OCTOBER, 1939

# THE ULSTER MEDICAL JOURNAL



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THE ULSTER MEDICAL SOCIETY

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# THE ULSTER MEDICAL JOURNAL

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# THE ULSTER MEDICAL SOCIETY

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Dear Sir (or Madam),

If you are not a member of the Ulster Medical Society, we would appeal to you to give the question of joining your consideration. The Society has been in existence since 1862, and has always been active in keeping its members interested in the advances in medical science as well as in current professional affairs. The Medical Institute, situated in College Square North, belongs to the Society (through the generosity of Sir William Whitla), and is ideally adapted for meetings, committee meetings, and recreation. There is a library with current medical periodicals, and facilities for reference to medical literature are available in conjunction with the library at the Queen's University. There is also a billiards-room available to members, and lighter periodicals are also provided. An annual dinner is held each year in December, and a golf competition in June. Meetings are held at intervals of a fortnight during the winter months, and papers are contributed by members. Distinguished visitors are occasionally asked to contribute papers on subjects upon which they are specially qualified to speak. THE ULSTER MEDICAL JOURNAL, the official organ of the Society, is issued to all Fellows and Members free of charge.

The subscription to the Society is one guinea for Fellows and Members living in the country; two guineas for Fellows living in Belfast; and one guinea for Members living in Belfast who are not qualified more than seven years. The payment of a sum of twenty guineas entitles one to election to Life Membership.

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If you do not wish to become a member of the Society, will you consider entering your name as a subscriber to THE ULSTER MEDICAL JOURNAL? The subscription is five shillings per annum, payable in advance to the Honorary Treasurer.

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JOHN M. MCCLOY, M.D., D.P.H., *President.*

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# THE ULSTER MEDICAL JOURNAL

PUBLISHED QUARTERLY ON BEHALF OF THE ULSTER MEDICAL SOCIETY

VOL. VIII 1st OCTOBER, 1939 No. 4


## PUBLICATION SUSPENDED

THE Editorial Board regrets that owing to the national emergency it has been decided to suspend publication of the ULSTER MEDICAL JOURNAL until happier days return.

The Board wishes to take this opportunity of acknowledging its indebtedness to those members of the profession who assisted in the publication of the Journal by their contributions, and to thank the readers of the Journal for their forbearance when issues were a little delayed.

The Board also offers its best thanks to those business firms who advertised in the Journal, and commends their names to the attention of members of the Ulster Medical Society when in need of the commodities in which they deal.

## ULSTER MEDICAL SOCIETY

OWING to the war the Council of the Ulster Medical Society has decided to cancel all meetings until after Christmas, when the position will be again reviewed.

The Council offered the Whitla Medical Institute to the Government of Northern Ireland for whatever purpose the latter might think fit. This offer has been officially accepted by the Prime Minister.

Until further notice it has been decided to close the Whitla Medical Institute each day at sunset.

H. HILTON STEWART, *Hon. Secretary.*

Malone Road, Belfast.

# Ophthalmology in General Practice

*By* JAMES CRAIG, M.B., F.R.C.S.ENG.

Honorary Consulting Ophthalmic Surgeon, Royal Victoria Hospital, Belfast

THE title of this article is not quite an accurate description of its contents.

It is scarcely necessary to emphasize the intimate relationship which exists between the science of medicine in general and ophthalmology in particular. In the eye, as in no other organ, can the living blood vessel be directly observed and studied. The condition of the retina—as directly observed—if often the best, and sometimes the first, indication of the efficiency or otherwise of the patient's renal system, and the condition of the retinal vessels the most reliable index of the condition of his cerebral vessels. In no other organ can the appearance of an important nerve—which with its sheaths is a direct prolongation of the brain and its membranes—be directly seen, and to the neurologist this is often a source of accurate information of vital importance. Of almost equal value is the estimation of the visual fields, the exact mapping of which is so essential to the diagnosis of pituitary and other lesions.

All this evidence is accessible to the practitioner who is even moderately proficient in the use of the ophthalmoscope, and as such will naturally come under the scope of the title of this article. It will, however, be more fully dealt with elsewhere.

The purpose of this article is rather to consider some of the eye conditions which the practitioner—whether he likes it or not—is bound to meet, and in the first instance, at least, to deal with. In a great many cases, and especially in the rural districts, he will be the first to be consulted, and the decision as to the further disposal of the case will rest with him.

Some of these conditions are comparatively simple and obvious, and their diagnosis and treatment are well within the scope of the general practitioner. In many, however, the diagnosis is difficult, the etiology obscure, and the treatment one which calls for operative interference. There are many pitfalls only to be avoided by the possession of expert knowledge and the exercise of trained observation, assisted by special equipment. It is the intention of this article to indicate what may be attempted and what should be guarded against. As it is written for the general practitioner, reference to any method involving the use of special apparatus —other than an ophthalmoscope and condensing lens—will be avoided.

Some of the commoner causes of an obvious inflammation of the eye may be here briefly described.

## FOREIGN BODIES IN THE CONJUNCTIVA AND CORNEA.

The most common seat of lodgment of a foreign body in the conjunctiva is the subtarsal sulcus—a groove in the palpebral conjunctiva of the upper lid. To expose it eversion of the upper lid is necessary. This simple procedure, like many others, is easy and painless if properly executed. It should be remembered that the basis of the lid is a firm plate which will not bend on itself but must be turned over on its hinge—the palpebral fascia—by which it is attached to the orbital

margin. The procedure is properly carried out in five successive movements, and is facilitated if the patient, while maintaining the head erect, looks towards his feet.

(1) Press the lid backwards with the left thumb, thus tilting its lower margin forwards. Keep thumb in position.

(2) Grasp the lashes with the right hand.

(3) Press the left thumb downwards and backwards against the globe.

(4) Move right hand forwards and upwards. The lid will now evert easily, and should be kept in its new position by shifting the left thumb on to the lashes of the outer half of the lid.

The foreign body can now be removed with a wisp of moistened cotton wool, or if imbedded, by a spud.

Foreign bodies in the cornea, if small, are frequently missed. Their presence, however, can always be detected by examination by one or both of the following methods:

(a) Focal illumination. This is best carried out by the use of a lens—the larger the better—of about fourteen dioptres strength. Daylight may be used, but better results can be obtained from an artificial source of light—a candle is quite sufficient. The light from this is focussed obliquely on the cornea, the small illuminated area being made to travel over its entire surface. It is important that the source of light should not be too near the lens—a mistake that is often made by the beginner—as this gives a too diffuse illumination. The beam from a pencil electric torch may also be used, but is not nearly so effective as the method described.

(b) Place the patient in front of a source of light, and make him follow the movements of your finger so that the light reflex travels over the cornea. This method is invaluable, not only in demonstrating the presence of a foreign body, but also in detecting any roughness or loss of substance of the cornea itself. Here again an artificial source of light is better than daylight.

The removal of the foreign body can now be undertaken, the eye being previously anæsthetised by the instillation of a three to five per cent. solution of cocaine. A drop repeated at five-minute intervals will give sufficient anæsthesia at the end of fifteen minutes. The eyes should be kept closed during this period to prevent the desquamating effect of the cocaine on the epithelium of the cornea.

The foreign body should be "levered" out with the spud, with as little scraping of the surrounding epithelium as possible. After removal, the eye should be irrigated with a mild antiseptic fluid, and bandaged for, at least, twenty-four hours.

*Conjunctivitis.*—Perhaps the most important conjunctival infection which the practitioner must recognize and treat, is the gonorrhœal infection occurring in the new-born infant—ophthalmia neonatorum. It is not too much to say that the prompt recognition, and effective treatment of this condition, will prevent the disastrous results which, in the past, have been the chief cause of blindness in children. The prophylactic treatment—on the lines instituted by Credé—which is of the first importance, only requires mention here.

The great danger to the eye lies in the destructive ulceration of the cornea.

This is largely due to the tremendous inflammatory œdema of the conjunctiva—chemosis—which causes it to overlie the cornea with retention of pus, and invasion of the corneal substance. In addition to the stereotyped treatment of frequent irrigation of the conjunctival sac with a mild antiseptic fluid, and the use of an antiseptic ointment to protect the cornea and prevent sticking of the lids, it will sometimes be necessary to snip the œdematous conjunctiva, or to relieve the pressure from the swollen lids by doing a canthotomy, i.e., enlarging the palpebral fissure, by dividing with scissors the outer canthus.

It is hardy necessary to point out the gravity of transference of the contagion to the eyes of the nurse or surgeon. This is likely to happen from a sudden squirt of the pent-up pus, when the glued lids are forced open.

In the gonorrhœl ophthalmia of the adult—which is generally unilateral—great care must be exercised to prevent infection of the sound eye. This is best effected by the use of a preventive shield, such as Bullers.

The much more common infection of the conjunctiva by the Koch Weekes bacillus, producing a simple acute catarrhal conjunctivitis, will be frequently met with in general practice. It generally begins in one eye, but almost immediately invades the other. It is characterized by a muco-purulent discharge, which can be seen on everting the lower lid, and which dries on the cilia and lid margins, causing the lids to stick together in the mornings. The palpebral conjunctiva is red and swollen, and the bulbar conjunctiva injected. The patient has a feeling of grit in the eyes, accompanied by a burning sensation. The condition yields to irrigation of the eye several times daily, and the use of one of the numerous antiseptic and astringent remedies, such as Argyrol ten per cent., collosol argentum, sulphate of zinc—two grains to the ounce, etc., dropped into the eye twice daily. The old-fashioned method of brushing the everted lids with a two per cent. solution of silver nitrate, immediately washed off with saline solution, will, if used on alternate days, shorten the duration of the disease.

A less severe, but more chronic form of catarrhal conjunctivitis, is that caused by the diplo-bacillus of Morax-Axenfeldt. It affects chiefly the lid margins and the canthi—hence its name "angular conjunctivitis"—producing a macerated appearance of the latter. The practical value of a recognition of this condition, which for the expert scarcely requires the proof of a smear, lies in the fact that it responds promptly to treatment by the zinc salts, which seem to have almost a specific action.

The more chronic forms of conjunctivitis are often due to persistent irritation from smoke, dust, etc. It should, however, be remembered that they may be caused by the strain of an uncorrected error of refraction, which must be compensated before a satisfactory result can be obtained. Otherwise their treatment is that of the acute condition.

A chronic conjunctivitis, limited to one eye, should always direct suspicion to the lachrymal sac, to an inflammatory condition of which it is often due. The condition of the sac, and the patency or otherwise of the naso-lacrimal duct, can be determined by syringing the sac with a canula introduced through the lower canaliculus. This procedure, if carried out with a proper syringe, is painless and

does not involve slitting the punctum or canaliculus. In some cases definite information can be obtained by simply pressing over the sac, when fluid—mucus or pus—can be seen to exude from the punctum.

In this connection may be mentioned the congenital obstruction of the naso-lacrimal duct, which is sometimes met with in infants, generally as a unilateral affection. This condition, which manifests itself by persistent watering of the eye, yields satisfactorily to treatment with the syringe, or failing this, to the passage of a dilator—a procedure, however, best undertaken by the expert. If allowed to go untreated, secondary inflammation changes are set up in the sac and duct leading to a fibrous stricture, the treatment of which is far from satisfactory.

The injection of the bulbar conjunctiva, occurring in conjunctivitis, must be distinguished from the deeper seated ciliary infection which indicates inflammation of the iris or ciliary body. In the superficial form, the vessels can be seen as such, and can be made to move with the conjunctiva. In the deeper variety, they impart a violet hue to the white of the eye in the peri-corneal region, and are not seen as individual vessels. It is never safe to diagnose an inflamed eye as conjunctivitis until the cornea is found to be normal, the aqueous clear, the iris normal in colour and texture, and the pupil active. When in doubt as to the existence of iritis, a drop of homatropine may be instilled, and the result noted as to how quickly and completely the pupil dilates. The only contra indication to the use of this or any other mydriatic drug is the existence of any rise of tension in the eyeball—a point which should always first be determined, especially in elderly patients.

The condition of the cornea can always be determined by the two methods already described—focal immumination and the light reflex. The presence and exact confirmation of any breach of surface can also, if necessary, be demonstrated by instilling a drop of fluorescin into the conjunctival sac, followed in a few minutes by irrigation to remove the superfluous stain. The denuded area is by this method coloured green—giving a very graphic demonstration of its extent and shape.

If there is much photophobia and blepharospasm the examination is made much easier, both to the patient and examiner, by the use of a drop of five per cent. solution of cocaine.

In the absence of direct trauma, extension from a conjunctival infection, or nerve lesion as a cause, ulceration of the cornea is always secondary to some toxæmia or nutritional defect, and this must be eliminated if a favourable result is to be obtained. The local treatment consists in the use of atropine one per cent., which gives the eye physiological rest by immobilizing the iris and ciliary muscle, and anticipates the iritis, which is a common complication, (2) an antiseptic ointment (with which the atropine may be incorporated), (3) irrigation of the conjunctival sac, (4) hot fomentations, and (5) the use of a well-fitting pad and bandage —this being contra indicated if there is a profuse conjunctival discharge. In the healing stage, the resultant opacity is rendered less dense by the use of some stimulating ointment, such as hydrarg ox flav one to two per cent., or calomel.

It is sometimes necessary, in the more severe or intractable forms, to resort to

such methods as the local application of ac. carbolic or other chemical caustics, the use of the galvano cautery, corneal section, etc., but these methods are perhaps better left to the expert.

There is one condition which nearly always involves the cornea, and sometimes also the deeper parts of the eye, concerning which the practitioner must be on his guard, viz. : Herpes Zoster opthalmicus. In this condition—by no means rare—the danger to the eye may almost be said to begin when the skin eruption with its attendant symptoms has subsided. Not only is there loss of sensation in the cornea, but there exists also a dystrophy, both of which persist for many months, and during this period the cornea is very vulnerable and requires protection. The more severe ocular complications—iritis, cyclitis, optic atrophy, etc., are so rare as only to require mention.

Perhaps one of the most dangerous ocular conditions—in that it eludes diagnosis—is that variety of irido cyclitis, which begins insidiously, and progresses almost without symptoms. An acute iritis with its periorbital pain, its dimness of vision, contracted pupil, discoloured iris, and muddy aqueous, can hardly be overlooked, but in these cases most of the above signs are wanting. There are, however, two signs of definite diagnostic importance—the formation of posterior adhesions in iritis, and the deposit of keratic precipitates in cyclitis.

The presence of adhesions can always be determined by the use of a drop of atropine—always remembering to first take the intra-ocular tension. Keratitis punctata—so called—the deposit of precipitates on the back of the cornea, due to disease of the ciliary body, by which the aqueous is secreted, is more difficult to see, but by the use of focal illumination, assisted by magnification, it can, if present, always be detected. It exists in two forms : (1) large greyish-yellow plaques, few in number and easy to see, and named from their appearance, "mutton-fat deposits"; and (2) innumerable fine pigmented dots, generally arranged in the form of a triangle, in the lower half of the cornea, with the apex upwards. The detection of these dots is of the utmost importance, as they furnish an absolute diagnosis of a condition, which, though apparently mild, is of the greatest gravity to the eye.

Chronic iritis and cyclitis generally exist together, and in the course of the disease, the adhesions may form a complete ring round the pupil, making a water-tight seal between the anterior and posterior chambers of the eye. The iris is bulged forwards, and the shallowing of the anterior chamber leads eventually to a blocking of the corneo-iridic angle, and the production of a secondary glaucoma, with loss of sight if untreated. This condition, if allowed to arise, calls for surgical interference—iridectomy.

In the treatment of chronic irido cyclitis, the recognition of the underlying general condition—whether tubercle, rheumatism, gonorrhœa, syphilis, or focal sepsis—is essential. The local treatment consists in the instillation of atropine, the use of dry or moist heat, and rest and protection of the eyes.

The subject of irido cyclitis leads naturally to the consideration of penetrating wounds of the eyeball. Their gravity lies in the possibility that the penetrating

body is infected, and the probability that there is wounding of the lens, iris, or ciliary body.

Apart from the immediate consequences, such as prolapse of the iris into the wound, traumatic cataract, traumatic iritis and cyclitis, a penetrating wound of the eyeball, constitutes for a period extending into many weeks a danger to the other eye, which may result in total blindness — the onset of sympathetic ophthalmia.

It is not within the scope of this article to discuss the pathology of this affection, or its diagnosis and treatment. It is important, however, to point out that the onset of the disease in the "sympathizing" eye is extremely insidious, and productive of no symptoms to the patient until the condition is well established, by which time the prognosis as to vision has become very grave indeed. While the early diagnosis and intensive treatment of this condition has frequently succeeded in saving the eye, it is still the most-dreaded of eye affections. Its original cause —penetration of the eyeball, followed by traumatic cyclitis—should be a matter for the expert. The evidence of penetration is sometimes obvious, but the history of the injury, the nature and size of the penetrating body, the presence of blood in the anterior chamber or vitreous, obvious wounding of the iris or lens, or lowering of the intra-ocular tension, will generally establish the diagnosis. Most frequently missed are the small penetrating wounds caused by a flying chip of metal or stone, with retention of the foreign body in the eyeball. In these cases, it is safer to assume that there is penetration and retention until it is possible, by expert examination, to disprove this assumption.

*Glaucoma.*—This occurs in two forms—acute and chronic.

The acute attack, which is generally a severe exacerbation of a previous chronic condition, is liable to be misconstrued by the practitioner. The severe headache, often accompanied by reflex vomiting, may simulate, and be mistaken for, an abdominal affection. Examination of the eye will, however, at once make the diagnosis clear. The tremendously injected conjunctiva, the dilated oval pupil, hazy cornea, and shallow anterior chamber, present a very characteristic picture, and the diagnosis is confirmed by the state of the intra-ocular tension. As the estimation of this is so essential to an examination of the eyes, a short description of the proper technique of its performance may not be out of place. The patient should be instructed to look well downwards. This allows the palpation to be effected through the thin orbital fascia, and not through the thick tarsal cartilage. Using the extreme tips of the two index fingers placed closely together, pressure is alternately exerted and relaxed. The lightest possible touch is required, both for accuracy of perception and for the patient's comfort. It is a good plan to palpate first the presumably normal eye in order to secure a standard. With a good sense of touch and a little experience, the examiner need never have any doubt as to the tension.

These cases call for prompt operation, but the use of eserine and adrenalin will, in some cases to some extent, contract the pupil and lower the tension, and should, in any case, be used as a preliminary measure.

Chronic glaucoma is a frequent cause of failing vision in elderly people, but is often overlooked or mistaken for cataract, with which, indeed, it may co-exist. The signs, although not so striking as in the acute condition, are similar in character—shallow anterior chamber, pupils larger than normal, and sluggish in their reaction to light, and some rise of tension. A history of periodic spells of dimness of vision, and particularly of haloes seen around lights, is very significant, and the diagnosis is established by finding that the optic discs are cupped, and that there is contraction of the visual fields. For the accurate charting of these, a perimeter or Bjerrum's screen is necessary, but a fairly good estimate can be made by the "confrontation" method. In this, the examiner sits facing the patient. In estimating the field of the patient's right eye, the examiner's left eye is used—and *vice versa*. The other eye—left of the patient and right of the examiner—is closed or covered. The examiner's hand, held midway between himself and the patient, is then approached from above, below, right, and left towards the line of vision, the patient indicating when it is first seen—his accuracy being checked, if necessary, by finger counting. By this simple method, the fields can be estimated quickly and with fair accuracy.

The treatment of chronic glaucoma rests between the palliative use of the myotic drugs—eserine and pilocarpine—and resort to one of the various forms of operation which need not be detailed here.

Cataract is one of the most common causes of failing vision in elderly people, and when the opacity of the lens is sufficiently dense, the diagnosis is obvious even on ordinary inspection. The earlier stages, where the cataract manifests itself by radially disposed opaque striæ in the superficial layers—cortical cataract—or as a centrally-placed discrete opacity—nuclear cataract—can be detected by the method of focal illumination, the examination being much facilitated by a previous dilation of the pupil. The possibility of raised tension must here again be borne in mind, and cocaine, which has the effect of lowering tension, is a safer mydriatic than homatropine. It should be mentioned that with a dilated pupil and strong illumination, the lens of most elderly people will appear diffusely opaque, and it is never safe to diagnose cataract by this method alone. It can be checked by observing how the fundus illuminates when examined at a distance of about one foot with the ophthalmoscopic mirror. Perhaps the best method of all is the direct observation of the lens with the ophthalmoscope, using the 20D lens of the instrument. This will detect the finest opacities, which become obvious as fine lines or dots standing out black against the pink background of the illuminated fundus.

Cataract may co-exist with, or be secondary to, other intra-ocular disease, e.g., choroiditis, detachment of the retina, etc. Such secondary cataracts are often distinguishable by their colour—yellow or chalky-white, instead of the grey or smoky-amber tint of the uncomplicated cataract. It is necessary, in any case, before deciding that the cataract is operable, to test the patient's field of projection. This simple procedure involves the use of a darkened room, a source of light, and an ophthalmoscopic mirror. From this the light is reflected into the

eye from above and below, and from the nasal and temporal sides, the patient indicating by a word or sign when he is conscious of the light. It is, of course, necessary, during the examination, to cover the other eye.

In a case where operation is contemplated, a knowledge of the patient's general condition, especially with regard to such matters as cough, tendency to vomit, or to psychological instability, high blood-pressure, etc., is of great importance to the operator, and for this he is largely dependent on the practitioner.

*Squint.*—The onset of squint in the adult is almost invariably due to a paralysis —partial or complete—in one or more of the external ocular muscles. The possible causes of this are very numerous, but are generally serious, and such a case calls for a complete examination of the nervous system. The squint is accompanied by diplopia and vertigo, but the vision of each eye taken separately is unchanged. The squint may not be very obvious, but the patient will always complain of double vision. A good rough and ready test to determine which is the affected eye is to cover each alternately, and make the patient walk rapidly to and fro across the room, observing his control in each case.

Paralytic squint in children is rare, and is generally due to congenital causes or birth injury. It sometimes occurs as a transient condition, accompanied by loss of accommodation and paresis of the soft palate, as a sequel of diphtheria.

The great majority of squints in children are of the concomitant variety, and most of these again are convergent.

The exact etiology of this condition is by no means clear. Hypermetropia sometimes accompanied by astigmatism, plays a very large part, and inability to fuse the image received by one eye with that received by the other has been held to be the chief cause. In a small number of cases, the cause of the squint can be traced to psychological disturbance, and its onset may follow shock or illness. Heredity plays an important part—a history of squint in parents, grandparents, brothers, or sisters can be obtained in a large percentage of cases.

*Tests for Squint.*—Parents are often unable to see a squint in their own child, which is quite obvious to outsiders, and on the other hand will consult the practitioner about a squint which is non-existent. There are two simple methods by which the existence or otherwise of squint may be determined.

The cover test is a good rough-and-ready method of detecting the presence of squint. The child, if old enough, is asked to look at a small attractive object held in front of its face. A screen made of a piece of folded paper, about one and a half inches wide, is held in front of one eye, and then rapidly changed over to cover the other eye. If no movement occurs, the eyes are "straight," if the eye, when unscreened, moves in order to fix, squint is present.

While the child still looks at the object, the screen is alternately held in front of the right eye and removed. If no movement of the eye occurs, the right is presumably the squinting eye. The procedure is now repeated on the left side. It will now be found that when the left eye is covered both eyes move—the right in order to fix, and the left to assume the squinting position. On uncovering the left eye, both eyes resume their original position. In a monolateral squint, therefore,

movement of the eyes takes place every time the "straight" eye is covered and uncovered, but not when this is done to the squinting eye.

In alternating squint, the child maintains its fixation with either eye, and only one movement occurs—the initial movement to fix with the exposed eye.

In order that this test should be effective, it is necessary that the vision of each eye should be sufficiently good to ensure central or macular fixation.

*Corneal reflex test.*—Another test requiring, however, a dark room, is to reflect the light from an ophthalmoscopic mirror alternately into each eye, and observe any want of symmetry in the position of the small bright reflection, as seen on the cornea, in relation to the pupil.

*Effects of Squint on Vision.*—When squint has once been established, certain results follow. It is probable that the first result is diplopia, or at least, a disturbing retinal confusion. In order to get rid of this unpleasant symptom, the child resorts to "suppression."

It is quite easy for a normal-sighted person, with full binocular vision, to suppress the image from one eye. This is habitually done by the microscopist, who uses either eye at the instrument without troubling to close the other. If the squint is monolateral, this constant suppression of the image of the squinting eye rapidly leads to the development of amblyopia ex anopsia—amblyopia from disuse. If the squint is an alternating one, this amblyopia does not occur, although even here the vision is suppressed in the eye which is at the moment squinting. The existence of suppression plays a very large part in the maintenance of squint, and its removal is one of the objectives of orthoptic treatment.

Amblyopia constitutes the most serious result of squint in children, and if measures for its prevention are not undertaken, the result is a useless eye. The earlier the onset of the squint the deeper the amblyopia is likely to be, and the longer it is allowed to continue the more intractable will it become. It is, therefore, imperative that treatment should begin as early as possible. There is only one effective method of carrying this out—occlusion of the "straight" eye, which, to begin with, should be continuous and complete. Later a partial occlusion may be sufficient. Total occlusion should be carried out until the vision of the squinting eye is equal to that of the fixing eye. The length of time necessary to reach this result depends on the age of the child, and on the percentage time of his life during which he has squinted. Between the ages of one and two it will take from one to six weeks. In children of four it will have increased to one to four months. It has generally been found that children over six years of age, with vision of less than 6/60 in the squinting eye, are unlikely to obtain much benefit from occlusion.

The further treatment of squint is essentially a matter for the expert. It consists in fully correcting any refractive error, and the use of orthoptic training. The latter aims at breaking down suppression and developing fusion—the ability to blend similar images, as seen with each eye, into a single perception, and finally, the blending of slightly dissimilar images into a single three—dimensional perception—stereoscopic vision. The question of operation, whether in any particular case it is necessary, and when it should be done, is beyond the scope of this article.

# Ear Diseases in General Practice

*By* HENRY HANNA, M.A., M.B.

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THE frequency with which one meets with diseases of the ear in general practice is a reason why the general practitioner should have a clear practical knowledge of how to approach such cases with a view to their diagnosis, prognosis, and treatment.

In approaching this subject it is essential to have a clear understanding of the anatomical divisions of the ear, and a good preliminary introduction to the study is often given by a careful study of the temporal bone. This should be obtained by referring to the many clear accounts in any modern textbook of anatomy.

We learn there that the organ of hearing is divided into two principal divisions: the sound-conducting and sound-receiving apparatus. The sound-conducting apparatus—(a) the external ear, the auditory external canal; (b) the middle ear (the tympanic cavity with the tympanic membrane and ossicles, the eustachian and mastoid process). The sound-receiving apparatus—(a) the labryinth and cochlea; (b) the auditory nerve.

*Methods of examination of the organ of hearing.*—The examination of the external auditory canal and of the tympanic cavity is the first essential for the diagnosis of disease of the ear. The membrana tympanicus is covered externally by the cutis of meatus and internally by the mucous membrance of the tympanic cavity. Hence it is in immediate relationship with diseases of the canal and of the middle ear. When these parts are diseased we recognise changes in the membrane which are obvious on inspection and enable us to form some conclusion as to the diseased state of the external and middle ear. We know from experience that disease of the tympanic cavity must frequently form a basis of diagnosis, and with this are noted changes on the tympanic membrane, so that the condition of the membrane is of great value in enabling us to diagnose diseases of the middle ear. We must not expect to find changes in the membrane in all cases of deafness, as in many patients with a high degree of deafness no change in the membrane can be seen.

In order to make this observation we should be familiar with the practical method of inspection and have a practical knowledge of the use of a few instruments which are essential. We use ear specula—Gruber is a suitable pattern. These have an oval aperature, and are arranged in three or four sizes to suit the individual case. A head-mirror is essential to reflect light through this speculum from light reflecting on the mirror. The illumination used may be ordinary daylight or artificial light. Dressing-forceps of the pattern of Politzer and a small blunt olive-tipped probe of silver or copper are, as a rule, all that is necessary to enable one to diagnose and treat the most common diseases in these parts. If we wish to add a further method we employ Siegle's pneumatic speculum, which is indispensible for

the diagnosis of middle ear affections. This is an ordinary speculum, the wide end of which is closed by a little obliquely set glass plate at the side of the broad portion; the speculum is attached to a rubber tube, which is provided with small air-bag of about three ounces size. This instrument is used in the ordinary way. The speculum is introduced in the meatus and fixed with the left hand so that the light reflex from the glass plate will not interfere with the view of the membrane. First of all exhausting the air-bag, the air in the meatus is alternatively condensed and rarefied, thus enabling one to ascertain any alteration in the mobility of the membrane.

Examination of the middle ear is carried out to ascertain the condition of the eustachian tube and tympanic cavity. By these methods we obtain information regarding the permeability of the eustachian tube and the state of the tympanic membrane. These methods come under three headings : method of valsalva, use of eustachian catheter, and Politzer's method. These have three various uses, and their advantages and efficacy depends upon the state of the diseased condition in question. Politzer's method is based on the principle of condensing the air in the nasal pharynx during the act of swallowing when this cavity is closed on all sides, and of forcing the condensed air through the open eustachian tube. This is carried out most advantageously with a pear-shaped rubber bag ten or twelve ounces in capacity and furnished with a tubular hard rubber nozzle. The patient is seated in a chair, takes a sip of water, which he is requested to swallow at a given signal; introduce the curved nozzle of the bag into the corresponding orifice of the nose, then closely compress the alae with the thumb and forefinger as the patient swallows, and the air is expelled from the bag. The air in the nasal pharynx is thus forced into both middle ears, the success of which, as a rule, is noted by a dull gurgling noise.

It is now necessary to consider some tests for hearing, which are of importance in making a diagnosis, by which is determined the degree of deafness, and to locate the seat of the pathological changes. When these methods give negative results we can determine whether the cause of the deafness lies in the sound-conducting or sound-receiving apparatus.

To use these tests we must examine the power of perception, for the waves of sound are transmitted through the air to the tympanic membrane as well as through the cranial bones. The methods used include the watch, tuning-fork, and speech. In the case of the watch the results of testing must vary owing to the difference in their intensity of tone. To overcome this difficulty, a small instrument known as an acoumeter is more useful as a test. In testing the perception for musical tones through the air, tuning-forks play an important part. A series of five tuning-forks, ranging from C64, C128, C512, and C4, ranging from 64 to 4,000 double vibrations D.V.S., as a rule are sufficient for testing for the perception of upper, middle, or lower tones. Testing the hearing for speech is a valuable method, although it has many difficulties. This method enables us to estimate the disturbances of hearing and the results of treatment. In the treatment of deafness we aim at improving the hearing power for speech, a fact which patients can recognise,

and is a most valuable method. To ascertain the hearing distance for speech we use ordinary conversation as well as a whispering voice.

*The method of examination of the patient.*—A thorough examination is necessary to establish a correct diagnosis and to determine prognosis. First of all the history of the case should be taken; how the disease started and how long it has lasted. The duration is of importance, as the shorter the duration the more favourable is the outlook. It is not possible always to lay stress on the accuracy of the patients' history, as unless there is a direct cause of the disease, such as the onset of some fever or injury, the patients are not always sure of the duration of their ailment. Patients often state that their deafness is of short duration, when on examination we find extensive disease which must have existed for a long time without their knowledge. Secondly, we determine the absence or presence of general disease directly bearing on the ear or through the disease of other organs. The age of the patient is to be considered, the presence or absence of subjective noises, the presence of pain or dizziness. It is essential to determine the presence or absence of a discharge, its nature, quantity, odour, etc.

We begin our examination of the patient with inspection of auricle, external meatus, and membrana tympani, noting any diseased conditions in the former before introducing the speculum and using a probe to determine the nature of any secretions, growths, or other conditions, leading to a narrowing of the meatus. If there is no obstruction to the inspection of the tympanic membrane, we determine its colour, transparency, and curvature. This inspection will give us information as regards vascularity, presence of chalk deposits, or perforations or bulging, and by using a Siegles' speculum we determine the mobility of the tympanic membrane. The use of the probe is most important, as we thereby can ascertain the seat of granulations or polypi, the presence of caries or necrosis in the temporal bone. At this stage we should examine the hearing function with an acoumeter or a watch, and the perception for low and high tuning-forks through the air, of hearing distance for speech, and the power of perception through the hearing bones, through the cranial bones. We now examine the condition of the eustachian tube by Politzer's method, and after this examination we may determine the difference in the power of perception before and after inflation. If there is improvement after inflation, the prognosis is favourable as a rule. If no improvement takes place or only a slight one after inflation, the prognosis is not so good owing to some disturbance in the middle ear or in the labyrinth. Should the middle ear be inflamed, we must examine the region of the mastoid process very carefully to determine any changes which would slightly modify our line of treatment. We should gently palpate the region of the mastoid to find out if there is any infiltration of periosteum and whether there is fluctuation also, whether pain is produced by pressure on the bone, and the examination should include the cervical and lymphatic glands. It is now necessary to examine the nasal pharynx, and any disease in these parts has direct bearing on the nature of the ear disease; the presence of obstruction in the nose, causing difficulty in breathing; of diseased tonsils and adenoids, and should the necessity arise, we should further examine the patient more generally, and, if

necessary, pay attention to the medical side of the case. The urine in all cases should be examined. Lastly, an inquiry should be made into the condition of the fundus oculi.

We now consider the more important diseases which affect the auricle and external meatus, causing obstruction and deafness. In the examination of a case of deafness we frequently find that there is hypersecretion of the ceruminous glands which tend to plug the meatus. The chief causes of this accumulation of wax are (1) a recurring hyperemia of the skin; (2) a narrowing of the passage, preventing the normal discharge of the secretion; (3) an abnormal consistency of the wax, favouring the retention of the secretions in the passage; (4) improper cleaning of the external passage, pushing the wax back into the bony meatus, where it accumulates into lumps, lying in close approximation to the tympanic membrane; (5) condition brought about by inflammation of the meatus, whereby the epithelial debris mixed with cerumin, etc., tend to form abnormal masses, which collect and obstruct the natural passages; (6) the presence of foreign bodies, which, with adherent cerumen, tend to form plugs which close the meatus. Unless these plugs of cerumen entirely close the meatus the degree of hearing present may be of slight amount; only when the plugs are closely adherent to the walls or lie close up to the membrane is the degree of deafness very marked.

The symptoms due to these conditions vary, causing merely an unpleasant fullness with sometimes abnormal subjective noises, e.g., dizziness: deafness is never intense, and when it is we may be certain to find more deep-seated pathological changes in the middle or inner ear. We diagnose the above conditions by resorting to the ordinary methods of objective examination with head-mirror, speculum, and blunt-pointed probe, which always enable one to form a true estimation of the changes present and their causation.

The outlook is generally favourable once the obstruction is removed, but no prognosis should be made until a further estimation is made of the condition of the middle ear. We usually find that in a case of one-sided deafness the trouble may be due to either an accumulation of wax or a defection of the middle ear. When Weber's test is used where the externalisation of the tone is to the better side, we may look for some defect of hearing located in the labyrinth or inner ear. Treatment is usually most satisfactory if carried out by syringing with warm water, best carried out by a large ear-syringe, to the nozzle of which one attaches a small length of suitable rubber tubing to protect the walls of the meatus from injury during the insertion of the nozzle. Should the method of syringing at first seem unsuccessful, one should not persist unduly, but at first instil for some time a small quantity of oil (liquid paraffin), and after a time again syringe as before with warm water. After the plugs are removed, the walls of the meatus are carefully dried with plugs of sterile dry cotton wool until all moisture and debris are removed. A little xeroform may be insufflated and a plug of sterile wool inserted for twenty-four hours, after which it can be removed.

At times when syringing seems to be of no avail, a careful freeing of the cerumen by a probe or blunt hook, and removal by means of suitable forceps, succeeds, but

great care is necessary when using instruments not to damage the soft part because of the severe pain which ensues and the risks of skin infection. A foreign body in the external meatus is usually removed by similar methods.

Foreign bodies are a frequent cause of obstructive deafness, and require even more care in their removal than when dealing with impacted cerumen. We are guided in their removal by considering (1) the nature of the body; (2) its position; (3) the condition of the meatus; (4) the state of the patient. Generally the patient is a child, and from the parent we may get a clear history of the nature of the foreign body, and if previous attempts have been made unsuccessfully to extract it. If vigorous treatment has been instituted the child may be very nervous and irritable, and this may have caused damage of some degree to the lining membranes of the ear. If so we should never hesitate to recommend the giving of a general anæsthetic to enable one to successfully deal with the case. The examination will show the situation of the foreign body : it may have been displaced and pushed into the bony meatus, rendering its extraction very difficult at times. If the nature of the foreign body is soft and of vegetable origin, the mode of procedure differs from that used when it is hard like a bead or other hard material. If the foreign body is soft and liable to swell with water, syringing should not be used, but drops of alcohol may be instilled, and after a short time the foreign body may be extracted piecemeal with the aid of suitable forceps, so adapted as not to further push it inwards but to grasp and extract it wholly or in part.

If all the above methods fail, nothing is left but to resort to operation, viz., preparation for an anæsthetic, preparation of instruments as for a simple mastoid operation, and then proceed to expose carefully the bony meatus or tympanic membrane, if a young child, exposing the seat of the foreign body, and removing; suture again the flap under very aseptic conditions and treat it afterwards as for a simple mastoid operation.

We might here consider the invasion of certain moulds or fungi, chiefly aspergillus niger or flavus, constituting the condition known as otomycosis. Mixed up with the hyphæ are disentegrating cells and crusts due to a concurrent eczema—treatment is carried out by the instillation of drops containing alcohol and two per cent. sol of salicylic acid and careful removal at each dressing of all discharge—the careful placing of half-inch sterile gauze ribbon, six inches long, saturated in the drops and placed in position in the meatus for at least a week, removing it at frequent intervals, soon brings about complete recovery.

At this stage I would stress the importance of the doctor carrying out the treatment personally and not leaving perfunctory instructions to parents and others who cannot have the knowledge or skill, and as a result the prolongation of treatment is made indefinite. This advice applies to the conduct of treatment of all ear diseases, and the neglect of it is the cause of so much increase in the incidence of ear disease which might otherwise have been cured at a much earlier stage and so have prevented the onset of many complications due to imperfect treatment. In the extern ear clinics we see far too many cases of chronic ear disease which should have had happier endings if this principle of personal attendance to the

treatment had been more faithfully followed. The common practice of ordering ear-drops for any ear disease to a patient, with no attempt at personal supervision of treatment, is always unsatisfactory both to patient and doctor alike and may lead patients to a false security, with disastrous results to health in after-life.

*Inflammations of the external ear include:—*

(a) Dermatitis of the auricle may be due to injury, burns, or appear as a severe erysipelatous attack. These should be treated on ordinary antiphlogistic lines and according to the degree and severity of the attack—and with due regard to the etiology, whether caused by chemical or bacteriological causes—suitable local applications, either lotions, ointments, or powders with, in addition, such internal medication as prontonsil if the cause is due to streptococcic infection.

(b) *Inflammations of the external auditory canal:*—The skin covering the external meatus is always the seat of the primary infection, which seldom extends to the bony or cartilaginous walls.

1. Furunculosis of the ear and canal is situated in the cartilaginous section and may be local or a part of a general furunculosis—it is due to any cause where a chronic discharge comes from the middle ear or an eczema is present, or where an injury is caused to the parts by scratching, with subsequent infection of the cutis. It is of frequent occurrence in adults and is often the result of some systemic disturbances as anæmia or diabetes. The symptoms are well known. Severe pain sets in and may cause the patient sleepless nights. Touching the ear is painful, and also pain follows the movements of the jaw, and there may follow constitutional symptoms such as fever and loss of appetite. On examination one sees the swelling in the meatus and abscess pointing; pain ceases on the bursting of the abscess.

Treatment is carried out according to the stage of the inflammation. A narrow half-inch sterile gauze ribbon soaked in ten per cent. sol of carbolic acid in glycerine, inserted into the meatus, alleviates the pain and prevents the adjoining walls of the meatus from becoming infected. If the abscess is pointing, convalescence is hastened by incising the abscess with suitably curved bistury, removing the pus with sterile strips of half-inch gauze and packing the meatus with same, renewing frequently, and the subsequent insertion of gauze soaked with an ointment like white precipitate ointment, 2½ per cent., or 5½ per cent. boracic ointment, until the irritation has subsided.

2. Diffuse external otitis due to an extension of the inflammation to the osseus meatus or even to the membrane—excluding the middle ear. Treatment follows on similar lines to that previously mentioned. As this is a very painful procedure, a general anæsthetic should be given.

Hæmorrhagic and diphtheric inflammation of the external meatus are frequently met with, following influenza and diphtheria. Treatment is carried out by means of antiseptic probes and sterile half-inch gauze inserted and strict adherence to antiseptic principles.

Eczema of the external ear, both acute and chronic, is frequently met with,

and follows the usual course of such in other eczemas with due regard to the anatomical disposition of the parts involved. Symptoms: mainly itching and a degree of deafness, depending on the degree of swelling of the mucous membrane, tympanic membrane, and eustachian tube.

Treatment varies with the cause and the stage of the disease: if acute or chronic, avoidance of water and strict protection of the inflammed surfaces with a suitable powder, such as calomel, but so used as to avoid blocking the meatus; a 1½ per cent. ichthyol in alcohol is very useful or 10½ per cent. ichthyol. If the patient appears to be anæmic or of a scrofulous diathesis, internal medication is useful, such as cod-liver oil, iron, etc.

*Acute suppurative otitis media.*—Usually this is the result of infection spreading from the naso-pharynx, and follows a cold, influenza, or one of the exanthemata, especially in a subject with enlarged tonsils and adenoids. Symptoms are those found in an inflammatory condition: pain, redness, temperature, swelling, and some degree of deafness.

The pain varies and may be absent. It is very necessary in cases of children to examine the tympanic membrane in cases with signs of cerebral irritation and unexplained rises of temperature. The appearance of the tympanic membrane is important, and generally it is not possible to define the landmarks. Swelling of the drum is seen especially posteriorly and may prevent the handle of the mallens being seen. Deafness varies, but examination reveals whether it is transient or caused by severe implication of the middle ear. When the drum alone is inflamed there is no deafness or bulging and the general condition is good. If one finds symptoms of acute otitis media, one should be prepared to incise the tympanic membrane (and this better done at once than wait until perforation of the drum obtains, for it is better to do a myringotomy sooner than later, as it often cuts short a severe inflammation by giving exit to retained pus in the tympanum, and so saving a probable infection of the mastoid cells with a subsequent mastoiditis, involving a more serious operation with less chance of a favourable recovery. The operation of myringotomy should not be done by anyone unless they are fully familiar with the technique, as it may be attended with unsatisfactory results).

The natural result of an unsatisfactory ending to a case of acute otitis may be an inflammation of the mastoid cells or antrum (mastoiditis). There is not only danger to life but to hearing, and should the acute attack pass off, the result is generally a chronic suppuration of the mastoid and middle ear should the inflammation extend beyond the mucous membrane and affect the bone. There is immediate danger to the life of the patient, and immediate operation should be carried out in order to forestall worse to follow. The actual operation should be left in the hands of the specialist, but very often he is dependent on the acumen of the practitioner in charge in bringing the case at the earliest opportunity before the disease has extended to neighbouring areas where delay is very dangerous.

If a case of acute otitis media continues to progress and a discharge persists for over a period of three months, it is very important to have further advice, as an

operation may be, and often is, essential, not only to save whatever hearing the patient at that time may have, but to safeguard life itself.

There is no doubt that one sees at the present time fewer cases of the ill-effects of middle ear disease since the attention of surgeons has been directed to the removal of adenoids and enlarged tonsils in suitable cases, but not enough attention has been given to the actual cases of suppuration of the ears, where the danger is more urgent and active treatment more essential. Were this fact more usually recognised and the responsibility of the general practitioners more taken to heart, I have no doubt that a great reduction in the number of patients whose hearing is affected would be considerably diminished. A closer co-operation should be maintained between the general practitioner and the aurist, and would no doubt have a beneficial result for the work of both concerned.

# Eye Injuries, Including Those Due to Foreign Bodies; with Notes on Treatment

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The eye, being situated in a bony socket and covered by the eyelids, is in a relatively secure position, these structures being so placed that it is only from the front and from the temporal side that danger can reach the globe, also the blinking reflex occurs so rapidly that noxious substances are more often than not warded off by the eyelids. Furthermore, the contents of the orbit form a soft cushion able to yield to a sudden blow, and the optic nerve permits a considerable forwards displacement as it does not lie taut in the orbit. Nevertheless, in spite of these safeguards, eye injuries are relatively common, and on account of the highly complicated structure of the organ a considerable injury may be caused by a comparatively minor trauma. It is to be emphasised that in injuries of the eye the time factor is important, and it is essential that appropriate treatment should be instituted without delay in every case. It is further worth remarking that as the function of the eye is to see, it is necessary to record the vision of every case at the first opportunity.

Eye injuries may be considered as falling into two main groups :—

1. Injuries entailing damage to the superficial tissues of the eyeball.
2. Injuries entailing damage more particularly to the contents of the eyeball.

1.—Superficial Injury.

(a) Injury by the access of foreign matter to the conjunctival sac. The presence of inert particles on the surface of the eye causes the commonly described gritty feeling due to irritation of the sensory nerve-ends in the cornea and conjunctiva.

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(b) If the particles are chemically active, damage may be caused to the tissues with which they come in contact. The most common substances are acids, alkalis, and lime.

(c) Damage may be caused to the eye by the physical effects of radiant energy —heat, infra-red, ultra-violet, and X-rays may all injure the eye superficially as well as in certain circumstances internally.

(d) Certain substances otherwise harmless may become detrimental to the eye on account of the biological effect known as allergy.

Normally the corneal epithelium possesses a considerable power of recuperation from injury, but certain factors render the eye more vulnerable, such as: 1—lagophthalmos, which permits excessive drying of the cornea; 2—anæsthesia, either due to cocainisation or due to a lesion of the ophthalmic division of the fifth nerve; 3—malnutrition, e.g., vitamin A or other dietary deficiency.

*Foreign body in the eye.*—One of the commonest accidents to the eye is the entrance into the conjunctival sac of a particle of foreign matter. Most often the blinking movements of the eye and the flow of tears wash the material out, but if it gets into the groove on the posterior surface of the superior tarsus it can only be removed by eversion of the upper lid, when it can be easily brushed off. A foreign body lodging in the conjunctiva can be removed by gripping with fine forceps and snipping off with scissors to remove a small piece of the conjunctiva at the same time.

*Corneal foreign body.*—The commonest injuries of this type are due to flying particles of metal or stone sustained by persons working at a grindstone. Such particles are often hot when they strike the eye, and cause a burn which remains as a brown ring when the foreign body has been taken off. This also should be removed. These foreign bodies are seldom septic, and the site of lodgment heals very rapidly after removal. A more serious lesion is caused by such septic material as hayseed, which may give rise to a corneal ulcer.

In the removal of a corneal foreign body it is important to remember to take the vision in both eyes as a preliminary. The eye should then be anæsthetised by instillation of two drops of cocaine solution (two to four per cent.), or of one of its substitutes. It is essential to have a good light, if possible focussed on the eye with a condensing lens. The foreign body is then removed from the eye with a sterile needle. A corneal loupe is a useful help once the technique of holding the eyelids apart and manipulating the eyelids with one hand has been mastered. Otherwise a binocular loupe may be used, which leaves both hands free. An iron or steel foreign body should be removed with as little delay as possible, otherwise a ring of tissue will be stained with rust and will have to be removed with a needle. Before rust has formed, such foreign bodies may be removed with a magnet. A particle of copying-ink pencil-lead is a dangerous substance, as it is likely to lead to ulceration, and its removal should not be delayed, followed by copious irrigation with weak tea. In removing any foreign body, care should be taken to remove as little normal tissue as possible, especially where a particle is deeply embedded. In such a case there is also a danger of pushing the foreign body

into the anterior chamber. It should be remembered that whereas the corneal epithelium is capable of complete regeneration, Bowman's layer is not. Another point worthy of note is the undesirability of using any hypotonic lotion or drops when the epithelium is not intact; it is preferable to order normal or slightly hypertonic saline (gr. 6 ad ℥i) rather than advise the use of, say, boric lotion, which may be made up too weak. In the great majority of cases no irrigation is necessary, and healing takes place inside twenty-four hours. It is well to promote this by the application of a silver proteinate or other antiseptic, and by using a pad and bandage for twenty-four hours. If there is more than a slight degree of ciliary injection it is well to secure cycloplegia and mydriasis by the use of atropine. If it is possible to see the patient the next day, one may use homatropine; if the case is then progressing favourably the discomfort associated with paralysis of accommodation is not so prolonged.

*Corneal ulcer.*—Ulceration of the cornea may result from injury :—

1. Where the substance causing the injury is septic.
2. Where an attempt has been made to remove a foreign body with a septic instrument.
3. Where there is already infection in the conjunctival sac, e.g., conjunctivitis, dacryocystitis.

An infected ulcer may be recognised by a greyish infiltration of the corneal tissue with a tendency to spread. There is considerable ciliary injection. Should the condition be severe, there may be pus in the anterior chamber (hypopyon). Pus may also form in the cornea or exude from the surface of the ulcer. The treatment is copious and frequent irrigations with boracic, normal saline, or other suitable lotion, antiseptic drops, atropine sulphate ointment or drops one per cent. Hot stuping is perhaps the best method of applying heat, and, unless in minor ulcers, the patient should be at rest in bed. If hypopyon is present, hospitalisation is necessary, and it often helps to apply leeches at the external canthus. In an ulcer that shows a tendency to spread, the margins may be treated with tincture of iodine or carbolic acid carefully applied, or the actual cautery may be used. A severe septic ulcer may not heal until the tension in the cornea has been released by perforation, and this may be anticipated by a Sæmisch section. The pupil should be kept well dilated to minimise the dangers of iritis.

In the general treatment the patient's diet should be supplemented by vitamin concentrates. It has been found empirically that a course of campolon (liver extract) is sometimes beneficial. In any case of severity a bacteriological examination should be made to ascertain which, if any, sulphanilamide derivative should be given orally. Local application of this drug is not necessary. The amount of vision remaining in an eye which has had an ulcerated cornea depends on the severity of the ulcer and on the site. A severe ulcer situated peripherally may give a good visual result, whereas vision may be seriously diminished by a slight ulceration centrally situated. There is especial danger of visual loss in a child, where even the period of tying up one eye may lead to amblyopia and the develop-

ment of a squint. On this account the eye of a child should not be bandaged up for any longer than is absolutely necessary.

*Chemical injuries.*—Corrosive injuries of the eye are caused typically by strong acids, alkalis, and by lime. The tissues with which the substance comes in contact are destroyed and slough away, and there is a danger of adhesion wherever two denuded surfaces are in contact, as the bulbar and palpebral conjunctiva (symblepharon). The treatment required is copious irrigation as soon as possible after the injury to secure complete removal of the irritating substance. An attempt may be made to neutralise the substance by using hot ac. boric in the case of alkalis, and hot sod. bicarb. or milk in the case of acids. All particles of lime should be carefully removed, and neutralising substances recommended are neutral ammonium tartrate ten per cent. solution instilled after cocainisation. Lately a solution of salammoniac four per cent. has been advocated. After-effects are diminished by securing rapid healing. The use of hypertonic saline (gr. 6 ad ℥i = 1.1 per cent.) together with scarlet-red ointment is beneficial.

*Irritant gases.*—The most important of these are the gases likely to be used in warfare. There are two main groups: 1—the irritants; 2—the vesicants (see *Ulster Medical Journal,* July, 1939). The first group acts by irritation of the nerve endings in the cornea and have only a transitory effect. The fumes of mustard-gas and lewisite cause irritation and blistering of the skin of the lids as well as of the surfaces of the eye. This may cause severe swelling with difficulty in separating the lids, and make the patient think he is blind when only the lids are damaged. He can be reassured by separating the lids with the fingers and demonstrating that vision is present. It is only a very small percentage of these cases that have any residual eye defect after the initial symptoms have passed off. The treatment recommended is copious irrigation. These patients also need a lot of encouragement, as they are often very depressed. If a drop of liquid mustard gets into the eye, the eye will almost certainly be lost.

*Physical effect of radiant energy.*—Damage may be caused to the eye by the extremes of heat and cold. Hot substances may sear the eye to a greater or less extent. A superficial burn is sterile and will usually heal well, though if situated on the cornea is likely to leave a scar. Such injury is likely to result from a splash of molten metal or by badly directed curling tongs.

*Ultra-violet light.*—The damage caused to the epithelial cells of the cornea and conjunctiva by ultra-violet light is seen in those cases where, as a result of exposure to the arc lamp, as in welding or in film making, there arises within twelve hours a marked conjunctival congestion with severe irritation of the eyes. Natural repair takes place in a day or so, and there is no permanent damage with a moderate exposure. Ultra-violet light also affects the retina, causing "snow blindness" from its effect on the rod cells.

*Infra-red rays.*—As an example of this, glass-blowers' cataract may be instanced. In this condition the lens is damaged by prolonged exposure to dull red heat, and in course of years a typical opacity develops.

*Visible light.*—Eclipse blindness is the name given to the condition resulting from the direct gaze at the sun (commonly done in an eclipse without adequate screening). The sun's rays falling on the cornea are focussed on the macula, and this part of the retina is irreparably damaged. A lesser effect may be produced by exposure to extremely bright light, e.g., electric arc, but varying with the severity of the exposure, recovery may take place.

*Allergy.*—It must suffice to make only a brief reference to conditions due to an acquired sensitisation of ocular tissues to commonplace substances, such as drugs (atropine, etc.), cosmetics (orris root, etc.), or plants (primula, etc.). The most commonly recognised conditions affect the skin of the lids, but it is also likely that the conjunctiva and cornea may become allergic to similar substances and that the internal structures may react to antigens circulating in the blood-stream. An interesting case has recently been recorded where iridocyclitis was found to be very closely associated with the exposure of the patient to egg-white (Parry, *B.M.J.*, Aug. 19th, 1939).

2.—Injuries Entailing Damage More Particularly to the Contents of the Eyeball.

(a) *Intraocular effects of a blow.*—A severe blow may cause rupture of the globe with or without extrusion of the lens. The conjunctiva may not yield, and healing may take place with retention of some vision. If the eye is completely disorganised, it should be removed. Less severe blows may cause disturbances of the various internal structures of the eyeball. Hæmorrhage may occur in the retina or uveal tract, and blood may be found in the anterior chamber or in the vitreous. The iris may be torn either at the root (iridodialysis), or at the pupillary margin, leaving a serrated edge and causing, in association with damage to the ciliary nerves, disturbances in the pupil reactions. The lens may be subluxated or completely dislocated from rupture of its suspensory ligament. In other cases a traumatic cataract is formed. This may be very late in developing, even years after the injury was received.

The retina during the first day or so after a blow exhibits contusion. It can be seen with the ophthalmoscope to be œdematous, and the vision may be much reduced. As a rule this condition clears up, but if the macula has been damaged full recovery may not take place. Another form of retinal injury is a tear which is likely to lead to detachment of the retina. This should always be looked for, as operative treatment has a good prognosis in an early case.

The choroid may be ruptured by a blow. The ophthalmoscopic appearance is that of a white line concentric with the disc. It may pass through the macula, in which case considerable visual deficiency is likely to result.

The immediate treatment recommended is rest in bed, with a pad or bandage on the eye. Cold applications may be made to limit hæmorrhage. It is well to refrain from using atropine in the first instance because it may accentuate the increase in tension reactionary to the initial reduction caused by the blow. After the first few days, if iritis is feared, a mydriatic may be instilled. The hæmorrhage usually

clears up rapidly, but a large vitreous hæmorrhage may take as long as six months to clear.

(b) *Penetrating wounds of the eye.*—These are caused by pointed or cutting instruments, the most common of which are thorns, glass, and needles, and by foreign bodies which, though often very small, have sufficient velocity to pierce the sclera. In so doing there is a great loss of velocity, so that it is very exceptional for a second perforation to occur. As a result the particle almost invariably remains in the eye. The resulting damage to the eye depends on the following conditions :—(1) Whether any septic matter was carried into the eye. If any infection has been carried in, the eye will almost certainly be lost from panophthalmitis. (2) The path taken by the perforating body. If the cornea is perforated the track will be through the iris (or pupil) and lens, causing traumatic cataract. If this is traversed, the foreign body will end up in the vitreous. The lens may escape with an injury coming from a very oblique angle. A cut on the cornea, unless caused by a very fine point (or tiny foreign body), will allow the aqueous to escape and the iris will be dragged up into the wound. In such a case a good result can only be expected if excision of the prolapsed iris is immediately undertaken. If the perforation overlies the ciliary body the lens will probably escape injury, but wounds in this region are regarded as dangerous and liable to produce sympathetic ophthalmia.

Every endeavour must be made to remove intraocular foreign bodies, particularly iron or steel particles, for these give rise to siderosis and degeneration of the eye if retained. The removal is carried out with the magnet after the situation of the foreign body has been accurately localised with X-rays. Tiny fragments of glass, stone, or other non-ferrous material may be tolerated, but if the sight is lost it is wiser to enucleate the eyeball. A foreign body which comes to rest in the lens is often well tolerated, although cataract results. Sometimes it can be removed along with the lens. After the removal of a foreign body the eye is treated in the same way as other perforating wounds, viz. :—atropine, pad and bandage, and the patient is kept at rest in bed until healing takes place.

Any consideration of eye injuries would be incomplete in which no mention is made of sympathetic ophthalmia. The possibility of this condition arising should be considered after any perforating wound of the eyeball—even one due to operation. The ciliary region is regarded as a dangerous area, but a wound in any part can originate the disease. It is usually said that six weeks elapse from the date of the injury before the danger of the complication arises, but there is no doubt that it may begin after a shorter time. The usual course in the sympathising eye is an iridocyclitis with exudation and extensive synechia formation. It may, however, commence as a choroiditis. If the exciting eye is irreparably damaged it should be removed. Once the condition has arisen, little benefit is said to be derived from enucleation of the exciting eye, and it should be preserved if any sight is left in it, as it may in the long run be the better of the two eyes.

# The Differential Diagnosis of Diplopia

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*Hermia*—"Methinks I see these things with parted eye,
When everything seems double."

*Helena*— "So, methinks,
"And I have found Demetrius like a jewel,
Mine own and not mine own."
—*A Midsummer-Night's Dream.*

IN Paris, on the 30th April, 1923, Professor Marquez, of the University of Madrid, delivered a lecture at l'Hotel-Dieu, presided over by Professor de Lapersonne, Professor of the Ophthalmological Clinic at the Faculty of Paris.

In that lecture Professor Marquez described a method devised by him for the elucidation of certain cases of diplopia.

In this paper I propose to explain his method in as simple a manner as possible, in what may seem to be a complicated subject.

The sudden onset of double vision in an adult is so distressing and alarming that the sufferer is compelled to seek professional advice at an early moment.

It is easy to give relief by the simple occlusion of one eye from vision.

To determine the reason of the double vision is not always easy, may be difficult, and indeed sometimes may leave an element of doubt in the mind of the physician.

Any method which pretends to facilitate the solution of our difficulties and resolve our doubts is of great interest, and, I think, is worthy of our consideration.

The method has its limitations. It only applies to affections of the extraocular muscles acting in the vertical plane, so we may dismiss from our minds such gross lesions as complete paralysis of the third and sixth cranial nerves, monocular diplopia, cases due to displacement of an eyeball by local effusions or tumour.

The muscles concerned are eight in number, and as each may be affected in one of two ways, by paresis or spasm, we may have to determine one out of sixteen possibilities, a formidable enough task.

To understand the working of the method, it is necessary to bear in mind certain definite principles.

1. In the normal eye, rays from an external object fall on the fovea. In a deviating eye these rays fall to one or other side of the fovea, according to the deviation, e.g., in convergent deviation on the nasal side of the fovea, in divergent deviation on the temporal side. The picture there formed is projected into space in the opposite direction, and is there seen by the patient.

2. Each muscle has a compound action, consisting of three components :—
   (a) elevating or depressing the anterior pole of the eye.
   (b) abducting or adducting.
   (c) rotation of the eyeball clockwise or anticlockwise.

Diagram 1 shows the threefold action of each muscle.

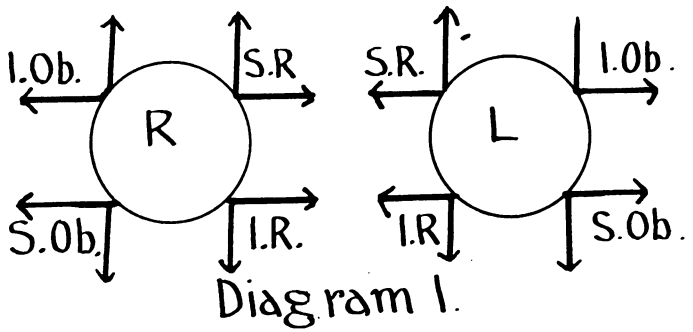

Diagram 1.

Note that in diagram 1 the inferior oblique muscle is placed, not in its anatomical position, but in accordance with its function, which is to elevate the anterior pole of the eye. For a similar reason, the superior oblique is placed on the lower part of the diagram.

3. The significance of crossed or homonymous images.
   Crossed images represent—
   (a) Paralysis of an adductor muscle.
   (b) Spasm of an abductor muscle.
   Homonymous images represent—
   (a) Paralysis of an abductor muscle.
   (b) Spasm of an adductor muscle.
4. Recognition of the false image—
   In the upper field of vision, the higher of the two images, and in the lower field, the lower of the images is the false one. The patient, wearing differently tinted glasses, can distinguish them by the colour.
5. For practical purposes the patient is examined—
   (a) in the primary position, the eyes looking straight forward.
   (b) in each of the four diagonal directions, upwards to the right, upwards to the left, downwards to the right, downwards to the left.

   In each of these diagonal directions two muscles act in association, one belonging to the right eye, and one to the left eye, the rectus of the direction in which the patient looks and the oblique of the other eye contrasting in name, e.g., if looking upwards and to the right, the associated muscles would be the superior rectus of the right eye and the oblique of the other eye of an opposite designation, in this case the left inferior oblique, or, if downwards, and to the left, then the muscles associated in this movement would be the left inferior rectus and the right superior oblique.

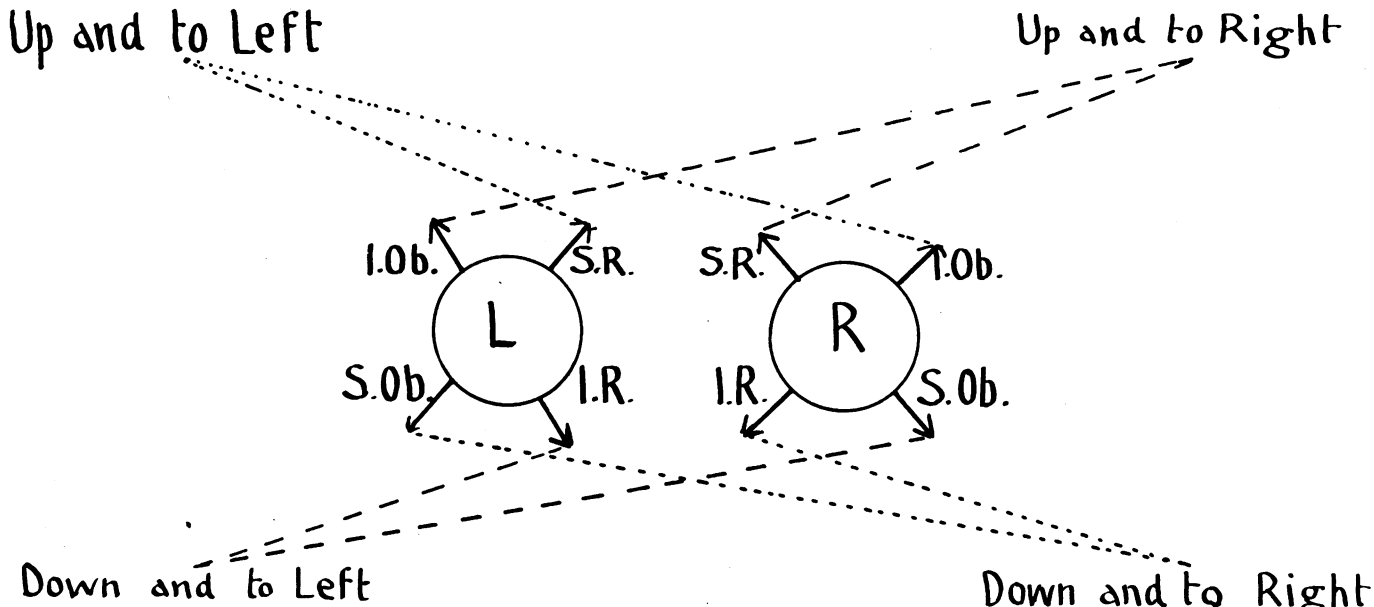
Up and to Left
Up and to Right
I.Ob.
S.R.
L
S.Ob.
I.R.
S.R.
I.Ob.
R
I.R.
S.Ob.
Down and to Left
Down and to Right

Diagram 2

Diagram 2 shows the associated movements in each of the four diagonal directions.

6. Rotation of the eyeballs.

Two directions, (a) clockwise, (b) anticlockwise. The muscles associated in the clockwise rotation are :—

The upper muscles (anatomically) of the right eye, and the lower muscles of the left eye, namely the superior rectus and superior oblique of the right eye, and the inferior rectus and inferior oblique of the left eye.

Those associated in anticlockwise direction are the lower muscles of the right eye and the upper muscles of the left eye, namely, the inferior rectus and inferior oblique of the right eye, and the superior rectus and superior oblique of the left eye, as shown in diagram 3.

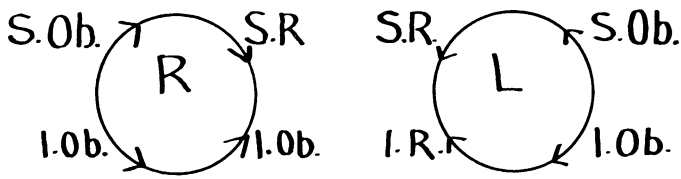


Diagram 3

EXAMINATION.

This takes place in a dark room, the patient being seated, and wearing differently tinted glasses, the red glass being in front of the right eye.

An assistant holds the head steady, eye movements only being allowed.

The examiner stands about two metres in front with a lighted candle.

Commence the examination in the primary position, eyes straight forward.

Enquire if two images are seen; if so, any difference in level, and which coloured image is to the right or left.

Note the replies.

Next examine by moving the candle in each of the four diagonal directions, the patient's head remaining steady, only his eyes following the candle.

Find out in which of these four directions the patient observes the greatest *vertical* separation of the images, which is the higher image, should this greatest separation be in the upper field of vision, and which is the lower image if in the lower field.

Note the replies.

Also enquire into the lateral relations of the two images, whether homonyous or crossed.

Note the reply.

The information now acquired is sufficient to tell us which eye is involved and the particular muscle affected.

However, as a control test, we can examine the patient with the head on one or other shoulder, the candle being held in front. Enquire on which shoulder is the separation of the images greater.

Note the reply.

The examination is now over, and we can proceed to interpret the information at our disposal, and so apply it, by Marquez's method, to build up in a graphic manner the diagnostic picture.

For this purpose draw two circles to represent both eyes, and mark them R and L, place dots on the circumference of each circle to represent the situation of each muscle, as in diagram 4.

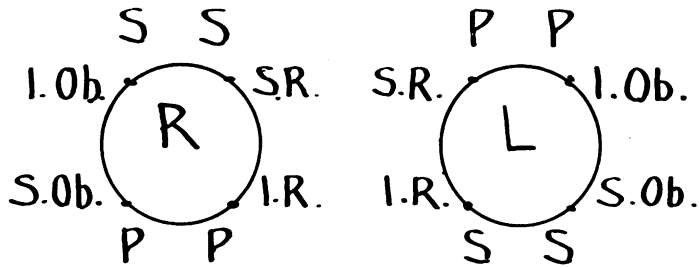


Diagram 4

Take each item of information, make the correct deduction, and note the result on the diagram by placing the letter P or S, representing paralysis or spasm, opposite the muscles in their appropriate positions.

Let me give you an illustrative case in detail.

The following points have been elicited :—

1. In the primary position, the red image was lower than the other.
2. The greatest vertical separation of the images was observed on looking downwards and to the left, and that the lower image was the red one.
3. That the images were homonymous.
4. There was the greater separation with the head on the right shoulder.

INFERENCES TO BE DRAWN :—

1. Red image lower than the other.

   This tells us that the anterior pole of the right eye is higher relatively than the anterior pole of the left eye.

   As yet we do not know which eye is in its natural position. Assume that the right eye is pathologically higher, this could be due to a spasm of an elevator or to a paralysis of a depressor muscle of the right eye.

   It may be that the left eye is pathologically lower, in which case this, in a

similar way, could be due to a spasm of a depressor or a paralysis of an elevator muscle of the left eye.

Place the letters P and S in their appropriate positions in diagram 5, in accordance with the inferences we have made.

2. The greatest vertical separation on looking downwards and to the left, and the lower was the red image. The associated muscles looking in this diagonal

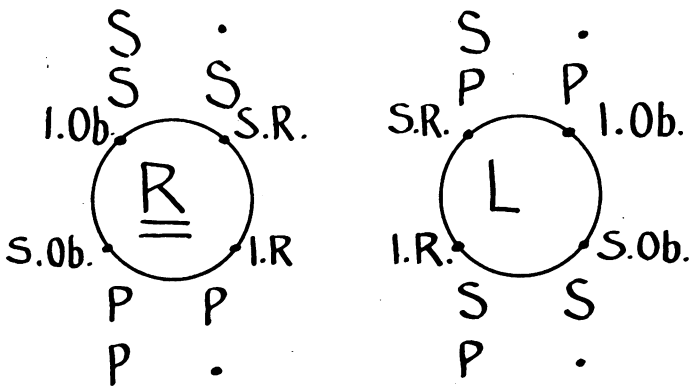

Diagram 5

direction are the inferior rectus of the left eye and the superior oblique of the right eye.

The inference is that one of these two muscles is paralysed or that one of their antagonists, the left superior rectus or the right inferior oblique, is in a state of spasm.

Add the inference to the diagram by placing the letters P and S in their appropriate positions. This leaves a blank where the remaining muscles were not in action in looking downwards and to the left. A dot may be placed against these muscles to show that they were not concerned in the movement. Also we are told that the lower image was red, so we know that the muscle affected belongs to the right eye. We mark this on the diagram by underlining the letter R.

3. The images were homonymous.

This signifies either paralysis of an abductor muscle or a spasm of an adductor muscle, and so we can mark this on the diagram by placing the letter P against each abductor muscle in both eyes, and the letter S against each adductor muscle. (Diagram 6).

We are now in a position to view the picture we have built up, and we can observe that there is only one muscle which shows the coincidence of an uninterrupted succession of letters of the same denomination, in this case the right

superior oblique, the letter P indicating that this muscle is in a state of paralysis, the underlining of the letter R in the circle bears this out.

Though we have formed an opinion, we have not exhausted the information at our disposal. We can use this as a control test.

In simple cases where only one muscle is at fault, this test should agree with the results of the previous ones. When more than one muscle is involved there may appear to be a contradiction, but the discrepancy is capable of explanation, as I shall show later

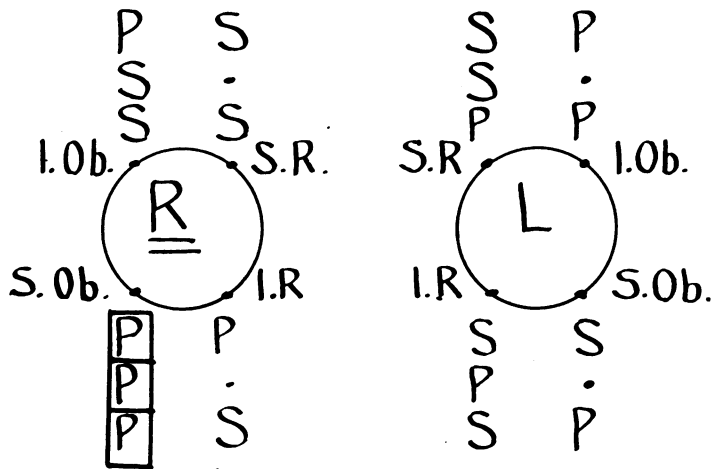

Diagram 6

However, in this case, we are told that the images were further apart with the head resting on the right shoulder. In this position the eyes tend to assume the vertical position, that is they move in a clockwise direction. The inference to be drawn is that one of the muscles rotating clockwise is paralysed, or that there is a spasm of one of the muscles rotating anticlockwise.

So we can complete the picture by adding the letters P and S in their respective positions, P against each muscle associated in the clockwise rotation, and S against the others, taking care to remember that we are dealing now with the obliques in their anatomical position, that the superior oblique is an upper muscle.

We have added another stroke to the hammer which drives the nail home. We have now confirmation that the diagnosis already made is correct beyond doubt. You will have noticed that no reference has been made to the well-known fact that in cases of vertical diplopia the false image is inclined, whilst the true image is erect. The direction of the inclination is precise in each case, but Professor Marquez does not utilize this in his method. It could, however, be used as a

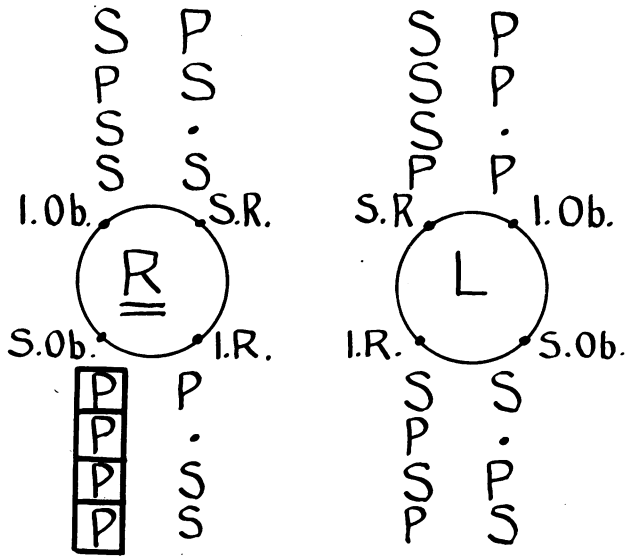


Diagram 7.

further confirmation. It presumes an intelligent patient, whose observations we can rely on.

Diagram 8, which I have copied from the *Encyclopedie Française d'Ophtalmologie,* shows in a very simple way the various inclinations of the false image, both in the upper and lower fields of vision, in paralysis as also in spasm. It will be noticed that in paralysis the upper end of the false image in the upper field, and the lower end of the false image in the lower field, is centrifugal in its relation to the erect image, whereas in spasm these are centripetal.

I have entered fully and at length into the description of this illustrative case, using separate diagrams and building up, step by step, the finished picture. This is for the sake of clearness. In practice only one diagram is required.

The second case will be dealt with in a few words.

Information elicited :—

1. Primary position—image of left eye lower.
2. The greatest vertical separation found on looking down and to the right; the lower image was red.
3. Images crossed.
4. Head on left shoulder showed greater separation.

Interpreting these findings on the principles already enunciated, the resulting picture (diagram 9) reveals a spasm of the left inferior oblique muscle, the control test confirming the diagnosis.

Finally, let me quote you a complicated case, taken from the practice of Professor Marquez—

*History*—The patient had had a "cold in the head" for five days, during which

he had three sleepless nights, followed by double vision, the patient himself having noticed that the left eye was turned slightly downwards and inwards. Examination revealed :—

1. That the red image was lower than the other.


Diagram 8

2. That the greatest vertical separation of the images was on looking upwards and to the left. Also that on looking upwards and to the right the images were separated, but to a less degree.

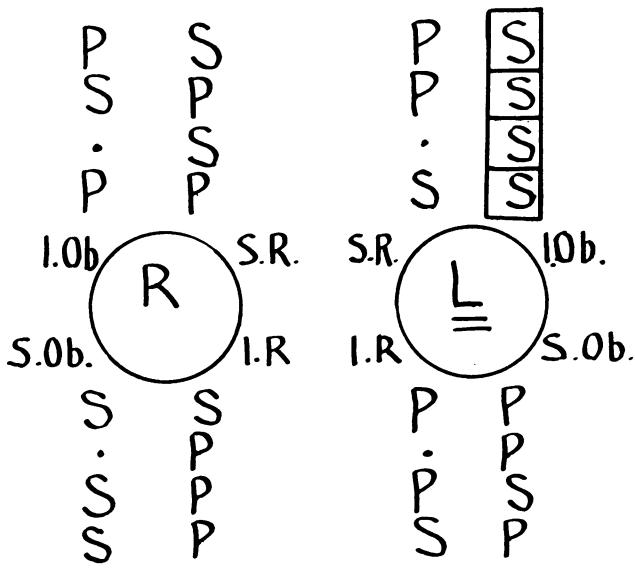


Diagram 9

3. The images were homonymous.
4. The head on the right shoulder showed greater separation.

Interpreting these findings as before, we obtain the picture of a spasm of the

left inferior rectus, but when we use the control test we find a discrepancy. This led Professor Marquez to look for a further cause. Remembering that the patient had noticed some separation of the images on looking upwards and to the right, though not so well marked as on the left, and interpreting this in the usual way, and adding the results to the diagram, with small letters p and s, the new composite picture (diagram 10) showed, in addition to a spasm of the left inferior rectus, a paralysis of the left inferior oblique.

This explained to him the apparent discrepancy in the control test. In this test we are only considering the rotation components of the muscles. Both muscles belong to the same rotatory group (viz., the clockwise), being both lower muscles

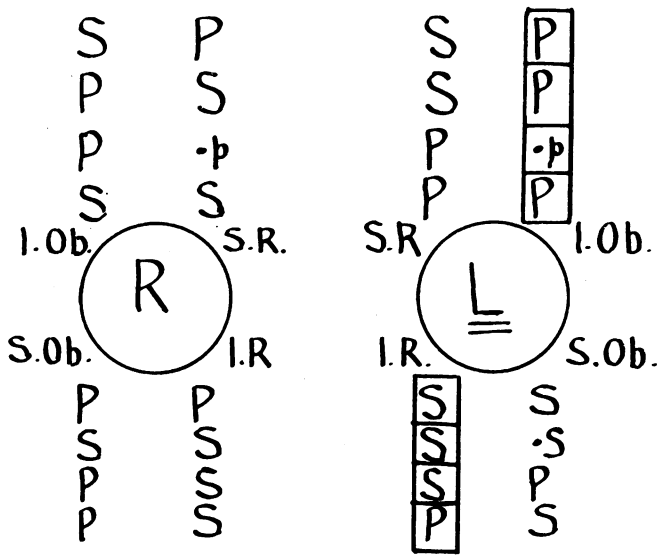


Diagram 10

of the left eye. The principal function of the oblique muscle is that of rotation. The rotary influence of an inferior rectus is very small, and although this is slightly increased by spasm, its effect was felt less than the complete absence of the naturally strong rotatory action of the oblique muscle, and so this factor preponderated, and reveals itself in the control test.

I have given a sufficient number of illustrative cases to enable the reader to understand the working of the method, and to allow him to form his own judgment as to its importance and utility.

Personally I have found it useful in practice. It is ingenious, logical, rapid in performance, and, I think, convincing.

I hope others will agree with me that it is worthy of being more widely known.

It is with that object, and in that spirit, that I make this contribution.

# The Treatment of Detachment of the Retina

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UNTIL recent years, detachment of the retina was a distressing eye lesion, which usually led on to blindness.

By careful and painstaking work, a Swiss surgeon, Gonin, proved that by means of operation a certain percentage of selected cases can be cured.

In this short paper I propose to discuss briefly the conditions of retinal detachment and give the results of my own efforts.

By detachment of the retina we mean really a separation of the two primitive retinal layers, so that the pigmented epithelium remains adherent to the choroid, and the inner retinal strata of cells and fibres are separated from it.

The simplest way to try to follow the mechanism of retinal detachment, is to assume that there are two main groups. The retina may be either :

(a) Pushed in from without (tumours, cysts, hæmorrhages, inflammation).

(b) "Floated in," when it has a hole or tear in it.

In the former group no operative interference is called for, except to remove the eye if a malignant tumour is present. The cases due to inflammatory exudates may clear up when the inflammatory lesion subsides, while hæmorrhages may become absorbed. These detachments have a solid appearance, and do not seem to float freely. If an accurate history can be obtained (often a difficult thing), it will be found that the visual loss is a gradually increasing area of blindness. In cases of neoplasm the intraocular tension may be raised. The differential diagnosis of the true pathology of the lesion may be extremely difficult, especially in the early stages.

In the second group (when the retina is "floated in") the detachments are, as a rule, spontaneous. It is in this group that operation should always be considered. A sudden or spontaneous onset was found in fifty-two per cent. of a series of cases reported by Stallard.

While in Stockholm some years ago, Professor Nordenson stated to us, that in a series of 1,100 patients with spontaneous detachment of the retina, eighty per cent. were myopic, and of these, fifty per cent. were over 50 years of age.

Now, about fifteen per cent. of all eyes are myopic, but it is usually only the highly myopic which are liable to suffer from detachment of the retina.

The above figures show how important it is to prevent myopia, or at least check its advance, especially in school children, and so prevent consequent ocular degeneration.

The old saying that a short-sighted eye is too long, sums up the pathology. The stretching of the eye causes a thinning of the retina, which becomes atropic, and the vitreous degenerates. As a result, both retina and vitreous are very susceptible to toxic or circulatory disturbances and minor degrees of trauma, which can cause rents or apertures in the degenerate retina.

Lister states that if we can substantiate a history of sudden loss of sight from

detachment of the retina, even though a hole cannot be seen, we know that a hôle must be present, and we can with equal certainty exclude a growth. A hole, however, may be present without a detachment, especially in the macula area.

As a rule, a hole in the retina will appear as a red area, darker than the normal fundus, lying in the grey area of detached retina. Tears are gaping with edges everted. In the late stages, with retina degenerating, a tear may become difficult to detect.

Vogt distinguishes retinal holes from retinal tears. Holes, he states, are due to the tearing away of a disc-like area of the atropic retina by an adherent and degenerative vitreous framework.

Tears occur near the ora-serrata (the thinnest part of the retina), and result from bodily effort or contusion. As a rule they are situated at the upper pole of the eye, and so it is here that the detachment will first occur.

During the last war a committee appointed by the Ophthalmological Society of the United Kingdom to report on the results of treatment of detachment of the retina associated with a hole, recorded no case of cure by surgical treatment, and only in very rare instances by rest.

An article by Sir William Lister in *B.M.J.*, December, 1927, states that treatment, as at present devised, in cases of detachment with holes is practically valueless. In 1925, however, Gonin stated that as a result of thermo-cauterization he had had more cures in three or four years than in the previous twenty-five years. From this method his new operation developed.

The first essential is to be able to find the hole or tear in the retina. Most surgeons agree that this constitutes the greatest difficulty in many cases. Even with a widely dilated pupil and a most careful search one may be unable to find the hole at the first attempt. It is then advisable to put patient to bed and continue search on subsequent days.

The second essential is to localise the tear, that is, to be able to visualise the point on the sclera which will be opposite the tear when the retina is reattached (i.e., the point on the sclera at which to operate).

The third essential is to close the tear. Originally the thermo-cautery was used, but to-day diathermy is the method of choice, though some schools prefer electrolysis.

Under local anæsthesia the sclera is exposed over the area involved. It is frequently necessary to resect one of the recti muscles in order to do this, resuturing it at the end of the operation.

Larsson devised a small, blunt-ended terminal, by which he applies diathermy to the scleral area. He next removes a small 1½-millimetre disc of sclera by means of a trephine. Through this scleral aperture the subretinal fluid is drained away by inserting a fine probe through the choroid.

Säfar in Vienna inserted small pins (like minute tacks) through the sclera by means of diathermy. Up to twenty pins may be inserted and then removed. Through these apertures the subretinal fluid drains away. I watched him working while in Vienna some years ago, and his results then appeared to be very good.

To-day a combination of the two methods is frequently tried, and while in America this summer I found that that was their method of choice.

Turning to my own results: The Belfast Ophthalmic Hospital was the first hospital in Ireland to have the necessary diathermy apparatus, and since 1936 I have operated on nine out of fourteen cases of retinal detachment which came under my care.

The five cases where no operation was undertaken included one new growth, one hæmorrhagic case from raised blood-pressure, one case of choroiditis, one large and longstanding detachment, and one case in which the patient refused operation.

In the nine cases where operation was performed, four of these got complete reattachment of the retina and very good vision; two got partial reattachment and retained some vision; while the remaining three were unsuccessful.

That is, about fifty per cent. success in unselected cases as regards duration of detachment, which is obviously an important factor.

When one considers Lister's remarks of twelve years ago, this is certainly a big step forwards in a previously hopeless lesion.

To quote one case as an example :—

A school teacher aged 43 years. First seen August, 1937. History of loss of sight in right eye for five days. On examination, I found a large retinal detachment in upper outer quadrant and a tear close to the periphery. Operation was performed the next day, diathermy being applied, after the superior rectus had been divided. Last seen in September, 1939, when patient's vision with suitable glasses was 6/9 part in the operated eye. The detached area has remained completely reattached, and one can see the scarring in retina and choroid around the area where the hole was situated. In this case there were four dioptres of myopia combined with two dioptres of myopic astigmatism.

# Hearing Aids and Social Problems of the Deaf

*By* PHYLLIS M. TOOKEY KERRIDGE, PH.D., M.R.C.P.
Lecturer in Physiology, University College, London

THE deaf are very numerous; and for the most part are neglected both by the medical profession and the charitable, unless they happen to have been deaf and dumb as children. The "hard of hearing" include the old ladies who do not hear when they are addressed unexpectedly, but who can overhear things they are not meant to when they are paying attention, and the senior gentlemen who complain that the elocution of actors is not what it was in their young days; also the families and individuals who develop otosclerosis, first noticeable in their twenties, and inconvenient by the time the forties are reached. Further, there are the people whose middle ears have scarred after a period of inflammation, some of them children whose defective hearing may be too slight to detect easily in a rapid school medical examination, and occasionally mistaken for a mental defect.

## THE INSTRUMENTS.

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## THE INSTRUMENTS.

Hearing aids are surgical appliances, but they have not yet been generally

accorded a footing equal to that of trusses, artificial limbs, or spectacles. The deaf have gathered for themselves misleading, exaggerated information from newspaper advertisements, and the choice of instrument has been usually haphazard. The aids have been evolved and exploited from without the medical profession, but there is nothing mysterious about their constitution. The principles of their design are not included in the conventional education of an aural surgeon, or perhaps were mastered and forgotten by him in his first-year physics course. But the use of these instruments can be readily explained to any intelligent person in this mechanical age.

There are only three types of instrument in use, although the trade names must amount to hundreds. The oldest kind is some form of horn, the most modern pattern being known as "auricles," which are shown in fig. 1. They are worn on or under the hair, leaving the hands free. The other two types of instrument are electrical, and their invention has followed from the telephone and the wireless set respectively. A typical microtelephone is illustrated in fig. 2. The microphone (1) can be worn on the coat, or even underneath a man's tie or a woman's dress. The earpiece (2) fits into the external auditory meatus. It may be replaced by the bone-conductor (3) which is held against the mastoid bone by the metal headband. (The latter is often covered with a ribbon by a woman.) An amplifier (4) is only essential with the less sensitive bone-conductor. The battery (5) can be hidden anywhere that is convenient. A woman can make a pocket for it in a bodice under the arm, or at the top of her stockings.

The valve amplifier type of instrument, which contains midget radio valves, is shown in figs. 3 and 4. In the former all the works are connected in a single box, which has the advantage of simplicity. In the latter the parts are divided so that they can be more readily distributed in pockets. Alternative earpieces are illustrated. The smaller is less conspicuous; the larger gives better reproduction. Bone conduction receivers can be attached to a valve amplifier, although in practice this is rarely done. Both the models shown in figs. 4 and 5 have adjustments so that high, middle, or low tones can be preferentially magnified.

### The Instrument and the Patient.

How far can the instruments meet the needs of the deaf patient? Of no other branch of medicine is it more true that successful treatment depends on both science and art.

Scientific knowledge will help to match the instrument to the physical defect, although with existing instruments this can still be imperfectly done. It will be recollected that sound is made up of vibrations of many frequencies. No hearing aid magnifies all these frequencies equally, nor does any deaf person go uniformly deaf to all the components of sound. The damaged ear may conduct vibrations inadequately to the auditory nerve cells, or these cells may be incapable of transmitting the most perfectly conducted sound from the ear to the brain. It should, however, be realised that not all inner ear deafness means damaged nerve endings. Were this so, the outlook for severely deaf people would indeed be gloomy.

Science will not, however, dictate which of the ladies thinks that people do not

notice she is deaf when they shout remarks to which she makes irrelevent replies, but considers that her friends will immediately become aware of her abnormality when she wears a horn or carries a "box." The woman who will always leave an electric battery switched on wastefully, or who will get the connecting flex wound up with her spectacle-cord, must also be recognised. Self-consciousness is not confined to the female sex. While men cannot cover gadgets easily with their hair, they have an advantage in the amount which they can hide in their pockets. The popularity of bone-conductor receivers is largely due to the fact that the mastoid bone which supports them is not visible when a person is viewed full face. But on the other hand, it must be held in place with a metal headband, which may show if the top hair is scanty.

Apart from psychological considerations there are occupational factors to be taken into account. Many of the better and more powerful electrical instruments are of the size of a camera. Thus, although they can be easily put on a desk or in a handbag, they cannot be carried round while a woman does housework, or a porter carts fish. Dressmakers and shoemakers, if they are severely deaf, have an advantage owing to their stationary and clean work. Again, one deaf person may be most anxious to hear sermons and lectures, while another, equally handicapped, is content with friendly gossips. Obviously the same instrument is not needed by both.

The social problems have been stressed because of their great practical importance. The scientific side of prescription of hearing aids is in such a state of rapid evolution that it would be unprofitable to devote space here to details of construction of present-day models and practices. It is the valve amplifier type which is changing most, particularly with regard to the convenience of its design. Already its advent has prevented many severely deaf people from social isolation. It is generally a mistake to quote striking cases, but the following example may perhaps be excused. A blind man was brought to a hospital hearing-aid clinic by somebody who had noticed him sitting solitarily every day in a park. The man had been blind for twenty years, and deaf for thirty years, the reasons for both conditions being obscure. His hearing defect was so great that not even his wife talked to him. He could guess at simple words if they were shouted right into his ear. The local visitor for the blind spoke to him by spelling on to his hand, using the special alphabet which has been devised for such cases. His hearing was tested at the hospital with a pure tone audiometer, when he was found to have a range of two octaves only (instead of the usual ten), and an auditory threshold ninety decibels from the normal. He was given a valve amplifier instrument the size of a box-camera, with the tone control set to magnify the middle part of the auditory range, wherein lay his residue of hearing. He now hears conversation like a normal person, as well as the band in the park, and broadcast programmes. He remarked to the almoner that he had quite forgotten that his wife could laugh: it was a strange sound after thirty years of silence.

It must, however, be admitted that although great benefit can often be afforded to severely deaf persons, the amount of help which slightly deaf people can get is frequently disappointing. These "hard of hearing" folk expect to hear at a great

distance, and most of them do not think themselves handicapped sufficiently to bother with anything which is obvious. But no small instrument will pick up sounds which are many yards away, so that for concerts and lectures even the slightly deaf need the valve amplifier type. Further, all electrical reproduction of speech sounds is somewhat unnatural, and the slightly deaf are unpleasantly conscious of this when they use hearing aids, whereas if they were deafer they would be delighted to hear at all. This inevitable distortion of speech must be distinguished from that resulting from unsuitable choice or adjustment of instrument, as for example, when people who are most deaf for the high notes in sound (as are most cases of senile deafness) listen through microtelephones, which magnify principally in the middle of the auditory range. They usually complain that they can "hear but cannot understand."

### Audiometers.

The "pure tone audiometer" is an expensive electrical instrument with which hearing acuity for different notes can be analysed much more readily than with tuning-forks. It has played a considerable part in the efforts which have been made towards scientific prescription. It is entirely different from the gramophone audiometer, which is playing an important part in the prevention of deafness. With the latter a classroom of children can all listen through headphones to the voice of a man reciting numbers. They write down as many as they can hear while the sound gets fainter and fainter. In this way children who have very slight defects of hearing can be detected more easily than in any other way. Treatment for middle-ear disease (which is by far the commonest cause of defective hearing in children) can then be instituted, while there is still hope of arrest of the condition and prevention of sclerosis. It is interesting that the gramophone audiometer was designed by a physics research laboratory at the instigation of a club of American deaf people, who hoped that if doctors had some easy way of ascertaining ear troubles in a very early stage, the next generation might be spared their own difficulties. The instrument, which can be used by a nurse or welfare worker, is described in full in the Board of Education report on "Children with Defective Hearing," published a year ago. This monograph also contains information on the pure-tone audiometer, hearing aids, and the treatment of ear disease in children.

### Severely Deaf Children.

Children who are too deaf to be taught in the ordinary schools amount to about one in a thousand of the school population, and are taught in special schools by suitably trained teachers. Although such schools cater for children who have been so deaf from birth or infancy that they have not taught themselves to speak, by no means all of the children are totally deaf. Magnified sounds can reach the majority, although with varying degrees of distortion. In general, the severely deaf children are well cared for educationally, and most of the schools now are fitted with classroom amplifiers. The teachers are actively engaged in gaining experience in the most profitable ways of using them in their educational methods. Figure 5 shows a class of deaf girls with defective speech being taught in this way.

## Hearing-Aid Clinics.

In spite of all the recent advances in the subject, it is still difficult to know what to advise a doctor to say to a deaf patient about getting a hearing aid. My experience at University College Hospital has been that the clinic system is the only satisfactory way of dealing with this technical subject. No general practitioner can be expected to have detailed knowledge of such an ultraspeciality, and no aural surgeon can afford to keep an up-to-date collection of hearing aids for trial. A quiet testing-room, a pure-tone audiometer, and a range of instruments can be provided in a hospital, as well as the invaluable services of the almoner.

In England about ten hospitals have started hearing-aid clinics, and one of these has facilities for paying patients. Many of the arrangements have unfortunately been temporarily disorganised by the war. Dealers will supply trial instruments free of charge to a hospital clinic and allow substantial discounts to patients on instruments bought. The amount of money saved when an appropriate aid is purchased through a hospital well justifies the travelling expenses of rural patients. Moreover, friendly societies and hospital contributory schemes make grants toward the cost of hearing aids.

It is universal practice among hospital clinics, and in direct dealings with reputable firms, for the patient to be allowed to have the recommended aid on trial at home for at least a week before the final purchase is made. When the instrument is not kept, a small paid sum is sometimes charged for use of batteries and other delapidations. Practitioners and patients cannot be warned too strongly against accepting instruments from firms without this home trial period. Innumerable deaf people have spent their savings, or pledged their earnings, for worthless or unsuitable instruments about which they have read, or concerning which they have been overpersuaded by a competent but unscrupulous salesman. They should not be taken in by a statement that they will be able to hear with the aid in time. This is a dangerous half-truth. People do get used to an instrument, as they do to spectacles, or to artificial teeth, but if they do not hear clearly within a week, they are unlikely to do so later. The only exception to this general statement is regarding deaf children who have never heard speech-sounds before. In their case it may be many months before appreciation matures.

## Information on Deaf Problems.

The National Institute for the Deaf is not so well known to practitioners as it might be. The offices of this organisation are at 105 Gower Street, London, W.C.1, where information and advice on problems concerning the deaf can be obtained. Many general particulars about schools, lip-reading, legal questions, and hearing aids are summarised in one of their publications called "All About the Deaf" (price 3s. 3d. post free). Pamphlets on "The Choice of a Hearing Aid" can be obtained for 3d.

There are some deaf patients whose chief need is not any kind of instrument, but help in re-adjusting themselves to their environment. For these people, and for their families, an excellent book has been written by one of their number. Margaret Munro called it "Breaking out of Prison," and Methuen published it about four years ago.

**Fig. 1—AURICLES.**

A pair of these auricles are usually worn. They are here shown over the hair for demonstration, but are usually worn by women concealed under the hair.

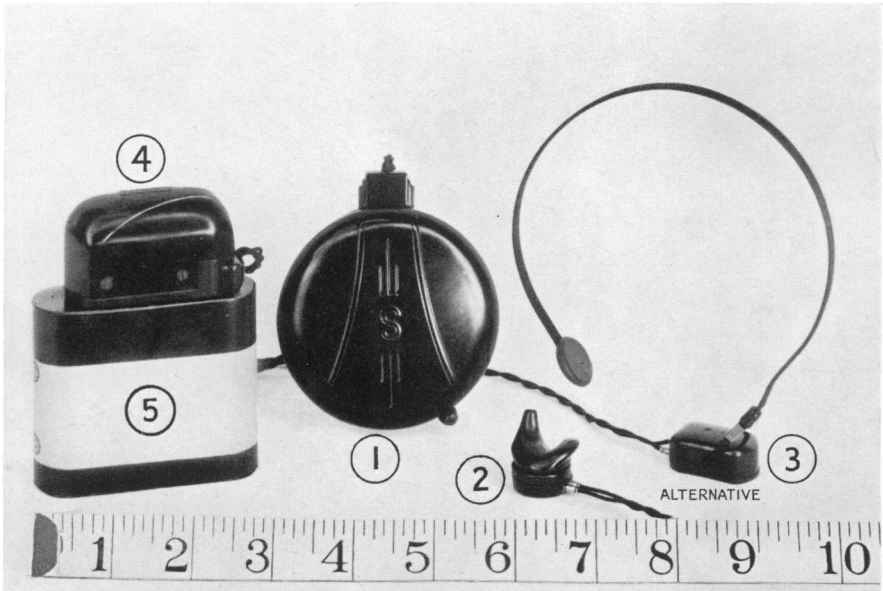


**Fig. 2—MICROTELEPHONE.**

Alternatives { (1) Microphone. (2) Earpiece. (3) Bone receiver.

(4) Amplifier.
(5) Battery.


**Fig. 3—VALVE AMPLIFIER.**

The piezo-electric microphone is in the same box as the three-stage amplifiers. The headband which keeps the earphone in position has been omitted.


**Fig. 4—VALVE AMPLIFIER (pocket model).**

(1) Piezo-electric microphone.
(2) Amplifier and switches.
(3) Batteries.
Alternatives { (4) Small earpiece. (5) Disc earpiece.

**Fig. 5—VALVE AMPLIFIER WITH MULTIPLE EARPHONES IN USE IN A SCHOOL FOR DEAF CHILDREN.**

The instrument can be used for magnifying the teacher's voice, or for transmitting broadcast programmes or recorded music. Each child has a volume-control on her desk. Tone-controls are provided, and the box containing these can be seen on the cupboard behind the instrument.

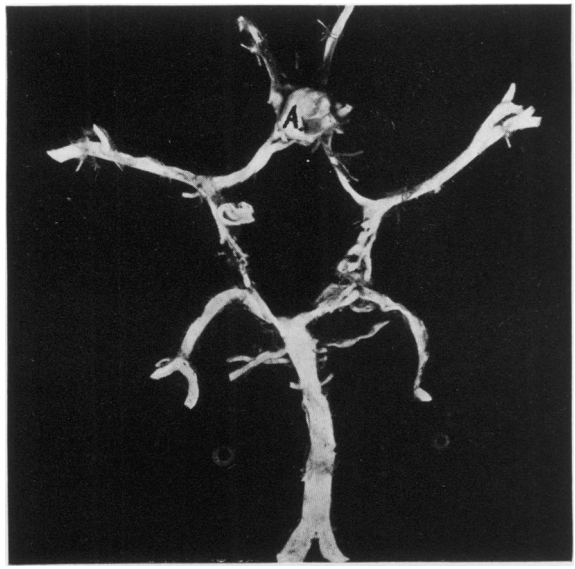


**Fig. 1.**

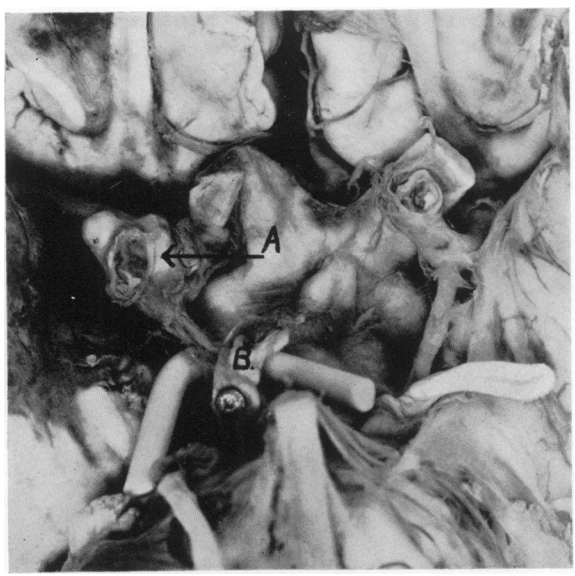


**Fig. 2.**

*Photographs by David Mehaffey.*

## CASE VII.

### A Case of Ruptured Cerebral Aneurysm.

*Clinical summary:* The patient was a woman of 31 years. She was married and had two children alive and well. Apart from appendicectomy when a child, the previous history is of no importance. Six weeks ago the patient began to suffer from headache. This began quite suddenly, and has always been confined to the right side, though it has varied somewhat in position between the frontal and occipital regions. Since the onset of the headaches there has been frequent nausea, culminating in vomiting when the headache is severe. Vomiting has not been definitely related to food. Ten days ago the right eyelid began to feel heavy, and since then she has been unable to open this eye.

#### Clinical Examination.

On admission the patient was found to be of average build and fair nutrition. There was no external evidence of anæmia, jaundice, or cyanosis. The pulse at 76 was regular and of good volume. The arterial wall was not palpable. The blood-pressure was 136/92. The heart was of normal size, and the heart-sounds were regular, easily heard, and without adventitious bruits. The lungs were normal. The abdomen, apart from a healed surgical scar over the region of the appendix, showed no abnormality. On examination of the nervous system, the patient was found to be intelligent and perfectly orientated. All the deep reflexes were present. There was ptosis of the right eyelid, but the patient could see perfectly if the eyelid was lifted. The right pupil was fixed and dilated, and there was absence of medial movement of the eye-ball. At one time during the examination the patient complained of diplopia. The left eye was quite normal.

Lumbar puncture showed a blood-stained fluid. The blood was evenly distributed throughout the fluid and did not diminish in intensity as the fluid came away. On laboratory examination, the protein was found to be 0.02 per cent.; globulin, a trace; cells + : blood + ; and the Wassermann reaction negative. The supernatant fluid was colourless.

Following the lumbar puncture, the patient was given an injection of omnopon. She appeared to become comatose, and did not waken until 8 p.m. the following day. She was then very restless and attempted to get out of bed. There was some evidence of seventh-nerve palsy on the right side. She continued in a stuporose state and died the next day.

## Post-Mortem.

A limited post-mortem examination was performed. The essential findings were as follows :—

The cranial bones were normal.

On incising the dura mater, blood was seen to extend upwards towards the vertex in the subarachnoid space on the right side. There was extensive hæmorrhage at the base, especially marked over the floor of the third ventricle. Hæmorrhage extended along the sheath of the right third cranial nerve almost as far as its origin.

At the origin of the posterior communicating artery from the right internal carotid was a small aneurysm. This measured 3 mm. in diameter, and from its surface two other small sacculations, each over one millimetre in diameter, protruded. The more lateral of these secondary sacculations was adherent by fine adhesions to the medial aspect of the right temporal lobe. The other more medial sacculation showed a rupture on its inferior surface. Numerous fine fibrous adhesions surrounded the aneurysm, and there was some adherence to the right optic nerve. From the site of rupture the blood had spread laterally along the right Sylvian fissure and backwards into the posterior fossa to cover the right side of the mid-brain and the anterior surface of the right cerebellum. In this manner it had come to bear an intimate relationship to the right seventh and eighth cranial nerves.

On section of the fixed brain, no intra-cerebral hæmorrhage was seen. The Sylvian fissure was greatly widened and distended with recently extravasated blood.

Careful dissection of the other arteries composing the circle of Willis revealed no other lesions. The arteries were everywhere thin-walled and showed no evidence of degeneration.

## Anatomical Diagnosis.

Congenital miliary aneurysm of right posterior communicating artery. Rupture : Subarachnoid hæmorrhage : Hæmorrhage into sheath of third cranial nerve with paresis.

## Comment.

Aneurysms of the cerebral arteries have been recognised for a long time. In 1761 Morgagni described dilatations of the posterior branches of both carotid arteries. In 1778 Biumi described a ruptured cerebral artery. Gull of Guy's Hospital wrote in 1859 : "Whenever young persons die with symptoms of ingravescent apoplexy, and after death large effusion of blood is found, especially if the effusion be over the surface of the brain in the meshes of the pia mater, the presence of an aneurysm is probable."

A large literature has now accumulated on the subject, and recently MacDonald and Korb have analysed 1,125 cases of saccular aneurism of the cerebral arteries, published after verification at post-mortem or operation. The lesion is by no means uncommon, and in our own material constitutes the cause of death in slightly over one per cent. of all autopsies.

The present case is relatively typical. The patient is usually quite well, when a sudden catastrophe occurs. This may be of varying magnitude. This woman had a sudden onset of a severe headache of very definite localisation, associated with nausea and vomiting which were cerebral in character; that is to say, they were not related to the character or state of the ingested food nor to the time of eating. These are signs of increased cerebral pressure, but the preservation of an active intelligent state shows that this cannot have been of severe degree. The amount of extravasated blood and the reaction to its presence in the subarachnoid space cannot, therefore, have been very great at the onset. Probably only a small leakage has occurred. The appearance of new symptoms ten days before admission, associated with the first appearance of paralysis of the right third cranial nerve, shows that further leakage of blood has occurred, and the post-mortem findings indicate that the nerve paralysis was due to this blood infiltrating the sheath of the affected nerve. The close anatomical relationship between the aneurysm and the third nerve allowed this to happen in spite of the fact that the extravasation of blood was not extensive, for the patient did not lose consciousness, and the increase in the intracranial pressure cannot have been severe. If she had been examined at this time it is probable that some degree of irritation of the meninges by the blood might have been detected. Many of these patients show some stiffness of the neck.

The occurrence of ptosis from this cause is by no means rare. France of Guy's Hospital in 1846 drew attention to this happening, and in several of our own cases in which the aneurysm was situated at the origin of the middle cerebral or posterior communicating arteries, paralysis of one third nerve has been an outstanding clinical finding.

Sooner or later the occurrence of leakage from these aneurysms is followed by a more extensive extravasation of blood leading to a diffuse subarachnoid hæmorrhage and usually death. In the present case, lumbar puncture shows a diffuse staining of the cerebro-spinal fluid by blood. The fact that when the blood was removed by centrifuging the specimen the supernatent fluid was colourless, is of some importance. Often the supernatant fluid shows a slight yellowish discolouration due to the presence of breakdown products of hæmoglobin. The absence of such discolouration in this patient can only mean that the previous leakages were of small volume, and were entirely localised to the vicinity of the aneurysm. The broken-down hæmoglobin would here be phagocytosed by large mononuclears, many of which are trapped in the fibrous adhesions which had formed round the aneurysm. In some patients the organisation of the local extravasation of blood results in the formation of relatively dense fibrous adhesions. These tend to obliterate the subarachnoid space in the neighbourhood of the aneurysm and often bind the affected vessel tightly to the surface of the brain. Subsequently the aneurysm ruptures, and the extravasated blood finds its way more easily into the substance of the brain than through the obliterated subarachnoid space. In this manner quite extensive intra-cerebral hæmorrhages can be produced, even occasionally traversing the brain substance to rupture into the lateral ventricles.

Unless this possibility is borne in mind, the appearance may suggest a primary intra-cerebral hæmorrhage and the aneurysm may be overlooked.

It has been shown by Forbus that these aneurysms occur in vessels which show a congenital deficiency of their media. There is a failure of fusion of the muscle-coat of the branches of the artery with that of the main vessel. Hence these deficiencies are found at the point of junction of vessels. When they occur they are most frequently seen in the angle of bifurcation, and it is in this angle that congenital aneurysms are most common. The site of the aneurysm by no means represents the whole congenital deficiency, for in these cases serial section of the angles of bifurcation of other apparently normal cerebral vessels reveals a similar lack of media. It is not quite clear, therefore, as to what actually produces the aneurysm, but the congenital deficiency offers a reasonable explanation of its site. Similar deficiencies in the media may be found in the branches of the mesenteric vessels, and in one recent case a ruptured cerebral aneurysm was found associated with an aneurysm of the splenic artery and bilateral congenital cystic kidneys.

On the circle of Willis the great majority of the aneurysms are found in an anterior branch. Thus MacDonald and Korb's analysis shows 48 per cent. on the internal carotid or middle cerebral vessels, 15 per cent. on the anterior communicating artery, and only 28 per cent. posterior to the internal carotid arteries.

In spite of the congenital nature of the lesion it is important to appreciate the fact that these aneurysms may produce symptoms at all ages. In our own material the youngest patient was 12 years and the oldest 75 years, but greater extremes of age have been reported. Relatively few aneurysms are found to rupture before the age of 20 years, and it is in the next two decades that the majority cause symptoms.

In a few patients similar small aneurysms are found to be the result of infected emboli, but the histological picture is entirely different.

Other forms of cerebral aneurysm are so rare as scarcely to enter the field of differential diagnosis. Occasionally atheromatous degeneration results in a fusiform dilatation not especially localised to the angle of bifurcation. Occasionally syphilitic change in the arteries may be the cause, but such cases are very rare.

We are indebted to Professor W. W. D. Thomson for the clinical notes.

# A Case of Anthrax Meningitis

*By* H. Hilton Stewart, M.D., M.R.C.P.(Lond.)

Anthrax is a rare disease now, and when a case presents itself accompanied by what must be its rarest complication, it is thought of interest to publish some of the details at length.

A young woman of thirty-two years came up from Dublin with her husband and family to spend a holiday at Bangor, Co. Down. A few days before they were due to go home, the patient complained on returning from the pictures on the 28/6/39 that she was feeling shivery, and on going to bed she took some aspirin.

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A young woman of thirty-two years came up from Dublin with her husband and family to spend a holiday at Bangor, Co. Down. A few days before they were due to go home, the patient complained on returning from the pictures on the 28/6/39 that she was feeling shivery, and on going to bed she took some aspirin.

She was noticed to have a slight "cold" on the lip, and some tender glands under the chin. The following morning (29/6/39) she awoke better, but with a slightly stiff neck. The doctor was called, but apart from a slight temperature of 99.2 degrees and the suspicious herpes on the lip, there were no physical signs. About 6 p.m. the doctor was called again, and he found the patient much worse, in fact only semi-conscious with a temperature of 103 degrees. When seen about 10 o'clock on the same evening the patient was found to be very pale, toxic looking, almost completely unconscious. She made retching movements, and could only be roused by loud talking, lapsing again into coma rapidly. She had a stiff neck and a high temperature. On her lower lip near the middle line on the left side was a small blister about a quarter of an inch in diameter. The centre of the blister was black. The submental lymph-glands on the left side were enlarged but not acutely inflamed.

The case was thought to be one of either streptococcal septicæmia or an anthrax septicæmia. The patient was removed to the Ards District Hospital, where a lumbar puncture was performed at once. The cerebral spinal fluid was under pressure, was turbid, and on making a slide it showed numerous anthrax bacilli among the many polymorphonuclear cells (see illustration).

An intravenous injection of .45 N.A.B. was given at once, and a pint of isotonic glucose solution was given by vein. The patient, however, died at 3.10 a.m.

### Comment.

The possibility of meningitis as a complication of anthrax is not mentioned in a number of well-known textbooks of medicine. Muir and Ritchie in their book on bacteriology note that a number of cases of hæmorrhagic meningitis have been recorded as a complication of the primary lesion. The cerebro-spinal fluid in the present case did not show any evidence of hæmorrhage, but a post-mortem examination was not available, so that detailed examination of the meninges, etc., was not possible. The case therefore reported is one of purulent meningitis due to anthrax bacillus, the primary lesion being on the lip.

The following are points to be noted in the case. Firstly the small primary sore. There was no surrounding œdema of the face as reported in some textbooks, and the toxæmia was out of all proportion to the lip lesion. Secondly, the rapidity with which the case developed. Death occurred in twenty-four hours. Thirdly, the absence of any cause of anthrax infection. The patient's only purchase had been a face-cloth in a shop in Bangor, and examination of similar cloths purchased in the same shop proved quite negative to the bacillus.

**Microscopic slide of cerebro-spinal fluid, showing anthrax bacilli.**

*Microphotograph by David Mehaffey.*

# REVIEWS

## CLAUDE BERNARD, PHYSIOLOGIST. By J. M. D. Olmstead. Pp. 318. Plates 7. Cassell & Co., Ltd., London, 1939. Price 15s.

Whilst many are familiar with the outstanding contributions of Bernard to physiology, few are acquainted with him as a man. It is therefore interesting to read something of Bernard as a man.

The work falls naturally into two parts. In the first the author deals with the life of Bernard, and traces for us the rise of the pharmacist's apprentice in a remote district of France to the Chair of Medicine in the Collège de France, and finally to his seat in the Académie. Unhappy in his domestic life, wherein death claimed both his sons, and his wife became an ardent anti-vivisectionist, he flung himself into his work with renewed zeal and did much to establish physiology as the scientific basis of medicine. During his lifetime, and largely by his own efforts, he saw the transition from pure empiricism in the schools to experimental medicine. The more easily applied discoveries of Pasteur have tended to overshadow the contributions of Bernard, but the present volume does much to re-establish his relative position among the master-minds of medicine. He was the pioneer in the discovery of the functions of the pancreas in digestion, the glycogenic function of the liver, the vasomotor system, and of the action of curare and carbon monoxide. Not the least of his scientific contributions was the idea of constancy of the internal environment of the body. Judged in the light of any generation, Bernard's contributions have been great, and when the lack of facilities under which he laboured is considered, his work is seen reflected in the light of genius.

The author of the book is himself a physiologist, and the treatment given to Bernard's work is excellent. In spite, however, of the attempt to re-create the personality of the great physiologist he remains still rather vague, a rather impersonal figure not without weakness. The book is written in a clear style with abundant quotations from original sources, and will be of value to all who are interested in the outstanding figures of medical achievement.

## TEXTBOOK OF MEDICAL TREATMENT. By various authors. Edited by D. M. Dunlop, M.D., F.R.C.P.Ed.; L. S. P. Davidson, M.D., F.R.C.P.Ed.; J. D. McNee, D.Sc., M.D., F.R.C.P. Foreword by A. J. Clarke, M.D., F.R.C.P., F.R.S. Pp. 1,127, 27 Figures, 4 Tables, 7 Plates, 8 Charts. 25s. net. Edinburgh: E. & S. Livingstone, 1939.

By far the most disappointing paragraphs of the average textbook of medicine are those dealing with treatment. The pathology, clinical symptoms, diagnosis, and prognosis are carefully and clearly enunciated, and then follows the vague and oftimes contradictory paragraph on what after all is the chief function of the physician—the curative. Diagnosis may be accurate, but failing helpful general and specific treatment the patient has little to be thankful for.

To remedy this defect, a series of books has been published, and amongst them the present volume by eminent Scottish teachers is sure to find a high place. The fact that it is the patient who is sick and not merely one of his organs is borne in mind, and results in an excellent treatise on the general management of the patient, including diet, rest, exercise, nursing, and psychotherapy. There is no useless piling up of long lists of drugs of doubtful efficacy, but attention is concentrated on those which produce a recognisable effect and are of proven help in the combat of the disease process. The use of endocrine preparations and vitamins is also dealt with.

It is not forgotten that the potency of the newer drugs is a two-edged sword, and that they should be used with care and only when accurate diagnosis has established the necessity for their use.

It would be invidious to comment on individual articles. Twenty-seven teachers in Scottish

universities have contributed. Each writes with first-hand knowledge of his particular subject, and the completed volume is one which bears testimony to the high standards obtaining in Scottish medicine.

It is a great pity that the medical student with his over-burdened curriculum will scarcely have time to peruse these pages. Certainly it should be in the surgery of every general practitioner, where it will serve as an ever-ready source of knowledge in time of need.

## TUBERCULOSIS AND NATIONAL HEALTH. By H. H. Thomson, M.D., D.P.H. 1939. London : Methuen & Co. Pp. 244. 10s. 6d. net.

This book was written with the idea of clarifying the present-day views on the epidemilogical and sociological aspects of tuberculosis. Dr. H. Hyslop Thomson has spent his whole medical career in the study of this disease, and his views as now expressed in this book will therefore be exceedingly useful and interesting to the medical profession.

In speaking of incidence and significance of tuberculosis he states that the notification-rate and death-rate have both been steadily decreasing, giving the actual figures from 1933 onwards. It is also interesting to note that the proportion of deaths to notifications is also falling, i.e., 1 in 1.9 in 1933 to 1 in 2.1 in 1937. This shows that with the improvements in treatment and the facilities for such, together with present-day preventative methods, there are hopes that this once-dreaded disease will be one day among the minor problems in medicine. Dr. Thomson goes on to speak of different types of the disease, and of the etiology, discussing parental transmission, impaired resistance, influence of associated disease, and the relation of mental and physical strain. He also lays out in detail the questions of milk supply and diagnosis of tuberculosis in cattle.

The more important aspect, modern treatment and its aims and prevention, are extremely fully gone into, and in a manner which leaves no room for criticism. The book ends with a list of the author's conclusions, and on perusing them one is made to feel that there is still a great amount of work to be done. In his own words: "The sociological aspects of tuberculosis present a problem which can only be successfully solved with state aid and co-operation."

## TREATMENT OF SOME COMMON DISEASES (MEDICAL AND SURGICAL). By T. Rowland Hill, M.D., M.R.C.P.(Lond.). 1939. Edinburgh: E. & S. Livingstone. Pp. 398. 15s. net.

Dr. Rowland Hill is to be congratulated on the idea of compiling a book which is, in the true sense, not a textbook, but rather a series of monographs on the treatment of diseases which commonly form the problems of the general practitioner. In so doing he has been able to eliminate many subjects which, though essential in a book of reference, prove an encumbrance to the majority of medical textbooks, and has used the space so gained in a much more valuable manner.

The book is written by various authors from London hospitals, amongst whom are many well-known medical and surgical names and most of whom have reached the top in their particular branch of the profession. The book is written in a clear and easy style and is moreover well illustrated by both figures and X-ray plates. On the medical side various cardio-vascular and lung diseases are fully dealt with. A long article on digestive disorders in children follows. But to me the most interesting was that on anæmia, the classification and completeness of treatment leaving a marked impression. Another chapter on prophylactic treatment by active immunisation begins with a photograph of a tombstone inscribed thus:—"To the memory of Benjm. Jesty (of Downshay), who departed this life April 16th, 1816, aged 79 years." "He was born at Yetminster in this county, and was an upright, honest man: particularly noted for having been the first person (known) that introduced the cowpox by innoculation, and who from his great strength of mind made the experiment from the (cow) on his wife and two sons in the year 1774." The author discusses fully the value of

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active immunisation in a large number of diseases, and gives details of the actual technique, etc.

Of surgical problems, enlargement of the prostate, malignant disease, various infections, and head injuries are dealt with in an up-to-date manner. There are also monographs on various skin, obstetric, ear, nose and throat, dental and anæsthesia problems. I can confidently recommend this book to the medical profession and to the general practitioner in particular.

## RECTAL SURGERY. By W. Ernest Miles, F.R.C.S.Eng. London: Cassell & Co. Ltd. 1939. Pp. 359. Figs. 105. 17/6 net.

THIS book is a personal interpretation of the various problems presented to the author by rectal disease, and the methods of treatment which he has found most efficacious. It is most important that a surgeon of Mr. Miles's standard and experience should at this stage of his career put pen to paper and give those coming after him the full value of the scope of his work. It is a pity, however, that he ignores the views of other authorities on this subject. Admittedly it is a "personal interpretation," but the book is nevertheless titled "rectal surgery," and as such should be comprehensive. For instance, dealing with surgical anatomy, he merely mentions the work of Milligan and Morgan in a few lines, a work which has been hailed by rectal surgeons, both here and in America, as the most important advance in this subject in recent years. Again, with regard to the "Pecten band," which he features largely in minor rectal surgery, it is hard for one to realize quite how a rounded band of fibrous tissue, presumably inflammatory in origin, should completely encircle the anus lying free in submucosa, with no attachments to mucosa or deeper structure. Is it not much more likely that "the band" is the result of a fibrosis of some pre-existing structure? That structure has been proved by Milligan and Morgan to be the subcutaneous external sphincter.

With regard to the treatment of ano-rectal abscess, it is not the general opinion that one should leave limited offshoots alone, as this is one way of inviting the subsequent development of a fistula. Again, his description of the lymphatic spread of cancer of the rectum, which he states has not changed since his address to the B.M.A. in July, 1910, does not correspond with the views of Cuthbert Dukes, who is looked upon as the authority on this subject. Mr. Miles still holds that downward and lateral lymphatic spread of cancer are important, whereas in St. Mark's it has been shown, from the microscopic study of a very large number of operative specimens, that downward and lateral spread only occur when the upward lymphatic channels have become completely blocked by carcinoma cells, and this is only long after the condition has become inoperable. It is, however, a most valuable book, written by one of the pioneers of rectal surgery.

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