

nature of the trouble was pointed out. The patient says that the only trouble he himself noticed was that he couldn't throw a ball as well as formerly.

At the time of his first visit to the City Hospital clinic the conditions were about as at present, and as the accompanying photographs show fairly well. There was a marked shoulder-drop on the right, marked supra- and infra-clavicular depressions, thinning of the cervical border of the trapezius and considerable wasting of the pectorals. Posteriorly there was some atrophy of the supra and infra-spinatus, with eversion and forward rotation of the right scapula. The right arm could be raised fairly well to a right angle with the trunk, but beyond that only with difficulty. All other motions of the arm and hand were also weak. Motions of the head and neck were possible but distinctly limited on the right. The right scapula could not be approximated to the spine. The affected muscles showed varying degrees of quantitative loss to faradism.

The situation to-day, Feb. 23, 1907, shows but little change for the better, although the patient has had the benefit of four months' treatment by massage and electricity.

The photographs used in illustration of the conditions in this last case may be regarded as illustrating all such cases, the only variation being one of degree of severity.

In the matter of prognosis it need only be said that the nature of the original lesions implies permanent damage. In Case I, the most recent of the three, a certain amount of recovery will probably take place. Case II may be characterized as one of "healing with defect," while a lapse of five years in Case III practically places the damage upon a permanent basis.

The surgical lesson taught by these cases is too obvious to require comment.

## Medical Progress.

### RECENT PROGRESS IN LARYNGOLOGY.

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AND  
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NASAL POLYPI.

THE etiology of nasal polypi has long been the subject of much discussion. That they are the result of underlying inflammation or disease is now undoubted. An interesting contribution to this subject appears in a recent monograph by Yonge.<sup>1</sup>

The author's position is strengthened by having produced polypi artificially in cats which he subjected to the conditions under which he believes that polypi are formed. Disease of the underlying bone, which by several authors has been looked upon as the primary cause, he considers secondary, if it exists, to changes in the mucous membrane. Briefly stated, the writer believes that on account of the structure of the mucous membrane from which polypi grow, a partial closing of the ducts of the glands accompanied by hypersecretion will tend to produce polypi. The sequence of events is as follows: Chronic inflammation of the mucous

membrane, dilatation of the glands going on to cystic distention, caused either by marked inflammatory infiltration of their ducts produced by septic discharges, or by excessive filling of the gland combined with a partial obstruction to the exit of the gland contents. Then follows edematous infiltration of the surrounding tissues, resulting from the passage of serum through the capillary walls, due to increased pressure in certain of the capillaries, owing to obstruction, and to increased permeability in the capillary walls, the result of inflammation, and to the laxity of the surrounding tissues. This leads to the formation of folds or projections on the infiltrated mucous membrane, the increase of edema in certain of the folds combined later with a hyperplasia of the fibrous elements, the formation of flat edematous structures containing the essential constituents of the nasal mucous membrane, or of edematous structures containing the same constituents but a greater amount of fluid, and perhaps of hyperplastic tissue, and each possessing a base which gradually becomes relatively constricted and stretched until it constitutes a pedicle.

#### ETIOLOGY OF DEVIATION OF THE SEPTUM.

That the nasal septum of civilized man should deviate from the median plane in a large proportion of the race has been a matter of interest for years. With the introduction of constantly improving methods for correcting the deformity during the past fifteen years, many theories to account for its existence have been brought forward. Many of these were for obvious reasons unsatisfactory. Spurs and ridges were often looked upon as outgrowths of cartilage or bone, only accidentally connected with deviation of the septum as a whole. More recently deviations, when not obviously due to trauma, have been commonly considered to be the results of asymmetrical development, and spurs and ridges, dislocated or misplaced portions of the septal cartilage or bone. While this asymmetrical growth is probably influenced by many factors, as is asymmetrical growth in other parts, no one factor, with the possible exception of trauma, satisfactorily accounts for the more common types of deviation, especially of the tendency of the lower border of the cartilage to dislocation along the upper border of the vomer. On this account the relation of deviation and spurs to the eruption of the permanent incisor teeth, recently studied by Mosher,<sup>2</sup> is especially interesting. Embryologically, the septum and the premaxillary bones are formed by the fusion of the mesial nasal processes. At birth the lower part of the septum is a shallow trough composed of three overlapping segments,—the vomer behind, the nasal spines in front, and between and connecting the two the premaxillary wings or subvomer bones,—into which trough the quadrilateral cartilage and the perpendicular plate of the ethmoid dip from above. Bearing this in mind, it may easily be appreciated that the weakest points in the septum are the suture line between the perpendicu-

lar plate and the vomer, and the point at which the vomer trough is overlapped by the trough formed by the premaxillary wings. Any force that disturbs the normal coaptation of these constituent parts may produce deviation to one side or the other. The subvomer bones are prominent offenders in this particular, producing pressure by hypertrophy, which hypertrophy is caused by irregular or delayed eruption of the incisor teeth, the sockets of which are formed by the premaxillary bones. When the two wings are symmetrically but only slightly enlarged they tip evenly outward and produce basal spurs on either side of the septum anteriorly. When, however, the enlargement is symmetrical and at the same time excessive, the tip of the septum is first pushed upward and then to one side, with a resultant horizontal folding of the lower part of the cartilage upon itself. When the delay is unilateral, the hypertrophy is on the delayed side only, the quadrilateral cartilage is tipped out of its bed along the vomer-ethmoid articulation making a spur at this point and causing a deviation to the side opposite the hypertrophy.

Up to the eighth year, at which time the ossification of the septum is complete, trauma plays a minor part in producing deviations of the septum, as the force of blows is reduced by the elasticity of the cartilage. After this age trauma is an important cause of deviation. Trauma by breaking one or both premaxillary wings and one or both leaves of the vomer can produce spurs and deviations identical with those produced by delayed eruption of the incisor teeth. Where trauma causes the deviation, the anterior border of the perpendicular plate of the ethmoid plays an important rôle. This is the thickest part of the septum and the buffer against which blows from the front expend themselves. If this border is obliquely vertical, as it usually is, it is rightly placed to withstand trauma. If, on the other hand, it runs horizontally backward, it transmits the force of the blow along the vomer-ethmoid articulation. The direction, therefore, of the anterior edge of the perpendicular plate of the ethmoid determines how far back on the septum the force of the blow will be felt. The typical deviation caused by trauma from the front is a double one. First, a vertical deviation and then a horizontal one into which the first merges. No rules can be given for deviations and spurs caused by excessive trauma from the front or from the side. The writer sums up his views as follows: A great many spurs and deviations are caused by delayed eruption of the incisor teeth. After the teeth, trauma is the most common cause of deviations of the septum. In many cases the teeth start the deformity; trauma supplements and increases it.

#### SKIAGRAPHY AS AN AID TO THE DIAGNOSIS AND TREATMENT OF DISEASES OF THE ACCESSORY SINUSES OF THE NOSE.

Coakley<sup>3</sup> first called the attention of the profession in this country to the value of x-ray plates as an aid to diagnosis and treatment of

accessory sinusitis. He had seen plates taken for this purpose by Killian, of Freiburg, and in March, 1905, published the results of ten cases of radical operation in which skiagraphs had been taken. Since that time several communications have come from him on the subject. His results, together with those of Mosher<sup>4</sup> and Chisholm<sup>5</sup> demonstrate conclusively the great value of such plates, especially in frontal sinus disease.

An antero-post and right and left side views should be taken in all cases. The antero-posterior plate shows the presence or absence of the sinus, the size of the sinus, the position of the complete septum separating the right and left sinuses, and the partial partitions, and the presence or absence of an orbital prolongation. As in one third of all cases the frontal sinus does not come into the brow, but is simply an anterior ethmoid cell within the upper angle of the orbit, the plate obviates the necessity of always making the initial opening at the root of the nasal bones, the only safe procedure previous to the use of the plates. Cloudiness over one sinus or in the ethmoid region denotes either pus or diseased, polypoid or edematous mucous membrane.

The side views corroborate the testimony of the antero-posterior plate in regard to the height of the sinus and the size of the orbital prolongation. In cases of diseased sinuses, in which the antero-posterior x-ray plate fails to show the outline clearly, the side views are of inestimable value, as in them the outlines of the sinus come out clearly even when the sinus is filled with pus. They also show the depth of the frontal sinus and the extent of the basal relationship between the floor of the sinus and the anterior ethmoid cells. This is of importance from the standpoint of prognosis as we may state before operation the probabilities of making a sizable opening into the nose insuring adequate drainage.

#### PNEUMOCOCCUS INFECTIONS OF THE ACCESSORY SINUSES.

In a preliminary communication founded upon fifty-two autopsies at Ancon, Isthmus of Panama, Darling<sup>6</sup> concludes that the portal of entry of the pneumococcus is, in most instances, an accessory nasal sinus, the mucous membrane of which is probably fitted for the reception of the pneumococcus by an antecedent influenza or rhinitis. Of the autopsies 37 were pneumococcus infections, including 22 lobar pneumonia, 1 acute pericarditis, 9 acute meningitis and 5 pneumococcus septicemia. Of these 92% showed in a very marked degree pneumococcus inflammation of one or more of the sinuses. It is fibrino-purulent in character, fibrin and mononuclear cells being abundant. Pneumococci are always present and in numbers depending on the duration of the process. A point of great importance is the age of the sinus infection which has been appreciably greater than that of the lung or meningeal lesion.

#### HYPEREMIA IN THE TREATMENT OF DISEASES OF THE UPPER AIR PASSAGES.

The methods of Bier for the treatment of different diseases by inducing hyperemia has been

studied by Polyak<sup>7</sup> in cases involving the upper respiratory passages. Following the technique of Keppler, passive congestion of the head is induced by an elastic bandage about the neck. The bandage should be so made that the degree of constriction can be easily altered; and especially if the effects of the hyperemia are desired in the larynx, it must be placed as far down on the neck as possible. It should never be placed over the larynx, but in the region of the thyroid gland, where it is generally tolerated by the patient without discomfort, even at his meals. Although Bier recommended that the bandage be kept on for twenty out of the twenty-four hours, the author has reduced the time to eight or twelve hours a day, broken by two or three intermissions of an hour or two each. In cases of disease of the larynx, especially tuberculosis, he begins with short periods, thirty minutes, noting the effects with the laryngoscope. The effects of this induced congestion were often striking. Headache disappeared in a few minutes, and pain in swallowing in cases of acute tonsillitis and pharyngitis were often quickly relieved. This relief of pain was also obtained in cases of laryngeal tuberculosis, so that the condition of the patient was much improved. When the bandage is removed, although the pain recurs, it is less rather than more acute as a result of the previous hyperemia.

A second method of inducing hyperemia consists in a special suction apparatus in which a cup is applied over some local point in the pharynx, and the air exhausted by means of a rubber bulb. This suction is continued for a few minutes, and may be repeated if desired. The author has obtained good results in cases of acute swelling of the tonsils, painful pharyngitis and crust formation.

The author considers that it is well worth while to try induction of hyperemia in certain diseases of the upper air passages. The experiment is simple and has never given rise to serious complications. Nevertheless, it should be carefully applied. At the beginning, at least, it should be under the observation of a physician. This is especially true in cases of laryngeal tuberculosis, where edema of the larynx is possible. It may be of use in acute catarrhal and purulent processes with crust formation, torpid ulceration, tuberculosis and lupus. Although it is not easy to describe the exact degree to which positive congestion should be carried, it may be said that it should never be distinctly uncomfortable for the patient, nor cause marked congestion nor headache. The proper degree is where a previous pain is at least relieved after a few minutes.

#### THE BACTERIA OF SCARLATINAL AND NORMAL THROATS.

Ruediger<sup>8</sup> has reported results of examinations of cultures from the tonsils of 154 cases, divided as follows: Normal 51; scarlatina 75; measles 14; tonsillitis 5; pneumonia 5; pharyngitis 4. Streptococcus pyogenes was constantly found in great numbers in all cases of scarlet fever and tonsillitis. As a rule this organism greatly predomi-

nated over other colonies when the inflammation of the throat was pronounced and rapidly decreased in numbers with the subsidence of the throat symptoms. When the throat symptoms were mild the proportion of the streptococcus colonies to other colonies was small. In normal throats the streptococcus was found in 58% of the series examined, but was always present in small numbers. The author considers that it cannot be considered a normal inhabitant of all healthy throats. The streptococci from normal throats had a slightly greater virulence for rabbits than those from scarlatinal throats, which agrees with the reported results of Hilbert<sup>9</sup> and Tummeliff.<sup>10</sup> Pneumococci of low virulence were found in 135 of this series of 154 throats. The Commission for the Investigation of Acute Respiratory Diseases of the Health Department of the City of New York<sup>11</sup> found the pneumococcus in an equally large percentage of persons not afflicted with pneumonia. Klebs-Löffler bacilli were found in 4 cases, which was to be expected, as innumerable observers have reported present in normal throats in varying percentages. Bacillus mucosus and bacillus influenzae were each found once. Staphylococcus aureus and citreus and micrococcus tetragenus were found occasionally, but were thought to be contaminations from the tongue. Gram-negative diplococci which form small brownish colonies were found quite frequently. Some of these were identified as micrococcus catarrhalis. A large group of organisms which lies between the typical streptococcus pyogenes and pneumococcus was found in all normal throats and in nearly all diseased throats. These organisms have little virulence for rabbits and, as they are found in great abundance in practically all throats, they would appear to be normal inhabitants.

#### A DEFINITE CONDITION OF IRRITATION OF THE LARYNGEAL NERVES.

Among the neuroses of sensation of the larynx and its neighborhood Boenninghaus<sup>12</sup> believes that certain symptoms occur together frequently enough to constitute a definite pathological picture. The principal symptom is pain or discomfort, varying much in different cases, but accompanied by definite spots which are tender to pressure. This condition arises generally as a sequel to inflammatory disturbances of the pharynx, larynx and trachea. As these tender spots are found in the paths of the laryngeal nerves, it is probable that the symptoms are due to an irritation of these nerves. As this condition is a not infrequent one, and as it seems to be benefited by massage of the neck, the subject is one of practical importance. It is fully as common in men as in women, and very rare in children. It may last for days or months or even years. The pain varies very much in different cases, but one very common characteristic is that the pain is aroused by the motions of swallowing when nothing is swallowed. The essential element in the diagnosis is the presence of certain definite spots sensitive to pressure, an upper spot between the

greater cornu of the hyoid bone and the upper edge of the thyroid cartilage, that is, in the lateral part of the thyro-hyoid membrane; and a lower spot on the lateral border of the trachea. The patient will sometimes point out one of these spots as the seat of his trouble. In other cases they are discovered by careful manipulation, especial attention being given to the relative sensations of each side. Treatment by massage is generally effective, and the galvanic current is also useful.

#### MALIGNANT DISEASES OF THE LARYNX.

As is usual, much has been written on this important subject during the past year; and although nothing essentially new has been advanced since the last review of the subject in the *JOURNAL*, Feb. 5, 1904, the increased numbers of reported results in operative cases has made prognosis more definite and hopeful. All the writers accentuate the necessity of early diagnosis and the removal of the growth in its incipency. Baginsky<sup>13</sup> states that although extirpation of the larynx has become a less dangerous operation than formerly, and after-treatment has been much improved, still the mortality is great, and early diagnosis holds out the only hope of permanent cure. Mackenzie<sup>14</sup> advances the view that injury to the growth due to excision for microscopical examination opens the pathway for metastatic invasion, and he makes a plea for diagnosis by exclusion without the aid of the microscope if possible. If, however, a piece must be removed for examination, let operation be immediate, if the growth prove malignant.

Jackson<sup>15</sup> urges the frequent malignant nature of chronic hoarseness. The early curable stages of cancer of the larynx are characterized by nothing but hoarseness, which may disappear and recur. Cough, odor, pain and glandular involvements are present only when the curable stage is passed. He reports 15 cases of thyrotomy and 8 cases of total laryngectomy. No immediate deaths occurred, which he modestly ascribes to good fortune; and the subsequent history of his cases show surprisingly good results. Of the 15 thyrotomies 5 were alive and well two years after operation. His conclusions are: Early diagnosis is essential; if discovered early, the comparatively slight operation of thyrotomy will cure. If discovered late, total or partial laryngectomy will probably prolong life for a variable period but recurrence is fairly certain.

In a recent paper Semon<sup>16</sup> reviews the whole subject, his present views not differing materially from those of his earlier papers.

#### THE ETIOLOGY AND PATHOLOGY OF VOCAL NODULES.

Miller<sup>17</sup> has contributed an interesting and original article on this subject. Microscopically he has found nodules to consist of a superficial localized edema manifesting itself on the edge of of the cord, with little or no change in the epithelial layer either in the external hornified stratum or in its relation to the subepithelial connective tissue. He found no evidence of an

inflammatory process. Nodules may be traumatic in origin, such as those produced during violent coughing, in which case the nodule may appear at any point on the cord. On the other hand, the nodules caused by vocal weakness display a puzzling affinity for particular portions of the cords. They are generally found protruding from the anterior and middle third on one or both sides of the glottic opening. The traumatic nodule and what may be styled the vocal node are oftentimes simultaneously present, the traumatic nodule existing by itself in some irregular portion of the cord or superimposed upon or blended with the vocal node each to be distinguished by its well defined location, though produced by totally different causes. His theory as to the causation of the typical nodes is as follows: A great majority of the subjects present a follicular tonsillitis, accompanying this there is more or less congestion of the mucous membrane of the larynx. This renders that portion over the vocal cords more liable to become edematous. It is further thought that there is a hyperactivity of certain fasciculi of the thyro-arytenoideus externus muscle, and that where these bundles cross the true cords there is produced localized edema or a singer's node. In support of this theory the author has succeeded in producing nodules experimentally in dogs. A tonsillitis was first produced by painting the fauces with cantharidal collodion and two days later rubbing on the surface a virulent culture of streptococci. Then through a slit-like opening in one side of the thyroid cartilage a small piece of the central portion of the thyro-arytenoideus muscle was removed, consisting of its whole thickness but not completely dividing the muscle, in the hope that the nodes would be produced at the joints where these fasciculi pressed on the true cord. Examination with the laryngoscope after convalescence showed a node about where the post-fasciculus crossed the cord. This was confirmed by a post-mortem examination. A very interesting fact was that, on splitting the larynx open from behind through the cricoid cartilage, the node disappeared. From this it is suggested that nodes cannot be preserved after death.

#### GASTROSCOPY BY MEANS OF A MODIFICATION OF THE KILLIAN ESOPHAGOSCOPE.

Chevalier Jackson<sup>18</sup> has devised a modification of the esophagoscope which he has used with success for direct inspection of the stomach for purposes both of diagnosis and treatment. The instrument is simply a lengthened esophagoscope with the lamp at the distal extremity of the tube as in the bronchoscope and esophagoscope previously devised by the author. For use in the adult the tube is 9 mm. in diameter and 80 cm. in length. The light is carried on a removable light carrier which passes through a small auxiliary tube made in the wall of the main tube. When the carrier is in place the small lamp is at the extreme distal end of the gastroscope where it brilliantly illuminates the field without interfering with vision or instrumentation. Dry

batteries are advised for lighting as the current from commercial lighting circuits may be "grounded" through the patient. The secretion aspirator, cotton carrier and tube forceps of increased length are used as in bronchoscopy or esophagoscopy. Deep anesthesia is absolutely necessary to prevent retching, and ether is the choice, as the author considers chloroform especially dangerous for gastroscopic work. The tube is inserted in the usual way with the patient supine and the head well over the end of the table in Rosen's position. It is first passed to the greater curvature and the anterior and posterior walls inspected. It is then partially withdrawn, inclined slightly laterally in the same plane and again pushed downward in a new series of folds. After the whole possible range has been covered in this way the tube is passed down until the extremity touches the wall of the greater curvature at the extreme left of the possible field. It is then moved slowly along the greater curvature, but not in too close contact, until the extreme right is reached. This movement is repeated as many times as is necessary to cover the field as high as the cardia, the tube being withdrawn a centimeter or two with each repetition. Abdominal palpation may then be used to bring unexplored portions of the gastric mucosa within the field. This sometimes is better accomplished by turning the patient from side to side; but during these latter manipulations the tube must be withdrawn from the esophagus, and reinserted when the stomach is in its new position. In a patient with a normal stomach and esophagus the greater curvature for an extent of about 14 cm. and a considerable area of both the anterior and posterior walls may readily be explored without the aid of external manipulation. The fundus and pyloric ends can be brought within range of the gastroscope by change of position or by palpation. In the vertical or gastropototic stomachs, the lesser curvature, the pylorus and the pyloric third are easily seen with little or no external manipulation. The author reports diagnoses of gastritis, gastropotosis, malignant disease of the cardia and the pylorus, each in one instance; of peptic ulcer in three cases, one of which was cured by direct application.

#### ADRENALIN CHLORIDE, DANGERS OF ITS INDISCRIMINATE USE.

Adrenalin has been a great boon to the intranasal operator, enabling him, as it does, to operate in a comparatively dry field. That it is not always an innocent and harmless agent has been shown by the investigations of Josué,<sup>19</sup> Erb,<sup>20</sup> Rzentkowski,<sup>21</sup> Fisher,<sup>22</sup> Pierce,<sup>23</sup> and Stanton,<sup>24</sup> during the past three years. Josué first called attention to the fact that intravenous injections of adrenalin in the rabbit were followed by extensive changes in the aorta and larger vessels, and this observation has been corroborated by the results of the other observers. The change consists of localized destruction of the smooth muscle fibers of the media accompanied by rapid calcification and other characteristic alterations in the elastic tissue elements. Erb states that there is no act-

ual similarity between this condition and the arterial sclerosis in the human subject. There is no sclerosis in the sense of a thickening due to proliferation of the intima, nor an atheromatous process, but there is apparently an analogy between the condition described and the calcification of the media as found in the large arteries of the extremities in man. Josué,<sup>25</sup> in a more recent article, says that hypodermic injections may be given up to  $\frac{1}{10}$  gr. in twenty-four hours, but if this dosage be exceeded there is danger of producing toxic effects. Applications to the unbroken nasal mucous membrane may be made without anticipation of untoward action. Adrenalin is often freely applied in mid-operation in intranasal work, and the question becomes pertinent as to whether in so vascular a tissue as the mucous membrane of the nose, enough of the solution may not be absorbed through the cut surface to give rise to the immediate toxic symptoms and later vascular changes. A case has recently been reported of profound general disturbance induced by the injection of half a dram of 1-1000 solution into the urethra for the purpose of checking bleeding after the passage of a sound.<sup>26</sup> The cut nasal mucous membrane would seem to offer as fair a chance of absorption as the urethra.

Less serious than the above described conditions, but still of importance, are the local symptoms which may follow the long-continued use of nasal sprays of adrenalin for the relief of hay fever. B. H. Potts,<sup>27</sup> has made a timely protest against the careless use of this drug, and reports several cases of persistent turgescence of the nasal mucous membrane, due to long continued home use of adrenalin sprays by the patient.

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- <sup>4</sup> Laryngoscope, Feb., 1902.
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- <sup>19</sup> Presse Medicale, 1903, xi, p. 798.
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DEATH OF RAILWAY SERVANTS FROM ACCIDENTS.—Some interesting figures have recently been given out showing the number of railway servants in England killed for each year from 1896 to 1906, both inclusive, in the movements of railway vehicles. The total number for eleven years was 5,241, and the yearly average number of deaths was somewhat over 476. The worst year was 1900 with 583 deaths, and the best year was 1905 with 399.—*British Medical Journal*.