descending part of the lateral sinus, laid bare as far as is necessary. The state of the triangular area of bone between the sinus and posterior semicircular canal should be scrutinized, and if doubtful cut away and the dura underlying examined. Ample room will be found as a rule for exploration, and for evacuation of the abscess, as illustrated by Cases I and II. Sometimes more than one doubtful point may be revealed, and it may be impossible to decide the track taken by the disease, as in the case of a young girl under my care in whom an extradural abscess over the cerebellum and a defective tegmen antri were discovered. The evacuation of the former was followed by cessation of symptoms for nearly a week, and on their recurrence the mid-fossa was explored through the tegmen and a large abscess tapped. On the other hand, no obvious track may be visible; if the brain symptoms are not very pronounced one may wait further development, and this is frequently justified by the case clearing up. When the symptoms are definite, the cerebellum may easily be explored after exposing the dura.

In a boy under my care with very definite intracranial manifestations following chronic ear disease, I laid open the middle-ear cavities and examined the sinus, which however appeared normal. Though no track was seen in the posterior wall or tegmen the cerebellar and cerebral cavities were explored. From the former a considerable quantity of serous fluid under tension escaped. The mental state rapidly cleared up after this and recovery was uneventful.

The case was probably one of serous meningitis which might have resolved by simply laying bare the bone disease, but the symptoms were so pronounced that further measures were deemed advisable.

When the lateral sinus is diseased, it must be laid bare well beyond the limits of its involvement, opened up, and the thrombi turned out. If symptoms continue and a collection of pus in the cerebellum is suspected, exploration should be made along the track of the affected vessel. We cannot hope, through a trephine opening from the surface, to reach all points of possible infection. Where pus collects around the descending part of the sigmoid sinus, this may be feasible, but elsewhere a successful issue is in doubt, as is well illustrated by an instructive case published by Bönninghaus,⁷ where a thrombus close to the torcular gave rise to an abscess which escaped tapping.

In deeper-lying abscesses proceeding from affection of the labyrinth, the infection reaches the posterior fossa through the internal auditory meatus or the aqueductus vestibuli. They can be dealt with by cutting away bone along the anterior aspect of the cerebellum. By pushing aside the dura with an elevator an extradural collection may be reached, but in such cases disease of the labyrinth exists, and the operation should combine eradication of the disease, such as by Neumann's method of opening the labyrinth, with the evacuation of the abscess. If it is borne in mind that 45 per cent. of cerebellar abscesses are due to labyrinth disease, the importance of dealing with that region is obvious. Where signs of affection of the labyrinth are present, it should be opened. As Neumann points out,⁸ this is in obscure cases of great diagnostic help. Cerebellar abscesses originating in the labyrinth and purulent labyrinthine disease present frequently the same clinical picture, so that the question whether one or both conditions are present in a particular case, with signs of labyrinthine involvement, is extremely difficult to decide. In that event Neumann advises that the labyrinth operation should be carried out and the result noted. If there is no improvement in the symptoms the diagnosis of cerebellar abscess may be made.

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WE are asked to state that the bathing establishments and Associated Grand Hotels at Roncigno, South Tyrol, will be pleased to entertain a party of English general practitioners, who will be received by Dr. Waiz of Roncigno, and will also have the opportunity of visiting Campiglio. The visit will be paid at the end of August, and further particulars can be obtained from Mr. Galloway Kyle, 47, Fleet Street, E.C.

THE SCIENCE COMMITTEE OF THE British Medical Association.

REPORT CVII.

SOME COMPLICATIONS OF CHRONIC OTORRHOEA.*

BY

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CHRONIC otorrhoea is very prevalent, especially amongst the children of the poorer classes; it forms a very appreciable percentage of those seeking advice at the aural externs of our hospitals. In examining 1,000 school children drawn from the poorer classes in London, Cheate¹ found no less than 335 to be suffering from suppurative middle-ear disease in one or both ears.

Suppuration of the middle ear has been defined as "chronic"² when it has existed for more than six weeks; this is a useful though a somewhat arbitrary definition.

ETIOLOGY.

* The etiological factors in its production may be grouped under two headings: (a) Predisposing, (b) exciting. The predisposing are: (1) Malnutrition, such as that found in rickety, tuberculous, or marasmic subjects; (2) pathological conditions of the nose and naso-pharynx, due to nasal obstruction and adenoids; or to the exanthemata, such as measles, scarlet fever, or diphtheria. In many children, particularly of the poorer type, there is a continual running at the nose, and this catarrh will lead to swelling of the nasal mucous membrane, and so to nasal obstruction. Adenoids are one of the commonest causes, their presence maintaining continual naso-pharyngeal catarrh, which, by spreading along the mucous membrane lining the Eustachian tube, carries the inflammation into the tympanum.

A boy, aged 8, was brought to me early last April for a right-sided otorrhoea of about two years' duration. As there were other symptoms of adenoids present, these growths were removed prior to commencing treatment on the ear; but when seen on April 22nd the discharge from the ear had entirely ceased, so that no local treatment for the otorrhoea has been necessary.

Frequently the discharge dates from an attack of measles or other fever. In quite young children the onset often coincides with the period of teething, so that its incidence is sometimes ascribed to this condition.

The exciting cause is probably the reaction of the lining mucous membrane to the deleterious effects of micro-organisms, which ascend to the tympanum from an inflamed naso-pharyngeal mucous membrane by the Eustachian tube, or perhaps gain entrance by the blood stream or lymphatics, and there set up an acute inflammation, for in nearly every instance the chronic otorrhoea has been preceded by acute otitis media, which has subsequently become chronic. Many different micro-organisms have been found in the discharge, but those most frequently seen are the pneumococcus, *Streptococcus pyogenes*, and the tubercle bacillus; to the last must be ascribed a large proportion of cases, especially amongst hospital patients; indeed Milligan³ states that 50 to 60 per cent. of his hospital patients who had not yet reached 6 years of age were due to tuberculous disease. Of the other organisms, the pneumococcus apparently evinces a preference for young subjects, for in a clinical examination of a series of cases,⁴ the *Streptococcus pyogenes* was found in 50 per cent. of all cases, but only in 30 per cent. in those under 10 years of age, whereas the pneumococcus was present in 18 per cent. of all cases, but in no less than 85.7 per cent. of those under 10 years of age.

ANATOMY.

The middle ear, or tympanum, is situated in the interior of the temporal bone, and the walls of the cavity are osseous except the external, the larger part of which is formed by the tympanic membrane or drum. Lining this cavity is a delicate mucous membrane containing blood vessels,

* Delivered before the Ulster Branch of the British Medical Association at Londonderry, May 2nd, 1908.

nerves, and lymphatics; its epithelium is of the columnar ciliated variety inferiorly, and ciliated squamous superiorly. This mucous membrane forms the periosteal lining to the bony walls of the cavity, and is reflected on to the auditory ossicles, forming their periosteum, too. In close relation to this cavity are structures of vast surgical and anatomical importance.

[Several other preparations were shown, the dissections being made to show the structures in relation to the middle ear and the inner surfaces of the tympanum itself; but owing to the irregularity of outline of these specimens they do not readily lend themselves to reproduction, and so are not now included.]

COURSE.

Suppuration in the middle ear resembles an ordinary abscess, in that there is a collection of pus in the tympanum, which will force a passage out to the surface in order to discharge its contents; this as elsewhere takes

Fig. 1.—A right temporal bone (recent state). The external surface has been removed down to the level of the tympanic membrane. Below the ring of bone surrounding the membrane is the jugular bulb. In juxtaposition to this anteriorly is the carotid artery in the carotid canal; posteriorly is the facial nerve in the aqueduct of Fallopius. These all form inferior relations to the middle ear, from which only its thin osseous floor separates them. Posterior to the membrane is the tympanic antrum, a cavity whose walls are formed of bony cells arranged in a spongy manner—that is, there is no plane wall definitely limiting this space. These cells are seen extending into the bone in all directions, apparently communicating with the mastoid cells inferiorly, while posteriorly they extend backwards as far as the comparatively thin layer of bone forming the canal for the lateral sinus. The very definite opening leading from the antrum forwards into the tympanum does not show in the photograph. A, Tympanic antrum. B, Lateral sinus. C, Tympanic membrane. D, Mastoid cells. E, Facial nerve. F, Carotid artery. G, Jugular bulb.

place through the line of least resistance, in this case the tympanic membrane.

The anatomical structure shows that suppuration may be confined to the attic, or to the tympanum proper; or even may extend throughout the whole cavity. Suppuration in the attic, especially when situated in the external attic, is prevented from extending backwards by the malleo-incudal body, or down into the tympanum proper by the tumefaction of the mucous membrane forming the floor of this compartment; part of this floor, however, forms the roof of Prussak's space, a very small cavity whose external wall is formed by that portion of the tympanic membrane, which extends across the notch of Rivinus, and is known as Shrapnell's membrane or membrana flaccida; it is the weakest structural portion of the tympanic membrane. When suppuration exists in the attic, by destruction of the mucous membrane, it will extend into Prussak's space and thence through Shrapnell's membrane into the external auditory meatus; indeed, it has been stated that attic suppuration is the extension into the attic of a pre-existing inflammation in the external auditory meatus. Should the suppuration involve the

whole of the attic, the perforation will probably extend into or actually be in the upper half of the tympanic membrane proper; on the other hand, should the disease exist in the lower part of the tympanum, then the perforation will be in the lower half of the membrane.

Chronic otorrhoea presents two main varieties (a) septic, and (b) tuberculous, but the latter usually become infected sooner or later by pyogenic micro-organisms. Both these varieties are veritable swords of Damocles, for though the condition may exist for several years without causing any serious symptoms, yet in the vast majority of cases there are certain definite symptoms, though perhaps only slight, such as headaches, lassitude, dyspepsia, constipation, which are usually not ascribed to the otorrhoea at all, and yet they are in reality signs of the absorption of the products of septic infection. In most cases, however, gradually increasing deafness supervenes, and every now and again one of these cases of neglected otorrhoea develops severe symptoms with startling suddenness. During the continuance of this suppuration the mucous membrane lining the cavity is gradually destroyed, being converted into

Fig. 2.—A vertical section cut through a right recent temporal bone, through and parallel with the external auditory meatus. This shows well the tympanum in section; its external wall is formed superiorly by the outer attic wall, from the apex of which the tympanic membrane is seen extending down to the annulus tympanicus below, and inferiorly by the annulus tympanicus and root of the styloid process, for the floor of the middle ear is at a lower level than that of the external auditory meatus. This specimen also shows the angles which the tympanic membrane forms with the roof and floor of the external auditory meatus. In the middle ear is seen the malleus *in situ*, with the suspensory ligament extending from its head to the tegmen tympani, and the tendon of the tensor tympani passing round the processus cochleariformis towards its insertion in the handle of the malleus. Anteriorly can be seen a fold of mucous membrane extending from the neck of the malleus to the lower edge of the outer attic wall; this forms the floor of the external attic and at the same time the roof of Prussak's space, a minute space which can be seen to exist between this fold and the short process of the malleus. An important point clearly demonstrated by this specimen is that the attic is wholly situated in the horizontal portion of the petro-squamous bone, which forms the floor of the middle cranial fossa. So that the middle ear consists of two portions—the upper or attic, and the lower or tympanum proper. The roof and sides of the attic are entirely formed of bone, while the major portion of the external wall of the tympanum proper is formed by membrane, and that the drum of the ear. The inner wall of the middle ear is formed of the bone which encloses the labyrinth, and in this section can be seen the commencement or first turn of the cochlea, and internal to this again is the anterior wall of the internal auditory meatus. Internal surface: A, Tensor tympani muscle in its canal. B, Facial nerve in aqueduct of Fallopius. C, Tendon of tensor tympani. D, Internal auditory meatus. E, First turn of cochlea. External surface: F, Attic. G, Head of malleus. H, Outer attic wall. I, Handle of malleus with tympanic membrane attached. J, External auditory meatus. K, Lower part of tympanum proper. L, Jugular bulb. M, Base of styloid process.

granulation tissue, which in its turn is replaced by scar tissue; sooner or later the malleo-incudal articulation becomes implicated, and this of itself will serve to maintain the condition. Later on, owing to loss of their periosteum, the ossicles themselves will be destroyed, or perhaps extruded more or less whole, but showing loss of their periosteum and caries of their articular surfaces. The tympanic membrane will be destroyed in whole or part, and the oval and round windows become filled with granu-

lation tissue, which is finally converted into scar tissue, obliterating these fenestra, and so irretrievably destroying all power of hearing, at any rate by air conduction.

A specimen of such a case was exhibited; the roof of the tympanum and of the antrum had been removed disclosing a sclerosed condition of the middle ear. The contents of the tympanum had all disappeared as also had the tympanic membrane, the various landmarks were obliterated, leaving no trace of round or oval window; scar tissue was seen everywhere, even in the antrum, levelling up the various cells, usually seen in open communication with the cavity; the sole remnant of the contents of this cavity was the fibrosed tendon of the tensor tympani muscle, stretching across and attached to some scar tissue in the anterior region of the annulus tympanicus.

When suppuration of the middle ear has existed for a few months, more or less impairment of hearing may be found, due to adhesions, which, stretching, for example, between the malleus or incus and the inner wall, or even ankylosing the malleo-incudal joint itself, will require all the ingenuity of a skilled aurist to deal with.

How often are children sufferers from a neglected otorrhoea punished for inattention at school! Urban Pritchard relates a case in point: a little London boy, attending King's College Hospital for otorrhoea, was asked on one occasion, "Well, Tommy, how are you?" To this he smartly replied, "Better, sir." When asked, "How do you know?" back came the quick response, "Don't have the cane so often, sir."

There appears to be some relation between the preponderance of the pneumococcus in the otitis media of young children and the bronchopneumonia which is so fatal in the young. Indeed, I am almost inclined to agree with Miller, that the pneumonia is secondary to the ear disease. Miller,⁶ in performing *post-mortem* examinations on 50 children who had died from various causes and whose ages ranged from 12 days to 4 years, found pus in one or other ear in no less than 37 cases. He suggests that after the pneumococcus has established itself in the ear, it becomes most virulent and then extends to the lungs.

I do not intend to discuss such well-known and grave complications as facial paralysis, meningitis, lateral sinus thrombosis, and other severe affections, but would mention in passing that suppurative labyrinthitis may easily occur, the infection taking place either by the lymphatics or directly through one or other of the fenestra, the result being, of course, total destruction of the organ of hearing in those cases which do not end fatally.

TREATMENT.

There are, of course, two methods of treatment—conservative and radical. As to the former, some practitioners prefer the wet method, using various lotions to syringe the ear, more powerful drugs to be instilled in the form of drops; others, again, use the dry method, plugging the ear or insufflating drugs in the form of powders. Both these methods are of great service, but the practitioner must bear in mind that his object is to obtain a cessation of the discharge in the least possible time—that is, while only the minimum amount of damage has been done to the structure of the ear; and it is advisable to remember that each of these drugs loses its efficacy in a given case after a certain length of time. It is not my purpose, however, to discuss these conservative methods of treatment, but to deal in particular with cases of long standing, or those intractable forms which do not show any appreciable reaction to a fair amount of conservative treatment.

Milligan⁶ suggests that before deciding on the method of treatment to be adopted, a cytological examination of the pus should be made. He states that when there is extensive leucocytosis with degenerated columnar epithelial cells and but few lymphocytes, the disease is superficially situated, and therefore capable of treatment by local remedies—that is, conservative treatment—but that if the lymphocytes are present in numbers, then the trouble is deep-seated and not amenable to local treatment. There is an antiquated idea existing in the minds of the laity "that the child will grow out of it," while others, after undergoing treatment for a few weeks, grow weary, and do not seek advice again until the disease has wrought sad havoc, frequently severely impairing the power of hearing, or, worse still, giving rise to one of those more serious complications that may necessitate instant surgical treatment. Therefore, it must be our endeavourment to impress on all these sufferers the necessity of adopting proper measures

to combat the ravages of this insidious disease. First, the nose and naso-pharynx must be attended to, catarrhal rhinitis, if present, appropriately treated, any pathological conditions—such as carious teeth, hypertrophied tonsils, adenoids, hypertrophied turbinates, a deflected nasal septum—dealt with on surgical principles, for while these conditions exist they will, by keeping up a catarrhal state of the nose and naso-pharynx, serve to accentuate and prolong the disease in the middle ear.

As to the length of time during which we may profitably employ conservative measures, it is difficult, and almost impossible, to lay down a hard-and-fast rule, individual cases varying so much, but one may as a rough guide advise surgical treatment in a case in which the otorrhoea has persisted in spite of conservative treatment for six months or more, for disorganization of the mucous membrane is progressing all this time, with its accompanying reduction of the power of hearing. Another indication is found in the position of the perforation, for should it be located in the upper half of the drum, disease of the ossicles will occur earlier than if it is in the lower half, and that itself will be a complication prolonging the disease and rendering it less amenable to conservative measures. Again, should the perforation be situated in Shrapnell's membrane only, then ordinary methods of treatment, as by syringing the ear, will be futile, for the attic in these cases can only be reached by means of a special syringe whose nozzle has to be passed in through the perforation; in these cases, too, surgical treatment may be advised much earlier than in other cases.

A specimen exemplifying this was shown, the perforation situated in and above the *membrana flaccida* only; it was obvious that in syringing such an ear in the ordinary manner little or no fluid would find its way into the middle ear, and what little did would not cleanse the cavity of the products of the inflammation. The *tegmen tympani* had been removed in this specimen, and revealed a definitely localized disease in the attic. The whole of this was filled with pus, embedded in which were the head of the malleus and body of the incus, and which, however, did not extend down into the tympanum proper. In the antrum were numerous bands, evidence of a plastic exudation.

This specimen is most instructive, as it shows localized attic disease, in which the greater part of the malleus and incus and certainly their articulation are imbedded in the pus; it is also obvious that there must be caries of these bones. Should one be fortunate enough to treat effectually the suppurative condition in such a case as this by syringing the attic, can the patient be termed cured? No; for when the disease has progressed to this extent, the "cure" will be analogous to that obtained in diseased joints elsewhere in the body—that is by ankylosis, in this case of the malleo-incudal articulation—and will result in marked diminution of the power of hearing. We have already seen the evidence of early implication of the antrum by the plastic exudation, this shows that in a short time suppuration would have extended into and involved the antrum itself. On further study of the specimen it is seen that the osseous wall separating the antrum from the lateral sinus is comparatively thin, so that purulent inflammation in the antrum would soon extend into and implicate the lateral sinus itself, thus initiating those grave series of symptoms which unfortunately so often terminate fatally. Therefore in such a case as this we should advise operation early; but the specimen shows that it would not actually be necessary to submit the patient to the severity of a mastoid operation, the focus of the disease only need be dealt with, and that through the meatus by an operation known as *ossiculectomy*, that is, by incising and removing the tympanic membrane together with the malleus and incus, and then cleansing out the attic. This will allow the sound waves to impinge directly on the footplate of the stapes, whence they will be conducted to the cochlea in the ordinary way.*

In a case of otorrhoea in which there is every evidence of the disease being due to tuberculous infection, and in which there is no gross lesion in the lungs, it is advisable

* There is, however, a controversy on the subject of this operation, several authorities stating that the results are not satisfactory owing to the disease having already extended on to the antrum, and therefore the radical operation has to be performed eventually in order to secure cessation of the discharge. This specimen by itself can hardly be taken as a definite argument against this statement; still, taken in conjunction with the anatomical structure of the attic, it certainly seems to show that the operation of *ossiculectomy* would suffice, provided it is performed early, and not at the later date, when a radical mastoid operation is called for owing to implication of the tympanic antrum.

to do a complete post-aural operation, instead of trying conservative measures for any long time. If a patient be suffering from a tuberculous joint or kidney disease, operation is advised early, with the object of removing the focus of disease, and the same argument applies to the ear. Tuberculous disease here is very resistant to simple methods of treatment; it frequently causes very extensive destruction of the tissue in the immediate neighbourhood, and is a source of infection which may easily extend to brain, lungs, or elsewhere.

I have recently seen a patient, 14 years of age, with a definite family history of tubercle, suffering from double otorrhoea of seven years' duration, which had been treated by recognized conservative measures for some considerable time, but to no purpose; the suppuration continued, though it occasionally ceased for a few weeks at a time. At times a well-defined swelling appeared in the neck, involving the lymphatic glands in the region of the parotid; this was followed by what the mother termed "the ear bursting"—that is, an exacerbation of the discharge, probably due to a reinfection by some pyogenic micro-organisms, after which the swelling in the neck subsided. This was a case of tuberculous disease which had absolutely resisted conservative treatment, and the girl's deafness was a serious obstacle to her obtaining employment. Practically the whole of each tympanic membrane had been destroyed, leaving, curiously, the major part of each malleus *in situ*; this, coupled with the fact that the incus was not visible, and that, on drying the tympanum, pus could be seen to appear gradually on the posterior wall, showed that the disease was situated in the antrum, and only to a lesser extent in the attic; therefore the treatment which opens the best prospect of a permanent cure was the radical mastoid operation.

To sum up, the main point we must bear in mind is that the middle ear is a small cavity containing minute bones and recesses, and is lined by a delicate membrane, and that the longer suppuration persists the greater the destruction the contents of this cavity must inevitably suffer. As the destruction progresses so will the deafness increase, becoming as time goes on more and more difficult to improve; while all the time that this condition lasts the sufferer is ever liable to one of those grave complications which may easily place him in that craft wherein Charon will row him across the Styx, and so beyond the help of mortal man.

I wish to express my indebtedness to the British Medical Association for its assistance in making these preparations.

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REMARKS ON IRITIS, WITH SPECIAL REFERENCE TO GONORRHOEAL IRITIS.

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IN the past the claim of iritis to a recognized position as a morbid entity has been slowly and grudgingly acknowledged; and only a hundred years ago it seems to have been considered a detail of scleritis. Even now the qualifying adjectives, "rheumatic" and "gonorrhoeal," connote morbid conditions the differences between which are vague and uncertain. Rheumatic iritis does not seem to have been recognized by John Hunter (died 1793), and he even doubted the existence of syphilitic iritis.¹ Specific iritis was, however, discovered, or re-discovered, by Schmidt in 1801. It does not seem that the word "iritis" was used before the beginning of the nineteenth century. George Frick,² writing on iritis, says: "This species of inflammation, though of frequent occurrence, has not been described until lately"; and the disease is not mentioned by Scarpa,³ in 1818. In describing it Astley Cooper⁴ writes: "Inflammation of the iris, or as it has been lately called *iritis*." He had doubts whether iritis was due to syphilis or to the mercury which was given to cure it,⁵ and Travers tells us that a primary inflammation of the iris—as, for example, from syphilis or from mercury—is distinguished from the secondary, or that by extension from the conjunctiva, by the more sparing vascularity of the conjunctiva, etc."⁶ The theory of mercurial iritis received its death-blow from Middlemore.⁷

Gonorrhoeal iritis was recognized by Brodie⁸; he relates the case of a patient who in March, 1818, 'became affected with an ophthalmia, but of a different

nature from that which he laboured under in the preceding summer"—gonorrhoeal ophthalmia. "The inflammation was seated in the proper tunics of the eye; and it appeared probable that it would speedily have terminated in adhesions of the iris and destruction of the power of vision if its progress had not been arrested by repeated blood-lettings and the use of mercury. He had another attack of the same kind four years after (1822)." Lawrence⁹ also, in describing gonorrhoeal inflammation of the external tunics and iris, says: "The inflammation soon extends to the iris, which loses its brilliancy, assuming a dull and deeper hue. The pupil contracts and lymph is effused from its margin." Travers¹⁰ makes a passing allusion to gonorrhoea as a cause of iritis, and Astley Cooper speaks of gonorrhoeal rheumatism as "not an infrequent disease."¹¹ Gonorrhoeal iritis does not appear to have been observed by Monteath,¹² nor by Tyrrell,¹³ nor by Middlemore.¹⁴

Mackenzie¹⁵ was well acquainted with gonorrhoeal iritis, and introduces the subject by stating "that the urethral discharge in gonorrhoea is productive, through the medium of the constitution, of synovitis and iritis, has generally appeared so improbable, that the fact has been very slowly admitted by medical practitioners." His description of its symptoms and course and of the liability to relapse shows the keenness of his observation and the wideness of his experience.

The patients who have been observed to suffer from gonorrhoeal synovitis and iritis have generally been young men of scrofulous constitution, who lived hard and were careless of exposure to cold. Each time the patient catches gonorrhoea he is liable to an attack of synovitis or iritis, or suffers first from the one and then from the other. In some cases, however, there has been no new gonorrhoea, although a second or a third attack of inflammation has affected the joints or the eye. Over-exertion of sight has sometimes produced a new attack of severe gonorrhoeal iritis. Generally one eye only is affected; sometimes the same eye suffers repeatedly. In other instances, first the one eye is attacked, and next time the other is inflamed. Rarely are both eyes affected at once.

Mackenzie¹⁶ gives details of a case of gonorrhoeal iritis in which the recurrences, not only of the iritis, but also of the arthritis, were frequent, and were spread over some seven years.

The interval which usually occurs between the gonorrhoea and the iritis probably explains the fact that the former as the progenitor of the latter is frequently overlooked. As a consequence, the iritis is fathered by chronic rheumatism or by some other putative parent. Moreover, these "secondary symptoms" of gonorrhoea are exceptional, and therefore unexpected and overlooked. In syphilis, on the other hand, the secondary symptoms are anticipated, because they usually occur. The modern teaching with regard to gonorrhoeal iritis is that the disease is rare. Noyes tells us¹⁷ that "gonorrhoea occasionally causes iritis." de Schweinitz says¹⁸ it is "a rare form of iritis." Berry says the same.¹⁹ Macnamara and Hartridge²⁰ state that "gonorrhoea is an uncommon cause of plastic iritis"; Fuchs²¹ that it "develops in those cases in which gonorrhoea has given rise to a general infection. This latter runs a course similar to that of acute articular rheumatism." Brailey and Stephenson,²¹ however, speak of it as "not infrequent," and J. Hutchinson says,²² "in men, however, the rheumatic affections, whether acute or chronic, which are induced by gonorrhoea, are not unfrequently accompanied by iritis." He thinks that those with a gouty constitution are more likely than others, *cæteris paribus*, to suffer from gonorrhoeal iritis.

There is no doubt about the rareness of the association of acute rheumatism and iritis; so rare, indeed, is it, that it may be fairly considered to be casual rather than causal. Hartridge²³ tells us that he has never seen it; Poynton and Paine,²⁴ "have little doubt that it is a rare but not unknown event." Hutchinson²⁵ states that

Iritis "in conjunction with rheumatic fever of the ordinary form is almost unknown, and even in cases in which patients suffer from repeated attacks, as is sometimes seen, the eyes usually remain free. So soon, however, as changes of type occur, the disease showing a tendency to attack the smaller joints, or to affect only single joints, or to pass into the chronic form, then we get the liability on the part of the eye to suffer." And, again, he says:²⁴ "All observers will admit, I think, that iritis associated with ordinary rheumatic fever is infinitely rare."

With respect to iritis associated with chronic rheumatism—that is, an iritis due to rheumatism pure and simple—its very existence is almost questioned by some authorities. Monteath²⁶ was of opinion that rheumatic