patient on June 5th, 1882. He gave a history of syphilis six years previously, followed in two years by violent pain in the head during six months, and, about Christmas 1881, by temporary deafness in the left ear. Seven weeks before admission, he began to suffer from deafness, which, in a fortnight, became absolute, and was accompanied by fits described as being of an epileptiform character. There was right facial paralysis, with numbness in the right fourth and fifth fingers, to which pain extended from the right mastoid region; the grasp of the right hand was also impaired. The sense of smell was absent, though pungent odours were perceived, and excited sneezing. The patient complained of a sensation as if his legs were giving way under him. He was given iodide of potassium, gradually increased up to three grains four times a day. The facial paralysis subsided under this treatment, but the deafness still remains.

We have here a history and train of symptoms indicative of syphilitic disease (pachymeningitis) becoming apparently localised in the posterior fossa of the skull, and affecting the two auditory nerves. The paresis of the right hand points to damage in the cortical arm-centre; and, though extension of the disease has been checked by treatment, the results of injury to nerve-cells and fibres still persist.

A question on which I should like the opinion of the Section, is the degree of efficacy of large doses of iodide of potassium in syphilitic diseases of the internal ear. I cannot at present say much in their favour; but one case of some interest under my care, now taking a drachm thrice daily, was at one time absolutely deaf, and is at length beginning to hear slightly with one ear.

There are many other subjects which I might with propriety have introduced into this paper; for example, malignant disease, the relation of othæmatoma to insanity, deaf-mutism, deafness with chronic interstitial keratitis from syphilis, the various other affections of the ear connected with syphilis, gout, albuminuria, diabetes, cerebral tumours, and bilious attacks, and a host of nervous disorders, such as deafness from pregnancy, from concussion—as in artillerymen and boiler-makers—and from sudden nervous shocks, as on the reception of distressing news; also auditory vertigo and tinnitus aurium. But some of them, no doubt, will be discussed during the carrying out of the second half of our programme.*

THE CONNECTION BETWEEN DISEASES OF THE EAR AND GENERAL MEDICINE.

Read in the Section of Otology at the Annual Meeting of the British Medical Association in Worcester, August 1882.

By LENNOX BROWNE, F.R.C.S.Ed.,
Senior Surgeon to the Central Throat and Ear Hospital.

ALTHOUGH I was one of those who signed the memorial for a Section of Otology, I am not at all sure that we, as specialists, are acting for the best by separating ourselves from the general body of our professional brethren, and that each class may not lose by our isolation. However that may be, there can be no doubt that the authorities administering the affairs of this Section have done very wisely in suggesting as the first subject for consideration, after our formation, one which at once implies that the otologist of to-day desires to take by no means a narrow view of his subject, but recognises that it is but a branch of the one great tree of general medicine and surgery; and if our discussion should tend, as I think it will, to show that a large number of ear-diseases are, even if unconnected with constitutional diseases, less amenable to general than to local measures, we shall at any rate have demonstrated that we have carefully considered the question in its broadest as well as in its more special aspect. Moreover, such a manifestation is undoubtedly required; for not even in the classic works of Wilde or Toynbee, much less in modern textbooks, is the influence of the general health on ear-disease more than alluded to. Harvey alone, a practitioner of considerable repute with his patients, wrote and insisted on the importance of this matter both from a diagnostic and a therapeutic point of view.

In examining into the question now under discussion, it may be well to first draw attention to a few points which are always taken note of by the general observer. They are sex, age, occupation, temperament, and family predisposition.

As to sex, I have gone through the list of patients applying at the hospital with which I am connected, to the extent of some thousands, and also through my private note-books, containing particulars of some few hundreds; and I find that ear-disease of all kinds occurs in excess in the female sex over the male, in the proportion of almost exactly three to two. I am not aware that this has been stated before, and it

may be capable of correction, as are all statistics, and of many explanations; but I give the fact, *quantum valeat*, and it appears to be not without interest. As to age, I do not think much information can here be gained. A large proportion of cases of ear-disease are of a suppurative character, and they occur, for the most part, in childhood, in connection, first, with a strumous diathesis, and then as a sequel of various exanthemata—mumps, whooping-cough, or other diseases of childhood. A large number of cases of Eustachian obstruction, or I might rather say of rarification of the air in the tympanic cavity, occur in childhood; but puberty also brings to both sexes an access of many cases of ear-disease. Adolescence, with thoughtless exposure to injurious atmospheric conditions, and other hygienic faults, has also its influence, and in the case of women, amenorrhœa, dysmenorrhœa, menorrhagia, child-bearing, and overlactation, on the etiology of ear-disease; and so as life goes on, overwork or overplay causing anæmia; over-feeding and little exercise causing congestion; the change of life in women, and the decline of life in both, all act as factors in producing deafness and other symptoms of auditory derangement. Nor do I think we can say that occupation largely influences ear-disease. It occurs in those who stay at home, and in those who travel; to the student and to the athlete, to the careful as to the reckless, to married and unmarried.

In temperament, without having taken notes on this point, I am inclined to the belief that ear-disease, especially in its most common form of progressive non-suppurative catarrh, is more common in those of fair complexion and lymphatic temperament, than in those known as of the bilio-sanguineous disposition; but I make this statement merely as suggestive, not as dogmatic. Family predisposition has been long recognised as an important factor in the production of ear-disease, but its knowledge has been, in my opinion, greatly misused; for instead of saying, as we commonly hear taught, "It is of no use trying to do anything in this case, for there is deafness in the family", we should, on the other hand, urge that it is just on this account that early treatment should be the more vigorously adopted, with a view of achieving what is but too often, alas! the limit of our skill—an arrest of onward progress of disease towards complete deafness, even where we cannot actually regain a measure of lost hearing power. All present will have had cases with very well defined evidence of family predisposition, but I would ask to be allowed to quote one from my own practice; first, because it is of some historic interest, as illustrating how infirmities are quite as often inherited as excellences; and, secondly, to show that not every case of deafness occurring in a deaf family is necessarily an incurable case, or necessarily, indeed, of that nature which has been generally associated with hereditary deafness.

I was consulted, early in 1880, by Mrs. S. S., aged 28, on account of deafness, which had supervened on an attack of measles and of scarlet fever, the first nine years, the second eight years, previously. The deafness was noticed only after the second illness. There had never been any discharge from the ears. She had been married three years and a half, and had two children, with a result of an increase of deafness after each confinement. The patient was of fair complexion, and pale, of feeble circulation, and subject to rheumatism, with constipation, heartburn, and flatulence. It would be out of place to describe all the local symptoms and appearances; but it may be stated that the tuning-fork was heard best on the vertex, that the vibrations could be perceived until cessation on the right side, and with only slightly diminished normal duration on the left, nor was there other evidence of nerve-impairment. The maternal grandfather and grandmother of this lady were first cousins, and respectively nephew and niece of the first President of the Royal Academy. They had four children: one son was deaf; and four daughters, three of whom, including the mother of my patient, were also deaf. I may here say that I saw and examined this lady—the mother—and that there was decided dulness of auditory nerve-sensibility, but no symptoms of what we now recognise as auditory nerve-deafness. My patient was one of ten, three of whom died in infancy. Two brothers and two sisters—that is, five in all of the surviving seven—were deaf; and in each the first appearance of deafness had occurred after scarlatina, which had attacked them at various ages, between those of ten and twenty years. In no case had there been suppuration, or, at least, perforation. This lady was improved somewhat by treatment of her general health, and by persevering inflation, but retrograded at her next confinement, and lapsed into apathy. One sister—of dark complexion, by-the-by—had evident nerve-impairment, and was extremely deaf. In another, fair, stout, and lymphatic, the deafness was due to thickening of membrane, made worse by frequent attacks of eczema auris. She improved greatly under treatment. Both brothers had ordinary chronic middle-ear deafness, and both improved, one very markedly, under treatment. In all, the moral effect of the family failing had a very depressing

* The discussion on this paper will be found on the next page.

influence. In the words of my first patient, it was "the only legacy they had received from Sir Joshua Reynolds." This account will not be without interest if, as it did to me, it teaches us that heredity, although it may predispose to disease, need not necessarily induce disease; and I should fail if I did not draw attention to the possible additional factor in this case, of intermarriage of first cousins, and to state that the two brothers unaffected in this family had not had the scarlet fever when the others were so attacked. I am, for my own part, inclined to think that analysis of other family histories, apparently equally adverse, would be attended with the same deductions as I have here suggested. There are, however, many undoubted cases indicating what may be termed a strictly deaf inheritance.

Having thus touched on a few general points of inquiry, I will ask you to examine into the influence of certain specific diseases upon aural affections; but I would entreat you to look at this question from a general, and not a special, point of view.

First, as to syphilis; it is undoubted that syphilis does play an important factor in the production of aural disease; but does it do so in as large a proportion as in diseases of the eye or throat for example? Some of the members attending this Section are connected with hospitals treating under one roof affections of the eye, ear, and throat. My own knowledge of the former was somewhat extensive in years gone by, when I was working with the late Mr. Zachariah Lawrence, and during a period of many years, in which I assisted Mr. White Cooper at all his operations; while for a lengthened period I have had equal opportunities of witnessing diseases of both the throat and the ear. My experience leads me to give an opinion that, while an ophthalmia, an iritis, or a keratitis of syphilitic origin is more common than an otorrhoea, a myringitis, or an otitis of the same nature, extension of pharyngeal or faucial syphilis of a secondary character along the Eustachian tube is decidedly uncommon. Condylomata of the ear are even more rare; and, as regards tertiary disease, although I willingly concede that a syphilitic infection may often be at the origin of, or render much more intense, a chronic deafness, I believe pure tertiary disease affecting the labyrinth to be less rare in proportion than other tertiary syphilitic nerve-affections. On this question, however, I am open to information and correction from general physicians, and those who are specially engaged in the study of nervous diseases. It may be worth while in this connection to point out that in general locomotor ataxy, whether due to syphilis or not, the ear is seldom affected. The same remark applies to general paralysis, to which I gave special attention in its relation to the throat and ear at the request of Dr. Crichton Browne, when he was superintendent of the West Riding Asylum.

Next, as to cancer of the ear; I have seen but two cases, and I know that both of them have been seen by nearly every other aurist in London. The ear is confessedly more free from this scourge, both in its primary and its secondary forms, than any other part.

Tubercle—I mean in its acute form, as in phthisis—has never come under my notice as affecting the ear; and I am not prepared to admit that an otorrhoea occurring in a tuberculous patient necessarily partakes of the specific character. I can quite understand that such a discharge would be very intractable. I have seen five cases of tuberculous ulceration of the pharynx and mouth; in none has it extended along the Eustachian tube. Pain in the ear is, of course, a common symptom of tubercular disease, and of cancer when affecting the throat, but is only here mentioned lest I should be accused of ignoring the connection.

Tubercle, in the form of struma, affecting the middle ear, and leading either to thickening of mucous or of glandular tissue and obstruction of the Eustachian tube or to suppuration of the tympanic cavity and perforation of the membrane, is common enough; and I shall not expect to be contradicted if I make the not original observation, that a scrofulous or strumous diathesis is the chief fact in the ear-disease of children, and that such a constitutional state is very frequently a predisponent in many cases of which an exanthem is the exciting cause.

Diphtheria again, if we may call that a specific disease, rarely extends along the Eustachian tube, and gives rise to otorrhoea. One such case has come under my notice, however, only in the last week. Still more rarely is there auditory impairment due to nervo-muscular disease as a sequel, the analogues in eye and throat being so common, that they are expected as the regular outcome of a severe attack. Nor does erysipelas, typhus, or small-pox affect the ear—I mean its middle and internal portions—so commonly as it does the throat and larynx. Finally, cardiac or renal affections are seldom complicated with ear-disease.

One word as to a special auditory disease known as Menière's. I think a certain proportion of the cases are undoubtedly syphilitic; others are due to either epileptic or apoplectic causes, but I venture to prophesy that with increased observation, idiopathic auditory vertigo will become more and more rare.

I find that my cases of ear-disease may be classified as follows:—Suppurative, with or without polypi, 37 per cent.; non-suppurative, including hypertrophic forms, mucous accumulations, and so called Eustachian obstruction, 37 per cent.; cerumen, 20 per cent. (cerumen, however, let me mention, I look on in almost all cases only as a symptom, although its simple removal often effects so marked an improvement that it is regarded by many as a cause); eczema, 4 per cent.; furuncles, 1 per cent.; auditory nerve deafness, 1 per cent. Now we find that, after we have eliminated the one case per cent. of nerve deafness, and a proportion of the suppurative cases as sequelæ of exanthemata, the remainder are all due to disorder of secretion. What is the constitutional state that gives rise to this disorder? Is it paralysis of a special cervical ganglion, or is it a general want of vaso-motor control? If the cause be vaso-motor, and I were asked to localise the seat of the inhibition, I would place it, if not at the brain, at the solar plexus, rather than at the inferior cervical, which is, as I suggest, but a junction or branch station, not the point of primary departure or one of first importance. That a large number of deaf patients are the subjects of imperfect vaso-motor control, must be conceded. Some are anæmic, some are hyperæmic, some nervously excitable, some lethargic; but, to go further, is not the condition of the general state of many of these cases similar to that of the gouty-rheumatic subject? It is very difficult to define tersely either gout or rheumatism. I would prefer to say "and" than "or," so allied are the two states in my mind from a practical point of view. But perhaps we shall agree that the prominent characteristic of both is an arrest of healthy secretion and its perversion, so as to effect deposit in various healthy tissues, this condition being alike influenced by climate and weather, by overwork, and by mental causes—sometimes one, sometimes the other, often by all. Is not this the general state of our chronic deaf patient, and does not the anatomical structure of the middle ear, with its mucous-lined cavity of narrow space, its minute ossicles with many joints, acted on by small but important muscles, and in relation to so delicate a part as the inner ear, suggest at once why the ear should be so often affected by gouty-rheumatic causes, and with affections of a gouty-rheumatic character? One further suggestion. How far does this description admit of being applied to the condition known as catarrhal? Whatever your answer to these inquiries, do not they suggest that our attention should be always directed most carefully to the *prima via*, diet, exercise, and hygiene? Unhappily, when we have done all this, are we not bound to confess that general treatment, however rational, will do nothing unless active local measures are employed; and, seeing how hopeless are the former, and how beneficial are the latter, may we not claim exoneration if, in these busy days of many topical contrivances, requiring much time, education, and trouble to employ, we sometimes give more attention to the ear and less to the general health than some of our professional brethren might think to be due? And may we not, on the same ground, urge them to study and pursue appropriate local means, in the certain hope that they will thereby gain a larger measure of success than by internal drugging?

Dr. CRESSWELL BABER (Brighton) had not found any permanent benefit from iodide of potassium in cases of congenital syphilitic nerve-deafness, although sometimes the hearing improved somewhat temporarily. He had found that vapours, applied by Valsalva's method, appeared to be harmful in two cases of syphilitic nerve-deafness. He alluded to rheumatism as a cause of non-purulent disease of the middle ear, and to a rheumatic family history he had observed in some of these cases. In addition to the hereditary character of chronic non-suppurative disease of the middle ear, which was well known, he thought he had seen evidence of heredity in chronic purulent disease of the tympanum. He also referred to extensive destruction of the membrana tympani occurring in the course of phthisis.

Dr. URBAN PRITCHARD (London) said that it was, to him, very astounding that ear-disease should be so rarely caused by syphilitic pharyngitis. As regards what was called hereditary deafness, if inherited syphilis of the internal ear and sclerosis of the middle ear were excepted, it would be found, he thought, that it was the pharyngeal affection which was hereditary, and not the deafness itself. Thus, it was very common to find a whole family affected with pharyngeal catarrh, but only one or two deaf, because the Eustachian tubes had escaped in the others.

Mr. A. A. NAPPER (Cranleigh) said that his daughter, aged 6 years, was very deaf; and this deafness he considered to be due entirely to hereditary mischief, as her mother was slightly deaf, and her mother's father and mother and grandfather also were deaf. In the child's case, there was no throat-mischief, and her general health was very good. Mr. Napper's eldest boy was also occasionally deaf.

Dr. WOAKES (London) said that, on the question of the treatment of

acquired syphilis, his experience was decidedly in favour of the use of iodide of potassium; but the principle of its success depended upon its being pushed rapidly to large doses, thirty to sixty grains two or three times daily. He thought that the influence of heredity was much overrated. The deafness was more likely to be due to the unnoticed effect of exanthema in early life on the ears.

Dr. BARR (Glasgow), referring to hereditary influence in ear-disease, said that he believed that hereditary tendency was a marked factor in the causation of nearly all diseases of the ear. Probably the most hereditary aural disease was the so-called sclerotic form of middle ear-disease, when the naso-pharyngeal mucous membrane was less involved than in most of the other diseases of the ear. According to Dr. Barr's experience of hospital patients suffering from aural affections, there was a great preponderance of the male sex over the female; this was to be expected from the greater exposure of the male sex to causes which brought on catarrhal affections. The symptoms of certain affections of the ear very often simulated diseases of other organs of the body. There was probably no mistake more common than for an acute inflammatory process in the middle ear to be taken for a meningitis, especially in children. Dr. Barr related a marked case in illustration of this mistake.

Mr. R. ELLIS (Newcastle-on-Tyne) observed that in the hospital to which he was attached one thousand cases of ear-disease came under observation yearly, and the proportion was about three females to one male. The combination of tubercle and otorrhoea must of course be rare, as had been observed by Mr. Lennox Browne; but still they did occur together. He had this summer seen a young gentleman, who suffered from enlarged cervical and inguinal glands, together with otorrhoea in both ears. The otorrhoea went on *pari passu* with tubercular disease of the lungs, and he died within three months with cavities in the lungs and otorrhoea.

Dr. C. WARDEN (Birmingham) corroborated Mr. Field's remark that aural furunculus was frequently caused by bad air and sewer-gas. Hereditary causes were very common, also strumous. He believed that cancer of the ear was not so uncommon as was stated. He regarded it an act of folly to grope about the meatus, instead of using the simple syringe.

Dr. McBRIDE (Edinburgh) considered that there was a form of ear-disease due to syphilis, which had not received sufficient attention. It consisted of deafness, shown only by means of the tuning-fork to be due to disease of the middle ear. The tympanic membranes might be perfectly normal in appearance. This form of ear-disease only differed from an ordinary case of sclerosis in the greater rapidity of its advent. Dr. McBride then called attention to the observations of Wendt on diphtheria. He had met with cases of otorrhoea due to this disease, which were most obstinate. In tubercle, two forms of ear-disease had been met with and described: suppurative and cheesy, recently observed by Buck. In renal disease, especially the cirrhotic, hæmorrhages might take place into the tympanum, and lead finally to suppuration.

Mr. T. MARK HOVELL (London) mentioned the case of a medical man, who stated that during early adult life he was subject to catarrh, accompanied by deafness, which passed off as usual after a few days, but he never found his hearing otherwise affected. About ten years ago, he ate some fish, which was not fresh, for dinner, and the following morning on waking found that he was "absolutely deaf". His hearing partially returned after a few days. Since that time, he had found that any error in diet was followed by increased deafness. Mr. Hovell asked if anyone present had met with a similar case.

Mr. PURVES (President of the Section) was certain that the papers read would, from their manysidedness, give to the practitioner who read them some information, and probably lead him to seek special advice where he would formerly have trusted to his skill in general medicine. He was, however, somewhat surprised to find no mention of anæmia, lactation, tabes dorsalis, fright, or embolism, as causes of aural disease. As regards the use of iodide of potassium, he considered it useful in the acute stages of acquired syphilis, but had seen little benefit from it in the tertiary stages when nervous tissue had been involved, and none in affections of the nerve in the congenital form. As to the question of heredity, Mr. Purves could not agree with Dr. Woakes or Dr. Pritchard. He had no hesitation in saying that there were hereditary affections causing impairment of the nervous structures directly, as well as impairment of function through mucous membrane change. This was, to his mind, proved by the frequent combination of an affection of the retina—retinitis pigmentosa—with a degeneration of the acoustic nerve, the combination being found not uncommonly in the children of consanguineous parents. There were cases in which there was undoubtedly a congenital affection of two sensory nerves, the one determinable to the observer by examination of both function and structure, the other by the functional disturbance only. Examina-

tion of the institutions for the deaf and dumb would certainly give examples of such. Of the liability to aural disease of one sex above another, he was not aware, except as regards nervous affection influencing the accommodation of the ear, to which females were, he believed, liable at the time of commencing menstruation, during pregnancy, lactation, and from nervous shock. In phthisis, he had seen perforations of the membrana tympani of a most obstinate character, with extensive destruction. In aural affections arising during diphtheria, there was always the difficulty of limiting the part due to the mucous membrane affection, and that due to the nervous, the accommodative part. Till cases were observed in which the membranes of the tubes and cavities were free from the affection, and yet there was loss of hearing, we could not speak definitely as to its causing accommodative loss.

Mr. FIELD, in reply, said he was pleased to find that most of the speakers thought highly of the efficacy of large doses of iodide of potassium in diseases of the internal ear from acquired syphilis, although he must admit he had not met with great success from the administration of such doses of the drug. In some patients, he had noticed that large doses, such as a drachm three times a day, had produced a very feeble action of the heart; so much so, that sometimes he had been unable to prescribe it. In congenital syphilis of the ear, he thought it was of no use. With regard to the question that had arisen as to the relative proportion of males and females affected with ear-troubles, he believed that more women attended hospital practice, probably because they were able to get away more readily than men during out-patient hours. He thought that aural diseases were hereditary in a great degree; and, contrary also to the opinion of several speakers, he had seen a very severe form of incurable ear-disease, with loss of the membrana tympani, in patients suffering from phthisis. He was glad that Dr. Warden supported his view with regard to sewer-gas and aural furunculus, etc. Most of the cases they had discussed showed the great importance of local combined with constitutional treatment in nearly all forms of aural disease.

A PROPOSED SUBSTITUTE FOR CARBOLIC SPRAY IN ANTISEPTIC SURGERY.

Read in the Section of Surgery at the Annual Meeting of the British Medical Association, August 1882.

By A. W. MAYO ROBSON, F.R.C.S.ENG.,

Lecturer on Pathology in the Leeds School of Medicine.

THE purpose of the present paper is to give the results of some experiments, which have extended over a period of two years, and which were undertaken in the hope of bringing before the notice of the profession a substitute for the carbolic spray, now used in antiseptic surgery.

Most, if not all, surgeons acknowledge the advantage of the Listerian method of dressing wounds; and nearly all are equally unanimous in asserting that the spray, hitherto a necessity, is both inconvenient and dangerous. The surgeon has his vision obstructed, "especially if wearing spectacles", and his sense of touch impaired. He, moreover, has the serious discomfort of living, during a considerable portion of his time, in an atmosphere too much resembling a Scotch mist. There are many slighter inconveniences to patient, assistants, and surgeon, which are so well known, that it is quite unnecessary for me to mention them; but these are trifling when compared with the dangers to the patient attending the use of the spray, especially in abdominal surgery.

That the risks of poisoning are not fanciful has, I think, been abundantly proved by Dr. Keith and other operators, who have been led to abandon the spray in ovariectomy. I believe I have myself seen death caused in more than one case of abdominal section, by chilling of the viscera and by carbolic poisoning.

About two years ago, an apparatus was advertised which created a current of air by means of a fan set in motion by clockwork, the air being forced through layers of gauze, moistened with 1 in 40 carbolic solution. About the same time, I had an apparatus made, which created a current by means of bellows, and sucked the air through a series of wash-bottles filled with 1 in 10 carbolic solution. From some experiments I made at the time with sterilised flasks, I came to the conclusion that, although the carbolic atmosphere was pure or aseptic, it was not antiseptic.

It then occurred to me that, if one could saturate the air with some volatile antiseptic, such as eucalyptol, cajuput, or peppermint, a really antiseptic air might be obtained, which, by being diffused in a room,