suggested that the anatomy, physiology, and pathology demanded from the optician would satisfy the requirements of medical examiners, or that the number of opticians who possess that knowledge is large, but Dr. Kenny thinks that in this controversy we should meet and defeat the opticians on the highest plane. The general claim would then of necessity fail. Ophthalmologists in the State of Victoria have been able to induce various Governments to refrain from introducing a bill for sight-testing opticians. The opticians have recently prepared a draft bill and submitted it to the Committee of the Eye Section of the Victorian Branch of the British Medical Association by whom it has been carefully considered, and as a consequence a draft of the views of the Committee has been sent to the opticians. Among other suggestions is one "that sight-testing should not be referred to in the bill and should not form part of the curriculum." Dr. Kenny, however, evidently thinks this clause unworkable, and suggests that the way to meet the difficulty is for ophthalmologists to train themselves by special university and medical school courses to practise refraction work more thoroughly and more accurately than the most skilled "optologist" or "optometrist." The public will soon recognize the higher class of work and the increased demand will call for an increased supply of highly-skilled ophthalmologists, which will in turn make void the contention of the opticians that the public must of necessity go to them, since there are not sufficient ophthalmologists to attend to them."

After Dr. Kenny had delivered his address, the Section agreed that it would assist the opticians in any efforts made to ensure a better education in their craft, but refused to have anything to do with the legal recognition of sight-testing on the part of people who had not received a medical education, a decision endorsed by the Congress as a whole.

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ABSTRACTS

I.—CATARACT EXTRACTION BY SUCTION

(1) Barraquer y Barraquer, Ignacio (Barcelona).—A review of modern methods of cataract extraction. (Critique des méthodes modernes d'extraction de la cataracte.) La Clin. Ophth., April, 1920.

(1) On page 580 of the British Journal of Ophthalmology for 1918 will be found a short account in abstract of the suction method of removal of the lens in its capsule devised by

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Barraquer. The reviewer was at the time impressed with the principle of the method, then called phakodialysis and now rechristened phakoerisis, and is not surprised to learn that the author has persevered with his work until he has completed 1,000 cases of cataract extraction in this way. The first part of the paper at present under consideration deals very much with the commonplace. It is when we come to the method of extraction of the lens in its capsule that the interest commences. Nineteen very beautiful photographic reproductions, selected from a cinematograph film, illustrate the author's operation from the commencement of the section to the double bandage and give one an excellent conception of the whole technique. One gathers that Barraquer met with various difficulties at the commencement, and it is greatly to his credit that he nevertheless persevered in the perfection of a method which, at the worst, seems to compare favourably with any other method of extraction in the capsule, and at the best may rival in successful results the ordinary method with cystotomy. For example, in 1,000 operations there were seven hernias of the vitreous, four ruptures of the capsule, three dislocations of the lens, two infections, and seven iris hernias. The following were the visual acuities obtained:

- Between 0.7 and 1: 694
- Between 0.3 and 0.7: 240
- Between 0.0 and 0.3: 63
- No vision: 3

That is to say that 69.4 per cent. were obtained when the lens was intact. When dealing with the article referred to in the opening line of this abstract the reviewer considered that the exact detail of the suction apparatus was not essential, since, as soon as the operation came into vogue, there would certainly be modifications of the apparatus. But when a surgeon has so perfected his apparatus that he has been able to compass 1,000 operations with it, the detail of the apparatus would be quite welcome. Unfortunately there is no such detail in the present article. In the plates one can only see the "business" end of the apparatus. The reviewer is unaware whether it has been employed to any extent by surgeons other than its inventor, but certainly it would now be a matter of great interest to have a full description in English. **Ernest Thomson.**


(3) Barraquer, Ignacio (Barcelona).—On *phakoerisis*. Contributed to this Journal and abstracted below.

(3) Dr. Ignacio Barraquer has published an account of the first thousand cases of senile cataract, which he has dealt with by this method, and a detailed description of the technique which he has evolved.
He was led to the choice after becoming convinced that extraction of cataract in the capsule was the method of election. He did not find the Indian operation satisfactory, owing to the considerable force that is necessarily applied to the eye, and preferred those methods in which the lens was seized and drawn out of the eye in its capsule; yet he found that the capsule often ruptured under the stress, and the operation converted itself into an extraction through a large breach of the anterior capsule. Hence he sought an instrument which would adhere to the anterior surface of the lens with sufficient force, so that, when withdrawn, it would break the attachment of the capsule to the suspensory ligament, and bring the lens in its grip out of the eye.

Nature had given him a lead in the suckers of a leech, or of the toes of climbing frogs, and he determined to construct an instrument which could be applied to the lens capsule and made to adhere to it, by the formation of a vacuum.

This instrument, the erisophake, is practically a small spoon, with blunt edges, on a hollow handle, which is connected with an air pump. Barraquer makes rather a large incision, nearly equal to half the circumference of the cornea, often with a conjunctival flap (Figs. 1 and 2).

He introduces the erisophake into the wound, and passes it through the pupil, which is slightly dilated with a mydriatic; to place it on the lower half of the lens. He then turns on the vacuum, which causes the spoon to adhere firmly to the lens, and by a
CATARACT EXTRACTION BY SUCTION

FIG. 4.

FIG. 5.
movement of the handle, rotates the lens round the horizontal axis, so that the upper edge passes through the pupil. This movement ruptures the fibres of the zonula. The lens can then be withdrawn held on the erisophake.

Barraquer says that the negative pressure of the vacuum should vary directly with the hardness of the lens, and the area of the opening of the spoon, with the softness.

His pump produces a constant vacuum which can be regulated to give rise to vibrations corresponding in amplitude and frequency to the elasticity of the crystalline lens.

He prefers to operate without iridectomy, so that adhesion of the fibres of the zonule may be averted; he has had, however, a considerable number of prolapses of iris.

He has been troubled by collapse of the cornea, and inversion of the flap, though the primary incision is not greater, he says, than that usually made; he has avoided it in his later cases, by reducing the amount of cocaine given.

In the illustrations which he sends, he wishes special attention paid to the size of the flap, to the method of introducing the erisophake, and to the lever movement which is necessary to dislocate the lens. (See figures.)

Though Barraquer thinks that the simple extraction is the operation of election, only 219 of the 1000 operations were "simple"; of the remaining 781, 251 were combined extractions, and 530 extractions with small peripheral iridectomies, which we are accustomed to regard as "combined."

The tabulated results show about 70 per cent. of cases with vision of 6/9 or better, and only 3 total losses.

The first notice of Barraquer's operation is, we believe, to be found in La Clin. Ophtal. of 1917. A similar proceeding had been outlined by Vard Hulen in the Jl. Amer. Med. Ass. in 1911, but it does not appear to have gone beyond the experimental stage.* Barraquer seems to have developed the idea independently.


*According to a writer in the American Journal of Ophthalmology of October last (p. 770) Coderque, after Hulen had written, operated upon a dog. No reference is given. —EDITOR.
II.—NYSTAGMUS


Stassen reviews the subject of nystagmus at some length in three consecutive papers which he divides as indicated by the titles. The first part deals with the work of several observers and gives details of the various schemes described for obtaining records of the ocular movements. He gives preference to the nystagmograph described by Buys (Soc. franc. d'Ophthal., May, 1909), a modification of the physiological recording tambour. Several tracings are reproduced. Stassen points out that they are of two main types, undulatory and spring movement (à ressorts), the latter being composed of a rapid and slow phase. The former is typical of the occupational nystagmus, the latter of the vestibular. In the second part he discusses the various conditions which may give rise to nystagmus and the types of that affection. In part three he deals with the theories of the causation of miners' nystagmus. He finds that if, by suitable stimulation, a vestibular nystagmus is produced in a patient affected with the occupational form of the disease the tracing is not a mixture of the two types, but a pure vestibular one. Arguing from this observation he points out that the seat of the affection must lie in the central nervous system, but where? "Is it in the as yet hypothetical centres that control the muscular equilibrium of each eye? Is it in the complicated apparatus that assures the associated movements of both eyes (Ohm), or in the supranuclear centres of association (Sauvinaud, Fromaget)? Or the cerebellum? Must we go still higher, as far as the optic tracts and the cerebral cortex? These are questions which in the actual state of our knowledge it is very difficult to reply to categorically." Stassen favours the hypothesis of centres situated above the oculo-motor nuclei, possibly even in the cerebellum, to co-ordinate the various motor innervations of each eye. He points out that miners' nystagmus is always noted only in looking up, at the beginning of the disease, and that elevation of the eyes is the weakest movement and the one for which the human eye is least adapted. Thus, "as the centres themselves are on the point of being disorganized by the abnormal action of the photo-receptive..."
elements (regulators of fixation), it is easy to suppose that a supplementary effort (such as a frontal direction of regard) completes the trouble and consequently brings equally difficulties in the muscular equilibrium of the eye which these centres govern.

The papers show evidence of careful study and are worth reading in the original.

E. E. H.

III.—THE OPERATIVE TREATMENT OF SUPPURATION AFTER CATARACT EXTRACTION


Suppuration in the time of von Graefe occurred in about 10 per cent. of the cases. To-day it is rare. It is difficult to state the exact percentage, but it lies between one and two per cent. It is a general opinion that when purulent infection is present little can be done to save the eye, which in the large majority of cases is lost. Most of the methods, both general and local, have proved futile. The best results are obtained by following out the operative methods described by Kuhnt. Stargardt divides these cases into three groups. Infection of the wound and cornea. Infection of the anterior chamber. Infection of the sac of the capsule, and infection of the vitreous. When the cornea is infected Kuhnt’s method must be adopted. In deep anaesthesia a double pedicled conjunctival flap is cut and the wound is examined to see whether the anterior edge alone or the deeper layers of the cornea are affected. If the former, the edge is freely cut away with scissors. If the deep layers are infected the cornea is split and the soft tissue scraped out with a minute scoop. The anterior chamber is now washed out with normal saline or with oxycyanide of mercury and the wound covered with the conjunctival flap. Kuhnt has published some successes with this operation. In some the organism was a staphylococcus, in others a pneumococcus. This procedure is better than cauterezation, for after this the conjunctival flap cannot be employed till all the burnt tissue has been exfoliated. Optochin and vouzin are useful in these cases, more especially when the cornea alone is infected. The anterior chamber can be infected alone or in conjunction with the cornea and the capsule sac. Isolated infection of the chamber is seen clinically under the picture of an iridocyclitis with or without hypopyon.
Retro-bulbar Neuritis from Barium Poisoning

The best treatment is to wash out the chamber with normal saline or with a 1:5000 solution of oxycyanide of mercury. Kuhnt recommends that the chamber be drained once a day till the iris regains its correct colour. When the capsule sac is infected it must be removed with forceps, one blade behind and one in front. A case is cited in which this treatment was successful. The paper recounts several cases in which drastic treatment has saved the eye, and it is quite obvious that in these patients we ought not to sit still and do nothing. Here and there we may save an eye which would, if left alone, be hopelessly lost. The reviewer has published a case in which treatment of the nature described saved an infected eye, with good subsequent vision.

T. Harrison Butler.

IV.—Retro-bulbar Neuritis from Poisoning by Barium Sulphate

Garraud and Le Roux.—Bilateral retro-bulbar optic neuritis, consecutive to the ingestion of sulphate of barium. (Névrite optique retrobulbaire bilatérale consécutive à l'ingestion de sulfate de baryum.) Arch. d'Ophthal., August, 1920.

Radiologists frequently make use of sulphate of barium in the examination of the gastro-intestinal tract by X rays. By reason of its cheapness it has largely replaced the bismuth salts for this purpose. Being insoluble, it has been reported as innocuous. The authors report a case of intoxication by this salt recently observed by them. The patient, aged 70 years, was seen on March 19, 1920, suffering from slight conjunctivitis; his sight was normal, and there were no ophthalmoscopical signs of disease. At 11 o'clock on May 12, 1920, he was given 125 grammes of sulphate of barium for a radioscopic examination of the stomach. Two hours later he found his sight was "disturbed," and he was giddy. At the same time he was attacked by severe colic and diarrhoea. At 18 o'clock, seven hours after his dose, severe vomiting ensued, lasting for half an hour. He was then seen by his ordinary medical attendant.

The failure of vision was progressive during the next three days, so that the patient was unable to read even very large print. At the end of the third day improvement in sight began and slowly continued. He was first seen by Garraud and Le Roux on May 24, twelve days after the administration of the barium salt, when they noted: Right eye—No surface inflammation; pupillary
reflexes undisturbed; no appreciable lesion in media or fundus; field of vision normal, V.=8/10. Left eye—No conjunctival congestion; pupillary reflexes present; media clear; partial decolouration of the optic pupilla, and narrowing of its arteries; no visible changes in the macular region; field of vision unrestricted; central scotoma, with slightly eccentric fixation, V.=7/10; urine normal.

June 2, vision improved; R.=9/10, L.=8/10. The central scotoma had almost disappeared.

June 14, complete recovery; R.V.=10/10, L.V.=10/10. Left optic papilla has regained the appearance of health.

The authors are not aware of any recorded case similar to theirs. They refer to one case of poisoning reported in la Presse Médicale of June 5, 1920, that of a man under the care of Dr. Japiot, of Lyon, who was given 200 grammes of sulphate of barium; half an hour later gastric pain, nausea, and vomiting developed, accompanied by muscular spasm, a thready pulse, and collapse. These symptoms lasted twelve hours and recovery ensued. Chemical analysis of the salt administered to this patient showed that it was free from lead, but that it contained two soluble and highly toxic salts of barium, sulphide and carbonate.

In Garraud and Le Roux’s case, the barium sulphate was proved to be free from adulteration by lead, but no tests were made for other salts of barium.

These two cases show that care should be taken by those employing this preparation to ensure that “chemically pure sulphate of barium, for administration for radioscopic examination,” is supplied.

J. B. LAWFORD.

V.—BACTERIAL PROPHYLAXIS OF POST-OPERATIVE INFECTION


Investigations made by Elschnig and by other workers have proved that in the majority of cases the conjunctival sac contains pathogenic organisms. The only safe method of preventing post-operative infection is to eliminate these organisms before operation. The value of this type of prophylaxis is shown by the published work of Bernheimer who reduced his losses to 0.25 per cent. Kuhnt says
Bacterial Prophylaxis of Post-operative Infection

That discussion of capsule is only permissible when bacterial tests have proved that the sac is free from organisms. Elschnig in over 1,500 operations lost only 25 eyes from mycotic inflammation, and this includes not only eyes enucleated, but those so severely damaged as to be useless. The methods which have enabled such splendid results to be obtained are worthy of careful study. A mixture of two parts of nutrient broth with one of sterile blood serum is prepared and a few drops are drawn into a sterile pipette. These are now blown into the conjunctival sac and well smeared about the sac with the end of the pipette. The liquid is drawn up again with the pipette and dropped back into the tube. The tube, together with a similar uninoculated tube, is incubated for from 24 to 48 hours. If at the end of 24 hours the broth shows a diffuse clouding the presence of streptococci is almost certain. A crumby clouding indicates the xerosis bacillus. Smears are stained by Gram's method and with methylene blue. In actual practice methylene blue gives all the differentiation that is necessary. If the tube remains clear the absence of organisms likely to cause trouble can be assumed.

Elschnig has made cultures after this plan before 1,500 operations for senile cataract—694 were found to be sterile, but in many cases lotions had been used before the patient was admitted, and the figure seems to the author to be too high. He has come to the opinion that it is impossible to draw a sharp distinction between streptococci and pneumococci. He has, for example, found that if a pure culture of pneumococci from a serpent ulcer is inoculated on to serum broth it is usual to grow nothing but streptococci. A few pneumococci may be present, but it is extremely rare to find pneumococci alone. In 20.5 per cent. bacteria of the streptococci group were present in the first cultures made when the patient was admitted. In another group of cases Elschnig published statistics which gave over 40 per cent. of streptococci.

The streptococci were found in four forms: pneumococci, short chains of diplococci, long chains, and double chains. It would appear that the nutrient media have much to do with the form assumed by the organisms. Staphylococci were present in about 30 per cent. of the cases. For a long time Elschnig ignored staphylococci, but he now regards them as equally dangerous with streptococci. They are just as likely to give rise to infection after cataract extractions as are the pneumococci! The smaller the cocci and the more they tend to assume the diplo form, the more they are to be feared. The colour of the colonies is no criterion of their danger. The staphylococcus albus becomes an intense yellow when grown upon gelatine. Xerosis bacilli, diplobacilli, and subtilis, are harmless and may be ignored.

The prophylactic treatment is carried out in the following manner.
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The first culture is made upon the day that the patient is admitted to the hospital. Next day the tube is examined and if there is a growth the operation is postponed. The conjunctiva is treated with disinfecting drops and in two days another examination is made. The last irrigation should be made at night and the culture taken next morning before any treatment has been carried out.

If there is a discharge of pus from the lacrimal sac, this must be extirpated, or the dacryocystitis cured by Toti’s operation. The best lotion is one in five thousand solution of oxycyanide of mercury. If the conjunctival sac be washed out two or three times a day with this lotion for two or three weeks it will generally become sterile. If the first culture contains streptococci, Elschnig uses a quarter per cent. solution of optochin for the sac lavage, or this may alternate with the oxycyanide. A one-half per cent. ointment of optochin is useful when pneumococci are present, and this organism is generally rapidly eliminated by the use of the oxycyanide lotion. Peroxide of hydrogen is not satisfactory. Axenfeld has shewn that these culture methods are not infallible, and Elschnig agrees that the first examination may give a sterile sac and a second may shew the presence of organisms. This is due either to a failure of the culture or to reinfection of the sac in the hospital. Either may happen. It is very necessary to be certain that the nutrient broth and serum are absolutely neutral, and to lose no time in putting the inoculated tube into the incubator. There are two chief causes for post-operative infection after operation. One is due to understimating the danger of staphyloocci. Many seem to imagine that the streptococcal group is alone responsible for the inflammations which occasionally follow operations upon the globe. Elschnig’s researches prove most conclusively that staphyloocci are responsible for a large proportion of these accidents. All that can be said is, that on the whole the inflammations caused by the staphyloocci are less severe than those due to streptococci. The reviewer, in a paper read at the 1920 Congress of the Ophthalmological Society of the United Kingdom on the causes of infection after operations for cataract, pointed out that in several of his cases the staphylococcus albus was the only organism present, and he was of the opinion that its danger had been greatly underestimated. Elschnig has done the profession a valuable service in pointing out the danger of staphyloocci, and in stating that even staphylococcus albus may be a source of failure.

T. Harrison Butler.
VI.—GLAUCOMA


(1) Gilbert is of the opinion that iridectomy is still the chief glaucoma operation, and the fact that the effect of all the more modern operations is compared with that of iridectomy shows that this is the case. At the present time, although there are so many alternative operations at command, yet a large number of oculists still perform iridectomy for glaucoma, just as they did in the past. This statement is only true of Germany, and shows that that country has to this extent ceased to be progressive; not one of the fistulizing operations arose in Germany, and, therefore, they are inferior. After quoting Meller, who has given up Elliot's operation for most cases, reserving it alone for those in which iridectomy is known to be dangerous, Gilbert brings forward the views of Hegner. He concludes that the good effect is not dependent upon fistulization, for there are many cases with good filtration in which the tension is not reduced, and others of the reverse order; there is no filtration, the hole is solidly healed, and yet the tension is reduced. He notes that the operation is to-day always combined with iridectomy, and he thinks that this iridectomy has much to do with the good effect of the combined operation. Trephining will never replace iridectomy, but it has its place, and this is chiefly in cases with very high tension, and advanced inflammatory forms of glaucoma. After these preliminary remarks regarding the comparative value of trephining and iridectomy, Gilbert goes on to discuss three points which are of value in deciding between the operative or conservative treatment of the disease. They are: operation and age, operation and the vascular system, and operation and the field of vision.

Although conservative treatment is doubtless responsible for many blind eyes, yet, on the other hand, not a few have been destroyed by operation. It is necessary to weigh most carefully all the factors, both general and local, before deciding upon a course of action.

Operation with reference to age.—The author thinks that cases of glaucoma simplex over sixty years of age should not be submitted to operation, and he gives instances of miotic treatment which have proved successful. He operates under sixty because the high pressure will have longer to act upon the eye, and will injure it. Of course, this advice refers to iridectomy, which is the operation employed by him for these cases. Were he to study the statistics which have been published in England, in France and in America,
he might realize that iridectomy is successful in, at most, 40 per cent. of the cases, and for this reason has been more or less completely abandoned in favour of some form of sclerotomy, which affords a percentage of success more or less in the region of 80 per cent. A comparison of these results with those of conservative treatment would lead to a different conclusion from that given by a balance between iridectomy and pilocarpin. The idea, too, that long years are necessary for glaucoma simplex to effect its deadly work, and that therefore, in the case of a patient aged 60, it may be allowed to go on merely checked by eserin, is futile, for many cases of glaucoma are blind in a year or two. Healthy age should be no bar to an operation for a glaucoma which is palpably advancing in spite of miotic treatment.

Operation with reference to the vascular system.—This is an important factor. Hegner points out that it is wise to treat cases with eserin, and to wait for the acute stage to pass off. Gilbert thinks that it is a good thing to bleed patients before operation, and he is supported by Dyes, Elschnig, and Kuhnt. A history of slight hemiplegic attacks should warn against operation and suggest miotic treatment. Small retinal haemorrhages, and the presence of arterial sclerosis and albuminuria are all indications for miotics, rather than for operation.

Operation and method of operation with reference to the field of vision.—Van der Hoeve, an adherent of iridectomy in non-inflamatory glaucoma, rejects this operation when the field of vision is small on the nasal side, or when central scotomata encroach near the fixation spot. He cannot give any reason for the bad effect of iridectomy in such cases, but he is of the opinion that the size of the iridectomy is not without influence. Gilbert has seen the field contract to the fixation spot after both large and small iridectomies, whether total or peripheral. Meller records loss of central vision after a small peripheral iridectomy, whereas Lagrange says that peripheral iridectomy is absolutely harmless. All these unfortunate cases have one thing in common, the loss of function runs parallel with the reduction of tension. Cases have been recorded, after trephining, after Lagrange's operation, and following cyclodialysis. Not a few cases are on record in which the field of vision steadily contracted although the tension had been reduced to normal or below normal by operation. Gilbert thinks that the alteration in tension may, in some cases, dispose to cavernous degeneration of the optic nerve. The paper is worthy of study, but in common with many others in German literature, leaves the impression that some ophthalmologists in Germany are not well informed upon the contemporary literature which appears in languages other than German.

T. Harrison Butler.
Asmus, A.—For and against Elliot. (Für und wider Elliot.)
(2) Asmus describes the delight with which Elliot's operation was at first received, especially after Stock's favourable account of it in 1912 had helped to popularize the method. At this time many surgeons employed the trephine even in cases of acute glaucoma. Then came disillusionment: case after case of late infection was recorded, and many of those who had been the most enthusiastic returned to older methods. The author gives the opinions of many eminent German ophthalmologists, and it is obvious that the majority now regard the trephining operation as too risky because of this liability to late infection, and have either returned to iridectomy or perform an alternative operation such as cyclodialysis. Axenfeld, Meller, and Haab, are among those who have abandoned the operation; whereas Fleischer of Tübingen praises it highly.

Asmus gives an analysis of his own 40 cases arranged in tabular form. Among these there is one case of late infection which appeared three months after the operation, and fortunately cleared up without affecting the vision. Eighty per cent. of the forty were successful, the tension was reduced to normal. He comes to the conclusion that the results of the operation are so good that we must not condemn it because of the risk of late infection, but must seek to avoid this complication. He suggests that it might be wise for trephined persons to wear goggles to protect the eyes.

T. HARRISON BUTLER.

(3) von Grosz has in the years 1913 to 1919 performed 1,152 operations for glaucoma at the University Eye Clinic at Buda Pesth. Elliot's operation was performed 401 times. For chronic inflammatory glaucoma 163 times. For absolute glaucoma 139 times. For glaucoma simplex 99 times. The large number of cases of absolute glaucoma is due to the fact that the patients are drawn from the whole of Hungary, and very many do not undertake the journey till the disease is far advanced. In spite of the fact that the government has established provincial ophthalmic centres, the people prefer to trust themselves to Pesth. For the same reason it is difficult to get any accurate statistics of the final results, for most of the patients return whence they came and are no more seen. Late infection was infrequent; one patient developed sympathetic ophthalmitis but the eye was saved. In 29 cases of glaucoma simplex which were examined after some time, 10 showed diminished acuity, 38 per cent. Choroidal haemorrhage
was rare but posterior synechiae frequent. Twenty per cent. of subacute cases showed loss of visual acuity. von Grosz sees no reason to alter the opinion he expressed at the London Congress in 1913. Iridectomy will in the future be the general operation, and the earlier the case the more suitable is it for this operation. Glaucoma inflammatorium chronicum with clear media and contracted field may be trephined. In cases of glaucoma simplex the author will no longer trephine but perform Lagrange's sclerectomy. Sclerectomy is also the correct procedure in the early stages of juvenile glaucoma. In advanced cases no operation is of any avail. Enucleation is best in absolute glaucoma.

T. Harrison Butler.


(4) Schürhoff, Assistant in the Kiel Ophthalmic Clinic, states that during the past twelve years 437 operations have been performed for glaucoma. The methods employed were the following: Cyclodialysis, 259 times; iridectomy, 155; sclerotomy (de Wecker), 20; trephining, 2; irido-sclerotomy (Lagrange), 1. The last two methods were not repeated because of the unfavourable results obtained. One trephining operation had no effect for good or evil. The second trephining and the single Lagrange were accompanied by loss of vitreous, and the eyes becoming infected were removed. It was surely premature to condemn and abandon an operation after two trials and one trial respectively. Loss of vitreous is very rare during trephining, and infection still less frequent. The results obtained by cyclodialysis were: no result, 18; bad result, 2; transient result, 28; good result, 97; permanently good result, 46. The corresponding figures for iridectomy were 22, 3, 17, 67, 2. It was constantly noted that when iridectomy failed single or repeated cyclodialysis succeeded, but that when cyclodialysis did not reduce the tension, iridectomy was equally ineffective. The author concludes that cyclodialysis is at least as efficient as iridectomy. No exact comparison can be made because the indications for the two operations are not the same. For example, cyclodialysis would rarely be chosen in acute glaucoma of recent date. It is, however, unusual in Kiel for a case to be seen at once; generally the acute attack has reached a chronic stage, and then cyclodialysis is better than iridectomy. This view confirms the opinion held by many English operators: that when an acute glaucoma has been in evidence for some weeks, then sclerectomy is a better operation than iridectomy. It is quite impossible to analyse or criticize the paper, because no attempt has
been made to classify the nature of the glaucoma. The figures include primary and secondary glaucoma, simple, congestive, acute, and sub-acute. Treatment suitable for one might not be ideal for another type. The paper is, we fear, but special pleading for cyclodialysis, the favourite operation at Kiel. The figures give no indication of the comparative value of cyclodialysis and a modern sclerectomy operation in simple glaucoma, for trephining was never really tried. Two operations were performed, and no operator can fairly judge a surgical procedure till he has mastered its technique, nor can he hope to become competent after two attempts.

T. Harrison Butler.


(5) Knapp gives an abstract of four cases in which hypotony followed trephining for glaucoma. He is of opinion that too free filtration is injurious and leads to changes in the intra-ocular circulation. He does not agree with Elliot in the view that artificially produced hypotony is not necessarily of pathogenic significance. It should be our aim to obtain just enough filtration to keep down glaucomatous tension, and Knapp advocates a small trephine cleanly removing the entire segment. In three of his cases, choroidal detachment was observed.

J. Hamilton McIlroy.

VII.—THE AETIOLOGY OF MYOPIA


Ochi performed a series of compression experiments on the eyeball of the young rabbit, and gives his views upon the general factors that are concerned in myopia. His first set of experiments was directed to the discovery of the part played by the ocular muscles in causing compression of the sclera, or alteration in the diameters of the eyeball. He experimented on forty-one young rabbits, inserting wedges of absorbent cotton either between the muscle and the eyeball, or between the muscle and the orbital wall, according to the condition of the muscle in question—some of the muscles being too delicate to stand the
former manipulation. The fellow eye in each case was taken as control.

Examination of the nine rabbits which survived, at the end of six months, gave, out of three cases in which the wedge had been inserted at the upper side of the eyeball, a slight decrease in the vertical diameter of the experimental eye in two cases, and no change in the other case; a slight increase in the transverse diameter in the three cases; and a slight increase in the antero-posterior diameter in two cases, with no change in the third case. (2) In the cases in which the wedge had been inserted at the lower side, the vertical diameter showed a slight decrease, and the other diameters showed no change. (3) The other cases showed no change.

These results being inconclusive, he decided to exert greater compression upon the eyeball, and his second series of experiments consisted in binding the equator of the eyeball with a silk thread instead of inserting the wedges. Six young rabbits were used, and three of these survived at the end of six months. Myopia varying from 7 D. to 10 D. was found in these experimental eyes. On enucleation the binding threads were found to be broken. Measurements showed the vertical diameter of the experimental eye to be either slightly decreased or unchanged; the transverse and antero-posterior diameters were slightly increased.

From these experiments he concludes that pretty strong compression on the eyeball does not greatly lengthen the diameter of the globe, and he argues that pressure of the muscles alone cannot effect much alteration in the antero-posterior diameter, provided the resistance of the walls of the eyeball be strong. He believes that the muscles alone could exert this lengthening influence if the sclera were weaker than normal, and he ascribes the development of juvenile progressive myopia to the pressure of the muscles on an eyeball which has a weak sclerotic envelope.

He considers the sclera to be developmentally part of the cranium, the cartilaginous layer in the lower vertebrates being a direct prolongation of the skull wall—the eye starting as the primary optic vesicle in the embryo, and the sclera developing around this in the same way as the cranium around the brain matter. He looks upon the sclera as the supporting structure for the soft eye-parts, and does not consider the bony wall of the orbit as intrinsically connected with the eye.

Ochi passes from this to the consideration that in the case of children of scrofulous habit, whose skeletons are weak in respect to rigidity, one may expect to find inadequate support on the part of the scleral tissue.

He concludes by urging the prophylactic treatment of myopia on lines which are directed towards the improvement of the general
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health of the individual. For strengthening the skeleton and sclera he recommends proper sports, and emphasises the principle of safeguarding the young growing eye against exhaustion in the same way that one protects the child from overstrain during the early years of school life.

J. HAMILTON MCILROY.

VIII.—THE SURGICAL TREATMENT OF BENIGN INTRADURAL TUMOURS OF THE OPTIC NERVE


In a long and suggestive paper based on an unusually large experience of cases, Golovine advances the opinion he has formed concerning benign intradural tumours of the optic nerve, and describes a method of operating which, planned on theoretical grounds, he has employed in the three cases now reported. He has had nine cases of this kind under his own care; five were published in 1904 in the Westnik Ophtal.; one in the same journal in 1909.

After noting that out of a somewhat chaotic arrangement of tumours of the optic nerve, two large groups of extradural and intradural tumours have emerged, he expresses the opinion that among the intradural variety a relatively large number have the characters of an inflammatory hyperplasia, and are, in a surgical sense, benign. These tumours are not dangerous to life except from mechanical invasion of the central nervous system, to which they seldom show any tendency.

It is very important that the collected experience of observers should be utilized in an attempt to determine the symptoms by which benign intradural tumours may be diagnosed clinically, and this diagnosis confirmed on the operating table. The doubt as to the malignancy of intradural tumours engendered by microscopic examination is confirmed by analysis of clinical data.

Two facts of great importance will be obvious to anyone who studies the clinical records, both old and new, without preconceived ideas: (1) No instance is reported of penetration of the eyeball by an intradural tumour; yet such an invasion by tumours belonging to the sarcoma group would be expected. (2) Intradural tumours, even of long duration, do not destroy the dural nerve sheath and
do not fill the orbital cavity as do malignant neoplasms from whatever part of the orbital tissues they may arise.

Another important fact is the result of surgical experience; the surgeon after dividing the tumour at its proximal end usually finds evidence that a portion of the growth has been left in or close to the optic canal, sufficient to be the starting point of a recurrence. Nevertheless, a recurrence is exceptional, and a fatal termination soon after operation, which has happened but rarely, has been due to intracranial disease in existence before intervention.

Golovine assumes that surgeons generally have abandoned operations which included removal of the eyeball, and have adopted procedures based on Krönlein's operation whereby the temporal wall of the orbit is resected, and the optic nerve and tumour removed, leaving the eyeball in situ. While fully agreeing with this method of exposing the tumour, he enquires (1) What are the disadvantages of extirpation of the tumour and optic nerve in its entirety, and what reasons are there for desiring to avoid this operation. (2) Is it possible to recognize the variety of tumour in which it is permissible to avoid resection of the optic nerve?

The author's objections to removal of the optic nerve and growth are the resulting paralysis of the levator palpebrae (13 times in 36 cases, Heilbron), and paralysis of the recti muscles, the abducens being most frequently affected. Heilbron's figures are: internus, rectus, 9; superior, 13; inferior, 11; and external, 17 times. Retraction of the eyeball and occasional neuropathic keratitis are other objections.

Method of operating.—Sub-vaginal extirpation of benign tumours of the optic nerve.

Golovine's method of exposing the orbital contents differs in several details from that originally adopted by Krönlein. The skin incision is forked; the upper arm, in the eyebrow, extends along the superior orbital margin, from a point slightly internal to the mid-point, to the outer angle; the lower arm of equal length runs along the lower rim of the orbit; these incisions converge to a point about half a centimetre outside the external angle of the orbit (see diagram in the Archives).

The outer margin of the orbit is exposed and the ligament and the tarso-orbital fascia is divided close to the bone, admitting of free digital exploration of the orbit. Resection of the outer wall of the orbit is effected without preliminary separation of the periosteum, as advised by Krönlein. The external rectus muscle is not divided. At the conclusion of the operation the eyelids are stitched together as a temporary measure for protection of the cornea in the event of swelling of the orbital tissues.

The real novelty in the author's procedure concerns the removal
of the new growth. He exposes it by the separation of the external and superior recti, makes an anteroposterior incision through the dural sheath and removes the tumour mass by scraping it away with a sharp curette. The optic nerve is left in position. A small drain, usually removed on the third day, is introduced into the opening in the sheath and the external wounds are closed.

Golovine narrates three cases in which he operated in this manner, and gives full clinical details. Two were in adult males, one in a female child. All the cases did well surgically, healing being uncomplicated, and in cases 1 and 2 the cosmetic results were very satisfactory, as evidenced by photos of the patients after operation. The subsequent history is important. In case 1 (male) there was no sign of recurrence two years later and the ocular movements were full, except abduction which was slightly limited. In case 2 (child) no further trouble had arisen three and a half years after operation. In case 3 (male) the result was not so happy; one year after operation the eyeball again became proptosed and other signs of a recurrent growth became manifest and a second operation was undertaken. Microscopic examination of the recurrent growth revealed the characteristics of a sarcoma.

While the first two cases support the author's opinion that benign intradural tumours can be dealt with, as he suggests, without removal of the optic nerve and with permanently good results, it is obvious that in the presence of a malignant tumour his method is not only unsuitable, but probably affords less likelihood of complete cure than more radical procedures.

In his notes of his third case Golovine notes that the appearance of the tumour and the thinness of its capsule led him to doubt if he was dealing with a primary intradural neoplasm.

The clinical diagnosis as to the benign or malignant nature of an optic nerve tumour is so nearly impossible that the procedure advocated by Golovine might well be considered as a preliminary measure to be followed by removal of the orbital contents if the pathologist pronounces the growth to be malignant.

A useful list of references to the literature of the subject is appended.

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