati, O.
- 1878. Clinton Wagner, New York, N. Y.
- 1879. G. Whitefield Ward, New York, N. Y.
- \*1886. Benjamin F. Westbrook, Brooklyn, N. Y.

\*Deceased.

† Corresponding Fellow.

## PAST OFFICERS.

*Presidents.*

1879.	Louis Elsberg.	1890.	W. C. Glasgow.
1880.	J. Solis-Cohen.	1891.	S. W. Langmaid.
1881.	F. I. Knight.	1892.	M. J. Asch.
1882.	G. M. Lefferts.	1893.	D. B. Delavan.
1883.	F. H. Bosworth.	1894.	John O. Roe.
1884.	E. L. Shurly.	1895.	W. H. Daly.
1885.	Harrison Allen.	1896.	C. H. Knight.
1886.	E. Fletcher Ingals.	1897.	T. R. French.
1887.	R. P. Lincoln.	1898.	W. E. Casselberry.
1888.	E. C. Morgan.	1899.	Samuel Johnston.
1889.	J. N. Mackenzie.	1900.	Henry L. Swain.

*Vice-Presidents.*

1879.	F. H. Davis.
1880.	W. C. Glasgow, J. O. Roe.
1881.	E. L. Shurly, W. Porter.
1882.	C. Seiler, E. F. Ingals.
1883.	S. W. Langmaid, S. Johnston.
1884.	J. H. Hartman, W. H. Daly.
1885.	H. A. Johnson, G. W. Major.
1886.	E. C. Morgan, J. N. Mackenzie.
1887.	J. N. Mackenzie, S. W. Langmaid.
1888.	W. C. Glasgow, C. E. Sajous.
1889.	E. Holden, C. E. Bean.
1890.	J. O. Roe, J. H. Hartman.
1891.	M. J. Asch, S. Johnston.
1892.	S. Johnston, J. C. Mulhall.
1893.	J. C. Mulhall, W. E. Casselberry.
1894.	C. C. Rice, S. H. Chapman.
1895.	J. Wright, A. W. de Roaldes.
1896.	T. M. Murray, D. N. Rankin.
1897.	A. W. MacCov, H. S. Birkett.
1898.	J. W. Farlow, F. W. Hinkel.
1899.	T. A. De Blois, M. R. Brown.
1900.	H. L. Wagner, A. A. Bliss.

*Secretaries and Treasurers.*

1879.	G. M. Lefferts.	1895.	H. L. Swain.
1882.	D. B. Delavan.	1900.	J. E. Newcomb.
1889.	C. H. Knight.		

*Librarian.*

1879.	F. H. Bosworth.	1893.	J. H. Bryan.
1883.	T. R. French.		











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