forehead, and with both feet. A current of fourteen volts was passed for half an hour. The resistance was found to be 600 ohms, rising to 680, and, when corrected by Mance's method, 543 ohms. Of this, 137 ohms were due to polarisation. The third had also had diabetes, and a current of 10 volts was passed in the same way. The resistance was found to be 1,100 ohms, rising to 1,160, and, when corrected by Mance's method, 1,025 ohms. Polarisation was equal to 145 ohms, a larger electromotive force than had been before demonstrated.

Dr. Stone then gave a very excellent measurement, made independently of himself, and which is represented by two curves on the diagram. The first part of the curve below the line in the middle is the period of charge. All the measurements are given. Then the discharge takes place where the vertical line is. The galvanometer shoots up to the point C, and comes down again, but not to the line of zero. On the contrary, it remains steadily, and for a very considerable time—very much longer than he anticipated—discharging through the galvanometer without losing its charge. In that case, there are ten minutes given, and the fall in the current is very slight. In many cases, he had been able to produce a much larger effect than that. It was intentionally taken with a small current, so that we should be able to measure it with a delicate galvanometer.

The Initial Throw.—As to the great initial throw, it could not be said, without experiment, how much of this was due to the needle swinging under its own inertia. This point had been determined, at Dr. Stone's request, by Mr. Wilkinson, Mr. Lant Carpenter's assistant. An experiment was made under exactly the same conditions, but with an inert instead of a polarisable resistance, and the permanent deflection reproduced. The throw, under these conditions, did not reach the point of discharge given from the body. The difference between the two was due to the effect of self-induction; it was exceedingly small in the experiment, because the electromotive force used was very low—about two volts, compared with the electromotive force of the body, which was about one volt. It was difficult to separate polarisation from capacity, but this experiment showed that there was some self-induction. The discharge from the patient observed in Messrs. Lant Carpenter and Wilkinson's experiment, referred to in the first lecture (see page 729), when no battery was in circuit, was 60 micro-amperes. After three minutes, it fell to 48.7 micro-amperes, and, after two minutes more, to 45 micro-amperes. The body, therefore, had discharged itself like a secondary battery. The curve of its discharge showed a perfectly steady falling current.

Electrotonus.—It was next pointed out that these observations had an important bearing on electrotonus. Dr. Stone said that he had long felt sceptical as to the accuracy of the statements current with regard to electrotonus, on account of the general agreement, that it was difficult to obtain constant results. He quoted the statement of Drs. Waller and de Watteville (in the paper above mentioned), to the effect that the inconstancy of the results was due to the inconstancy of the nervous matter, and expressed the opinion that this explanation was unsatisfactory. It had not been shown that the physical agent was constant. Too much stress had been laid on the terms anode and cathode, which were, in truth, fictitious terms, founded on the assumption that the current went from the one to the other. On the other hand, it was known with certainty that, at the + terminal in an electro-depositing apparatus, oxidation took place; and that, at the — terminal, hydrogen came off, and bases were separated; and it was also known that this produced a secondary battery, even in the living human body, of no inconsiderable power. The inconstant results might well be due to chemical changes produced in this way. Such phrases as "weak," "strong," "of medium strength," as applied to currents, were utterly vague. The latter phrase probably meant a current which exactly balanced the electromotive force of the body. If the electromotive force of the current were sufficiently strong to overpower the counter electromotive force of the body, electrolysis would take place. As a rule, the currents used were too strong. Dubois-Reymond, for instance, had used the current from eleven or twelve Grove cells. Rosenthal had, in fact, explicitly admitted that the results obtained were thus rendered inconstant. Another probable source of fallacy was the tetanising key of Dubois-Reymond; it was a short circuiting apparatus, and was supposed to cut off the electric agency from the body experimented on, but this was not scientifically true. Rosenthal admitted that some current, though he qualified it as a very little, did continue to pass through the body experimented on. When the induction-coil was used, the problem became still more complex; when the continuous current, and induced currents, were united, a problem was presented which was quite past accurate solution. Another false assumption was one which Drs. Waller and de Watteville appeared to have made; this was, that the laws of diffusion were the same for the

constant and for the induced currents. Dr. Stone had found that the induction-current might show a resistance of only half or two-thirds that found with the constant. In one experiment corrected by Mance's method, the resistance with the constant current was found to be 1,141 ω ; with the interrupted 575 ω .

Errors due to Inappropriate Instruments.—The phenomena, though admittedly inconstant, had been well and carefully observed, but error had arisen from working with instruments which were oversensitive, like Thompson's galvanometer, or insusceptible of calibration, like the galvanoscopic frog; which, moreover, was not constant, no two frogs having the same galvanometric power.

The telephone, used in the manner indicated in the last lecture, would probably be of service to measure, not only the resistance, but also the comparative self-induction. But, before observed phenomena could be safely attributed to physiological conditions, it was essential that the physical conditions of the instruments of research employed should be thoroughly understood. The experiment referred to afforded an instructive commentary on this head; the telephones produced a loud tick on making, and a soft tick on breaking the current; and on withdrawing the coil along the slide, as was done in physiological experiments, both ticks grew fainter, and the softer soon ceased to be heard. The resemblance between this experiment and the experiments on electrotonus, made in physiological laboratories, could not fail to be observed; the telephone in this purely physical experiment had reproduced the peculiar difference between make and break, which, when manifested in muscles, had been set down to physiological conditions.

In concluding his lecture, Dr. Stone expressed the fear that the phenomena in question had been incorrectly though laboriously observed, and too often ingeniously misinterpreted.

TWO LECTURES

ON

TUMOURS OF THE LARYNX; THEIR PATHOLOGY, SYMPTOMS, AND TREATMENT, WITH ILLUSTRATIVE CASES.

Selected from a Course of Lectures delivered during the Winter Session of 1885-86 at the Glasgow Royal Infirmary.

By DAVID NEWMAN, M.D.,

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LECTURE II.—(Continued from page 770).

WHAT I have said up to the present time regarding malignant growths has had reference specially to the sarcomata. I have now, gentlemen, to ask your attention to a form of malignant disease which is not only more frequently met with, but is less under the control of the surgeon. I refer to the carcinomata.

Cancer of the larynx appears, in the great majority of cases, as epithelioma. Medullary cancer comes next in order of frequency, and the least common variety is scirrhus or hard cancer. I have no intention at present of entering into a detailed discussion of the various forms of cancer which may affect the larynx. By doing so, I would occupy more time than I have at my disposal; and, besides, I think I can instruct you better by referring you to the specimens and cases now before you. I shall ask you to examine these carefully along with the specimens placed under the microscopes.

When cancerous disease attacks the larynx, it is usually limited to that cavity, and, during the early stages, seldom extends to the lymphatic glands. It is true that at one time it was believed to arise not in the larynx itself, but in the parts close to it. This, however, was a misconception; and it is now a recognised fact that cancer is more frequently intrinsic than extrinsic in its origin. In many cases, it is impossible to decide precisely where the disease commenced, but this is not a matter of great clinical importance; the point which one is anxious to make out is not whether the disease has its origin in one or other part of the larynx, but whether it is limited to the cavity itself, or has extended to, or originally involved, the epiglottis, the base of the tongue, the aryteno-epiglottidean folds or the oesophagus. In the cases met with in hospital practice, the disease is, in many instances, so far advanced before admission, that it is not easy to ascertain the part of

the larynx first affected; but, by referring to the literature of the subject, I find that, of the parts external to the larynx, the epiglottis is most frequently attacked, while of the intrinsic parts the vocal cords are the most common seat of the primary nodule.

Cancer of the larynx is practically a disease of advanced life, 50 per cent. of the cases occurring between the ages of 50 and 70; sarcoma, on the other hand, is a disease of middle life, appearing usually between the thirtieth and fiftieth years.

The case which I am about to describe to you illustrates in a most typical manner the symptoms and appearances of an extrinsic epithelioma of the larynx. The patient, D. McK., aged 64, sent to me by Dr. Dickie of Strona, was admitted to the hospital about a month ago. At that time, he was only able to speak indistinctly, and so was unable to give a very accurate account of his illness. From what he then stated, it appeared that, eighteen months ago, he noticed for the first time an alteration in his voice, unaccompanied by pain during either phonation or deglutition. The alteration in the voice gradually became more marked, and in April 1885 was accompanied by pain in front of the larynx. At that time, there was no difficulty in swallowing or breathing. It was not until a fortnight before admission that he suffered from dyspnoea. This symptom appeared very suddenly, and was associated with a severe paroxysmal cough which caused him considerable distress; so much so that, on one occasion, his wife feared that he would die from suffocation. On admission to the ward, the obstruction to respiration was so great, that I considered it advisable to perform tracheotomy without delay.

As the patient was advanced in years, and the dangers of the administration of a general anaesthetic, such as ethidene dichloride, chloroform, or ether, were considerable, I thought it advisable to avoid their use, and resolved to try the effect of a hypodermic injection of a 5 per cent. solution of hydrochlorate of eucaine. Therefore, about twenty minutes before operating, twenty minims of the solution were injected under the skin over the cricoid cartilage. This caused complete local anaesthesia, and tracheotomy was performed with as much deliberation as if the patient had been under the influence of chloroform. During the operation, he only suffered slight discomfort, no actual pain.

The day following the operation, I made a careful laryngoscopic examination, and found the tumour occupying the upper two-thirds of the cavity, and attached to the false cords on the right side. The growth was also seen to extend along the right aryteno-epiglottidean fold, to the base of the epiglottis; and it stretched across the cavity so far, that respiration by the mouth seemed impossible. The upper surface of the tumour was ulcerated, and covered by a coating of gray mucus and slough, which, when removed, exposed an irregular surface with elevated edges.

A few days after, the trachea was opened; the laryngeal obstruction somewhat subsided, and the voice improved a little. This favourable change might be accounted for by the rest afforded to the affected parts.

Since admission, the growth has increased in size rapidly, and now, as you will observe, there is no possibility of respiration by the natural channel, and the aphonia is complete. When I first examined the patient, it was with difficulty I could detect any enlargement of the lymphatic glands; at the present time, not only can indurated glands be detected at the side of the thyroid cartilage, but there is also a chain of enlarged glands in the sublingual region.

A few days ago, I removed a small portion of the tumour, *per vias naturales*, for diagnostic purposes, and you may see a section of it under the microscope after the lecture.

I will now show you a second specimen of extrinsic cancer of the larynx. This larynx was removed by me from a patient in the Western Infirmary in September, 1883. You will observe that the tumour involves the interior of the larynx above the level of the true vocal cords, as well as the whole of the epiglottis; but none of the lymphatic glands in the neighbourhood were infiltrated. I operated upon this case, not because I considered it a suitable one, but because the patient and his friends urged me to operate, after all the dangers of the proceeding had been explained to them, and after I had advised them that the ultimate results would not be satisfactory, even although the patient survived the immediate effects of the operation.

The patient, D. McD., aged 55, was admitted to the Western Infirmary on September 3rd, 1883. The principal features of the case were aphonia, and difficulty in respiration, accompanied by a copious discharge of blood-stained mucus. The patient was emaciated, and prematurely old. He stated that his father had been operated upon for cancer of the lip. The first sign of the disease in the larynx was a troublesome cough, which commenced three years ago, and, at that

time, was paroxysmal in character, but subsequently was almost constantly present. On pressure over the larynx, the patient complained of pain, but external manipulation failed to indicate any departure from the normal in the form of the parts. The laryngoscopic examination revealed the tumour which I have already described to you. Great difficulty was experienced in coming to a conclusion regarding the condition of the lungs, on account of the impediment in the larynx interfering with the access of air to the chest, and so producing sounds that obscured auscultation. Percussion showed slight diminution of resonance at the right apex, and at both bases posteriorly; the cardiac phenomena were normal. On September 7th, a consultation of the staff was called, and it was decided that extirpation of the larynx should be performed. Consequently, on the following morning, I performed laryngectomy, and along with the larynx proper, removed the whole of the epiglottis. The wound was packed with a sponge sprinkled with iodoform, and enveloped in perforated green silk, and a large tracheotomy-tube was fixed in the trachea.

During the first twenty-four hours the patient appeared to be doing well, the highest temperature being 101.4° Fahr., while the pulse maximum was 117. The respirations, however, were rapid, (from 30 to 40 per minute), and a good deal of mucus was coughed up from time to time. On the evening after the operation, a small oesophageal-tube was introduced through the nose, and a small quantity of peptonised beef-jelly was administered, along with a spoonful of brandy. As there was no tendency to vomiting, this was repeated every two hours. On the following morning, the patient seemed to be in fairly good spirits, but not so well as on the preceding night. The wound was dressed the same as before; but afterwards he appeared to be greatly exhausted, and the pulse became fluttering and irregular. During the day, a considerable quantity of mucus was coughed up, and, on examination of the chest, the lungs were found to be dull over the entire lower lobes; the pulse averaged from 100 to 117, the respirations from 40 to 48, while the temperature rose to 102.4° Fahr. In the evening, the pulse improved in volume, but still continued irregular in rhythm. The patient continued to take food without vomiting. At midnight, the pulse gradually became weaker and weaker, notwithstanding free stimulation; perspiration was profuse. This condition continued until 4 A.M., when he died from collapse.

Microscopic examination of the tumour shows it to be a typical epithelioma. At the *post mortem* examination, the whole of the growth was found to be removed, and none of the lymphatic glands were involved. The heart was collapsed, and very soft in consistency. The lungs were in a state of hypostatic congestion, and, to my surprise, a small cavity was found in the substance of the left lung, if I remember correctly. The cavity was situated at some distance from the surface; its walls were lined by a layer of mucus, and showed no evidence of recent destructive processes. On account of the physical conditions in the larynx, to which I have already alluded, the state of the lungs was not easily made out; and although special attention was directed to the condition of the lungs, this cavity was not detected, either by the physician who examined the chest or by myself. To this point I will refer hereafter.

This other larynx was extirpated in July, 1879, by my colleague, Dr. William Macewen, from a man, aged 56. In this case, the disease was more extensive than in any of the others that I have referred to, with the exception of D. McK. The tumour involved the larynx and upper part of the gullet, while there was a large glandular mass situated on the left side of the neck. The whole growth was excised, including the larynx, a portion of the gullet, and the enlarged glands. The patient died on the third day; and, on *post mortem* examination, the whole of the diseased tissue was found to be removed. On examining the larynx, you will observe that the arytenoid cartilages, the posterior wall of the larynx down to a quarter of an inch below the true cords, are occupied by an epithelioma; while the anterior part of the larynx, and the base of the epiglottis, appear to be quite healthy.

The three cases which I have just described to you are illustrative of extrinsic epithelioma of the larynx. I shall now give you an account of two cases of intrinsic epithelioma; upon one of these I operated on February 6th last.

The patient, J. W., aged 37, was admitted into the ward on January 5th, 1886, and tracheotomy was performed on the 14th of that month. The following is the history of the case as recorded in the ward journal.

About three years ago, the patient first noticed a slight hoarseness in speaking, unaccompanied by pain or by any difficulty in swallowing or breathing. The hoarseness commenced about November, 1882, and continued until the following summer, when some improvement took

place, but he was not certain whether the voice regained its normal condition or not. The following winter, 1883-84, his throat again troubled him, became worse than during the preceding year, and, since then, the disease had gradually developed to the present condition. He now complained of pain over the larynx extending upwards to the left ear, but not increased by palpation. Aphonia was complete, and there was slight difficulty in deglutition. Digital examination externally did not reveal any alteration in size or form of the larynx, or enlargement of the lymphatic glands. The epiglottis was practically normal, but the aryteno-epiglottidean folds were thickened slightly, and the mucous membrane of the upper part of the larynx was hyperæmic. On the left side, midway between the arytenoid cartilages and the thyroid attachment of the false cords, there was a deep ulcer with a sharply defined edge anteriorly, but posteriorly the edge was rounded, and the mucous membrane covering it presented a warty appearance. On the right side, the mucous membrane was considerably thickened over the false cords; the true vocal cords were completely destroyed by a large ulcer, which extended down as far as the lower margin of the thyroid cartilage, and presented the characteristic appearance of an advancing epithelioma.

Tracheotomy was performed, as I have stated, on January 14th; and on February 1st I made the following note. The patient stated that, for the last few days, the pain in deglutition had so increased, that he found considerable difficulty in swallowing solid food. For some time back (two months) he had had difficulty in swallowing fluid food; but, till lately, he had been able to swallow solids without pain, or even difficulty. This change was accounted for by the fact that, within the last week, the mucous membrane covering the arytenoid cartilages and the interarytenoid fold had become considerably indurated, apparently by inflammatory products. The only other change worthy of note was an increase of pain over the larynx, and in the left ear.

Previously to operating, I asked Dr. Perry to examine the patient, especially as regards the condition of his heart and lungs. These Dr. Perry pronounced as practically normal. Having satisfied myself, by microscopic examination of a portion of it, that the growth was an epithelioma, I asked Drs. Macewen and Knox to assist me in the operation. I intended to have done it in the ward, and so avoid exposing the patient to cold air while being removed from the operating-room to his bed; I therefore did not ask any of you to be present on the occasion, but limited the onlookers to those whom I absolutely required for assistance. The morning, however, was so dark, that I found it necessary to operate in the theatre attached to Dr. Macewen's ward.

My reasons for operating upon this patient, and refusing to do so upon D. McK. were that, in J. W., the growth was entirely limited to the laryngeal cavity, although it occupied both its sides. The patient was a young and otherwise healthy man; the tumour was of comparatively slow growth, and the patient was anxious to have the operation performed; whereas, in the case of D. McK., the growth was not limited to the cavity of the larynx, but extended along the right aryteno-epiglottidean fold to the base of the epiglottis, and the lymphatic glands were enlarged not only over the thyroid cartilage and the immediate neighbourhood of the larynx, but also in the sublingual region. The patient was a prematurely old man, the tumour was growing rapidly, and the condition of his lungs was not so satisfactory as one would desire. I therefore satisfied myself in the case of D. McK. with what I had done for him, in relieving him of the danger of suffocation, etc.

I shall describe the method of operation when we come to consider the subject of laryngectomy, and the after-treatment in the case of J. W.

This other specimen of intrinsic epithelioma was removed by the late Dr. Foulis. The primary growth was, I believe, a papilloma, and was removed by Dr. Morell Mackenzie, about five years previous to the time that the patient came under Dr. Foulis's care. The papilloma was followed by the epithelioma, which you now see within the larynx. Laryngectomy was performed on April 30th, 1881, and the patient recovered so rapidly from the effects of the operation, that he was sent home on May 27th following. Unfortunately, however, he took too much liberty with himself after returning to his occupation, and, during the following winter, he died from an acute affection of the lungs, the exact nature of which I have been unable to ascertain.

I have now shown you five specimens of malignant disease, all of which have been removed by complete laryngectomy; one by Dr. Macewen, two by the late Dr. Foulis, and two by myself. The only other example of malignant disease to which I will direct your attention is the one I now present to you. It is one of epithelioma, involving the pharynx and larynx, as well as the right border of the

epiglottis. The growth passed downwards, on the posterior wall of the larynx, to about three-eighths of an inch below the vocal cords, occupying chiefly the fissure between the cords, but also involving the posterior extremity of the right cord. The surface presents superficial ulceration, and several glands in the neighbourhood of the larynx are enlarged. The patient from whom this preparation was removed was under the care of Professor McCall Anderson, in Ward 2, in August, 1873. The history is rather imperfect; but, as far as can be ascertained, her age was 30 years, and she stated that she had had a slight cough for many years, accompanied occasionally by hoarseness and dyspnoea. The symptoms became aggravated six months previously to admission to the Royal Infirmary; and then dysphagia, for the first time, set in. The expectoration was profuse, muco-purulent, and tinged with blood.

We now come to the discussion of the general question of diagnosis of neoplasms of the larynx, and the two points we have to determine are: first, Is there a tumour in the larynx? and second, If so, what is its nature? For diagnostic purposes, symptoms arising from functional disturbance are, when taken by themselves, not of much value; thus, we may have all the subjective symptoms of tumour present without the existence of a new formation; and, on the other hand, a neoplasm may occupy the larynx for years without revealing itself. It is only by a laryngoscopic examination that it is possible to be certain whether or not the laryngeal symptoms are due to the presence of a tumour. There are five methods which we may adopt in the diagnosis of tumour. These are: first, the employment of the laryngeal mirror; second, passing the laryngeal sound or probe; third, palpating the larynx externally, or passing the finger through the mouth; fourth, auscultation and percussion; and, fifth, microscopic examination of a portion of the growth removed by the endolaryngeal method. By the first method, namely, the laryngeal mirror, we can make out the relationship of parts, the situation, the colour, and the general appearances of the new formation; but, by the reflected image alone, it is difficult to estimate the consistency, or establish the situation and seat of origin of the growth. For this purpose, we must employ the laryngeal probe or sound; by it, the insertion of the tumour may be precisely ascertained. Auscultation and percussion have both been employed in the diagnosis of laryngeal tumours; but the results are unsatisfactory, as compared with those derived from the methods I have just mentioned, and they are now seldom resorted to. Palpation externally may reveal facts of importance. By external manipulation, the relationship of the ala of the thyroid cartilage, or of the cricoid and thyroid cartilages, may be ascertained; and infiltration or inflammatory enlargement of the lymphatic glands, as well as perforation of the cartilages by the tumour-tissue, may be discovered. If, in addition to palpation externally, the larynx be anaesthetised, and the finger be introduced into the upper part of the larynx, or fauces, points of considerable importance may be elucidated; the consistency, the extent, and the firmness of the attachments of the tumour to neighbouring parts may be ascertained, and the observations made by the laryngeal mirror and probe corroborated. To assist you in diagnosing the exact nature of a tumour, there is no method more certain than removing a small portion of the growth, and submitting it to microscopic examination. This method I shall refer to more fully hereafter.

I do not think it necessary in the present lecture to discuss, nor even to indicate briefly, the points which distinguish the products of tuberculosis, syphilis, and lupus, from non-inflammatory neoplasms. I shall consider the diagnosis of these conditions when I come to speak of tuberculosis.

Suppose, now, that you have ascertained to your satisfaction that a tumour occupies the larynx, what is the next point to be cleared up? It is this: Is the tumour benign, or is it malignant? It is almost impossible to lay down any hard and fast rules for your guidance; and, while I attempt to do so, I trust you will bear in mind that the statements I make must be taken with certain reservations. The following circumstances are worthy of your attention, as distinguishing malignant from non-malignant growths.

In the former, especially in round-celled sarcoma and in soft cancer, the development of the symptoms and the growth of the tumour are rapid; whereas in the latter, as a general rule, the symptoms remain stationary, or nearly so, for a considerable time, often for years, and the increase in the bulk of the neoplasm is practically imperceptible. One exception to the slow growth of benign tumours is the papillomata, which, in many instances, grow with considerable rapidity. When the larynx is the seat of a benign growth, the mucous membrane may be hyperæmic, or slightly thickened by chronic catarrhal changes, but is not usually otherwise altered in appearance;

whereas, in malignant disease, especially in cancer, not only is the tumour ulcerated itself, but the mucous membrane is indurated, infiltrated with inflammatory products, and not uncommonly marked by erosions. Again, in cancerous disease, or when the larynx is occupied by a soft round-celled sarcoma, hæmorrhage may be a prominent symptom, especially if the patient suffer from paroxysms of coughing. This symptom is seldom present in non-malignant disease. Unless the larynx be the seat of prolonged and intense inflammation, enlargement of the lymphatic glands may be regarded as pathognomonic of cancer. In the sarcomata, the glands are not affected. Another symptom which makes one very suspicious of cancer is pain, at first limited to the larynx, but subsequently radiating to the ear and cheek and neck, on the affected side. In the early stages of the disease, it is, in many cases, very difficult to come to a definite diagnosis. This is especially the case in the sarcomata. Associated with these tumours, you have not the distinctive symptoms, subjective or objective, that you have in the carcinomata. The patient seldom complains of pain; there is rarely enlargement of the lymphatic glands, or ulceration of the surface of the tumour; but still the tumour is malignant, and the patient incurs almost as great a risk to life as if he were the subject of a cancerous growth. What means have we, then, of ascertaining with absolute certainty the nature of the new formation? At the last lecture, you saw me remove from the larynx of L. a small portion of the growth. This I did in order that I might examine it microscopically, and be quite sure as to its nature. This method should always be employed when there is any doubt respecting the histological characters of a tumour. It is a very simple operation, is practically devoid of danger; if the tumour be benign, it is but a step for its complete removal by the endolaryngeal method; if malignant, the sooner the fact is ascertained the better. Some growths which are homologous in their origin—for example, the papillomata and adenomata, may, at a later period of life, become heterologous, and develop signs of malignancy.

The diagnosis of intrinsic from extrinsic tumours is important, especially when we have to deal with malignant neoplasms—so important, that I will not apologise for repeating some statements which I have already made. By the term intrinsic, we mean to convey the idea that the growth is strictly limited to the laryngeal cavity. When this is the case, the prominent symptoms are aphonia and dyspnoea. The lymphatic glands are seldom affected; as a rule, cachexia is not a prominent feature during the earlier stages of the disease, and dysphagia is not a common symptom. In patients suffering from extrinsic growths, on the other hand, aphonia is not usually present at the commencement of the disease, and, indeed, there may be only slight alteration in the voice; while dysphagia is, as a rule, present as soon as the growth has reached any considerable size. Pain in the larynx and pharynx, extending round the neck and to the ear of the affected side, is more characteristic of extrinsic than of intrinsic new formations. In the former, the glands also are involved at an early period, and cachexia is usually pronounced.

[To be continued.]

THE SALICYLIC TREATMENT OF GLYCOSURIA.

By J. SINCLAIR HOLDEN, M.D.,

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A FRESH impulse has been received with regard to the treatment of glycosuria, or diabetes, from the recent valuable researches of Professor Latham on the pathological connection between diabetes and rheumatism. Dr. Latham considers that there are two distinct kinds of diabetes. First, there is that which arises from a neurotic disturbance of the function of the liver; this has the effect of arresting the metabolism of the glucose, and allowing it to pass unchanged into the general circulation and appear in the urine. Second, that which arises from a neurotic disturbance of the function of muscle; this allows glucose to form in that tissue, and to pass unchanged into the general circulation and appear in the urine. He has also shown that this second kind of diabetes is intimately connected with rheumatism; so intimately, that a degree of more or less oxidation determines whether the muscular tissue generates an abnormal amount of lactic acid or of glucose in the system. Moreover, he has shown that, when salicylic acid is administered, it has the property of arresting the formation of both lactic acid and glucose, by means of a chemical combination which it forms with the antecedents of these products.

These very important views of Dr. Latham, I think, are corroborated by the following cases of glycosuria which I have met occurring in rheumatic persons.

CASE I.—Mrs. C., aged 61, was crippled with rheumatic arthritis. In May, 1879, while attending her for eczema of both legs, I found that she was also suffering from diabetes, which, from her account, must have been going on for two years. Her urine had a specific gravity of 1055, was loaded with sugar, and measured nine pints daily. For six months, I treated her in the usual way—restricted diet and codeia—but never got the specific gravity of the urine lower than 1047, nor the daily quantity much below nine pints. As she had some acute pains in her joints, I then left off treating the diabetes, and gave her salicylic acid, in doses of twenty grains thrice daily for three days, and then in ten-grain doses. At the end of a fortnight, not only were the joint-pains relieved, but I found that the specific gravity of the urine was 1035, with less sugar, and she was passing only five pints daily. I continued the salicylic treatment, and only restricted from her diet sugar and potatoes. On December 13th, 1879, the urine was quite free from sugar, of specific gravity 1020, and normal in quantity.

This improvement continued for two and a half years, when there was a return of the same condition of glycosuria; a month's treatment with the salicylic acid completely arrested the attack, and there has been no symptom of it since. At the present day, she is in good health, except for the rheumatic arthritis.

CASE II.—Mrs. F., aged 56, of a very rheumatic family, suffered from rheumatic pains. For the last four years, she had been under medical treatment for diabetes. From being a strong robust woman, she had become helplessly weak. She consulted me in May, 1880. She was then passing daily from nine to twelve pints of saccharine urine, of specific gravity 1040, and suffered intensely from pruritus vulvæ. I thought her case hopeless, but put her on the salicylic treatment, the diet to be what she fancied except sugar and potatoes. During the four weeks following, the urine fell to three pints daily, of specific gravity 1030. She had gained in flesh and strength, and was quite free from pruritus vulvæ; she was able to resume the duties of managing a large boarding school. This improvement continued for nearly four years, when cancer of the liver set in, from which she died. In this case, I could never get the urine free from sugar, nor its specific gravity lower than 1030; yet, at the same time, the quantity remained normal. She took the medicine at intervals up to the last.

CASE III.—Mrs. H., aged 51, had, on the fingers of both hands, nodes of rheumatic arthritis. Symptoms of diabetes had existed a year; she had wasted greatly. I saw her in February, 1881. She was then passing eight pints of urine daily, of specific gravity 1040, loaded with sugar. After two weeks' taking of the salicylic acid, forty grains in the day, I found the specific gravity of the urine 1020, and only a trace of sugar; and she was passing a normal quantity. She continued the medicine, in less doses, for a month. At the end of that time, she wrote to me that she was in every respect quite well. I had no further visits from this case, as she left the neighbourhood while under treatment.

CASE IV.—Miss W., aged 52, was subject to rheumatic pains and cramps. I saw her in consultation in March, 1885. Diabetes had existed four months, rendering her unfit lately for household duties. Her urine was highly saccharine, of specific gravity 1030, and seven pints were passed daily. She was ordered salicylic acid, fifteen grains in mixture, three times a day, for a week; and then in ten-grain doses. At the end of the second week, the specific gravity of the urine was 1010, with no sugar. The quantity was six pints daily. She said she always passed about this quantity, but now felt quite well. The medicine was shortly afterwards discontinued; and there has been no return of the glycosuria. In this case, no restriction of diet was ordered.

CASE V.—Mrs. P., aged 59, had rheumatic arthritis in the fingers and wrists, and muscular pains and cramps frequently. She first consulted me on February 3rd, 1885, for cataract forming in both eyes. Symptoms of diabetes dated back a year. The urine was highly saccharine, of specific gravity 1035; and eight pints were passed daily. She commenced the salicylic acid, taking thirty-six grains daily, and from her diet she was ordered to exclude sugar and potatoes. On February 10th, urine eight pints, specific gravity 1028; much sugar. On February 17th, urine five pints, specific gravity 1020; less sugar. On February 26th, urine four pints, specific gravity 1010; no sugar. On March 12th, she was in the same condition as at the last report. I had to leave off the salicylic treatment, as she complained of it giving her indigestion. She said she was very much stronger. The above rapid improvement, under the salicylic treatment, only lasted three months, as, on May 28th, the urine, though only four pints in the day, had a specific gravity of 1030, and there was a return of the sugar. On resuming the medicine, the glycosuria again disappeared. Owing to the dyspepsia which the medicine causes, this lady cannot continue it long.