he is considered to have passed the test if he recognises the equality. In this test R. P., who did so well in the other tests, failed, and failed most egregiously, succumbing to the suggestion as completely as the least intelligent of the feeble-minded girls. The most probable explanation of this result is that suggestibility, or, at all events, the sort of suggestibility that we are dealing with by such a test, depends largely on affectivity and impulse, and that these factors rather than the intelligence are at fault in this case. And the facts as to the girl's delinquency tend to confirm this surmise. She had committed a very silly act of arson, setting fire to a chair in the house where she was employed as a servant. She admitted the crime but could not assign any motive for it, saying merely that the idea came to her and that she acted without being able to think what she was doing. This occurred within a few hours of a more serious outbreak of fire which appears to have been due to accident, but in which, at any rate, it was not shown that she had any hand. Further, she had been subjected from childhood to a peculiar form of pathological lying which would lead her constantly to confirm and supplement by imaginary details any statement or opinion emanating from a person who had gained some influence over her. It is difficult not to connect this morbid trait and the apparently imitative act of arson with the marked suggestibility revealed in the test with the lines. I have thought it worth while to refer at some length to this girl's case as an illustration of the point I wish to make regarding the indirect value of some of the Binet-Simon tests outside the field for which they are specially intended. In the interpretation of the engravings and in several of the questions and definitions the subject's affectivity is very frequently shown in an equally instructive manner.

It should, of course, hardly be necessary to point out that this method is not in any sense proposed as a substitute for that complete clinical study on which alone an opinion of any value can be formed with regard to a case of mental deficiency. What is claimed for it is that it supplements the clinical investigation, and enables its results, so far as the factor of intelligence is concerned, to be presented with a clearness and an objectivity which must considerably enhance their value. From this point of view it is likely, I think, to be found of very real service in medico-legal practice and in the certification of the feeble-minded.

In conclusion, it remains only to express my very deep appreciation of the great kindness shown me by the late M. Binet and his fellow-workers, to whom I have been indebted for the opportunity of making myself familiar with this interesting and valuable method. M. Binet, with the generous spirit of the true *savant*, not only allowed me free access to his laboratory, but gave me most freely the invaluable aid of his advice and supervision. Dr. Th. Simon, the distinguished physician of Morel's old asylum of St. Yon, whose charming hospitality I cannot sufficiently acknowledge, gave me the opportunity of seeing in his service the application of the method to a large number of congenital defectives of all grades, and also to a number of insane patients. To Mlle. Giroud, secrétaire de la Société Libre pour l'Étude Psychologique de l'Enfant, I am indebted for instruction in the details of the various tests, and I have to thank M. Vanney, the enlightened headmaster of one of the principal primary schools in the district of La Villette, for allowing me to practise the method on a large number of his pupils of different ages. I have also to acknowledge the kindness of the well-known philanthropist, M. Henri Rollet, who permitted me to test the intelligence of several adolescent criminals in one of his after-care homes. And finally I have to thank the Prison Commissioners for granting me the period of special leave during which I was enabled to undertake this study.

H.M. Prison, Holloway, N.

THE (Biennial) Health Conference and Exhibition, 1912, will be held at the Royal Horticultural Hall, Westminster, from June 24th to 27th, under the patronage of H.R.H. Princess Christian of Schleswig-Holstein, in coöperation with the National Health Society. The promoter and organiser is Miss R. V. Gill, 35, Ludgate-hill, London, E.C.

PHARYNGEAL SUPPURATION: COURSE AND DIRECTION OF VARIOUS TYPES.

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IN dealing with this subject it is advisable to consider first the anatomy and physiology of a region so intimately concerned with all the vital processes, and then to apply well-established principles of surgery and pathology without being led either by the specialist's tendency to magnify fine clinical distinctions or by the general surgeon's desire for differences which, although not prominent, may be of great importance in diagnosis, prognosis, and treatment. It is also advisable in giving a comprehensive description of any surgical condition that we should avoid the use of terms which, though sanctioned by ancient usage, are not scientifically accurate, and may be misleading. Such terms as "quinsy" and "croup," for instance, should be relegated to the past. There is some danger, however, of substituting for these terms others which are more impressive, but which are, after all, only more evidences of our want of knowledge of the essential nature of the disease with which we have to do. In this category comes the expression "retro-pharyngeal abscess," an expression which neither describes nor defines the several conditions to which it is commonly applied.

The methods usually employed by medical writers in classifying diseases may be either anatomical or clinical. In classifying suppuration in the region of the pharynx, while it is a great advantage to possess a wide experience of the various and varied appearances which present themselves to the surgeon engaged in their treatment, only a thorough grasp of the anatomy and physiology of the region will furnish the principles which go to form reliable knowledge, and which will enable him to apply his technical skill in a manner calculated to bring the greatest amount of relief to the sufferer.

Points for Consideration in the Anatomy and Physiology of the Pharynx.

The most important structure to study in connexion with the pharynx is the strong aponeurosis which, known as the pharyngeal aponeurosis, forms a kind of fibrous bag, around which are applied the structures required for the performance of the important functions concerned and on which they act. This aponeurosis is attached above to the under surface of the basal portion of the occipital bone, immediately in front of the pharyngeal tubercle; then to a line extending along the under surface of the petrous portion of the temporal bone as far as the anterior border of the jugular foramen; then to the inner end of the Eustachian tube and along the border of the internal pterygoid plate, to the pterygo-maxillary ligament and to the posterior end of the mylohyoid ridge on the lower jaw. From this the aponeurosis passes down the side of the tongue to the hyoid bone. Here it ends, but under the name of the thyrohyoid membrane is continued to the middle of the posterior surface of the thyroid cartilage, where it becomes merged in the lining membrane of the larynx.

Posteriorly the bag formed by the pharyngeal aponeurosis is complete, and forms a continuous layer of tissue from the base of the skull to the sixth cervical vertebra, where it joins the fibrous coat of the œsophagus at the level of the cricoid cartilage. The soft palate may be considered as part of the pharynx, and the fibrous aponeurosis, which is clothed by mucous membrane in front and behind by both muscles and mucous membrane, forms an integral part of the pharyngeal apparatus and is intimately concerned in suppurative processes, especially in the neighbourhood of the tonsils. The soft palate when drawn back acts as a curtain separating the mouth from the naso-pharynx and nose.

Superficial to the pharyngeal aponeurosis is the mucous membrane, which is continuous with that of the several cavities or canals opening into it, but which has a distinct character of its own. Numerous mucous glands are to be found scattered over its surface, while an abundance of lymphoid tissue, which is especially marked during the earlier years of life, is responsible in great measure for the ease with which pathogenic micro-organisms produce their effects within its substance.

The lymphoid tissue is mainly collected into a series of aggregations called "tonsils," which form a ring extending from the roof of the pharynx down the sides of the faucial isthmus to the dorsum of the tongue. Lying beneath the body of the sphenoid is the collection of lymphoid tissue known as the pharyngeal or Luschka's tonsil. With this the name of "adenoids" is associated when it is hypertrophied; a smaller collection is that at the posterior lip of the Eustachian orifice and in the fossa of Rosenmüller lying above and behind it. At the sides of the buccal aperture, between the anterior and posterior pillars of the fauces in the recess known as the tonsillar recess, is the faucial tonsil or tonsil proper, while on the pharyngeal aspect of the dorsum of the tongue, lying between that and the epiglottis, is the lingual tonsil, which differs from the others in its relative insignificance during the years of childhood.

Having considered the aponeurosis and its overlying mucous membrane, we next have to deal with the muscles which lie outside the aponeurosis in a space between that and the strong layer of tissue known as the prevertebral fascia. This space has been described as the "retro-pharyngeal space," a description which is too vague, especially when we come to consider suppuration in the pharynx as a whole. We must bear in mind that there is an anterior as well as posterior and lateral surfaces to the pharynx, and we shall thereby be enabled to include various important forms of suppuration beneath the root of the tongue which lie in the same plane as the space in which the constrictors of the pharynx lie. The constrictors are three—the superior, middle, and inferior, which are associated in deglutition by the stylopharyngeus, the stylohyoid, the palatoglossus, and palatopharyngeus, together with the muscles of the soft palate. These muscles are important in connexion with suppuration, not so much from the point of view of cause as of effect, for their involvement gives rise to one of the most characteristic symptoms of that affection—viz., dysphagia or difficulty in deglutition.

Posterior to the muscle lies the strong prevertebral fascia, which stretches across the neck from the deep surface of one sternomastoid to that of the other, and thus separates the anterior surface of the bodies of the cervical vertebræ and the ligaments and muscles attached thereto from the muscles of the pharynx. Posterior to the prevertebral fascia on the rectus capitis anticus major lies the post-pharyngeal gland, which may caseate and form an abscess presenting on the pharyngeal wall. Behind these several structures we come to the bodies of the first six cervical vertebræ, and thus complete the list of the anatomical factors likely to be involved in suppuration of the pharynx.

Etiology of Pharyngeal Suppuration.

The etiology of suppuration in the region of the pharynx resolves itself into a question of bacteriology, and when we consider that in apparently healthy throats there are found, among other numerous pathogenic bacteria, the tubercle bacillus, the diphtheria bacillus, streptococci, staphylococci, pneumococci, bacillus coli communis, the micrococcus catarrhalis, and various forms of leptothrix, the only wonder is that inflammations and suppuration are not more common than they are. The structure of the lymphoid tissue itself predisposes to the entrance of micro-organisms, for in the epithelium of the crypts there are gaps which permit of the passage of leucocytes, and *a fortiori*, of the much smaller schizomycetes which set up disease processes. Placed at the entrance to the respiratory and digestive systems, and intended evidently by nature to act as a protecting filter, the tonsillar tissue must be admitted to fail to a great extent in the purpose which it is supposed to fulfil.

As factors predisposing to suppurative processes in the pharynx may be mentioned such causes of chronic irritation as smoking, alcoholism, and syphilis. The exanthemata, especially measles and scarlet fever, also predispose to infection, and the influenza bacillus by its effect on the accessory air sinuses is responsible for many cases of suppuration owing to the discharge into the naso-pharynx of the products of acute and chronic sinusitis. Middle-ear disease through its connexion with the Eustachian tube is liable to produce suppurative pharyngitis.

The mechanical causes of suppuration in the pharynx are foreign bodies, such as fish bone, chicken bones, rabbit bones, while such an object as a broken pipe-stem has been extracted from a tonsil, where it lay embedded for weeks.

In children, wounds from pointed sticks give rise to suppuration not infrequently; while in lunatics and persons of suicidal tendencies we may have to deal with the results of infected wounds inflicted by knives, pieces of glass or metal, and by bullets.

Classification of Suppuration in the Pharynx and its Neighbourhood.

The only scientific classification of pharyngeal suppuration is an anatomical one based on the tendency which pus usually exhibits of travelling in the planes of cellular tissue. One is not unmindful of the possibility of this, as of all other disease processes, extending from the original seat to adjacent strata, but we should always endeavour to have before our mental purview a definite conception of a starting-point from which to follow the course and progress of the disease in each individual case. Suppuration originating in each of the layers which compose the pharyngeal wall has a definite character of its own, which often will enable the careful investigator to recognise and deal with it effectually as soon as the time for action arises.

The classification which I would propose is as follows. Pharyngeal suppuration, according to its seat of origin, may be: (1) Lymphoid; (2) submucous; (3) subaponeurotic; (4) prevertebral.

1. *Suppuration arising in the lymphoid tissue of the pharynx.*—Although this is by far the commonest seat of infection, it is seldom that we find any large collections of pus in this layer of the pharyngeal substance. In acute lacunar tonsillitis the crypts may contain pus which either confines itself to the separate lacunæ or spreads as a false membrane over the tonsillar surface. Occasionally one finds as a result of parenchymatous tonsillitis the whole tonsil becoming smooth and rounded, forming a localised abscess. In my experience I have only observed a slight number of cases in which suppuration resulted in a pure tonsillar abscess. It is rarer still in the pharyngeal and lingual tonsils. In Vincent's angina one sometimes finds a membrane due to staphylococcus infection which may be mistaken for diphtheria.

2. *Suppuration originating in the submucous tissue of the pharynx.*—This is the form of suppuration which most often presents itself to the surgeon, and is best exemplified by the well-known peritonsillar abscess to which the popular designation of quinsy is applied. It is characterised by a rapid infiltration of the loose submucous tissue over an extent of surface varying with the virulence and duration of the infective process. In the case of peritonsillar abscess the local manifestations are most marked in the soft palate, but may, if unchecked, spread over the whole of the submucous layer of the pharynx. In the form of pharyngeal suppuration described by Senator under the name of "acute infectious phlegmon" the disease may run its course and cause death in four or five days, either from œdema of the larynx or from the severity of the constitutional symptoms. Here the deeper layers of the pharynx may be practically free from pus.

The most prominent symptom in all submucous affections is dysphagia. This is due partly to the presence of the swelling, but mostly to the pain caused by pressure on delicate nerve endings. Trismus is also largely reflex in order to prevent pain.

3. *Suppuration arising in the subaponeurotic layer of the pharynx.*—To suppuration occurring in the space between the pharyngeal aponeurosis and the prevertebral fascia some writers would confine the term "retro-pharyngeal abscess." This, however, appears to me to favour the looseness of thought which in the past has done so much to prevent a clear understanding of the various processes which may result in an abscess in this region.

Adhering to the classification proposed above, the term "subaponeurotic suppuration" would include not only an abscess originating in the deep cervical glands and presenting at the back of the pharynx, but also the particular form of submaxillary phlegmon known as "angina Ludovici," while it would exclude an abscess the origin of which was due to caries of the cervical vertebræ or caseation in the post-pharyngeal gland.

4. *Prevertebral suppuration.*—The last of the forms of suppuration in the pharynx is that with which the name of retro-pharyngeal abscess is almost always associated in the mind of the general practitioner. Arising not in the

pharynx but as an abscess either of the vertebræ or of the lymphatic glands adjacent thereto, it has in reality no right to be designated as pharyngeal, and the name "prevertebral" ought, I think, to be employed instead to describe this condition. A prevertebral abscess may, of course, arise as a result of a penetrating wound of the pharynx, just as an abscess of the lung may result from a stab of the chest-wall, but in the latter case we describe the disease in association with the organ in which it is found. The subject of caries of the cervical vertebræ and of caseation of the post-pharyngeal glands, therefore, while of great interest to the surgeon, need not be exhaustively treated of here, for it is a subject which has been adequately dealt with by more than one writer. One or two points in connexion with diagnosis may be referred to. The history alone will do a great deal to enable us to distinguish the other three forms of suppuration from this one. The sufferer is often a child or young adult and the accompanying signs of spinal caries are mostly fairly evident. The duration, the absence of fever, the lack of muscular rigidity except where actual deformity exists, and the slow onset of dysphagia will decide us in making a diagnosis. The pus may present either in the middle line or laterally, and the presence of fluctuation will distinguish from sarcoma, while there is no superficial bleeding when the swelling is touched, as in the latter disease. The prognosis depends upon the extent of the spinal mischief and to some extent on the care with which the treatment is carried out, for although the symptoms may not appear urgent the tendency for the pus to track downwards, and so beyond the reach of the surgeon, and the risk of secondary infection if the abscess opens into the pharynx are considerations of weighty import in dealing with a case of this kind.

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A CASE OF ACUTE MYELITIS WITH OPTIC NEURITIS (NEUROMYELITIS OPTICA).

By ERNEST F. CLOWES, M.R.C.S. ENG., L.R.C.P. LOND.

With Remarks by Dr. FREDERICK TAYLOR, Consulting Physician to Guy's Hospital.

THE following case of this interesting form of disease came under my care last year, and I have thought it worthy of publication. Dr. Frederick Taylor, who published a case of the kind some years ago in the *Guy's Hospital Reports*, Vol. LIII, p. 45, has very kindly added some remarks as to the literature of the subject.

The patient was a single woman, aged 39 years. She had two brothers and two sisters. The brothers were both healthy, but very sensitive and highly strung men. One of the sisters was very neurotic and had frequent hysterical attacks, and the other was mentally deficient. The father had died from senile decay at the age of 90 years and the mother from cerebral hæmorrhage when 78 years old. By all her family the patient was always regarded as very capable and industrious, and she was endowed with a strong personality which clearly dominated the whole circle. She came home from her situation to attend her mother's funeral, and remained at home afterwards to assist her sister, who was greatly pressed with her business; and to complete an order the patient and her sister worked for two whole nights. When the work was finished the patient delivered it, and coming home was caught in a severe rainstorm and got wet through. She had a hot bath and went to bed at 7 P.M.

On the following morning (July 14th) the patient was awakened at 2.30 A.M. by a severe "stabbing" and "burning" pain in the spine "just below the shoulder-blades." The pain radiated round to the front of the chest; it was agonising. Hot flannels and other means were tried, but the pain persisted in severity, and I was called to see her at 5.30 A.M. I found her sitting up in bed absolutely rigid and grasping the sides of the bedstead with each hand, thus keeping the body and neck perfectly straight. Her eyes were fixed and looked directly forward. She was quite sensible, and when I asked her what she complained of she said that if she moved in the slightest degree she had intense pain just below the "shoulder-blades." I proceeded to examine the back, but the movement of

the bed-clothes caused her to shriek out with agony. The pulse was rather full, but regular, 73 to the minute, and the respirations were 18 to the minute. I injected hydrochlorate of morphia (gr. $\frac{1}{4}$) and waited to watch its effect. In less than 15 minutes the patient said she felt drowsy, and moved her head a little to the right side, and asked for some milk; she then gradually levered herself down into the recumbent position and dropped off to sleep. I saw her again at 11.30 A.M. and found her still lying down in the bed. She had had five hours sleep, and was fairly free from the pain in the back, so that I could make a more detailed examination. She did not look ill, and had a bright complexion. She complained of not being able to see clearly with the right eye, and said the left was also very weak. Round her waist she said there was a feeling as if a broad elastic band was applied very tightly, and the skin over this area was so tender that she could not bear the weight or touch of the bed-clothes. The right leg was everted and she said it felt weak; there was marked loss of power in this limb. The left leg was not everted, and apparently had normal power, as she could flex it against considerable pressure. There was no loss of power in the arms and a good strong grasp was present in each hand. There were no sensory changes in the legs or thighs; the patient was quite sensitive to the touch of a feather or pin anywhere, and could locate accurately the slightest touch. Over an area in front limited above by a line drawn round the chest about an inch below the nipples, and below by a line drawn round the abdomen 3 inches above the umbilicus, there was marked hyperæsthesia; touching the patient with a feather anywhere over this area, back or front, caused intense pain. Over the face, head, arms, chest, and back sensation was normal. In the right limb the knee-jerk was absent. Plantar reflex was also lost, but ankle clonus was very marked. In the left limb a very faint knee-jerk was present, but no plantar reflex and ankle clonus could be obtained. If either foot was flexed the foot remained so for a short time, the muscles slowly relaxing. There was no wasting of muscle in the legs, arms, or hands. The electrical reactions could not be tested. The bladder and rectum were unaffected. Of the special senses hearing was perfect. When tested for smell with the left nostril closed the patient could not detect the smell of ordinary scent (lavender water) or even the smell of an onion. With the right nostril closed she could but faintly tell the difference between the two scents mentioned. In taste a little liquor strychninæ applied to the left half of the tongue could not be appreciated, but when it was applied to the right half she could easily distinguish the bitter taste. Sugar and salt when applied to each half of the tongue could be distinguished on the right half but not on the left. Motion and tactile sensation in the tongue were normal. The patient could distinguish heat from cold when tried in the lower part of the body or limbs. The pupils were equal and they reacted to light and accommodation, there was no oculo-motor paralysis, and apparently no limit to the visual field except in the right eye. The right disc was blurred and indistinct but the left only slightly so. The urine was acid, of specific gravity 1016. No albumin or sugar was present.

July 16th: The patient had passed a very restless night. The pain in the back was most severe. She had tried to get out of bed and had badly bruised the left shin and knee. Sensory changes had developed since the day before and she could not tell the touch of a feather from that of a pin. When the left leg was touched she said it was the right. The left leg had lost its power and it fell quite limp when raised and allowed to fall. The reflexes remained the same as on the day before. She said her eyesight was more dim. The bladder and rectum remained unaffected and the band of hyperæsthesia remained the same in extent as before. The temperature was 100.4° F. From the 17th to the 21st the patient's condition remained unchanged.

July 22nd: The patient had had a bad night, and the motor symptoms had greatly changed. There was now almost total paralysis in the lower limbs and the knee-jerks were absent. Plantar reflexes could not be obtained, but marked ankle clonus was present. There was total anæsthesia over the lower limbs, extending upwards almost to the umbilicus. Breathing was almost entirely abdominal. The bladder and rectum remained unaffected. The arms, neck, and head could be moved easily and apparently without any loss of power. Both optic discs remained very blurred,