able skill, and enjoys the reputation of being able to drive a shrewd bargain.

An almost continuous tinnitus aurium troubles him, but it is not sufficiently intense to cause any very great annoyance. At the present time he does not suffer from headache. The

Fig. 3.—Side view of face and neck, showing general enlargement of features and cervico-dorsal kyphosis.

first sound of the heart is weak, and he has had two or three epileptiform syncopal attacks, but there is no irregularity of the pulse and no dropsy of the limbs.

MEASUREMENTS OF THE PATIENT.*

	Inches.
Length of hand from lower fold of wrist to end of middle finger ...	8½
Length of middle finger from palmar fold at its base ...	3½
Dorsal length of middle finger from base of first phalanx ...	5
Palmar length of little finger ...	2½
Circumference of hand (without thumb) at head of metacarpal bones ...	11½
Greatest circumference of "obstetric hand" ...	13½
Greatest thickness of hand (callipers) at level of thenar eminence ...	2½
Circumference of middle finger ...	4
Circumference of thumb ...	4½
Circumference of little finger ...	3½
Circumference of wrist immediately below extremities of ulna and radius ...	9½
Circumference of wrist at level of styloid process ...	10½
Circumference of forearm at the middle ...	10
Circumference of arm at the middle ...	13
Length of nail of middle finger ...	1
Length of nail of thumb ...	1
Breadth of nail of middle finger ...	1
Breadth of nail of thumb ...	1
Length from iliac crest to summit of head of fibula ...	23
Length from summit of head of fibula to tip of external malleolus ...	11½
Vertical diameter of patella ...	2½
Transverse diameter of patella ...	3
Circumference of thigh at middle ...	19
Greatest circumference of calf ...	16
Circumference immediately above tip of internal malleolus ...	10½
Greatest length of foot ...	13
Circumference over heel and instep ...	16
Greatest circumference of foot ...	12½
Greatest width of foot ...	4½
Circumference of great toe ...	5½
Circumference of little toe ...	3
Length of nail of great toe ...	½
Width of nail of great toe ...	1
Length from top of forehead to tip of chin ...	10½
Length from top of forehead to upper part of nasal bones ...	2½
Length from upper part of nasal bones to tip of nose ...	3½
Greatest width of alae nasi ...	1½

* *Marie in Brain*, vol. xii, 1890, for measurements required.

	Inches.
Distance from tip of nose to point of junction of the latter with upper lip ...	1½
Length from septum of nose to point of chin ...	3½
Greatest distance between outer surface of cheek bones ...	5
Width of mouth ...	2½
Vertical measurement of lower lip ...	½
Transverse measurement of tongue at middle ...	3
Thickness of tongue at middle ...	½
Distance (with callipers) from temporo-malar articulation to lower part of symphysis of chin ...	7
Distance (with callipers) between angles of lower jaw ...	5½
Ditto, with tape measure along the body of the bone, passing in front of the symphysis ...	12
Ears, greatest length, right ...	3
Ears, greatest length, left ...	3½
Ears, greatest breadth ...	1½
Circumference of thorax over nipple ...	49
Circumference of neck between the hyoid bone and upper part of thyroid cartilage ...	18

This case is believed by the authors to be the first reported in Scotland.

The figures are from photographs taken by Messrs. A. Rae and Son, Banff.

THE PATHOLOGY AND TREATMENT

OF

SUPPURATIVE DISEASES OF THE EAR.

Being an abstract of the Harveian Lectures delivered before the Harveian Society of London.

[WITH A COLOURED LITHOGRAPHIC ILLUSTRATION.]

By G. P. FIELD, M.R.C.S.,

Aural Surgeon to St. Mary's Hospital and Dean of the Medical School.

LECTURE I.—ANTISEPTIC IN AURAL SURGERY.

As regards the pathology of suppurative otitis media I wish, as briefly as possible, in view of the shortness of the time at our disposal, to lay before you some of the more recent results arrived at by observers, both British and foreign. There are few busy practitioners, who have watched the rapid progress of pathological knowledge during the past fifteen years, without experiencing an impatience amounting sometimes almost to exasperation when, face to face with some obstinate complaint, they find themselves unable to perceive that all this new science gives them a tittle of substantial aid. If one, however, compares the results of treatment some twenty or thirty years ago with those of the present day, it is impossible not to admit that times have changed for the better, and that, in fact, splendid practical advance has been made in the treatment of aural disease. Although it may be true that the majority of cases are managed much as they were in years gone by, there is yet this difference in our treatment, that it is based no longer on empiricism, however practical, but upon definite and well-recognised principles: we can justify our methods by reasons as well as by results. In olden days conclusions as to the character of disease, the probable efficacy of medicine, and of modes of treatment were deduced, not so much from observed facts, as from fancied analogies among things natural, and the healing art, as a whole, was held to be dominated by the influence of the stars and powers unseen and supernatural. Later the teachings of experience were clouded by false theories of the construction of the frame corporeal. In these last times—we may say since when John Hunter taught how death itself, when it comes, is no new thing to man, but only the final stage in the processes of life—a new pathology has arisen: Nature has been interrogated, and we have learned from her that though disease may have its phases according to the forces brought to bear upon it, still those forces are of natural origin, and can be antagonised alone by natural methods. We now know our enemy and the manner of his attack, and when deadly complications arise we have greater resolution and resource in combating them than heretofore.

From the observations of many writers we have arrived at this broad result—that, as expressed in Hüter's dictum, supuration, that is, natural suppurative, is a specific disease endemic in the whole world; or, defining it yet more closely, we may state it to be a group of closely allied but distinct specific diseases caused by different and well characterised organisms. It is to the genius of Lister that we owe the recognition of the laws to be laid down for its prevention.

Of course, I would not have you to infer from my present remarks that I ignore the possibility of the production of suppuration by artificial means. The familiar croton-oil pustule is, as you are aware, free from germs, and its pus—an exudation filled with dead leucocytes—is caused by a chemical irritant. Similar aseptic suppuration, as Grawitz and De Bary among others have determined, and as we might have expected, may be brought about by the application of such irritants as caustic ammonia, digitaline, and cadaverine.

PREDISPOSING CAUSES OF SUPPURATION.

The natural causes of suppuration due to chemical irritation are parasites, the secretion of which, either directly or by inducing fermentative changes in the fluid of the living tissues they infest, cause the death of exuded leucocytes, and when absorbed into the general circulation, give rise to toxic phenomena included by us under the term "fever." These organisms (or microphytes), it must be clearly recognised, are not the sole factors in the production of the diseases which they characterise. Thus, the mere introduction into the middle ear of a pyogenic coccus from the mouth or air passages where it normally exists, by Valsalva's method of inflating the tympanum, will not in itself determine the commencement of otitis, for the production of which preparedness of the host is as necessary as the presence of the parasite.

On the other hand, any influence bringing about an abnormal condition of the mucous membrane, and concurrently an exudation into the cavity of the tympanum of mucus or serum serving as an acclimatising medium or culture fluid for the development of pyogenic organisms, whether it be myringitis, set up by ingress of water in bathing, or inflammation of reflex nervous origin (cold in the head), or a general fever, such as influenza, measles, small-pox, scarlatina, or typhoid, may be provocative of a discharge from the ear. Suppurative otitis may thus be simply a by-product in the course of many diseases, and may present no features diagnostic of its mode of origin. In the case of pyæmia, aural suppuration may give character to a general affection of the body. One mycotic organism, the *Aspergillus niger*, claims more than common attention on account of its remarkable life history. This fungus may leave its wonted habitat, the superficial portion of the epidermis, and, penetrating the deeper layers of the membrana tympani, may cause its perforation. Professor Delépine has lately shown¹ that this fungus is to a limited extent pathogenic in rabbits. Before the study of pathogenic microphytes had been systematised, Grawitz thought that by suitable acclimatisation he could confer toxic properties on the common *Penicillium glaucum* and other moulds. Later researches have shown that fungi cannot thus readily be rendered hostile to animal life. Though acclimatisation has not the importance Grawitz claimed for it, we know that the powers of micro-organisms may be greatly modified by cultivation under different conditions. Recognising the interaction of two ever-changing living things, the parasite and the host, we are now beginning to understand the variability of infectious diseases, the nature of immunity from the same, and other world-old problems, so that the present must necessarily appear as a bright epoch in the future history of pathology.

PYOGENIC BACTERIA FOUND IN THE MIDDLE EAR.

The following pyogenic bacteria have been encountered in middle ear suppuration:

1. *Streptococcus pyogenes*.
2. *Staphylococcus*.
3. *Pneumococcus* of Fraenkel.
4. *Pneumobacillus* of Friedlaender.
5. *Tubercle bacillus*.

I give lithographic drawings of some excellent microscopic preparations and pure cultures of these organisms, made by Mr. J. J. Clarke, so that I shall not now devote any time to a discussion of their morphology, but shall instead dwell on the different clinical effects attributable, so far as is known, to their action.

Streptococcus.—It appears that *streptococcus pyogenes*—first detected by Ogston in the pus of an abscess—is the most frequent cause of acute suppuration. It is not only the most ubiquitous, but also the most dangerous of the pyogenic organ-

isms, being the usual agent when suppurative otitis eventuates in meningitis, cerebral abscess, thrombosis of the lateral sinus, or general pyæmia. In one case (of Zaufal's) it was this *streptococcus* which determined a hæmorrhagic discharge. We thus find that the commonest and more pernicious of the suppurative diseases of the ear is brought about by the same organism which is met with as the most frequent cause of acute osteomyelitis, ulcerative endocarditis, and puerperal fever, and which, in all probability, when confined to the corium, determines ordinary erysipelas. If it were necessary to found an argument for the adoption of strict antiseptic treatment in aural practice, evidence of the wide distribution of this deadly parasite would be alone sufficient.

Staphylococcus.—The species of its genus most commonly met with is *staphylococcus aureus*. Not infrequently it is found to have caused acute suppuration of the middle ear (Fraenkel and Lussano, Dunin, Rohrer, Netter). Though generally less dangerous, it has a wider pathogenic potential than *streptococcus*. It has been discovered in abscess, thrombosis, pyæmia, and endocarditis. Among its many other effects are acne, sycosis, pustules, boils, carbuncles, and ordinary warts. We may hence deduce a possible explanation of the frequent association of purulent otitis with adenoids of the pharynx if, like enlarged tonsils and cutaneous warts, these bodies are hyperplastic growths due to the irritation of *staphylococci*.

Pneumococcus.—This organism—proved by Fraenkel to be the immediate cause of croupous pneumonia—has been frequently found in the pus produced in acute inflammation of the middle ear, and in each of these diseases, as Zaufal and others have pointed out, its effects have a definite course. This fact has led me to attribute to *pneumococcus* numerous cases of otitis which occurred in my practice during the late influenza epidemic. Unfortunately otitis due to *pneumococcus* is not uniformly brought to a satisfactory finish after a rapid cycle of pathological conditions, as it results occasionally in a general meningitis. Like the organisms already mentioned, *pneumococcus* has been met with in endocarditis. In rabbits it produces a true septicæmia.

Pneumobacillus.—The *pneumobacillus* of Friedlaender has been detected by Zaufal as a sole immediate cause of middle ear suppuration. Like Fraenkel's *pneumococcus*, it is encapsuled when occurring in the bodies of animals—not so when artificially cultivated—but it is distinguishable from *pneumococcus* by its more elongated form and by its refusal to stain by Gram's process. The original view of Friedlaender as to the excitation of croupous pneumonia by this bacillus has been shown to be unjustified.

Tubercle Bacillus.—Strictly speaking, the bacillus of tubercle is not a pyogenic organism, but wherever a tissue attacked by tubercle is exposed to infection by pus cocci there chronic suppuration takes place. Thus it is that a thin discharge from the ear due to tuberculosis may at any time become thick and purulent. One may take it as a rule that where, in spite of free drainage, there is chronic suppuration, its cause is generally tuberculosis. In the ear this begins either as an affection of the mucous membrane, or as osteo-myelitis of the mastoid. In severe tuberculous meningitis the middle ears are always filled with muco-pus; and our pathologist at St. Mary's Hospital tells me that since his attention was directed to the matter by Dr. Lees some years ago he has examined the muco-pus in many cases, and always found it to contain tubercle bacilli. In his preparations of this muco-pus may be seen crowds of tubercle bacilli excluding all other organisms. To the treatment of ear disease producing symptoms of meningitis I shall have occasion to refer somewhat later.

THE IMPORTANCE OF BACTERIOLOGY.

The bacteriology of suppurative otitis, on account of the tremendous issues involved in the progress of the disease, is a subject worthy of our most earnest attention. When perhaps in thirty years or more it has entered into the practical daily consciousness of the whole of the profession, we shall, of course, see no more neglected cases. At a yet later period the minds of an intelligent lay public will be revelling in a very definite, if somewhat oddly distorted, vision of microscopic parasites; and a future generation of practitioners will receive with due submission their patient's report, that such

Fig. 1.—Tubercle Bacilli. Cover-glass preparation of muco-pus from the middle ear of a child who died of tuberculous meningitis. Some free bacilli and the remains of a giant cell filled with bacilli are shown. Leitz, one-twentieth inch oil immersion, Zeiss oc. 2. Stained by the Ziehl-Neelsen method.

Fig. 2.—Streptococcus Pyogenes. Cover-glass preparation from a pure culture. Same enlargement. Stained with methyl-blue.

Fig. 3.—Staphylococcus Pyogenes Aureus. From a pure culture. Same enlargement and staining.

Fig. 6.—Aspergillus Niger. The asexual fructification seen partly by transmitted and partly by direct light. The spores have been removed from the upper surface so that the apices of the sterigmata are seen. Hartnack obj. 7, oc. 4. Natural colour.

Fig. 4.—Pneumo-bacillus of Friedländer. In the left hand circle encapsulated (capsules diagrammatic) as seen in a cover-glass smear taken from the lung of a youth who died of acute pneumonia; in the right hand circle, part of a pure culture obtained from the same lung. Same enlargement, etc.

Fig. 5.—Pneumococcus of Fraenkel. The left hand circle shows part of a pure culture obtained from a lung in a state of grey hepatisation; in the right hand circle is part of an alveolus in a section of the same lung containing a zoogloea mass of encapsuled pneumococci. From a preparation by Mr. A. B. Franey. Same enlargement, etc.

and such a lotion is unsuitable for the particular bacillus with which they are infested.

EXTENSION OF SUPPURATION OF THE MIDDLE EAR.

The significance of suppuration in the middle ear is at once apparent when we consider that the tympanic cavity has on its inner side the labyrinth, below it the jugular vein, above it cerebral dura mater, and, posteriorly, openings into the mastoid process, and that the only safe outlet for pus, except by perforation of the membrana tympani, is through the Eustachian tube, through which, however, it finds its way with extreme rarity. When, owing to chronic suppurative otitis, caries of the tympanic walls is set up, pus, if it penetrates upwards, causes meningitis or abscess of the brain, if downwards septic thrombosis of the jugular vein, or pyæmic abscess of the lung, and possibly also of the liver. Again, if it proceeds inwards, the facial nerve and carotid artery are jeopardised. Attacking the mastoid process, pus may occasion thrombosis of the lateral sinus, meningitis, or abscess of the cerebellum. Pneumonia, pleurisy, Bright's disease, and amyloid degeneration are among the possible more remote effects of persistent aural suppuration.

THE "PERFECTED" URETHROSCOPE.

By WILLIAM K. OTIS, M.D.,
New York.

In spite of the great advances made by the introduction of the incandescent electric lamp as the source of illumination, the modern urethroscope still possesses several decided disadvantages. It is heavy, somewhat complicated in construction, and expensive. To overcome these objections I have devised an instrument on an entirely different principle from that of former urethroscopes, using a lens as a condenser instead of the reflected light from a concave mirror.

the lens. A thumb-screw "switch" in the handle places the lamp under control so that it may be turned on or off at pleasure.

This instrument consists of a metal tube or cylinder one inch and a quarter in length by one half inch in diameter, closed at one end. One quarter of an inch from the open end of this tube is a plano-convex lens, so arranged that it may be easily removed for cleaning. On the interior surface near the closed end of the tube an elbow is let in, one quarter of an inch in length and one half inch in diameter, through which the source of illumination (a small incandescent electric lamp) is introduced, a row of holes being bored at its base to allow of ventilation. The handle of the instrument consists of a piece of hard rubber, one inch long by one half inch wide, the electrical connections running through it to the lamp which is placed on top. This handle fits into the elbow by means of a bayonet joint, bringing the lamp immediately behind the plane side of

The instrument is attached to the urethroscopic tube by means of a stout wire one inch and a half in length, with hinged joints at each end, which swing in opposite directions and are furnished with set screws, thus allowing the instrument to be put in any position, though when once adjusted it will rarely be necessary to change it. If the ordinary urethroscope tube is used, the distal end is provided with a simple ring-sliding joint, but as I greatly favour the use of the tube devised by Dr. Hermann G. Klotz, I have adapted the instrument to this form of tube by placing at the distal end a small flat foot, at the outer extremity of which is a smooth pin. This pin fits into a hole in the tube plate, and on revolving the instrument a quarter circle the foot swings under a shoulder riveted to the plate, and is securely fastened. This joint is firm and easy of manipulation, readily allowing the illuminator to be attached or removed at any time during the examination.

When the instrument is in position and the lamp illuminated, a strong beam of light is thrown directly down the urethroscopic tube, and the urethral mucous membrane more easily and clearly observed than with any other form of urethroscope with which I am familiar.

The advantages of this instrument are: (1) The exclusion of all extraneous light, the presence of which is a most annoying fault both in the urethroscope of Leiter, and in my own improvement on it; (2) a very much more ready access to the urethral field, both to the eye and for instrumental applications; (3) increased illumination; (4) by abandoning the funnel and sliding joint, one inch and a half in distance is gained from the source of illumination to the distal end of the urethroscopic tube, increasing the illumination, and allowing the eye to be placed just so much nearer the mucous membrane to be examined; (5) its extreme compactness and lightness, weighing less than one ounce, even when constructed of brass; (6) its great simplicity of construction, which should insure a moderate cost.

MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, Etc.

CASE OF CYSTIC TUMOUR OF THE LARYNX IN A WOMAN EIGHTY YEARS OF AGE: INTRA-LARYNGEAL REMOVAL: RECOVERY.

THE following case is of interest on account of the extreme age of the patient, the rapid development of the tumour, and the completeness of the recovery which has ensued after intra-laryngeal removal.

Miss M., aged 80 years, was brought to me on August 13th, 1892, by Dr. Robert Stirling, Perth, suffering from great dyspnoea and almost complete suppression of voice. Her voice had been more or less affected for about a year, and the larynx had been repeatedly examined up to April last by Dr. Stirling, who on each occasion found merely the appearance of chronic laryngitis. From April to August 12th the larynx had not been examined, nor had the patient been seen. On the last-mentioned date the patient again consulted Dr. Stirling, who now readily detected a large growth or tumour in the larynx. The tumour had thus undoubtedly developed within a period of from five to six months. The case being now one of great urgency on account of the marked respiratory impediment, Dr. Stirling travelled with the patient to Edinburgh, and placed her in my hands.

On laryngoscopic examination a large tumour was seen in the larynx, growing from the left side, probably from the ventricle, and completely obscuring the left vocal cord. The right vocal cord was partly hidden, and the glottis was almost completely blocked. The tumour was firm, smooth, red, and slightly movable, and was partially concealed by a broad and somewhat pendulous epiglottis (Fig. 1). Respiration was performed with great difficulty, and it was quite apparent that unless the tumour could there and then be removed tracheotomy would, in the first instance, require to be performed.

After the application of a 15 per cent. solution of cocaine, I