The only valid objection to the magnet is that the force is considerable only at the centre of the solenoid. In consequence, the eye must be kept in the centre. I have never found any difficulty in placing the eye in this situation and keeping it there.

I have succeeded in removing pieces of steel from the cornea which were difficult to extract with a needle, and shall make further experiments in this direction.

The two photographs in the text (Figs. 1 and 3) are from the new magnet at Birmingham.

Fig. 3 shows the ring placed too obliquely over the patient’s head; it should be almost horizontal, resting gently upon the neck.

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Butler, T. Harrison.—"The Ring Magnet." THE OPHTHALMOSCOPE, May, 1909, page 325. This article contains illustrations of the original type of Ring Magnet, and others which show the distribution of the lines-of-force in the Haab type and the Innenpolmagnet.

ABSTRACTS.

I.—COLOUR INTERLACING AND PERIMETRY.


This paper which formed a thesis by Walker, of Boston, for membership in the Society, deals with some improved perimetrical methods devised by the author, and the results obtained by them in neurological cases in which there were changes in the optic discs of a nature suggesting increased intracranial pressure.

All surgeons who have paid attention to the difficult subject of perimetry, a subject very inadequately dealt with in the text-books, must have felt how unsatisfactory the results obtained by the ordinary recording perimeters are. For the rough measurement of the peripheral field for white, in the hurry inseparable from the
work of a large clinic, they may serve well enough; but for the accurate measurement of scotomata and colour fields, they are most untrustworthy.

Walker begins by discussing the difficulties of obtaining trustworthy results under three heads:—1. Psychologic; 2. Physical or physiologic; and 3. Mechanical.

1. Under the first heading he takes into account the personal equation due to the patient’s intelligence and previous experience. Thus, highly educated persons may unconsciously take advantage of the percentage of chance, and also may judge colours entirely by their light intensity. This is facilitated by the fact that all colours pass through a threshold of various neutral tints before the true colour is appreciated. The threshold for blue is usually less sharp than that for red, while green has such an indefinite one as to render it of much less value in these examinations.

In order to reduce guessing of this type, it is of great importance to avoid anything like a definite sequence of presentation of the colour.

He goes on to state that for the best results the form field should be made a separate examination from the colour test, because it involves a different class of judgment, but, of course, all the colour readings on a particular radius should be taken as nearly at the same time as possible. The first few readings in both cases are apt to be wrong, and should be discarded. The reading for white is practically worthless, because of its very confusing threshold, varying through all the shades of grey. For this reason the patient is never allowed to say “white,” but is forced to report first motion only. The rate of motion of the test discs is of considerable importance, and must be adapted to the intelligence and attention of the individual patient. The examiner, also, should be on his guard against letting the readings fit in with his preconceived idea of the field, as he may do unconsciously. In order to avoid this, the author prefers to take the field before making an ophthalmoscopic examination.

2. As regards physical conditions, Walker attaches great importance to making the patient comfortable. He himself has devised a suspension apparatus for the perimeter, but, if this is not available, advises the use of an adjustable perimetric table on which the patient can rest his arms while seated in a comfortable chair. In many cases he has found it necessary to allow numerous periods of rest during the examination. Severe headache or pain will cause great variations in the reading. Unfortunately, this group of cases includes often the ones that have choked discs and other evidences of increased intracranial pressure requiring prompt decompression, so that it is impossible to wait for the infrequent periods in which the headache is very slight. It is precisely this type of case that is likely to show colour interlacing due to the varying attention during
any one set of observations, thus making it necessary to take the average of more than one reading.

3. **Mechanical.**—The room in which the observations are made should be comfortably warm and free from noise and disturbance. Walker uses a room with large windows of northern exposure, and has the walls facing the windows darkened, and wears dark clothes and gloves. He has devised a method of artificial lighting by means of a circle of electric incandescent lamps behind the patient, of which an illustration is given.

He next gives what he believes to be the necessary requirements for accurate perimetric measurements from the mechanical point of view. These relate chiefly to the importance of being able to work from a blind area and to approach a scotoma either at right angles or tangentially, conditions the importance of which will be thoroughly appreciated by all who have worked with Bjerrum's methods. He lays stress on the importance of being able to change colours in the testing disc noiselessly and instantaneously, for which purpose he has devised a very ingenious carrier, illustrated in the text and previously described by him (Archives of Ophth., Vol. XLII, No. 6, 1913). He also discusses various devices to maintain fixation in cases of defective central vision. One ingenious method of managing in a case of central scotoma seems worth drawing attention to, i.e., the attaching of several spots of fixation on his pattern of perimeter at points found by several approximations to lie just on the periphery of the scotoma and directing the patient to keep all those spots in view while the peripheral field is being examined.

He mentions electric perimetry merely to condemn it as inaccurate and lengthened, owing to the difficulties connected with light and dark adaptation.

He illustrates his form of perimeter, which aims at obtaining the largest possible surface upon which to make measurements, and definitely rejects all means of mechanical recording. The method of construction consists in attaching to the ordinary perimeter a sheet of thin brass cut into a section of a sphere of 28.6 cm. radius. This surface is cut to extend 35 degrees about the centre in three quadrants, and 95 degrees in the remaining quadrant, with a lateral width sufficient to include three of the 30 degree lines radiating from the centre. The whole surface is marked by deep numbered lines, cut in the metal to correspond with the field chart, and it is attached to the perimeter by means of rollers, so that eccentric fixation may be obtained by displacement along the arc to the desired number of degrees. The position of the arc is set at any desired 30 degree angle and fixed in position by a spring catch. The eye is placed at 28.6 cm. from the centre, in order that the discs (a table of the sizes of which is given) may be recorded in visual angles directly
as indicated or in diameters. He says that in this way the field for
the smaller visual angles can be measured with much greater ease
and rapidity than by Bjerrum's method.

The rest of the paper is devoted to a summary of the results
obtained and to an explanation of the results obtained by less
accurate methods. Walker comes to the following conclusions:—

1. For the detection of early pressure effects on the optic tract,
examination of the fields for the smallest visual angles gives the
most reliable results.

2. Colour interlacing is not a reliable test for cerebral pressure.

3. Most of the colour interlacing found in the past in brain cases
may be accounted for by a variety of variables largely psychological
and physical.

4. Perimetry on semi-reclining patients by artificial illumination
imitating daylight has been found practical.

At the end of the paper is given a series of tables of various cases
with opthalmoscopic signs of possible raised intracranial pressure
in which colour interlacing was or was not present, taken from
Professor Cushing's clinic.

The paper is a noteworthy contribution to a difficult subject,
which has been rather neglected in this country.

We think the author does rather less than justice to Bjerrum's
methods, especially in the simplified form described by Sym and
Sinclair (Ophthal. Review, 1906, p. 145) and Duane (Archives of
Ophth., Vol. XLIII, No. 6, 1914), but his disc carrier is an addition
of distinct value.

E. E. H.

II.—THE MAGNET AND MAGNET OPERATIONS.

(1) Alt, Adolf.—Magnet extraction of a piece of iron from the
eye: avulsion of iris; glaucoma; enucleation. American

(2) Shahan, W. E.—Removal of steel from lens; non-formation

(3) Ohly, John H.—The electro-magnet and the magnet

(4) Morax, V.—Notes on the prognosis and the technique of the
extraction of intra-ocular magnetic chips. (Notes sur le
pronostic et la technique de l'extraction des éclats
magnétiques intra-oculaires.) Annales d'Oculistique, T. CLIII,
octobre, 1916.

(1) The description by Alt, of St. Louis, of the microscopic
appearance of an eye which became glaucomatous after being badly
damaged by the forcible removal from the eye of a piece of metal, should be read in the original. It may be said here that the eye became glaucomatous, in spite of the complete tearing away of the iris, because "the compressed fibres of the ligamentum pectinatum were filled with, or covered with, a newly-formed connective tissue, which here and there was covered on the inner surface by a thick layer of pigment epithelial cells; in other places the foremost ciliary process was firmly attached to this newly-formed tissue. Schlemm’s canal was obliterated in all the sections." ERNEST THOMSON.

(2) Shahan, of St. Louis, records an example of the type of case, which occurs occasionally and confounds the prognosis of the ophthalmic surgeon, where a penetrating injury of the lens results only in a localized opacity. In the present case a piece of metal entered the lens, from which it was extracted through the original corneal wound with the hand magnet. Eight months afterwards the visual acuity was 20/15. The "lens was clear except at former site of foreign body, where there is a linear scar in the anterior capsule and iris pigment and circumscribed clouding behind it. I have seen two other somewhat similar cases."

Most ophthalmic surgeons have had such cases now and again.

ERNEST THOMSON.

(3) This lengthened thesis by Ohly, of Brooklyn, was accepted for membership in the American Ophthalmological Society.

Its first eight pages are devoted to the history of magnetism and the electro-magnet. Ohly shows that the magnet was used in medicine nearly two thousand years ago. According to Hirschberg, the points of broken steel arrows were extracted by magnetic ore by Sucruta Ayurveda. In 1462 Brunswyek advised the removal of iron splinters from the eye with a magnet, and in 1656 Fabry employed the same means for the removal of an iron foreign body from the cornea. In 1858 the English ophthalmic surgeon Dixon (Ophth. Hosp. Reports, 1858, I, p. 282) reported the successful extraction of a steel scissor blade from the vitreous by drawing it into such a position that it was removed by forceps through a scleral incision. The more modern work of McKeown (1874), Hirschberg (1875), Snell (1881), Gruening (1880), and many others receives due recognition. The giant magnets of Haab (1892), Mayweg (1902), Schloeser (1903), as well as the magnets of Volkmann (1902), Mellinger (1904), and Lancaster (1915) are briefly described.

The next few pages of the thesis are devoted to a consideration of the various methods employed to diagnose a foreign body within the eyeball. The credit of first using the magnetic needle for the detection of magnetic particles within the eye is given to Thomas R. Pooley (New York Medical Journal, 1902). Various forms of siderscope are described. The author concludes that the X-rays are the most accurate means of detecting a foreign body in the eyeball,
which cannot be diagnosed by the usual methods. Localization
is next touched upon, and the methods of Sweet, Mackenzie
Davidson, Hullen, Holth, Dixon, and others receive attention.

The methods of removing foreign bodies from within the eyeball
next claim Ohly's notice. In this matter he recognises that it is
impossible to follow any general rule. The chief consideration is to
select the plan which will cause the minimum amount of injury and
avoid any entanglement of the foreign substance in the tissues of
the iris or ciliary body. A description is given of the so-called
"anterior" (Haab) and "posterior methods" (Hirschberg). Both
have their successes and their failures. In 5 of the 10 cases
reported by Ohly the posterior method was adopted. Under no
circumstances should an attempt be made to extract a foreign body
from the eyeball until its exact position has been ascertained. In
order to avoid infection, Ohly makes a large conjunctival flap, and
when the operation is finished, sutures it in such a way that none of
the stitches are placed over or near the opening in the sclera. The
sclera itself is not sutured. In making the incision, the conjunctival
vessels afford good landmarks, and a sterile compass is a valuable aid.
He usually makes a T-shaped incision, employing a Graefe knife for
the purpose. Care is taken to avoid entering the vitreous to a depth
of more than 1 mm. or 2 mm. The vertical part of the incision is
3mm. to 5mm. in length, while the horizontal part does not exceed
2mm. to 3mm. The lips of the incision being held apart, the tip
of the magnet is introduced between them, and at the first attempt
never thrust into the vitreous. If the foreign body does not appear
(as it usually does when correctly located), smaller tips are used, but
in none of his cases did he find it necessary to enter the vitreous
to a greater depth than 2mm. or 3mm. Detachment of the retina
as a result of the operation is due to (a) making too deep an incision,
(b) entering the tip of the magnet deeply into the vitreous, or
(c) moving the magnet about without due caution. When detach-
ment occurs with proper care, Ohly assigns it to injury produced in
the vitreous by the entrance of the foreign body. In one of the
author's cases complete aniridia was produced on making an attempt
to extract the foreign body through the original wound in the limbus.
Ohly advises that the large magnet should be suspended by a counter-
weight, and that the current should be controlled by a foot switch.

Ohly's 10 cases may be briefly summarized as follows:—in 1
the foreign body was in the lens, and in 9 in the vitreous. In 8 of
the last-named it was removed, and in 1, on account of faulty
localization, it was not extracted, although both the anterior and the
posterior routes were tried. One case, where the foreign body was
removed through the original wound in the sclera, regained V.
of 6/6, and 1, where it was extracted by the original wound in
the limbus, had V. of fingers at 1 metre. One case where the
anterior method was adopted, had V. of fingers at 2 metres, and is still under observation. Of the 5 cases where extraction was by the posterior route, 2 had V. of 6/6; 1, V. of 6/9; 1, V. of 6/12; and 1, with choroidal disease and cataract, V. of moving objects.

There are 74 entries in the table of references with which the thesis concludes.

(4) The prognosis of the ocular wounds with the presence of a magnetisable fragment in the intra-ocular tissues depends on several factors, but more especially on the infective complications and the hæmorrhagic lesions caused by the penetration of the chip. The infective accidents occur with chips of all sizes, although naturally the larger fragments drag in more contamination from the usually infected conjunctival sac than the smaller ones—the infection leading to slight iritis, iridocyclitis with hypopyon, or even to panophthalmitis. Sometimes the extraction of the foreign body leads to a very favourable issue, but often the infectious processes continue, ending in the need for enucleation. As to the hæmorrhagic lesions, they may actually occur from section of vessels or from the contusion, and are related more directly to the size of the chip. Morax prepared a graph from some of the industrial and war accident cases at the Lariboisière, Paris, in recent years, the first graph dealing with 59 cases of intra-vitreous magnetic chips extracted by the electro-magnet, but discarding the cases where the chip lodged in the iris, anterior chamber, or lens. The following Table I (simplified for purposes of reproduction) gives the substance of the graph. In this table the weight of the fragment from 1 milligram and less up to 10 centigrams is given, and at the side four classes of results:—

A. Very satisfactory functional results, i.e., V. = $\frac{1}{2}$ or more;
B. Useful results, i.e., V. =1/10 to 1/2;
C. Functional result, nil, but globe retained, i.e., V. = less than 1/10;
D. Enucleation necessary for hæmorrhagic lesions or infectious complications.

Table 1.—Results of 59 extractions of magnetic chips from vitreous, arranged according to the weight of chip.

<table>
<thead>
<tr>
<th>Milligrams</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. V. = $\frac{1}{2}$ or better...</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>B. V. = $\frac{1}{2}$ - $\frac{1}{10}$</td>
<td>8</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>C. V. = 0 or below $\frac{1}{10}$</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>D. Enucleation</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Total cases</td>
<td>15</td>
<td>9</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
THE MAGNET AND MAGNET OPERATIONS.

The very satisfactory results occur chiefly in cases where the foreign body is not more than 7 milligrams, i.e., 8 times out of 35 cases, and if one adds the 15 useful cases, one gets 23 appreciable results out of 35, i.e., two-thirds of the cases. In the 12 cases where the results have not been favourable, one finds 7 cases with vision equal to nil or less than 1/10 and 5 enucleations. When the chip is 10 milligrams or over, the failures are preponderant. In the 24 cases of this series, there is not one very satisfactory result, and only 5 useful results and 8 enucleations. The exceptional case is that with a 10 centigram chip where useful vision was obtained.

Morax found corroboration of his views on the relationship between the weight of the foreign body and the gravity of the ocular lesion in the thesis by Mme. Mangini based on 54 observations on war foreign body cases under Rollet, where the giant magnet was successfully used.

TABLE 2.—Results of 48 cases—war injuries (Mangini), showing weight of metal chip.

<table>
<thead>
<tr>
<th>Weight of Metal Chip</th>
<th>1 2 3 4 6 9 10 20 30 50 70-100 200 300 600+</th>
</tr>
</thead>
<tbody>
<tr>
<td>V. = 1/2 or more</td>
<td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>V. = 1/2 - 1/10</td>
<td>0 1 2 0 0 0 0 0 0 0 0 0 0 0 3</td>
</tr>
<tr>
<td>V. = 0 or below 1/10</td>
<td>1 2 2 1 1 2 8 2 2 4 2 1 1 1 30</td>
</tr>
<tr>
<td>Enucleation</td>
<td>0 1 2 0 0 0 2 0 2 2 2 1 1 2 15</td>
</tr>
<tr>
<td>No. of cases</td>
<td>1 4 6 1 1 2 10 2 4 6 4 2 2 3 48</td>
</tr>
</tbody>
</table>

This Table 2 shows how serious the results are with a magnetic fragment weighing more than 3.5 milligrams.

In Morax's second graph, Table 3 (again simplified for the purpose of reproduction), he draws attention to the different results obtained in the 59 vitreous foreign body cases as compared with the 15 iris, anterior chamber, and lens cases, where the proportion of satisfactory and useful results towers above that of the former.

TABLE 3.

<table>
<thead>
<tr>
<th>Intravitreous Foreign Bodies</th>
<th>Iris, Lens, &amp; Anterior Chamber.</th>
</tr>
</thead>
<tbody>
<tr>
<td>V. = 1/2 or more</td>
<td>Cases 8 = 13.5%</td>
</tr>
<tr>
<td>V. = 1/2 - 1/10</td>
<td>20 = 34.0%</td>
</tr>
<tr>
<td>V. = 0 or below 1/10</td>
<td>18 = 30.5%</td>
</tr>
<tr>
<td>Enucleations</td>
<td>13 = 22.0%</td>
</tr>
<tr>
<td>Totals</td>
<td>Cases 59</td>
</tr>
</tbody>
</table>

TABLE 3.
In the one enucleation case of this group the foreign body was not extracted from the anterior chamber until one month after the war wound had been received. It is precisely the lack of weight that prevents the anterior segment foreign bodies from going deeper, so that it is necessary to compare the anterior segment cases with those vitreous ones where the chip is from 1 to 3 milligrams; but even then the prognosis is more favourable in the anterior segment group. In Mme. Mangini's thesis there are noted 6 anterior segment cases, and of these the result has been very good in 2 cases, i.e., \( V = \frac{1}{2} \), useful in 1 case, i.e., \( V = \frac{1}{8} \), functional result nil in 2 cases, enucleation in 1 case; in the favourable cases the weight of the chip was equal to or less than 3 milligrams.

Speaking of the relative value of the large and the small magnet, Morax says that each has its special sphere of usefulness. There is no invariable technique for the removal of these chips. According to the weight and seat of the foreign body, and the disorders which it has produced, or which it can still produce, so must the technique be modified. The anterior segment cases can generally be dealt with satisfactorily with the small magnet alone, while sometimes even the vitreous ones call for the small magnet. Such a case is quoted by the author where the giant magnet was used with the assistance of the ophthalmoscope for a vitreous foreign body, and yet the foreign body refused to come through the zonule. Scleral puncture had to be done, and the foreign body was recovered by the small magnet. After a week, the vitreous was still clear and vision full.

Morax finds the small pole that can be adapted to the giant magnet rather cumbersome. He considers that with delicacy and precision in the use of the giant magnet and with aseptic care the risks of the scleral route are not very great. He holds, however, that the special rôle of the big magnet is to coax the foreign body from the vitreous round the lens and through the pupil into the anterior chamber, whence it can be recovered by the small magnet after a corneal incision with the keratome. This is the method he has used, believing that it conserves best the delicate ocular tissues and gives the best chance of avoiding the risks of infection.

W. C. Souter.

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III.—THE USE OF CELLULOID IN PLASTIC SURGERY.


Higgens, of London, has lately had a considerable amount of experience of plastic surgery of the face, in connection with war
wounds. He soon began to recognise the want of a material which would make up deficiency of bone, fill up cavities, and level up depressed cicatrices. Paraffin was tried, but was not of great value, because of its tendency to "wriggle out of the position it was placed in." Deformity was but little improved. Celluloid was then tried, and "experience has proved its value. Higgens has used plates of celluloid for replacing bone, and solution for filling cavities and raising deep cicatrices. For placing beneath cicatrices, Higgens, who formerly used plates for this purpose also, has now replaced the celluloid plates with a solution. There are two solutions, the one of a solution of celluloid in acetone, the other a secret trade preparation invented for making corks watertight. The latter is to be preferred. The method adopted is to make a tunnel under the cicatrix (subcutaneous detachment of the cicatrix) and then to inject the semifluid celluloid into the tunnel by means of a syringe with a screw-down piston. The syringe having been removed, a collodion dressing is applied to the wound. Major Pailing, a colleague of the author, has recently closed an opening in the skull with a celluloid plate. "The edges of the plate, which was curved to correspond with the curve of the skull, were pushed between the bone and dura and covered by the scalp." The result of this operation seems to have been excellent. Higgens considers there is a great future before the "celluloid operation."

Ernest Thomson.

IV.—THE RELATION OF CHOKEO DISC TO TENSION OF THE EYEBALL.


Observations on the tension of the eyeball in cases of brain tumour led Parker, of Detroit, to think, that in cases in which the degree of papilloedema is equal in the two eyes, the ocular tension is equal, or nearly so; whereas, in those in which the swelling of the disc is greater in one eye than in the other, the tension is different in the two eyes, being less in the eye showing the greater degree of swelling.

The present communication is the record of an endeavour to prove by experiment the relation between choked disc and the tension of the eyeball, in the case of artificially increased intracranial pressure. The author refers briefly to the chief theories concerning the pathogenesis of choked disc, and although he does not commit himself, it is obvious that he favours the mechanical theory. He
then says, "The results obtained from experimentally produced intracranial pressure are as varied as the theories of the causation of papillœdema in brain tumour." He considers very briefly the experiments of Manz, Levinsohn, Cushing, Bordley, and others, and expresses the opinion that "the whole subject of the etiology of choked disc . . . is somewhat chaotic."

With a view of determining the effect that a difference in tension in the two eyes might have on the initial appearance or degree of papillœdema in cases of increased intracranial pressure, the following experiments were conducted:

The tension of one eye was diminished by sclero-corneal trephining. After recovery from the operation, the intracranial pressure was increased and the effect on the two eyes observed. The experiments were carried out on 20 dogs and 3 monkeys by the following methods:

The refraction of each eye was determined with the ophthalmoscope, and the tension taken with a Schiötz tonometer. The tension of one eye was reduced by a trephine operation. After recovery from the operation, a second ophthalmoscopic examination was made and the tension was again recorded. Artificial intracranial pressure was then induced through a trephine aperture in the skull: (1) by direct digital pressure; (2) by the injection of normal salt solution under registered pressure; (3) by the distension, under registered pressure, of an air-bag introduced between the skull and the dura; (4) by the injection of paraffin through a brass cannula screwed into the skull; (5) by the introduction of sea-tangle tents between the bone and the dura; and (6) by the introduction of sponge tents between the skull and the dura.

The results are given in groups arranged according to the method employed to augment the intracranial pressure. Interested readers should consult the original article for details both of the experiments and of their results; they will find there, in addition, a series of microphotographs of the optic nerves from several of the animals operated upon. A few of the results only can be given in this abstract:

**Group 1.** Digital pressure. Three dogs were subjected to experiment, but of these, 2 died too soon for observation. In the third dog, swelling of disc was quickly induced, and was greater by 4 to 6 dioptres (according to the duration of the pressure) in the trephined eye.

**Group 2.** Saline solution. Results inconclusive.

**Group 3.** Air-bag. Three dogs were used: 1 died from the anaesthetic; 1 was a control in which no trephining of the eye had been done; at a pressure of 200 mm. Hg. death ensued, and no measurable swelling of the discs had been induced. In the third dog, under a pressure of 20 mm., both discs became engorged, the
trephined eye first showing evidence of swelling; at 60 mm., the
disc in the trephined eye was swollen 6D., the other 2D.; at 90 mm.,
both discs were swollen to 7D., and at a pressure of 280 mm. (when
the dog died), the swelling was 8D. and equal in the 2 eyes.

GROUP 4. Paraffin. Three tests were made. In each the
tension of the left eye was reduced by trephining, and the injection
was made on the opposite side well back (i.e., in reference to the
trephined eye the tumour was contralateral). In all three the
swelling was greater in the trephined eye, but "on the whole
the paraffin was unsatisfactory; the œdema of the disc was never
greater than 3D., and subsided in a few days."

GROUP 5. Sea-tangle tents. Results unsatisfactory.

GROUP 6. Sponge tents. Four observations were made, one
being a control. In the others the tent was introduced on the side
opposite the trephined eye. Dogs 1 and 2 died early. In the third
dog, on the third day, the disc in the trephined left eye showed
swelling of 3D.; that in the right eye, congestion but no swelling;
seventh day, left disc 5D., right disc, 1D.; ninth day, left disc 6D.,
right disc 3D.; twenty-seventh day, nothing but congestion of both
discs; forty-fifth day, both discs normal.

In the control dog, both discs became swollen on the third day,
with a difference of 1D. between them. Dog died on the fourth
day.

In the three monkeys, sponge tents were employed. In each
experiment the tent was introduced on the side opposite to the
trephined eye. In every case the swelling of disc appeared first, and
was greater in the trephined eye. It is noteworthy that in two
instances a return to normal or nearly normal tension in the
trephined eyeball was followed by a subsidence of the papilloœdema;
and that a repetition of the trephining led to a recurrence of the
swelling of the disc.

The author's conclusions are:—

1. Choked disc can be produced in the dog and monkey by
artificially increasing the intracranial pressure. The most satis-
factory results are obtained by the use of sponge tents.

2. When the intracranial pressure is increased by artificial tumours
placed in the occipitoparietal region, one element in determining
which disc will be affected first is the tension of the eyeball.

3. When the intracranial pressure is increased by artificial tumours
placed in the occipitoparietal region, the nerve in the
eye of least tension is the first to show the choked disc.

4. When the intracranial pressure is increased by artificial tumours
placed in the occipitoparietal region, there is no direct
relation between the location of the tumours and the eye first
affected.

J. B. LAWFORD.
THE BRITISH JOURNAL OF OPHTHALMOLOGY.

V.—REMEDIES.

(First Notice.)


(8) Simon. — Ionotherapy and episcleritis (salicylic ion and lithium ion). [Ionothérapie et episclérite (ion salicylique et ion de lithium)]. La Clinique Ophtalmologique, juillet, 1916.

(1) Bader, of Basle, has already (Zeitschrift für Augenheilkunde, Bd. XXXIII, 1915) published an account of his researches upon the action of subconjunctival injections of potassium chloride solutions. These, carried out upon rabbits, led him to the conclusion that the action of the potassium salt was similar to that of sodium chloride, but more rapid and energetic.

The present communication gives an account of some clinical experiments with injections of potassium chloride alone, and of alternating injections of the chloride salts of soda and potash.

The author employed 1 per cent. and 2 per cent. solutions, combined with a $\frac{1}{3}$, 1, or 2 per cent. solution of novocain.

He injected daily, or upon alternate days, 0.5 or 1 cm. of a 1 per cent. solution of potassium chloride, with a $\frac{1}{3}$ or 1 per cent. solution of novocain (amount not stated); or double these doses, according to the nature of the disease.

The injections were made as follows:—
The conjunctiva was first anaesthetised with a few drops of a 2 per cent. solution of cocaine, and then the saline solution was slowly injected with a Pravaz syringe. The needle was entered at a spot 5 mm. from the limbus and pushed in for from 3 to 4 mm. When sodium chloride was injected, the eye was bandaged, and the patient kept in bed for two hours.

Bader admits that his experience is not yet sufficiently extensive to enable him to define the indications for, or the contra-indications against, the use of the potassium salt, but he finds that it is useful in cases which are suitable for sub-conjunctival injections of sodium chloride solution, but which call for more rapid and powerful treatment than is afforded by this salt.

The first case cited was one of disseminated choroiditis, which appeared after an attack of enteric fever. The Wassermann reaction is not mentioned, but it is stated that tubercle and syphilis were not present.

Two courses of sub-conjunctival injections of a 4 per cent. solution of common salt effected a slight improvement. Then a 2 per cent. solution of potassium chloride was tried. The result was astonishing. The turbid vitreous cleared up; the pathological changes in the fundus became more circumscribed; and the central and peripheral vision rapidly improved.

The second patient suffered from chronic irido-cyclitis, with vitreous opacities. Here, again, sodium chloride injections effected little, but potassium injections rapidly ameliorated the condition.

The third case was a similar one, but, as both eyes were affected, it was possible to use sodium injections for one eye, and potassium for the other. The latter showed a marked superiority.

The good results obtained were repeated in two more examples of chronic uveal disease.

Bader comes to the following conclusions:—

Sub-conjunctival injections of 1 and 2 per cent. solutions of chloride of potash are well tolerated by the eye. They are more painful than the corresponding solutions of sodium chloride, and should, in consequence, be combined with novocain. Whereas they act more intensively, they may be in a more dilute solution, and less of it can be used than would be necessary with sodium chloride. By stimulating the blood-vessels, the salt causes an active hyperæmia, which is effectual in causing the absorption of intra-ocular inflammatory products, such as vitreous opacities. In a word, we have at our command a new stimulant which is useful as an adjuvant to injections of sodium chloride, and which may succeed where the sodium salt has failed.

T. Harrison Butler.

(2) Deutschmann, of Hamburg, claims to be one of the first to employ radio-therapy in the treatment of intra-ocular tumours.

He describes a case in which one eye had been removed after an
accident. Later, a melanotic growth was discovered in the remaining eye. Rather than excise it at once, Deutschmann decided to try the effect of mesothorium.

He obtained a capsule coated with an equivalent of 10 milligrammes of pure mesothorium. The salt was covered with a silver plate, which served as the first filter. A rubber covering acted as second filter. An incision was made in the conjunctiva and a pocket fashioned into which the flat capsule was introduced. It was left in situ for an hour. This treatment was repeated upon several occasions.

Deutschmann describes the gradual recession of the tumour. Unfortunately, the patient returned to South America, and nothing further was heard of him. This facts robs the communication of all interest, for most probably he went the way of most cases of unoperated melanotic sarcoma. T. HARRISON BUTLER.

(3) Chance, of Philadelphia, was consulted by a man, aged 58 years, for a growth upon one eye which had been present for about ten months. It was a nodular tumour, the size of a small bean, which protruded from the palpebral fissure, and which arose from the limbus of the left eye. It extended well into the cornea, to which it was adherent. Its colour was pearly-white, and large and tortuous vessels converged from the conjunctiva to meet at its base. Three weeks after excision, the parts looked normal, but in the course of two months, there was a nodular, and fungoid recurrence. A second and third excision were followed by recurrences. It was accordingly determined to try the method of "electric desiccation," and the patient was taken for that purpose to William L. Clark. Two applications were made, and some six weeks later, cure appeared to be complete. Pathological examination of excised masses of the growth showed that they were sarcomata. In a second case, in a woman of 37 years (under the care of P. N. K. Schwenk), a melanosarcoma, which had originated from a congenital mole, was present to the outer side of the limbus in one eye. It measured 6·5 mm. by 2·5 mm. It was not adherent to the cornea. The growth recurred after excision. This tumour, shown to be a pigmented sarcoma by pathological examination, disappeared after desiccation.

"Desiccation" is not the same thing as "fulguration," which consists in "the indirect destruction of tissue by the application of a current generated by an induction coil or transformer, through the action of which the nutrition of a part is so altered as to prevent the proliferation of cells." "Desiccation" is defined and described by Chance in the following words.—By "desiccation" is meant the dehydration of tissues by means of heat applied in the form of an electric "flame" produced by a high-frequency current, whereby the vitality of tissue cells is destroyed. The heat is generated by a
monopolar electric current of high tension, generated best by a static machine revolving at great speed, and then transformed by suitable appliances. The heat-flame, which must not be so intense as to char the tissues, flows from the point of a fine steel needle. The current from such an instrument can be regulated precisely, and the visibility of the flame affords one the opportunity to apply it exactly when and where the operator desires.” Chance considers that “desiccation” offers distinct advantages over radium and other emergent rays.

(4) A man, aged 30 years, consulted Snell, of Rochester, N.Y., on account of the dark lobulated growth shown in the figure. V. = 20/20, although the mass slightly encroached upon the inner edge of the pupil. The condition had commenced five years before, and had been removed upon five different occasions. The patient, indeed, had been advised to have the eye enucleated in case of recurrence. Between October 31st, 1913, and January 31st, 1914, the X-rays were applied on twelve occasions, and a saturated solution of boric acid was kept constantly flowing over the cornea during each exposure. A medium soft tube was employed, two to five minutes being the time of exposure. The tube was placed as close to the eye as the glass cone would permit. Improvement was noted after the fourth treatment, which was discontinued when two-thirds of the area was healed. Six weeks after the last application of the X-rays, the entire tumour had disappeared. The cornea was clear. A few non-elevated deposits of pale brownish pigment extended from the limbus into the conjunctiva beyond. Nineteen months after the treatment, the patient was free from trouble.

It should be noted, finally, that the growth was reported by E. A. Shumway as a melanotic, epibulbar sarcoma of the limbus.

S. S.

(5) The reviewer has read with very great pleasure this article by Darier, of Paris. It is apparently a portion, perhaps the first chapter, of a new work on ocular therapeutics by the author, entitled Compendium et Répertoire de Thérapeutique Oculaire.
While there may be little in this article that is absolutely new, there is a great deal that is very recent. More than that, it conveys to the reader the why and the wherefore of many methods of investigation of a complicated character, in the most simple language possible and with the minimum of technicality. Since the book itself will shortly, we hope, be available in its entirety, it would serve no very useful purpose to take up the points in the present article *seriatim*. Nevertheless, there are some of these points which may well be referred to. The author divides the methods of diagnosis under the following headings, namely (a) Clinical diagnosis, symptomatology. (b) Anatomico-pathological diagnosis, microscopic and bacteriologic. (c) Experimental diagnosis, animal inoculation. (d) Sero-diagnosis, deviation of complement. (Bordet-Gengou, Wassermann, Cuti-epidermo-opthalmo-reactions to tuberculin, Abderhalden’s reaction). (e) Therapeutic diagnosis.

Under the heading Clinical Diagnosis, Darier gives the first place to the dentition, and reviews our knowledge in this direction. One feels justified in transcribing what he has to say on the subject of the first permanent molar as an indicator of syphilis.

“The canines may, in certain cases, be alone involved, but sometimes it is the first permanent molar which shows those stigmata of syphilis which Hutchinson has so well described for the front teeth. It was in 1900 that I made the first observations, and when, in 1904, I showed my casts to Sir J. Hutchinson himself, he admitted to me that he had not attached importance to molar lesions. He attributed these lesions to the influence of mercurial treatment. But it is easy to understand how the teeth which will be altered by syphilis will be those of which the ossification takes place at a time when this disease exercises its harmful effects. This explains why the first dentition is seldom involved: all the milk teeth have their ossification period in the fourth or fifth month of intra-uterine life; if syphilis affects the feetus at this time, the latter is killed and abortion follows. If, on the contrary, syphilis manifests itself only in the final weeks of intra-uterine life, it will interfere with the development of the only tooth which receives its enamel cap at this time. That tooth is the first permanent molar (p*remi察 grosse molaire (tricuspi*e) permanente.*”) In a similar way the date of the syphilis can be determined by knowing the period of ossification of the other teeth. The whole of this paragraph on the dentition is of very great interest.

The main points for the understanding of the reactions of Wassermann, Noguchi, Abderhalden, and others are given in the clearest possible way, the author admitting, what is undoubtedly true, that at the present time most of these reactions are too complicated for the average clinician to carry out himself. He looks forward to the time when so much simplification of technique shall
have taken place that some of them at least may be handled by the practitioner.

Finally, we may say that if this chapter is a fair sample of Darier's forthcoming book, that book will be a most excellent and useful work of reference; not, perhaps, for the laboratory worker, but for the ordinary oculist practitioner. **Ernest Thomson.**

(6) Ectogan is described by A. Terson, of Paris, as a "derivative, of very pure type, of peroxide of zinc." It has been largely used in the course of the war as a dressing in powder form. It appears to have the advantages of iodoform without the inconvenience of the odour of iodoform. Terson has employed ectogan in the form of ointment, not as powder, in eye cases. The ointment is made up with equal parts of lanoline and vaseline, and is not used in greater strength than 2 per cent.; more usually, one gathers, Terson has used 1 per cent. He has employed this ointment in corneal and conjunctival affections and in palpebral dermatoses. Eczematous lesions tolerate the weaker percentage well, while, in ulcerative blepharitis the stronger is much preferable to either oxide of zinc or ichthyol. The author, however, does not make any comparison between this drug and mercurial preparations in blepharitis. His advocacy of the claims of ectogan would perhaps have been stronger if he had been able to show a superiority for the new drug over the older and well-tried mercurial ointments. **Ernest Thomson.**

(7) A. Terson, of Paris, mentions that one of his patients reacted in the direction of conjunctival irritation and lid swelling to atropine, duboisine, scopolamine, etc. Cocain and euphthalmin only, in spite of frequency of application necessary to obtain mydriasis in iritis, gave practically no bad results. In another case the use of atropine resulted in a follicular conjunctival inflammation of such intensity that any ophthalmologist might have been excused for making a diagnosis of trachoma. The case must have been rather remarkable, for the author says, "I have never before seen such an identity (with trachoma), and would never have believed that the ordinary follicular conjunctivitis of atropine could have covered the whole of the upper tarsal conjunctiva with such voluminous products (productions) so absolutely crammed one against the other. Nevertheless, six weeks after the substitution of euphthalmin for the atropine, the upper tarsal conjunctiva had entirely recovered its physiological polish and transparency."

**Ernest Thomson.**

(8) The article by Simon is of much interest, more especially if his results of ionotherapy in episcleritis can be confirmed. Presuming that episcleritis is of rheumatic or gouty origin, then the obvious thing to do is to bring the necessary drugs into absolute contact with the affected tissues. Internal treatment, and even treatment by subconjunctival injections, does not do this so
satisfactorily as ionization. The author has had a special eye bath made. It is of glass, and has two apertures in the bottom, for the admission and exit respectively of the fluid to be used. This is salicylate of lithium, chemically pure, of 1 per cent. strength. In the side of the bath is a carbon plague attached to a terminal. The current used is, in the case of a salicylic ion, 1 or 2 milliamperes, and in the case of the lithium ion, \( \frac{1}{2} \) milliampère. The time of application seems, for the cases recorded, to be 5 or 6 minutes for the salicylic ion and 3 minutes for the lithium ion. To obtain the action of the salicylic ion, the negative pole is at the eye-bath; to obtain the lithium ion the positive is in this position. As a matter of practice, the author seems to have employed the salicylic ion for about 6 minutes, and then to have reversed the current, so as to get the lithium ion, for 3 minutes. A number of cases are reported, and although one or two of them were rather rebellious and took some time, the majority seem undoubtedly to have been first relieved of pain and then cured in a few days, after one or two sèances. Certainly, from one's ordinary experiences of episcleritis, one would say that the author's results are very good indeed. He makes no pretence, it must be said, to have used no other treatment; but, even allowing for the use of constitutional and local treatment of the ordinary kind, the rapidity of the appearance of good effects is distinctly striking.

**Ernest Thomson.**

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**BOOK NOTICE.**


The ninth volume of the *American Encyclopaedia and Dictionary of Ophthalmology* commences with the second portion of the work on Institutions for the Blind; that, namely, which deals with American Institutions. It finishes, except for a few dictionary definitions, with an account of the "Legal Relations of Ophthalmology," which runs to some 150 pages. This work is by T. H. Shastid and is the gem of the volume. Within the reasonable compass of an article, a more scholarly and complete exposition of the subject can hardly be imagined. Here and there flashes of humour illuminate a rather sordid tract of country and help to relieve the gloom with which most of us regard it. Indeed, when it is considered that by the time all the volumes of the *Encyclopaedia* have appeared in print, this writer must have contributed a number of biographies, at a rough guess, running into three figures, one is