often seen upon the edge of the disc, and may involve the whole circumference, or may extend far into the retina, where sometimes separate patches of opacity are seen.

They are never seen in the yellow spot, nor in the central part of the disc, because in these situations there are no nerve fibres.

The retinal vessels are normal in size, and when they pass in front of an opaque patch, will be seen very distinctly; they may, however, pass along in various depths in its substance, when they will be more or less obscured, varying in obscurity with the depth at which they are embedded.

Unless extensive, these patches do not cause dimness of vision, but usually produce an enlargement of the blind spot; and they do this because the cloudy nerve filaments cover the deeper sensitive elements of the retina.

One or both eyes may be affected.

These patches may be recognised by their fine striated appearance, radiating from the disc, and their pearly white lustre, which has been described by v. Recklinghausen as resembling asbestos, the edges being marked with a feathery or hair-like fringe.

There is seldom any difficulty in distinguishing between this condition and the opacities due to neuro-retinitis.

TWO CASES OF TOTAL LOSS OF HEARING IN BOTH EARS, CONSEQUENT UPON MUMPS, WITH OBSERVATIONS.*

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I HAVE brought here two patients, afflicted with complete, or almost complete, loss of hearing, originating in mumps. In the one case the deafness has been of five months' duration, in the other it has existed for twenty-three years.

The *first* or more recent case was sent to me by Dr. M'Vail, of Kilmarnock, and is that of a boy, over 5½ years of age, who suffered from mumps in November last. The attack followed

* Shown to the Glasgow Pathological and Clinical Society on 13th May, 1889.

immediately after a brother had been affected by the same disease. The boy is one of a family of eight, and was regarded by the mother as the least robust. He was very susceptible to nasal catarrhs, and he generally breathed by the mouth. There was frequently also a discharge from both ears; this discharge, however, never continued for more than a few days, and was always preceded by restlessness. On these occasions, however, the hearing was only slightly and temporarily affected. During the course of the mumps, he was not confined to bed, although somewhat feverish, and, as the mother expressed it, "the swelling of the neck did not come much out." After the mumps had passed off, a discharge from the right ear was noticed, but this ceased in two or three days. When the illness had lasted for about a week, the child seemed, quite suddenly, to lose his hearing, and could not make out what was said, even when spoken to in the loudest tones. At the same time he was seized with giddiness, so marked that, in the words of his mother, "he was like to fall." The child also complained of hearing a "mill" in his ears. On the same day, just before these symptoms were noticed, the child came in from the open air crying that he had great pain in the back of his head. This pain, however, soon passed off. The disturbance of equilibrium only continued for about a week, but the loss of hearing has persisted, and so far as can be made out, the hearing power is now abolished, for all practical purposes. The parents believe that a very loud whistle sounded near to the ear is audible to the child. The power of speech, which was very good prior to the illness, is becoming less and less distinct, and will no doubt soon be entirely lost. Objective examination of the ears shows in the right a small round perforation in the postero-inferior part of the membrane, while the existing portion of the membrane is opaque. In the left ear there is a cicatrix in the antero-inferior part of the membrane. These lesions point, of course, to past inflammatory processes in the tympanic structures.

The *second* case is that of a man, 35 years of age, who heard perfectly well, and who never had any form of ear disease, up to the time when he had an attack of mumps at the age of 12 years—23 years ago. He is the son of a soldier, was born in Singapore, and lived his earlier years in Madras. While in India he suffered several times from ague, for which he had taken large quantities of quinine. When he suffered from mumps, the whole of the family, including his mother, were affected with the same disease. On account of the length of

time which has elapsed, it is difficult to obtain accurate details of the symptoms, but apparently the hearing power passed away somewhat more gradually than in the case of the boy, but seemed to be entirely lost about a fortnight after the commencement of the mumps. As he was recovering from the mumps, he became affected with a second illness which continued several weeks and was termed typhoid fever. During convalescence from this fever he complained of noises in his ears, which were so disturbing as to prevent sleep. There is no recollection of giddiness, but this symptom—though present—might have been unobserved in consequence of the second illness. This man is unable to hear speech, even though words are spoken loudly into a conversation tube inserted into his ears. He hears the note of the tuning-fork C by bone conduction, as well as by ærial conduction when held close to the ear. He hears also the click of Politzer's hörmesser near to, although not touching, the ear; this is remarkable considering his utter inability to hear speech. On account of the more advanced age at which he lost his hearing, this patient has not lost the power of speech although, as we generally find in such cases, the voice is harsh and unmodulated. Objective examination shows no signs of disease in the conducting structures; the tympanic membranes are quite normal in appearance, and the Eustachian tubes are permeable.

Observations.—These cases should be clearly distinguished from the affections of the external and middle ears which sometimes arise from inflammation of the parotid, whether this inflammation be of the epidemic or of the simple inflammatory form. In these two patients *the lesion is undoubtedly in the labyrinth.* In the case of the boy, there is in addition mischief in the middle ear, mainly the result of old inflammatory processes, but this would produce only partial defect of hearing, and there is little doubt that the middle ear disease existed previous to the mumps, and at a time when the hearing was satisfactory. A most interesting question is—How was the labyrinthine disease brought about, and what is its nature? It is easy to understand how inflammation of the parotid gland may extend to the external auditory canal or middle ear through the *incisuræ Santorini* (clefts in the cartilage) to the external auditory canal, and through the Glaserian fissure to the tympanic cavity. But in such cases as I have shown, the mode in which the labyrinth has been involved, and the nature of the pathological process therein are not so clear.

Some authorities, as Dr. Roosa, of New York, argue that the parotid inflammation passes first to the tympanic cavity, and then through the inner wall of the tympanum to the labyrinthine spaces. This, judging from the suddenness of the deafness, and the usual absence of fresh lesions in the middle ear, is a most improbable explanation. Others have suggested, with equal improbability, that along the facial nerve the disease may be propagated to the labyrinthine structures. The view which commends itself to my mind is, that the mode of extension and the nature of the pathological process are similar to the processes in inflammation of the testicles or of the mammæ, which are well known phenomena in the course of mumps. The probability is that the morbid poison of mumps which, according to Ollivier,* is of the nature of micro-organisms (cocci and bacilli), attacks in certain cases the labyrinthine circulation, leading to serous or hæmorrhagic exudation, or to embolism of the internal auditory artery in its cochlear or vestibular branches, and that in many cases these exudations are, after absorption, followed by atrophy of the nerve structures. In short, the parotitis, the orchitis, the labyrinthitis are local expressions of the same morbid condition of the blood, and due to the migration of the micro-organisms into these several structures.

In our standard text-books I find little mention of labyrinthine disease as a possible concomitant of mumps. In Reynold's *System of Medicine*, in Gerhardt's *Handbuch der Kinderkrankheiten*, and in Barthez and Rilliet's treatise I find no allusion whatever to this possibility. It is referred to, however, in Ziemssen's *Cyclopædia of the Practice of Medicine*. Even in special text-books on disease of the ear only meagre information has, up till very recently, been given. Roosa, Burnett, and Dalby enumerate mumps as an important cause of ear disease. Toynbee and Hinton were aware of this complication, and seem to have regarded it as a frequent occurrence. Toynbee says—"The peculiar poison which causes the disease, generally known by the name of mumps, is *very often* the source of complete deafness which, however, usually occurs in one ear only." The experience of other otologists does not bear out this view of the frequency of this complication, and up till eight years ago very few cases, if any, had been recorded. More attention has been given to this subject since a paper was read to the American Otological Society by Dr. A. H. Buck, of New

* A. Ollivier, "The Contagiousness of Mumps" (*Revue Mens. des Mal. de l'Enfance*, 1885, Julliet).

York, in 1881, in which he related two cases of sudden and total loss of hearing, limited, however, to one ear, originating in mumps. I find in going over the literature of the subject that, since this paper of Dr. Buck was reported, 29 cases have been recorded in America, France, and Germany, and 1 in this country. In 8 of these both ears were involved, and in 22 the deafness was limited to one ear. In all, the ear complication came on suddenly from the fourth to the eighth day after the onset of the mumps, was attended by total loss of hearing, which proved permanent, and was looked upon as undoubtedly labyrinthine in character. In 11 of these vertigo and tinnitus were observed; in the remaining number there was tinnitus but not vertigo. In some, however, owing to the long period which had intervened between the attack of the mumps and the time when the case came under observation, it was impossible to determine whether vertigo had or had not existed as a symptom. It has been suggested that in the cases where there is no vertigo the pathological process is limited to the cochlea, while in the cases attended by disturbance of the equilibrium the vestibule and the ampullæ of the semicircular canals are the parts which are mainly involved. With few exceptions, there was in the recorded cases no middle ear disease, and where such did exist, it was evidently a mere concomitant, and could not account for the serious functional disturbance of the organ.

In order to elucidate still further the relation of the labyrinthine affection to mumps, as well as its clinical and pathological aspects, it would be most desirable that the general practitioner and the physician should be on the look-out for ear complications during mumps. It is possible that loss of hearing, due to mischief in the labyrinth, especially when limited to one side, may be a much more common result of mumps than is now believed. One-sided deafness, we know, is very apt to escape attention, especially in childhood, so also defective hearing of a temporary character is apt to be overlooked, and, for aught we know, some—perhaps many—of these unrecorded or unobserved cases may recover. Therapeutically, also, the early recognition of these cases might be of great importance, for by the use of such an agent as pilocarpine, exudation into the labyrinth might be more quickly absorbed, and permanent mischief to the nerve structure might thereby be averted.