it is written by men who are expert in their branch of medicine, and it concerns a most important subject." Its recommendations are, the journal says, very urgent, and it hopes "that this admirable report will be followed by the necessary action which would benefit so many sorely handicapped children."

The *Glasgow Herald* in its remarks says: "The chief difficulties in the way of giving education to short-sighted children are the need for having the classes small in number, and the special training required for the teachers. These two facts taken together entail it is needless to say, a considerable financial outlay and the present is not a time when that can be lightly undertaken."

The *Lancet* also comments on the extra expenditure which the Council's recommendations would entail, and the difficulties of the present time when the outcry in all Government Departments is for economy. Surely, however, it cannot be regarded as an economical policy for a State to carry on a form of compulsory education which tends to lower the standard of vision in its future workers, and in some instances produces inmates for its blind asylums.

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**ABSTRACTS**

I.—DISEASE OF THE UVEA


(1) Fuchs has demonstrated histological lesions in the optic nerve in cases of sympathetic ophthalmitis, granulomatous in nature, which he considers specific to the disease, and which are of such a nature as to suggest that the method of propagation from one eye to the other is by direct spread of a virus along the nerve. He has studied in all 101 cases of sympathetic ophthalmitis; in 30 cases the optic nerve was not sectioned, in the remaining 71 it was examined histologically. Of these, in 17 the optic nerve and papilla were normal, although the characteristic epithelioid cell infiltration was present in varying degrees of intensity. In all the remaining 54, there were changes in the nerve; in 24 there were definite lesions on the nerve trunk, especially marked in the pia, in 4 nodules of some size in the substance of the nerve. The favourite site of the lesion is the pia and its immediate vicinity,
some distance, averaging 14 mm., behind the eye; it does not extend up to the lamina cribrosa. The arachnoid is always free and unaffected. The lesion may well be so pronounced as to be readily visible to the naked eye as a bluish speck, but it never exceeds a diameter of more than 1 mm. to 2 mm. The pathological anatomy is that of a perineuritis or optic neuritis; the infiltration is largely lymphocytic; it infiltrates the pia, separating out its lamellae, and is frequently related to a similar infiltration in the periphery of the nerve trunk itself, arranged especially in association with the peripheral blood-vessels. Much more rarely discrete nodules occur in the substance of the nerve. These also are made up of lymphoid and epithelioid cells, and are always closely associated with the corresponding lesion in the pia, and with a similar infiltration of the uveal tract and sclera.

Fuchs considers that this infiltration of the pia with lymphocytes and epithelioid cells which is associated fairly frequently with a similar interstitial infiltration in the peripheral region of the trunk of the nerve, and more rarely with definite discrete nodules of the same character and in the same region, and associated always with a similar infiltration in the uveal tract, and which occurs some little distance behind the globe and is independent of the condition of the disc, is pathognomonic of sympathetic disease. He enumerates four conditions where a somewhat similar inflammatory infiltration occurs in the optic nerve, all of which have characteristics which distinguish them adequately from the lesion of sympathetic ophthalmitis.

**Infective Endophthalmitis.**—This is found always in association with a papillitis, and varies with it in severity: only when the disc is pathological is the nerve pathological. The severity of the lesion in the nerve is greatest immediately behind the disc, and gradually diminishes as the distance from the eye increases. The central part of the nerve is the most severely implicated—not the periphery.

**Panophthalmitis.**—Infiltration occurs only at a late stage, and only in the region of the disc.

**Atrophy Bulbi.**—Infiltration of the nerve with lymphocytes occurs rarely and only when the abscess is in the posterior part of the vitreous; then the lesion is immediately behind the disc. In old cases the nerve is free from inflammatory lesions.

**Iritis Serosa.**—When the retina is implicated and infiltrated with plasma cells, sometimes the optic nerve shares the infiltration. Such, however, is confined to the immediate neighbourhood of the disc, and again affects primarily the central part of the nerve trunk rather than the periphery.

W. S. Duke-Elder.

(2) **Jaeger** remarks that in spite of all that has been done to elucidate the mystery of sympathetic ophthalmitis we are still in ignorance of its cause. Even the diagnosis is difficult, for bacteriology gives us no help and the histological examination is often of doubtful value. The treatment is purely empirical in nature. In the paper under review he has collected and analyzed all the cases that have occurred in the Tübingen Clinic, and the cases published between the years 1876 and 1923. The conclusions confirm the criteria laid down by Schirmer: the diagnosis of sympathetic ophthalmitis cannot be made with absolute certainty since symptoms identical with those found in the sympathizing eye can be due to varied causes. The diagnosis will, however, be the more likely the nearer the case fulfils the following conditions:

(a) There must be a uveal inflammation in the exciting eye caused by exogenous infection.

(b) The time interval between the inflammation of both eyes must be at least fifteen days, but may be much longer.

(c) The sympathizing eye must suffer from uveal inflammation.

(d) Careful examination of the whole body must not discover any other cause for the inflammation.

Seventy cases of sympathetic ophthalmitis which were treated at Tübingen, for present purposes have been divided into three groups. In the first we have cases in which the exciting eye was not excised. The second contains cases in which the exciting eye was removed after the onset of the sympathetic ophthalmitis, and the third instances of prophylactic excision.

**GROUP 1.**—Contains fourteen cases in which both eyes ultimately became blind. Five of these were extractions of cataract. There were four cases in which the exciting eye became blind but the excited eye retained useful vision (5/8, 5/5, 5/10, 5/8). Only the last was an operation case (cataract extraction). In one case only did both eyes recover. Three of the favourable cases showed choroiditis and papillo-retinitis, but this was seen once only in the examples that ended in blindness. Secondary operations were found only in the severe group and these were tolerated badly, especially by the excited eye. It is interesting to note that among nineteen cases in which the exciting eye was not removed 14 (70 per cent.) became blind in each eye, four retained sight in the excited eye, and one in both.

**GROUP 2.**—Twenty-three cases retained useful acuity (in 16, 6/12 or better), and the average time between the onset of
sympathetic inflammation and enucleation of the exciting eye was 15 days. In sixteen the eye became blind. Here the average time between the commencement of the sympathetic ophthalmitis and the removal of the injured eye was 67 days.

Comparing the two groups we find that when the exciting eye was retained 70 per cent. of the cases became totally blind, whereas when the exciting eye was excised only 40 per cent. became blind, and also that the longer the injured eye was retained the worse was the final result. These results are supported by a study of 383 published examples of sympathetic ophthalmitis following operations. These confirm the opinion gained from the Tubingen cases that the worst forms of the disease follow operations and especially extractions of cataract. Those few cases in which the sympathizing eye was so severely attacked that it had to be removed are of great interest. Only 10 cases could be discovered in the literature and three more were seen at Tubingen. Eleven followed extraction of cataract. Even those cases which first started after the prophylactic excision of an eye which had become inflamed after extraction, in the main ended unfavourably. The value of early excision is absolutely confirmed by these 383 published cases. Special consideration was given to examples of sympathetic ophthalmitis starting after prophylactic enucleation of the injured eye. The much disputed question as to how long after the removal of an injured eye an inflammation in the fellow eye can be regarded as sympathetic in nature is still unsettled. The most important criterion is the histological picture of the enucleated eye. Although the differences between what we may call a dangerous type of eye and the real sympathetic inflammation may be small, and may be confused by mixed types of cell infiltration, yet the microscopic appearances described by Axenfeld, Uhr, Fuchs, and we may add by Henderson in this country, must be regarded as typical of sympathetic ophthalmitis.

Jaeger agrees with Schick who gives fourteen days as the longest time that can elapse between the removal of the exciting eye and the outbreak of sympathetic inflammation in the fellow eye. He says that he pays no attention whatever to the cases cited by the English Committee in 1886 because there was no sharp differentiation between eyes that had been actually removed and those eviscerated, for he says: "the word excision which is exclusively employed might apply to both operations." We think that the author would be well advised to inquire what English ophthalmic surgeons imply by the terms they use before making such a wholesale condemnation of a very useful investigation. It is certainly news to us that "excision" is ever used by English-speaking surgeons to describe evisceration. The cases published in the literature in which sympathetic ophthalmitis appeared at a later
DISEASE OF THE UVEA

date than fifteen days after enucleation of the exciting eye are carefully analyzed, and the author comes to the conclusion that either the inflammation had been present before it was actually detected or that it was due to causes other than sympathetic. We have critically studied these cases and we are bound to agree that Jaeger has to a large extent proved his point. In many cases there was no examination of the excised eye, or the typical Fuchs infiltration with epithelioid cells was not present, and in others the type of inflammation and its clinical history were not that of true sympathetic ophthalmitis. In other cases there was a strong suspicion amounting to probability that the inflammation had been present for a longer time than that recorded.

The conclusions of the research are the following:

1. Eyes in which the exciting inflammation follows an operation upon the globe and especially cataract extraction, give rise to a very severe type of inflammation in the second eye, one which in general ends very unfavourably. Sympathetic ophthalmitis does not often follow simple iridectomy, and when it does is often of a mild type.

2. Sympathetic inflammation which manifests itself essentially as a chorio-retinitis and retino-papillitis, that is to say, affects principally the posterior half of the eye, is in general milder than the irido-cyclitic type.

3. The excited eye is extraordinarily sensitive to any form of operation, and such are generally followed by severe and mostly fatal relapses. The exciting eye on the contrary tolerates secondary operations well.

4. Removal of the exciting eye, even after the outbreak of sympathetic ophthalmitis in the second eye, has, in an overwhelming majority of cases, a most definitely favourable influence upon the inflammation, and the sooner the injured eye is removed the better the result will be as regards final visual acuity.

5. It is highly probable that fifteen days is the latest date for the outbreak of real sympathetic inflammation.

T. HARRISON BUTLER.

(3) Truc, H., and Dejean, Ch. (Montpellier). — Sympathetic ophthalmitis consecutive to extraction of cataract. (Ophthalmie sympathique consécutive a l'extraction de la cataracte.) Arch. d'Ophthal., July, 1925.

(3) This paper is a record of three cases of sympathetic ophthalmitis arising after uncomplicated operations. The patients were females, aged 65, 73, 72 years; in all, the combined operation was performed. The value of the paper lies in the very thorough examination, macroscopic and microscopic of the exciting eye of
one of the patients, illustrated by good micro-photographs. Inflammatory changes of the well-known type were present in all the tissues of the eyeball with the exception of the retina and optic nerve, which were essentially normal.

J. B. Lawford.


(4) Woods' case occurred in a woman, aged 59 years, suffering from diabetes. Vision of the right eye had been reduced to perception of light with poor projection as a result of old iritis and cataract, and the left eye showed a violent diabetic irido-cyclitis. Insulin and dieting were of no avail, attempts to dilate the pupil caused glaucoma, and local treatment with heat, dionin, etc., was unsuccessful. The condition became critical, it was decided to try non-specific protein therapy and 25 million killed typhoid bacilli were therefore given intravenously. Four hours later temperature rose to 101° and there was a leucocytosis, which disappeared next day, when the eye was found to be quieter and vision clearer. Four days later 50 million killed typhoid bacilli were given intravenously and within twenty-four hours the eye had greatly improved. It was now possible to dilate the pupil without causing rise of tension and the improvement was maintained. Vision eventually came up to 20/30 with glasses.

F. A. Williamson-Noble.


(5) Knapp's investigation forms an interesting application of the discoveries of Alan Woods. The latter found that after injuries to the uveal tract there developed, in the serum of these cases, a complement fixation reaction to an antigen made from uveal pigment. This reaction was positive when normal healing in the first eye took place and negative when healing was delayed, and sympathetic disturbance in the second eye sometimes occurred. The clinical value of such a test is obvious, but the practical difficulty is in the performance of the complement fixation test which is of a complex nature. Woods has therefore suggested the performance of an intradermal test, the technique being as follows: The pigment of a cow's uveal tract is suspended in 7.5 c.c. of saline and two dilutions are made: 1 in 10 and 1 in 50. Small intradermal injections are made with each of these solutions on the flexor surface of the forearm and a fourth control injection
of 0.15 per cent. tricresol in saline is also made. A positive reaction consists in the development of an erythematous area sometimes with a central bleb. This comes on within an hour and lasts for a number of hours. In a negative reaction, there is no redness or swelling. Twelve cases of traumatic irido-cyclitis were tested. Four were positive and two of these developed sympathetic ophthalmitis. Eight were negative, and in seven the second eye remained normal. In one, however, a typical sympathetic irido-cyclitis developed. In case the pigment used might have been too old, a fresh supply was obtained but the second test was also completely negative. Knapp does not offer an explanation of this anomalous case but suggests that the subject warrants further study.

F. A. Williamson-Noble.


(6) von der Heydt's paper brings forward the various collateral manifestations which may appear during an attack of uveitis. Most of these are of course well known, but it is useful to have them all grouped together. Thus, fluctuations of intraocular tension are common, hypotony causing the formation of folds in Descemet's membrane, which tend to persist for some time even in the presence of raised tension and consequent oedema of the corneal epithelium. Should the uveitis be extreme in intensity and prolonged in duration, keratitis with deep vascularization of the cornea may occur. Neuro-retinitis is quite common, and may cause central scotomata, as described by Miller. Zeeman has proved in tuberculous cases, by microscopic examination, that the toxins first involved the retina at the ora serrata, then passed along the smaller to the larger vessels, eventually reaching the nerve head and causing a lesion there. It is also accepted that toxins may pass along the lymph spaces of the vitreous.

F. A. Williamson-Noble.

II.—THERAPEUTICS


(1) In an endeavour to find out what radium will do in certain eye conditions, and how best it can be done, 141 cases, comprising various lesions, were treated in the Radium Clinic of the Boston City Hospital from August, 1921 to August, 1923.
It was found that in no class of case was radium uniformly and consistently successful in producing a definite result. At the same time it gave very satisfactory results in several cases. Contrary perhaps to usual belief it did not appear that radium was helpful in xanthelasma. In chronic blepharitis the results were very variable, and of little value in pterygium. In corneal opacities it was found that however dense the scar, a decided improvement came about with treatment, but this was often long and difficult of application outside a hospital clinic. In vernal catarrh the results were sometimes spectacular; in others the treatment was long drawn out before any result could be seen.

In cataract it produced sufficient result in early opacities—both clearing these and improving vision—to make it clear that the improvement was not spontaneous. In more advanced cases no effect could be made on the opacity. The most interesting results came from radiation in five cases of glaucoma where the tension was measurably reduced and vision improved. It is suggested as an aid to miotic treatment prior to, or where necessary, in place of, operation. Many changes of dosage and type of radiation were used to try to determine a consistent line of treatment in any particular eye condition, and, while this perhaps did not appear to be effected, the work accomplished enough to warrant an effort in the use of radium to bring out its possibilities.

R. C. Davenport.


(2) Castra de la Jara and Castresana review the bewildering number of remedies advanced from time to time in the treatment of trachoma. They have resuscitated the somewhat discredited treatment by radium, and believe that with it they have obtained beneficial results of clinical interest and importance.

A preliminary report—admittedly premature—embodying nine cases so treated is given. The dosage used is the equivalent of 10 mgr. of the sulphate salt applied in an initial exposure of five minutes working up to ten minutes, repeated at five-day intervals. Twenty-four hours after the first exposure a reactionary hyperaemia occurs, disappearing largely in 48 hours, which reaction becomes less marked with successive treatments. The immediate end-result is a definite ischaemia of the conjunctiva, with a diminution in size of the granulations and follicles. No long end-results are yet given.

W. S. Duke-Elder.
(3) Lane (Minneapolis) and others. Radium in ophthalmology. *Jl. of Amer. Med. Assoc.*, December 6, 1924.

(3) A communication on this subject was read before the Section of Ophthalmology of the American Medical Association, 1924, by Lane (Minneapolis) of a somewhat academic nature. There was a very interesting discussion.

Edward Jackson (Denver) said: "It was right that the discovery of physical agencies such as the Roentgen ray and radium should be quickly followed by their trial as remedies for all sorts of pathologic conditions. Such trial reveals their dangers, their failure to fulfil some of the hopes that have been entertained regarding them, and their real usefulness in therapeutics.

The radiations that proceed from radium, like the Roentgen ray, seem to have the greatest influence on cells that are relatively undifferentiated, in which the vital force has been and is being expended in the direction of rapid multiplication, rather than toward high differentiation and permanent maintenance of characters. In the eye, the most highly differentiated epiblastic cells of the lens or retina and the mature tissues of mesoblastic origin are relatively unaffected, while the rapidly developing and multiplying cells of an epithelioma or sarcoma are killed or greatly damaged by the same exposure. As with so many other most valuable of therapeutic agents, the large dose kills, while the small dose stimulates or produces the more delicate modification of nutrition that was desired. The killing of cells at the centre of radioactivity, desired in the treatment of malignant tumours, may be followed by more rapid development of similar cells, that have escaped in a more peripheral zone, and receive only a comparatively small dose. The difficulty and importance of destroying all the outlying cell colonies of a cancer are just as evident in using radium as in treating cancer with the knife. Its advantage is in its power to search these out and destroy them by its selective action, while the normal, highly specialized cells, among which the cancer cells are located, are relatively immune.

From a survey of the field, we may learn in what directions and by what paths of experiment in the laboratory or in the dosage, and to what particular problems in therapeutics, our trials with radium may be directed wisely."

Sandford Withers (Denver) said: "The present acceptance of the physical agents radium and Roentgen ray in ophthalmologic practice is particularly apparent. It is unfortunate that the mass of literature on the radiation therapy of lesions of the eye has been published in journals dealing with radiology and has, therefore, not been properly called to the attention of the ophthalmologist. A complete review and bibliography of the use of radium in ophthalmology has recently been made and will appear.
shortly in the American Journal of Ophthalmology. It is essential that we familiarize ourselves with the histologic characteristics of cells and tissues which determine the degree of radiosusceptibility or resistance, in order that we may know fairly well, on a priori grounds, whether a given lesion will or will not regress favourably under irradiation. In general, the more rapid the growth and embryonal the type of cell and the greater vascularity and absence of stroma, the greater is the radiosensitivity of cell and tissue. It is evident, therefore, that the highly specialized non-vascular nature of the normal tissues of the eye makes these structures particularly resistant to irradiation, so that little or no damage should be done in giving intensive irradiation for malignancies about the eye. In dealing with malignancies, I want to urge that the patients come first for irradiation, rather than as a last resort, and that irradiation be considered as radical and rational a procedure as surgical ablation."

Derby (Boston) said: "It was my duty recently to review the work that had been done in the use of radium and Roentgen ray in non-malignant diseases of the eye. Assisted by Dr. J. H. Waite, I went over the literature for the last fifteen years, and, as the conclusions I came to differ from those of Dr. Lane, it may not be out of place to refer to them here. I can endorse Dr. Lane in saying that most articles are sadly lacking in details as to the dosage, screening, length of time between treatments and their duration; also as to whether the element or emanation was used. We came to the conclusion that radium treatment is valuable in non-malignant disease only in very limited groups of cases: first, in the various types of angioma that occur in the region of the eye, it seems to be of very considerable value; second, in xanthelasma; third, in vernal conjunctivitis.

The pathologic changes occurring in early trachoma would seem to be a fertile field for the use of this agent. Unfortunately conclusive evidence is still lacking that radium is of benefit, perhaps owing to the fact that trachoma is due to some infecting organism, and up to date, I believe, it has not been possible to kill such organisms when deep in the tissue without causing necrosis of normal tissue. I believe, however, that further careful work on trachoma is desirable."

Melville Black (Denver) said: "The term trachoma has been used rather loosely. There are many stages. The question is whether radium will be of value in the early stages, or whether its application will be of service in the later stages. It is the old trachoma, with its hard, blue, cicatricial palpebral conjunctivitis with recurring attacks of keratitis, and ulceration of the cornea, that comes to us year after year, and we try everything in the whole category in order to give these patients relief. The only
thing that has ever given me satisfaction in these cases has been excision of the tarsus."

Black's remarks are very much to the point. It is hard to believe that any treatment can very greatly improve old trachoma in which the normal tissue of the conjunctiva, tarsus, and cornea have been replaced by cicatricial tissue. But in the earliest stage of the disease, with small pin-head follicles, it is possible that radium may prove to be of real service, though it is doubtful if it will be usefully applicable in large trachoma clinics.

A. F. MacCallan.


(4) Withers states that there are five general structural characters which determine susceptibility to radiation. They are:

1. Undifferentiated form of cells.
2. Rapid growth with abundance of mitoses.
3. Large hyperchromatic nuclei.
4. Vascularity, especially when due to an abundance of thin-wall capillaries.
5. Absence of stroma or intercellular substance.

On the other hand, differentiated cells with little chromatin in the nuclei, growing slowly with few mitoses and well-formed vessels, are relatively unsusceptible. Bearing these factors in mind, the following conditions appear to be those in which treatment by radiation is the method of choice: Basal cell carcinoma especially as operation, involving removal of more than half of either lid, frequently entails subsequent enucleation to free the patient from the irritation and infection of an exposed globe. Epithelioma of the cornea which should be treated at one sitting with relatively unfiltered radium in cauterizing doses accurately applied. The cornea is ten to fifteen times more radio-resistant than the epithelium of the lids, hence will not perforate readily.

Sarcomata:

(a) Undifferentiated sarcoma: glioma of the brain or cord ought on a priori grounds to yield more readily to moderate radiation than any other known tumour.

(b) Lympho- leuco- and round-celled sarcomas: huge bulky tumours of this type have disappeared within a few days.

(c) Giant-celled sarcomas: the best method is radiation through the intact skin—the skin and tumour capsule should not be incised for diagnosis, as the scar may break down and infected cases as a rule do badly.

Myeloid deposits: several cases of three to five year regressions have been brought about by X-rays or radium.
Angiomas: the results are as a rule admirable.

Spring catarrh: the granulations could easily be caused to disappear by beta radiation.

In the following conditions the use of radium is of proven value but not necessarily the method of choice.

Adenoid cystic carcinoma of the skin or lacrimal gland: radium treatment has been entirely successful.

Prickle-cell carcinomas: no comment made.

Sarcomas and orbital melanomas of differentiated-cell structure: radium treatment usually of little value unless combined with surgical excision.

Actinomycosis, blastomycosis: radiation should be used as an adjunct to the usual iodide treatment. Six cases so treated were permanent cures.

Lupus vulgaris and erythematous: radium the method of choice in all but the acute fulminating cases.

The following are conditions in which radium may be used when more traumatizing procedures are contra-indicated.

Cataract: no definite statement but quotations from papers where a large percentage of cases have shown improvement.

Pterygium disappears with radium therapy: some recur but many completely cured.

Papilloma, particularly susceptible, naevus and xanthelasma require considerably larger doses.

Cicatrices being more radio-sensitive than normal tissue can be markedly softened.

Trachoma and its complications: beta rays should cause disappearance of pannus and granulations with softening of cicatrical tissue.

Conditions where experimental use of radium would be justified.

Phlyctenular conjunctivitis and keratitis, because of the favourable effect of radium on tubercles and the surfaces of tuberculous ulcers.

Keratoconus: the scars from radium applications are uniformly less opaque than those from cauterization.

Chronic dacryocystitis: the granulations blocking the passage made in West’s operation could be smoothed down permanently with radium.

Relief of pain frequently follows radium application to a tumour even though there be no gross effect.

Blepharitis: temporary epilation might aid in bringing about a cure.

Radium has also a large field in prophylactic procedures.

F. A. WILLIAMSON-NOBLE.

(5) McKee and Swett having noted that several authors claimed to have diminished lens opacities by the use of radium, decided to investigate this treatment. The procedure was as follows: 10 milligram hours twice a week for eight treatments, then once a week for eight treatments, then once a fortnight for eight treatments. The radium was in a suitable holder the open end of which was one centimetre from the cornea. The results obtained with twenty-five cases went to show that the therapeutic effect was nil, not a single case showing any improvement. Some cases claimed that their vision had improved but examination showed the opposite to have occurred; it could be traced to the effect of individual training and stimulation of interest in the examination, the lens itself showing no change.

There was no apparent injury to any of the structures of the eye except for an occasional erythema and slight irritability of the lids.

F. A. WILLIAMSON-NOBLE.


(6) Johnston’s paper is based on a demonstration given at a meeting of the New South Wales branch of the British Medical Association in July, 1924. Radium has been used at Sydney hospital since 1911; about 2,000 cases of rodent ulcers have been treated in all and of these 90 per cent. have been absolutely cured. All the cases shown were treated more than ten years ago and the results as shown in the three pages of illustrations are obviously very good. It is well known that the majority of rodent ulcers react most favourably to radium treatment; in the cases here under review the results were obtained by a combination of the selective or specific action with the inflammatory reaction of radium. Of the cases described four were fungating epitheliomas, fourteen were rodent ulcers, one was a case of spring catarrh, one of keloid scar, one of cavernous angioma, and one of verruca necrogenica. The illustrations for the most part have come out well, but the picture of the case of spring catarrh hardly shows the state of affairs to advantage.

R.R.J.


(7) Since Sezärac and Levaditi in 1921 introduced the treatment of syphilis by bismuth, a considerable number of observations has been published on the place of this addition to our therapeutic
armamentarium. The original compound—tartrobismuthate of sodium or potassium—has been largely replaced by the iodo-
bismuthate of quinine (Fournier and Guenot; Acad. de Sci., Paris, Oct., 1921). Using this latter Morón reports the results of the treatment of 72 cases of ocular syphilis dealt with by him during the last twenty months. The cases include the more acute complications, as well as those tertiary manifestations so frequently and typically met with in the eye, and which react so disappointinglly to arsenical or mer-
curial medication. He finds the drug non-toxic, and that it possesses an especially marked therapeutic effect in the recent tertiary manifestations of the disease. On several occasions when mercury and arsenic have been given with little or no effect, the exhibition of bismuth has achieved dramatic results. In resistant cases it may well be substituted for these, and the employment of combined medication is not excluded. Especially in neuro-ocular manifestations is its superior efficacy marked.

W. S. Duke-Elder.

(8) Gourfein, D. (Geneva).—The chemotherapy of ocular tuber-
culosis by means of the salts of bismuth. (De la chimio-
thérapie de la tuberculose oculaire par les sels de bismuth).
Rev. gén. d’Ophthal., January, 1925.

(8) In the year 1921 Gourfein commenced the study of the action of bismuth as a therapeutic agent in syphilitic eye diseases and published two interesting articles in the Revue générale d'Ophthalologie for 1922 and 1923. Abstracts of these articles will be found in the British Journal of Ophthalmology for 1923, page 284, and 1924, page 41. Being well satisfied with the results obtained in syphilis by this method of treatment, and although he is well aware that there is no sort of consanguinity between the spirochaete and the tubercle bacillus, Gourfein decided to see whether the good results obtained in syphilis could be repeated in tuberculosis. He expresses himself as greatly astonished to find that they were so repeated, and six cases of eye disease clinically diagnosed as tuberculous were successfully treated by the intra-
muscular injection of tartrobismuthate of potassium and sodium. There is no doubt, says the author, as to the good effect of the treatment in these six cases, but while the condition was clinically tuberculous, the action of the salt must be confirmed by experiments on animals. About a score of experiments seem to have been carried through on rabbits, cultures of tubercle being injected into the iris, while the bismuth salt was injected intramuscularly (in most cases) at varying intervals thereafter. Not all the experiments are detailed in this article, but the author's conclusion is that in all the infected rabbits the bismuth salt retarded the
action of the tubercle infection, and had a curative effect in several of them. In all the controls, not treated by the bismuth salt, the evolution of tuberculosis was more rapid and severe. Gourfein is careful not to make too much of his results and hopes that further observation and experimentation will prove the value of this method of treating ocular tuberculosis.

Ernest Thomson.


(9) It is always of interest to hear the conclusion of the whole matter even though one does not necessarily agree with all the conclusions. Chaillous and Cotoni have reported to the Société d'Ophthalmologie de Paris on the above-named subject. The article contains six chapters, namely: (1) on serums and vaccines in general; (2) serums, vaccines, and tuberculins in ocular tuberculosis; (3) vaccines and serums in ocular complications of gonococcal infection; (4) serum therapy and vaccination in ocular pneumococcal infections; (5) antitetanic serum therapy, (6) serum therapy and vaccinotherapy in staphylococcal and streptococcal infection of the eye and adnexa; (7) autoserumtherapy and autohaemotherapy in ocular therapeutics. The conclusions come to by the authors occupy a whole page of the journal; an effort is made to synopsize them usefully, as follows: in contrast to the undeniable results of antitubercocitic and antitetanic serum therapy stands the inefficiency of serums and vaccines in the greater number of infections to which man is liable and which may involve the organ of vision. Tuberculosis is a case in point. Regarding antigonococcal serums, in spite of successes obtained in ocular therapeutics we should not rest content until such serums are clearly efficacious whatever the site of the infection. As to meningococcal infection the value at the present moment of serums and vaccines is mainly preventive rather than curative. Serum therapy is only an adjuvant in the treatment of pneumococcal hypopyon keratitis. Bacteriotherapy has had some success in the treatment of staphylococcal infections of the eyelids. The possibilities of zur Nedden's autoserumtherapy in sympathetic ophthalmitis should be borne in mind. The specific treatment of trachoma remains to be discovered.

Ernest Thomson.

(10) Brandes, Dr. (Antwerp).—Chronic inflammation of meibomian glands and intestinal vaccine. (Meibomite chronique et entéro-vaccin.) Arch. d'Ophtal., March, 1924.

(10) Brandes' patient was a female, aged 44 years, who had suffered for two years from suppurative inflammation of the meibomian glands. Local remedies and fifteen inoculations of
antistaphylococcic vaccine had failed completely. Bacteriological examination of the nasal mucus discovered abundant bacillus coli and some unusual staphylococcus aureus. In the stools the colon bacillus predominated. A vaccine was prepared from the bacillus coli from both sources. Ten injections in increasing doses were given, the first four every fourth day, the others at intervals of a week. The general reaction was slight and after the third injection the temperature did not rise above 37.6°C. After the fourth injection the patient expressed herself as better in health. Six months later there had been no recurrence of the tarsal inflammation.

The author's discussion of the interpretation to be placed upon the result of his treatment should be read in the original.

J. B. Lawford.


(11) Aubineau, after some remarks on the literature of the subject, tells how, with the utmost scepticism, made trial of the internal administration of the Russian tuberculin "endotine," which tuberculin is characterized by the absence of exotoxins. His conclusion from the observation of three cases is a very modest one and may be given in his own words: "The object of this study is limited to the possibility of action of tuberculin introduced by the mouth. Our observations appear to demonstrate that 'tuberculin therapy by ingestion' may be efficacious and merits attention. In bearing witness to what we saw, or rather, to what we believed we saw, we may express the strong desire that similar trials by other hands and eyes will either confirm or refute our results."

Ernest Thomson.


(12) Allisson refers in the first place to three cases of adult gonococcal conjunctivitis treated by subcutaneous injections of typhoid bacilli according to the method of v. Szily and Sternberg, which cases were recorded in *Rev. gén. d'Ophthal.*, p. 101, 1922 (*vide Brit. Jl. of Ophthalm.*, p. 190, 1923).
The present cases are those of two adults with gonococcal purulent conjunctivitis and their importance lies in the fact that no other method of treatment whatever was employed, unless one counts as treatment the use of a preliminary washing out of the culs-de-sac with 1 in 2,000 permanganate of potassium solution. The following is a summary of the treatment:

Case I.—September 14, 1922: subcutaneous injection in the left arm of 0.5 c.c. of typhoid vaccine; no rise of temperature. September 17: no change; secretion very abundant. September 18: injection of 1 c.c. of vaccine; temp. 38.80 C.; less secretion and less chemosis. September 21: injection of 1 c.c. of vaccine; temp. 39.20 C.; secretion almost nil; eyelids no longer oedematous; chemosis gone, three small ulcers near the limbus. September 25: corneal ulcers completely filled up, eye normal; visual acuity 1.

Case II.—The details of treatment are practically the same as in the first case; one injection of 0.5 c.c. and two injections of 1 c.c. of vaccine resulted in complete cure with full vision in six days; there was no corneal ulceration in this case; the maximum temperature reached was 39.20 C.

These results are extremely interesting. The author refers to the work of others who have used the method.

ERNEST THOMSON.

(13) Fietta (Fribourg).—Some trials of iontophoresis with atropin. (Quelques essais d'iontophorèse à l'atropine.) Rev. gén. d'Ophtal., August, 1924.

(13) Fietta deals in a very fair and judicial way with the question of the value of iontophoresis with atropin. Hitherto, he states, iontophoresis has been carried out in ophthalmology with a very limited number of substances, chloride and iodide of sodium, zinc sulphate, and salicylate of soda; but there seemed no reason why atropin, for example, should not be capable of electrolysis, and, applied in the form of ions, give stronger results than when used in the ordinary way. On examination, however, of the constitution of the alkaloid it turned out that, according to Richet, the various bodies into which atropin is transformed by the addition or subtraction of water, are by no means active. When heated and submitted to the action of acids, atropamin (C17H21N02) and water are formed from atropin (C17H28NO0:) while, on the other hand, hydration results in the formation of tropic acid (C9H1003) and tropin (C8H15NO). It was clear, then, that even supposing atropin to be capable of decomposition by electrolysis the resulting bodies would not be harmful. Now, although we know practically nothing about the ionization of alkaloids, it seemed probable that a solution of sulphate of atropin would be decomposed into an acid radical and atropin itself with unimpaired properties. The
question which required an answer was whether atropin ionised
would be more active than when instilled and give stronger, more
rapid and more lasting results, and would break down synechiae
which had resisted instillations. The first point to be decided
was the action of atropin ionization on the normal eye. Owing to
the extreme sensitiveness to atropin of the human eye as com-
pared with the eye of certain other animals (some of which are
very resistant to atropin, e.g., rabbit, which can feed upon bella-
donna leaves), experiments in ionization were carried out on the
rabbit. The results were quite positive, for whereas instillation
of 1 to 1,000 or 5 to 1,000 gave very little result, iontophoresis for
one or two minutes at one milliampré gave quite marked and
rapid mydriasis with abolition of the pupil reflex. Obviously
the alkaloid had not lost its properties and in the ionic state had
increased activity.

It would occupy too much space to give details of the four cases
of rebellious iritic adhesions which the author now treated with
atropin iontophoresis. The result only will be given here. The
solution of atropin sulphate employed was 1 to 1,000, the current
employed was from 0.75 to 1.25 milliamperes and the duration 1.5
to 2 minutes. The results were only moderately satisfactory so far
as the breaking down of adhesions was concerned. As the result
of thirteen applications in the four cases complete rupture
occurred twice and partial rupture three times. The author
suggests that better results might be obtained with stronger
solutions of atropin or more powerful mydriatics such as
scopolamin, but he points out that such applications might not be
very "convenient" since all his patients suffered to some extent
from headache after the treatment with 1 to 1,000 atropin. He
suggests the further exploration of a method which might be of
considerable value.

Ernest Thomson.

(14) Ring, G. Oram (Philadelphia). — Adrenalin chlorid with
special reference to its subconjunctival injection for glaucoma.
Amer. Jl. of Ophthalm., July, 1925.

(14) Ring, after referring to Gradle’s article gives a brief
résumé of the various effects produced by adrenalin. The
following points are worthy of note. Pilcher in 1914 found that
its injection, under pressure, into the nasal submucosa is almost
equivalent to intravenous injection; a lethal dose causes acute
dilatation of the heart and pulmonary oedema; solutions may be
boiled once or twice without losing their potency; when dropped
into the eye it produces widening of the palpebral fissure and slight
exophthalmos as well as blanching of the conjunctiva, and where
the sympathetic mechanism is abnormally sensitive, as in hyper-
thyroidism, mydriasis occurs. In the ordinary way this is not brought about unless the drug is injected subconjunctivaly. Loewi's sign, viz., that such mydriasis indicates pancreatic insufficiency or hyperthyroidism is not sufficiently constant to be of value. Adrenalin mydriasis is accompanied by a lowering of tension due to local vaso-constriction, which is followed later by vaso-dilatation, and a rise in tension; it is therefore advisable to follow the adrenalin with some miotic in cases of glaucoma. Adrenalin is therefore useful (1) where atropin is only partially successful in breaking down synechiae; (2) when "despite our desire to continue the mydriatic we are compelled to resort to the miotic because of the sudden rise in tension." The author concludes with an account of three glaucoma patients in whom adrenalin was used and produced an almost immediate and rather startling decrease of tension, which he followed in 48 hours by posterior sclerotomy. The usual dose is 4 m. of 1/1,000 adrenalin, injected subconjunctivaly, midway between the lower border of the cornea and the inferior fornix.

F. A. WILLIAMSON-NOBLE.


(15) Fraser, who is the Director of the Medical Professorial Unit of St. Bartholomew's Hospital, gives in this paper the results which have been obtained in the wards of the hospital in a series of 24 cases of Graves's disease. For more than a hundred years a relationship between endemic goitre and iodine has been recognized and the earlier physicians tried iodine extensively in the treatment of goitre with the result that a certain number of cases so treated developed a state of affairs resembling true Graves's disease; the pendulum swung back and iodine was given up to a large extent in the treatment of thyroid cases.

Of late years evidence has accumulated to show that in exophthalmic goitre an iodine deficiency may be present and that the administration of that drug may have some therapeutic value in these cases.

Eight of the author's cases are here described in some detail; the rest of his paper deals with the regulation of the dosage and discusses the results of recent workers, mainly American, in this field. A good bibliography of modern work on the subject is appended. Fraser's conclusions are as follows:

"(1) The effect of iodine administration has been studied in twenty-four cases of exophthalmic goitre.

(2) Iodine can bring about a lowering of basal metabolic rate, and of heart rate, and an increase of body weight, with a striking improvement in the general condition of the patient."
(3) The improvement obtained with iodine does not as a rule persist.

(4) The optimum dose at the commencement of the treatment appears to be about m. xv of a 10 per cent. solution in alcohol, but this dosage cannot as a rule be maintained more than a few days or weeks. If the administration is stopped the condition immediately relapses. For prolonged treatment the dose should be lowered as soon as the initial improvement has taken place, and the administration continued with doses of m. iij to m. vj daily. The dosage must be carefully regulated according to the condition of the patient.

(5) Increasing hardness of the thyroid gland is an indication for a smaller dosage.

(6) The condition of the patient may be made worse, instead of better, if too large a dosage is employed."

R.R.J.


(16) South-east Missouri being a hotbed of trachoma Donnell has had considerable clinical experience of this disease during his twelve years of work there. He found that even pannus and ulcers were no contraindication to the use of 2-3 per cent. silver nitrate solution. A case in point is a boy, aged 18 years, who was seen in 1915 and treated for six months on the lines indicated below. The corneae cleared, the lids smoothed down, vision was improved to 20/30, and although he has had no further treatment there have been no recurrences up to date. The technique is as follows: Three instillations of 5 per cent. cocain precede all applications. Cotton wool is wrapped tightly round a toothpick and dipped in a 1 per cent. solution of silver nitrate, all excess of solution being removed. This is applied to the inside of the lids with fairly stiff massage two or three times a week. The strength of the solution is gradually increased until the point of toleration is reached. This varies in different patients, strengths up to 10 per cent. having been used. The conjunctiva is irrigated with normal saline before allowing the everted lids to resume their normal position if the strength of the silver nitrate is 2 per cent. or greater. Ice packs are used after the application of strong solutions. The best results are obtained in the chronic cicatricial stage of the disease, the acute follicular cases being more intractable. The author considers, however, that in these cases one obtains better results by silver nitrate than by any other method.

F. A. WILLIAMSON-NOBLE.

(17) The essence of Nicati's article is fairly well summed up in the title. The author pins his faith to "dear old copper," a well-known remedy since the time of Hippocrates. But he employs the remedy in the form of injections of a strength from 1 to 1,000 to 1 to 100, and especially the last named. "The application is made in the conjunctival cul-de-sac immediately behind the edge of the everted tarsus. It should be repeated soon after the disappearance of the very intense oedema brought about in the eyelid, say after approximately eight, ten, or fifteen days. The maximum number of applications has been six for each eye." Under this treatment the cicatrix is said to be pale, flat, and superficial and not accompanied by palpebral inversion. The author holds that the disease in question is "eminently curable."

ERNST THOMSON.

(18) Poyales, F. (Madrid).—Ocular phototherapy with Koeppe's apparatus. (Primeros ensayos de fototerapia ocular con el aparato del Profesor Koeppe.) Arch. de Oftal., Hispano-Amer., Tomo XXV, pp. 555-559, October, 1925.

(18) Poyales records very favourable results from an initial series of cases treated by phototherapy, using the instrument and technique of Koeppe (Diathermie u. Lichtbehandlung des Auges, Leipzig, 1919). By this instrument filtered light of wave-length 3,500-5,000 Å is focussed directly upon the eye, and the optical system is so adjusted that a diffuse light can be rayed over the eye and lids, or a concentrated beam can be focussed upon the structures of the anterior part of the globe. Using the former technique ("external phototherapy"), in sittings starting with one to two minutes duration, and working up to ten minutes, Poyales has obtained results which may be summarized as follows: blepharitis uncomplicated by refractive errors, and resistant to treatment by drugs locally, clears up after the first few treatments; persistent treatment (up to 40 sittings) completely takes away the inflamed appearance of the lid margins, and induces the lashes to re-grow. Phlyctenular conjunctivitis reacts well; the soothing effect on the photophobia is especially marked, immediate relief, though somewhat temporary, being often obtained. Superficial corneal ulcers rapidly improve, and are cured in eight to ten sittings. In severer ulcers (serpiginous, etc.) he considered that
the gravity of the lesion did not justify him relying entirely on light treatment; local treatment by drugs was therefore used as well. The impression, however, gained is that the light therapy is of real value in these cases. He considers benefit to be derived from the method in iritis and chronic glaucoma, but none in interstitial keratitis, vernal catarrh, and old trachomatous lesions with pannus, ectropion, etc. The second method of application ("internal" phototherapy) was used in conjunction with the "external" treatment in cases of chronic irido-cyclitis and choroiditis. Satisfactory results are claimed here also; a case of tuberculous iritis reacted particularly well.

W. S. DUKE-ELDER.

III.—ANATOMY AND PHYSIOLOGY

(1) Fortin, E. P.—A simple entoptoscope for viewing the retinal circulation. (Presentacion de un pequeño aparato para la visión entópica de la circulación retiniana y glóbulos de la sangre.)


(1) Fortin has devised an entoptoscope for which he claims simplicity in principle, ease in application, and clearness in results. It is particularly suitable for viewing entoptically the vitreous and the foveal retina. In 1907 he demonstrated to the Academy of Sciences at Paris a similar instrument, using as a source of light a mercury vapour lamp of the type devised by Cooper Hewitt. The price and inconvenience of this instrument has prevented its general clinical application, and for this he now utilizes intense solar light concentrated by a convex lens, and filtered through blue glass which transmits a diffuse, homogeneous, monochromatic blue light of wave-length 4360 Å. Against this uniform blue field there stand out clearly the histological elements of the vitreous, and the structural details of the foveal region, with a clear picture of the capillary vessels and their contained red cells.

The Histological Structure of the Vitreous.—With the aid of the entoptoscope the principal structural elements of the vitreous
ANATOMY AND PHYSIOLOGY

are seen to be elongated narrow cylinders, which, internally and externally, have a calibrated appearance, presenting constrictions at more or less regular intervals. The author compares them to collars of pearls with several detached pearls at the ends of the string. There are many immature and intermediate forms, but it would seem probable that these are derived from a common source. They move about continuously, responding to every movement of the eyes, rolling up, and becoming entangled in bundles. When they congregate in front of the macula in great numbers they obtrude themselves upon, and may even impede vision to an appreciable extent, constituting the material basis of the everyday "subjective" phenomenon of "muscae volitantes."

The Perifoveal Circulation.—Against the blue field of the entoptoscopy the retinal blood-vessels of the foveal region are easily seen, and the circulation of the red corpuscles readily observed. At the fixation point itself there are no capillaries, and there are no vessels of size greater than a capillary for some distance round that area. These are so small in calibre as to allow only one erythrocyte to pass at a time, and these pass in a regular sequence separated the one from the other by a column of plasma. The vessels in this neighbourhood appear and disappear from time to time, and are distributed in a regular manner all round the fixation point, being separated by quite regular intervals.

The Structure of the Macula.—For the examination of the macula, if the eye is placed behind a filtering screen which excludes all rays except the yellow of wave-length 5770\ Å, a direct view of this region is obtained as a clear, sharply defined positive image against the yellow field.

If between the source of light and the eye a Nicol prism is interposed and slowly rotated, a mosaic of circles is seen entoptoscopically in the region of the fovea. Under ideal conditions, that is, with a bright mercury vapour lamp, a diaphragm interposed to reduce the field of projection, and the eye placed at a suitable distance so as to obtain the maximum magnification of the smallest field, it is claimed that these are readily demonstrable clinically with monochromatic light of very varying wave-lengths, red, green, or yellow. This observation is not new, and they have already been described as "les Houppes de Haidinger"; Fortin has, however, attached much importance to them. He argues that, since they appear as small, equal circles arranged side by side in one plane, they must be the optical effect of an extremely delicate, single, regularly arranged histological layer in the retina, which he has located, partly by a process of exclusion, partly by the method of parallax, in the layer of fibres of Henle, between these and the layer of internal granules.
He explains the fact that this has hitherto escaped detection by the usual histological methods as due to its delicate and transparent nature. By taking fresh sections from the eyes of chloroformed animals, he has demonstrated a hitherto undescribed layer in the foveal region of the retina, situated between the fibres of Henle and the internal granular layer, monochromatic photographs of which are reproduced in his paper. It is composed of a single stratum of transparent bell-like structures, characterized by the regularity of their arrangement. They are closely packed, there being more than 800,000 to the square centimetre. Each lies with the dome of the bell towards the cones, and the mouth is closed by a plano-convex meniscus, from the centre of which a fine fibre runs into the layer of internal granules.

The author hazards the opinion that the study of the characters and the functions of this layer, and of the fibres of Henle which surround it, may throw some light on obscure points in the physiology of the retina, and that a knowledge of its morbid changes may lead to a better understanding of such little understood pathological problems as failure of fixation, amblyopia, strabismus, and nystagmus.

This paper may be compared with interest with:


Scheerer used an arc lamp viewed through a uviol glass filter, by which simple means the red blood corpuscles are seen entoptoscopically as small bright spots. Over 550 eyes were thus examined clinically, and the circulation studied in the normal and various diseased states. The optical physics of the phenomena of entoptoscopic vision are given in detail, as well as a very comprehensive bibliography of the theoretical and clinical issues involved.

Former communications by Fortin on this research are:

Arch. d’Ophthalt., 1906-1908—
Essai sur la Physiologie de la Fovea centrale.
Du scotome central dans l’amblopie congénitale (avec Scrini).
De la méthode entoptique comme méthode de diagnostic.

Receuil d’Ophthalt., 1906-1908—
D’une théorie psychophysiologique de la vision.
Les Houppes de Haidinger, test de vision centrale.

Comptes rendus, Acad. des Sciences de Paris, June 1, 1908.
Confer. en la Facultad de medicina de Buenos Aires, October 4, 1924.
Asociación Médica Argentina, May 7, 1925.

W. S. DUKE-ELDER.
(2) Bednarski, A. (Lwow, Poland).—Physiological excavation of the optic nerve. (De l'excavation physiologique du nerf optique.) Arch. d'Ophtal., January, 1925.

(2) Bednarski has examined ophthalmoscopically 833 eyes in reference to the presence or absence of excavation of the optic nerve in emmetropia and varieties of ametropia. He finds that an appreciable excavation is present in 86 per cent. of emmetropic eyes; the same percentage is found in hypermetropia up to 3D.; in hypermetropia from 3D. to 5.5D. the percentage is 74, and in hypermetropia of 6D. and higher it drops to 34. In low myopia, up to 3D., 84 per cent. show excavation; in myopia from 3 to 8D., 23 per cent.; in myopia of 9D. and upwards the percentage is only 5. In cases in which the refraction is equal or nearly so in the two eyes the excavation is, with few exceptions, of equal depth; in cases of anisometropia the eye with faulty refraction almost invariably shows a lower degree of excavation.

J. B. Lawford.

(3) Edmund, Dr. Carston and Möller, H. Ulrik (Copenhagen).—Vision in light of reduced intensity. Arch. of Ophthal., November, 1925.

(3) Edmund and Möller’s work was carried out with a series of what are known as photometric glasses, manufactured according to Tscherning’s specifications. The glasses are made in the same way as Triplex glass, with a central sheet of neutral grey gelatin. By varying the thickness of the sheet, it is possible to obtain variations in the amount of light transmitted. They are numbered from 1 to 10 in such a manner that number 1 transmits $\frac{1}{10}$ of the light, number 2 $\frac{1}{10^2}$ number 3 $\frac{1}{10^3}$ and so on, the unit being called a photoptive (Ph). The advantage of this scale is that the glasses may be added in the same manner as spectacle glasses, measured in dioptres. Thus Ph. 2 combined with Ph. 1 is equivalent to Ph. 3. Fractions are also provided, 0.25, 0.50 and 0.75. It is suggested that a similar scale would be useful for the classification of smoked glasses.

The degree of brightness of an object (C.) is determined by the strongest Ph. glass through which a maximally adapted eye is just able to see it. Maximal adaptation is obtained by wearing Ph. 10 light-proof for half an hour. Under these conditions, the normal individual can just see a square of white paper 27. mm. square at 1 metre’s distance and illuminated by a standard candle, through Ph. 5. The degree of brightness of this paper is therefore put at C. = 5; if a ten candle power lamp be used, it becomes 6 while a 100 cp. gives 7 and so on. The degree of brightness of a candle flame is 10. The unit is the faintest light which a fully adapted eye
can just perceive and corresponds to \( \frac{1}{10^{10}} \) of the brightness of a candle flame. A brightness of 5 means that an object is \( 10^5 \) times as bright as the unit. **Power of distinction.**—This follows the usual Fechner or Bouguer law, the normal eye being able to distinguish the difference in brightness of two well illuminated objects provided this difference is not less than \( \frac{1}{100} \) of the total brightness.

Tscherning designates this faculty by the letter D. and suggests the following method of measuring it:

\[
\begin{align*}
D. &= 0 \quad \text{Bouguer's fraction} = \frac{1}{10^6} = 1 \\
D. &= 1 \quad \text{“} \quad \text{“} = \frac{1}{10^1} = \frac{1}{10} \\
D. &= 2 \quad \text{“} \quad \text{“} = \frac{1}{10^2} = \frac{1}{100} \\
D. &= 0.75 \quad \text{“} \quad \text{“} = \frac{1}{10^{0.75}} = \frac{1}{5.6} \quad \text{and so on.}
\end{align*}
\]

Special grey test types have been devised for measuring this power, the letters being large so as to rule out the effect of visual acuity and illuminated to a degree of brightness \( C. = 8 \). Various observations have been made with these glasses, among which are the following: The normal range of adaptation is up to \( 10 \) Ph. if eccentric fixation is used, in the centre, however, the range is only \( 7 \) Ph. This difference is accounted for by absorption due to the yellow pigment of the macula. The more the illumination is reduced the greater becomes this central scotoma. The time required for complete adaptation varies enormously with the pre-exposure. If it has been bright sunlight one requires half an hour of darkness before being able to see a candle flame through \( 10 \) Ph.; if it has been lamplight, only 10 minutes are required. The above statement applies only to peripheral sight. On account of its yellow pigment, the macula is already in a state of adaptation which corresponds to that which the periphery has, after wearing \( 3 \) Ph. for some time. The centre therefore attains its maximum adaptation (Ph. 7) very rapidly. On passing from darkness to light, adaptation is lost quickly at first and then more slowly, the process taking about the same time as that required for adaptation. If test types are illuminated to the degree \( C. = 8 \), Ph. 1 or even Ph. 2 will not reduce visual acuity. A more or less proportional diminution occurs however with the stronger Ph. glasses, and a curve may be plotted with Ph. units as abscissae and visual acuity as ordinates. The normal curve differs considerably from that found in conditions such as hemeralopia idiopathica, glaucoma simplex, etc.

F. A. WILLIAMSON-NOBLE.
DISEASE OF THE LENS

IV.—DISEASE OF THE LENS

(1) Pesme, P., and Chauliac, J. (Bordeaux).—Congenital anterior capsular cataract. (Cataracte congénitale capsulaire antérieure.) Arch. d'Ophtal., June, 1925.

(1) Pesme and Chauliac describe and illustrate an unusual variety of cataract unlike any reported examples which they have been able to find. The condition was discovered accidentally in a soldier, aged 26 years. The opacities examined in the ordinary way resembled spots of candle grease (taches de bougie). By oblique illumination each eye shows on the anterior surface of the lens, and limited to the pupillary area, a series of rounded dead white spots. They vary in size from that of a pin's head to that of a millet seed and are arranged in a rough circle. Examined with a corneal microscope and slit-lamp the spots appear to be quite superficially in the anterior capsule, as if imbedded in this structure. Each spot is bounded by a minute depression which appears dark or luminous according to the incidence of the rays of light. This halo has been noted by Vogt who believes it to be constantly present in anterior capsular cataract. Each spot is dead white in direct illumination and its surface has a felted appearance, whereas by transmitted light it is translucent and faintly brown. The opacities are very thin and do not encroach upon the layers of the lens immediately beneath the capsule.

In the right eye there is a small remnant of pupillary membrane, and in both eyes are small areas of minute pigment dots in the circle of the grease spots.

The authors consider this case to be one of congenital cataract; no family history of defect of vision was obtainable, but it does not appear that any other members of the family had been available for examination.

J. B. Lawford.

(2) Gourfein-Welt, Madame L. (Geneva).—Does the blood-serum of cataractous patients differ from that of the non-cataractous? (Le sérum du sang des cataracteurs diffère-t-il de celui des non-ataracteurs?) Rev. gén. d'Ophtal., April, 1925.

(2) Gourfein-Welt's short article appears to be of the nature of a preliminary communication of investigations on the subject of the question asked in the title, based on the determination of refractive indices. The details of experimental method should be sought in the original. Suffice it here to say that the author compares by means of the Zeiss refractometer the respective refractive indices of (1) human-blood serum alone; (2) blood-serum of non-cataractous persons plus dessicated lens matter; (3) blood-serum of cataractous persons plus dessicated lens matter. The principal conclusions reached are the following: (1) The index
of refraction of human serum in presence of dried pulverized human cataract was, in 57 cases out of 64, higher than that of serum alone. The blood-serum thus possesses a modifying power with regard to the cataractous matter; (2) the difference between the index of refraction of serum plus cataract (S. plus C.) and that of S. alone of the cataractous is almost always smaller than that which exists between the index of refraction of (S. plus C.) and S. alone of the non-cataractous.

From these conclusions it follows that the modifying power of blood-serum with regard to cataract powder is lower in the cataractous than in the non-cataractous. These conclusions differ from those of v. Hippel and Abderhalden and of Schoeppe, on the one hand, and from those of Roemer and Gebb on the other. The author does not consider that her conclusions are definite, or complete; far from it, indeed, since a crowd of questions are presented for solution.

ERNEST THOMSON.

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BOOK NOTICES


The sixty-first Annual Meeting of the American Ophthalmological Society was held at Washington, D.C.; the volume under notice contains the papers read and the discussions that took place. Some of these have already received notice in our columns and we hope to deal with some of the others later. The volume in make-up and general appearance bears a striking resemblance to that of the Ophthalmological Society of the United Kingdom with the exception that its records are confined to those of the American Society, but do not contain a Bowman Lecture or any equivalent for that valuable feature. The two coloured plates, if of no very exceptional interest, are of great excellence. All the papers contain many points of interest and reflect credit on writers and on the Society.

Archivos de Oftalmologia de Buenos Aires. November, 1925, No. 1, Tom. 1, and December, No. 2, Tom. 1.

Argentine ophthalmology has reason for congratulations on the appearance of the first two numbers of the above-mentioned journal. Both the paper and the printing are excellent. Many of the contributions have previously been read at meetings of La Sociedad de Oftalmologia. The Inaugural Address of the Professor of Ophthalmology, Argañaraz, contains an interesting account of