linear identity, has been adopted empirically in all the most accurate physical instruments, and is used for example in the vernier and the balance. Physicists have been very ingenious in applying it to otherwise apparently unsuitable measurements, as for example the measurement of temperature by the thermometer. There are, however, many physical measurements to which this criterion cannot, or at present has not, been applied, e.g., photometry. In all such cases the experimental error is enormously increased, and in many cases it is so great that only very approximate results are attained. Physicists are of course not blind to the physiological factors and do much by graphic and statistical methods to minimize errors. The fact, however, remains that they are so accustomed to deal with measurements of the highest order of accuracy, founded upon linear identity that they succumb to two errors: "(1) that of regarding these observations as of the supreme validity of mathematical abstractions; (2) that of regarding other observations, to which the 'linear identity' criterion is inapplicable, as of far greater accuracy than is in fact the case. When the mistakes arising from these errors are too patent to be ignored, physicists are apt to exhibit an unwarranted impatience with the shifting sands of biological science. The fact must, however, be faced that in all cases the observing instrument is a living organ and is, therefore, in a perpetual state of change. The rate of change is relatively slight in the most favourable cases but rapid and complex in the less favourable. Physicists have been notoriously successful in so reducing the physical complications of experiments to a minimum that the problem nearly approximates to a mathematical abstraction, and, therefore, the highest degree of accuracy. Further advance is to be sought by greater attention to the biological complexities in order that they, too, may be subject to more complete control."

BOOK NOTICES


In September, 1920, the Minister of Health (Dr. Addison) appointed a Committee "to investigate and report on the causes of blindness, including defective vision sufficient to impair economic efficiency, and to suggest measures which might be taken to prevent blindness."

This Committee has held 46 meetings, besides numerous meetings of two Sub-Committees, and has examined 64 witnesses.

It presented an Interim Report, in 1921, relating to the lights
used in cinema studios and we now have before us its Final Report.

The gross cost of the preparation of the Reports (including the expenses of the Committee) is estimated at £907, of which £103 10s. represents the gross cost of the printing and publishing of the Reports.

The Committee has confined its attention to England and Wales, availing themselves in a few instances of information acquired from Scotland.

In dealing with the subject the Committee has divided up the different forms of blindness and impaired eyesight into classes, mainly according to their causation. To give the reader a general idea of the Committee's findings, we will first briefly epitomize the conclusions it has arrived at as regards causation under each of its headings, and subsequently deal with the recommendations it makes respecting preventive measures and treatment.

**Ophthalmia Neonatorum** is the commonest cause of blindness. The returns which the Committee has had before it of the number of notifications of this disease in different districts, appear to indicate such variations in completeness, and in the conditions notified, that it has found difficulty in giving any final opinion respecting the increase or decrease of the disease. It finds, however, that there is definite evidence of diminution in the amount of blindness to which the disease gives rise.

Bacteriological examination in cases of ophthalmia neonatorum has shown that the gonococcus is present in from 50 to 60 per cent.

**Syphilis** is the direct cause of not less than 10 to 15 per cent. of the blindness at present existing in this country. It is the innocent who suffer most as shown by the high incidence of congenital syphilis as a cause of blindness in children.

**Congenital Malformations of the Eye** are stated in one return to be responsible for 29.4 per cent. of blindness in children, and in another for 20.2 per cent. These figures sound very surprising until we read that they include such defects as cataract, dislocation of the lens, complete or partial absence of the iris, or albinism. A large number of cases of congenital cataract gain sufficient sight by operations to enable them to follow useful occupations, so that their blindness is only of a temporary character. The vision of patients with congenital dislocation of the lens can usually be greatly improved, by a plus lens if they see through the aphakic area, or by a minus lens if they look through the edge of the dislocated crystalline lens. Complete or partial absence of the iris is not in itself a cause of blindness, only of impaired sight. The same applies to albinism. Albinism in Robert Lowe (afterwards Lord Sherbrooke), which was of a very pronounced character, did not
BOOK NOTICES

prevent him becoming a Member of Parliament for London University and Chancellor of the Exchequer! It is doubtless a good thing to group these cases together for educational purposes, so that they may receive specially designed courses of instruction, but many of them, when they grow up would be quite capable of performing work for which eyesight is essential, and would not, therefore, come within the Ministry's definition of blindness.

Surface Inflammations of the Eyes in Childhood (other than Ophthalmia Neonatorum and Trachoma) is the next of the Committee's headings. Under it are included purulent conjunctivitis in later years, inflammatory diseases of the eyes due to measles, phlyctenular diseases and chronic blepharo-conjunctivitis—not very potent causes of blindness, but capable of giving rise to much disablement, and most of them certainly preventable.

Trachoma is now a very small factor in the causation of blindness in this country, and its incidence among the school population is now a markedly diminishing factor, compared with its prevalence in former years. Its re-introduction from abroad is, however, always a potential danger.

Myopia is not only a cause of blindness in both children and adults, but is also responsible for a serious amount of impaired sight.

Glaucoma is a serious factor in the production of blindness after middle life, and its determining cause is unknown.

Industrial Diseases affecting Eyesight.—Apart from miners' nystagmus, it will be found that the number of cases of serious impairment of vision caused by these diseases is probably very small. No exact information is available as to the amount of blindness due to toxic substances used in industry, but it would appear to be very small.

Lead Poisoning may give rise to manifestations, collectively known as encephalopathy, amongst which optic neuritis resulting in blindness may occur. Albuminuric retinitis is also sometimes reported as a result of lead poisoning. Evidence tends to show that blindness due to lead poisoning is small in amount and decreasing.

Derivatives of Benzene; Dinitrobenzol and Trinitrotoluene used in munition work are not at the present time giving rise to cases of blindness.

Carbon Bisulphide is used in vulcanizing india-rubber. No cases of optic neuritis caused by it have come to the notice of the Home Office during recent years.

Methyl Alcohol, either from the inhalation of its fumes, or from its consumption as a beverage, has in the U.S.A. given rise to blindness or great injury to vision; and in many instances death is reported to have resulted from its use. No authenticated instance
of injury to eyesight from this cause appears to have occurred in this country.

Glass Workers' and Metal Workers' Cataract takes at first the form of a posterior cortical cataract, different in character from ordinary senile cataract. In this stage it causes but little impairment of sight. Should the cataract become mature it may be extracted with probability of success; so that from the point of permanent blindness the disease is probably of little importance, but it is evidently a cause of considerable loss of working capacity.

Electric Arc Welding may give rise to symptoms of conjunctivitis with pain and photophobia, which cause temporary disablement. There is, however, no evidence of permanent injury to the eye from this affection.

Corneal Ulceration due to Pitch has been met with amongst those employed in breaking it up, either in loading or unloading trucks and vessels or in patent fuel works. It may cause disablement; four certificates to this effect, under the Workmen's Compensation Act, were returned in 1920.

Miners' Nystagmus is the most important of the industrial diseases affecting the eyesight. Its incidence is very heavy. In 1920 there were 7028 cases in receipt of compensation, of which 2865 were fresh cases receiving compensation for the first time during the year. It is estimated that in that year some £300,000 was paid in compensation for this disease alone. The essential factor in its production is deficient illumination.

Eye Accidents in Factories and Workshops occur chiefly in the metal and engineering trades (including ship building). The majority of these are caused by flying fragments of metal or other substances, and splashes of molten metal are responsible for most of the remainder.

The processes in which most of these injuries are met with are metal casting and forging, machine work, particularly at lathes and drilling machines, fitting, grinding, fettling and trimming castings and smithing.

Aerated Water Manufacture has been responsible for a relatively high percentage of eye injury due to the bursting of bottles and flying fragments. Increased safety has been afforded in many cases of recent years by the adoption of an improved type of machinery which practically eliminates danger from the filling process.

Textile Industries are accompanied by a special danger to the eyes caused by flying shuttles. The number of eye accidents among all accidents from this cause is very small, but such as do occur are often of a very serious nature.

Industries involving the use of Chemicals are attended by risks of eye accidents of a serious nature, especially those caused by splashes of acid and caustic. The Committee is, however, impressed by the
very low record of serious impairment of vision from such accidents of which it obtained evidence.

Eye Accidents in Mines and Quarries have together been a large factor in the causation of blindness due to industrial causes. In mines the majority of eye injuries occur in those working below ground, those working on the face being specially prone to suffer. Both in the coal and metalliferous mines the predominant cause of eye accident consists in flying fragments of mineral, metal and other substances. The remaining accidents were due to falls of roof, face or sides of the mine, to accidents with tools or to persons striking against objects or being struck by objects in motion.

In quarries 90 per cent. of the eye accidents are caused by flying fragments of stone, explosions being the principal cause of the remainder.

Eye Accidents in Agriculture. The majority of these are due to injuries from thorns, branches, etc., occurring to persons engaged on hedge trimming and bush cutting. Other operations responsible for eye accidents are dyeing, threshing and loading of corn. In threshing, the Committee was told that the workers feeding the threshing machines, or working on the stack run the risk of pieces of straw entering the eye. In dyeing, the eye injuries may be caused by an overlapping branch or piece of twig striking the eye of the worker while bending down. In loading and unloading carts or in building stacks an eye may be injured with a pitchfork, or a piece of straw may strike the eye when a sheaf is thrown up to the loader. Again, in cleaning cattle, severe injury to the eye may be caused by the animal giving a sudden jerk of the head and striking the worker with its horn. Occasionally also, eye accidents are caused in liming and in broadcasting fertilisers owing to the wind blowing back the lime or other material into the workers' eyes; the use, however, in recent years of mechanical devices for these operations would appear to have reduced the risks attendant upon them.

Eye Accidents among Railwaymen are due mainly to cinder or ash getting in enginemen's eyes, or to particles of grit or rust in the eyes of men chipping rust and old paint from steelwork; the number of such accidents is extremely small.

Eye Accidents in Civil Life (other than industrial). A table is given in the Appendix to the Report classifying the nature of such accidents in a large number of cases. The accident took place before the age of 16 in over 50 per cent. of these cases. A small proportion of these accidents result in blindness and many in the loss of one eye. Amongst children the accidents are chiefly caused by forks, scissors, knives, hat-pins, stones, catapults, tip-cats, etc.

Blindness due to the late War. The number of pensioners in England, Wales and Scotland who have been totally blinded as the result of war service is approximately 1,520.
Sympathetic Ophthalmia. The incidence of this disease has markedly diminished in recent years under modern methods of treatment, but it is still a serious cause of irremediable blindness.

Treatment of Eye Diseases and Errors of Refraction by Unqualified Persons. The Committee is of opinion that it would be undesirable and a positive danger to the public for Parliament to pass any measure which might convey the idea that an optician, who is a person qualified to provide glasses prescribed by medical men, is further competent to examine the eyes of patients and to prescribe glasses for the correction of errors of refraction. It also states that the resort of sufferers from any eye trouble to irregular practitioners who practice for gain the "Fournet" or any other so-called "system" of treatment is not only generally futile but positively dangerous, particularly in those cases of disease in which the prompt use of appropriate medical or surgical remedies is of vital importance, and where delay may entail the risk of irreparable damage to the eyesight.

On looking through this epitome it will be seen that it does not contain much with which any well-informed ophthalmic surgeon is not already familiar. The value of the Report does not consist so much in the novelty of its findings as in the wealth of evidence and statistics with which they are set out. These indeed are well calculated to carry conviction to the minds of government officials, and to supply justification for putting into practice the lines of action, and preventive measures, which the Committee has seen fit to recommend.

Comprehensive as the Report is as to the causes of blindness and impairment of eyesight there are several rather striking omissions. No mention is made of relapsing iritis, associated either with gonorrhoeal arthritis or oral sepsis. Any ophthalmic surgeon looking back upon his career must be able to recall such cases which have resulted in complete or partial loss of sight, all of which, due to the relapsing character of the affection, have interfered sadly with the sufferers' occupations.

Under the heading of surface inflammations of the eyes in childhood, some reference might have been made to the rapidly destructive inflammation of the cornea termed keratomalacia, if only to draw attention to the decreasing amount of blindness due to it. In this country it is mainly confined to marasmic children, but in countries where famine and pestilence are rife, and where, due to climatic conditions, life is more easily maintained in the much emaciated, it is met with at all ages, and bulks more largely as a cause of blindness.

It is a matter of surprise that no reference is made in any part of the Report to tuberculous affections of the eye, conditions which are certainly responsible for a considerable amount of impairment of
vision, and the relative incidence of which in different localities
would have been of considerable interest.

Under the headings of either myopia or injuries some reference
to detachment of the retina might have been expected. Beyond a
statement in a statistical table as to the causes of loss of sight in
children in schools for the education of the blind, no mention is
made of this common cause of blindness.

Reference is made to blindness from lead poisoning in industrial
pursuits, but it is not mentioned that it occurs from diachylon pills
taken to produce abortion, though it is stated in a foot note that
young women are those principally affected.

The rare cases of toxic amblyopia from the benzene derivatives
are referred to, but no mention is made of the commonly occurring
cases of tobacco amblyopia. Though it is seldom that permanent
loss of sight is produced by this form of poisoning, the sufferer's
economic efficiency is for a time, at any rate, impaired. Some
word of warning as to the dangers of the excessive use of the
stronger, dark-leafed tobacco might at least have been given.

Mention might also advantageously have been made of atrophy
of the optic nerve produced by drugs, such as the aryloarsonates
and quinine, when administered in injudicious amounts.

The danger of consanguineous marriages in connection with
certain hereditary degenerative affections of the eye, such as retinitis
pigmentosa, might surely have received some reference.

The only mention made of injuries of the eyes received in sports,
such as gunshot wounds and injuries in ball games, is in a
statistical table in the appendix. This table consists of an analysis
of eye injuries received in civil life, other than industrial, and is
compiled from hospital reports. Had cases from other classes of
patients been included the percentage of sporting injuries would
probably have been much larger.

Coming now to a review of the Committee’s recommendations
respecting the prevention of blindness and impaired eyesight. To
start with, it takes a hopeful view of what it is possible to accom-
plish in this direction. It points out that certain factors,
predominant in the production of blindness in former days, as
smallpox and trachoma, both dependent upon infection, have now
been checked, and it has little doubt that a later generation will
similarly view some present causes. Ophthalmia neonatorum and
syphilis, predominant to-day, are dependent upon infection, and
although the problem of dealing with them is more complicated,
success in the campaign against venereal disease is, in its view, the
key to the prevention of blindness from these two causes.

The problem of blindness from ophthalmia neonatorum is a many
sided one, and presents, therefore, several different approaches from
which it may be attacked. The Committee deals with the prevention of the disease under three headings:—(1) **Combating Gonorrhoea.** (2) **Ante-natal Measures.** (3) **Prophylaxis at Birth.**

(1) **Combating Gonorrhoea.** As bacteriological examination has shown that the gonococcus is present in from 50 to 60 per cent. of the cases, a diminution in the amount of gonorrhoea would necessarily be accompanied by a diminution in the amount of ophthalmia neonatorum.

As the preventive treatment of gonorrhoea in the adult population is one which the Ministry of Health is already dealing with, the Committee makes no recommendation on this question.

(2) **Ante-natal Measures.** The Committee states that the more general adoption of clinical investigation during pregnancy should lead to early discovery of cases of vaginal discharge, research into its bacteriology, and prompt measures for securing treatment by a private practitioner, or at a general hospital, or at a special session of an ante-natal clinic or at a venereal clinic.

(3) **Prophylaxis at Birth.**—Under this heading are discussed the instructions which should be given to midwives as to the care of infants’ eyes at birth, and the suitability of their training for putting such instructions into practice. If the rules of the Central Midwives’ Board were carried out universally, the Committee thinks, there is little doubt that ophthalmia neonatorum occurring in the practice of midwives would be materially reduced. It has, however, been forced to the conclusion that, as a rule, the practising midwife is not sufficiently trained to deal adequately with the prophylaxis of this disease. It recommends that arrangements should be made for pupil midwives to visit ophthalmic hospitals, or the ophthalmic departments of general hospitals, for the purpose of gaining direct experience of ophthalmia neonatorum.

With regard to the use of prophylactic drugs, the Committee, though fully satisfied as to the efficacy of Crede’s method in skilled hands, cannot recommend it for adoption by midwives. It considers, however, that this method should be used under medical supervision in all cases where vaginal discharge is known to exist. As the essential point of Crede’s treatment is the introduction of drops into the infants’ eyes immediately after birth, this suggestion if put into practice, would necessitate the attendance of a medical man at the birth of every child where vaginal discharge was known to be present. This is not, we fear, a very practical proposition.

One of the Committee’s summary of observations on this subject is that the successful treatment for the prevention of blindness from ophthalmia neonatorum demands promptness of recognition, and the early provision of adequate nursing assistance and hospital facilities.

The administrative means now in force appear to be sufficient to
secure that cases occurring in the practice of midwives are early brought under the notice of the Public Health Authority. The Committee states, however, that it cannot disregard the evidence that it heard to the effect that some medical practitioners fail to recognize early, and to notify promptly, cases of this disease; it was indeed stated in evidence that some of the worst results of ophthalmia neonatorum occur in cases which have from the beginning been under the sole charge of a medical practitioner.

The remedies suggested by the Committee to meet these difficulties are: (1) That in cases of suspected ophthalmia neonatorum, facilities for consultation with an ophthalmic surgeon and for bacteriological investigation should be provided wherever practicable. It might also have added, that this ophthalmic surgeon’s services should also be made available for consultation as regards the treatment of the disease in any of its stages.

(2) That the General Medical Council again be urged to insist that every student presenting himself for a qualifying examination in medicine shall be examined in ophthalmology.

The Committee is very emphatic as to the necessity of a supply of skilled nurses for the treatment of cases of ophthalmia neonatorum which are dealt with in their own homes. It mentions nothing, however, about the inefficiency of many monthly nurses, especially those employed by the poorer classes of the community. The usual time at which infection of the eyes takes place in this disease is at or immediately after birth, and the incubation period before symptoms manifest themselves is usually three days. In about 20 per cent. of the cases symptoms do not commence until after the fourth day; presumably in these cases infection did not take place until after birth, and was due to the sponge or towel which became contaminated at the baby’s first bath. The ritual which should be observed in connection with the baby’s first bath cannot be too strongly insisted on in connection with the training of all monthly nurses and midwives. Every new born child should be regarded as coming into the world with its body covered with what is possibly infective material; nothing should be used to wash it with that cannot at once be destroyed, and the towel used to wipe it with should not be used again without having been passed through boiling water.

It is interesting to find the Committee recommending that in every area, whether urban or rural, the Ministry of Health should take measures to secure the provision of suitable hospital accommodation for babies suffering from ophthalmia neonatorum and for their mothers. The late Dr. Nimmo Walker seems to have been the pioneer, in 1909, in adopting this form of in-patient treatment for both mother and child in this country. He established a special ophthalmia neonatorum in-patient department at the St. Paul’s Eye Hospital in Liverpool.
It was shortly after this that Sir Shirley Murphy, at that time Medical Officer of the London County Council, tried to find similar in-patient accommodation for such cases in London. He circularized all the London General and Special Eye Hospitals as to the provision of beds for these cases, but met with very slight response. It was not until evidence had been given before the Venereal Commission on the matter, and a deputation from the British Medical Association had urged its importance on the London County Council and the Metropolitan Asylums Board that the Local Government Board was induced to move, and put the responsibility for providing the necessary accommodation for these cases on the Metropolitan Asylums Board. In this way the St. Margaret's Hospital came into existence, where now facilities are afforded for the instruction of midwives, and where also, if the Metropolitan Asylums Board could be made to realize the value of the material they have under their control for the purposes of medical education, medical students could receive a most thorough and efficient training in the treatment of this most destructive malady.

Much valuable experience has been gained in the treatment of cases of ophthalmia neonatorum at the St. Margaret's Hospital and, if another similar institution is to be provided for London, as was originally intended, much care will have to be taken in the choice of its site, and in its construction, so as to ensure the maximum amount of fresh air and sunshine to counteract the marasmic tendencies with which the disease is found to be frequently associated. The idea that these institutions are likely to become regarded as specially associated with venereal disease, as suggested by the Committee, seems improbable, for it is in only 60 per cent. that the gonorrhoeal organism is found.

In connection with syphilitic eye diseases it is recorded that out of 1,855 blind children 399 had lost their sight from interstitial keratitis, of whom 359 showed evidence of syphilis. This would seem to indicate that many of them had not received adequate local treatment during the time of active inflammation. Generally—in such cases the opaque cornea, after it has become vascularized regains its transparency, and then, if the pupil has been kept dilated and adhesions prevented from forming, useful vision is regained. It is still very doubtful if anti-syphilitic treatment has any influence on the course of the affection once it has started, but probably all would agree that good hygienic conditions, and plenty of good food and fresh air, are likely to prove valuable adjuncts to recovery in such cases. This being so, it might have been well for the Committee to have considered the possibility of providing institutional treatment in a country district for these cases, similar to that which is now being provided for a large number of children suffering from phlyctenular diseases and chronic marginal
blepharitis at Swanley. Indeed, there seems no reason why a part of the White Oak Institution at Swanley, which is no longer required for ophthalmia cases, and which has been isolated from the rest of the establishment, should not be used to save sight in this very pitiable class of innocent sufferers.

So successful has the experiment of treating the cases of phlyctenular disease from the London County Council Schools at Swanley proved, that the Committee recommend that adequate provision should be made for the education and treatment in special residential schools of children suffering from phlyctenular keratitis and other forms of chronic external eye disease.

A table is given in the Report showing the number of new cases admitted to the Metropolitan Asylums Board Ophthalmia Institutions each year, since they were first opened in 1903. Up till recently, these cases were drawn entirely from the Poor Law Schools of London. It is very gratifying to note the steady decrease in the amount of contagious eye disease in these establishments since 1912.

The Committee speaks of trachoma as a "highly contagious disease." It is undoubtedly contagious, but not nearly so contagious as the ophthalmia due to Weeks' bacillus or the gonococcus. As a general proposition it may be stated that the greater the amount of discharge from the eyes in cases of ophthalmia the more highly contagious they are. Trachoma is essentially a chronic disease with comparatively a slight amount of discharge. When what may be termed epidemics of trachoma occur there is invariably mixed infection, the trachoma being then associated with purulent or muco-purulent ophthalmia, the infection of the two forms of ophthalmia apparently being transmitted from one individual to another at the same time.

Every year some of the children at the Ophthalmia Schools have been removed arbitrarily by their parents, before they could be certified as cured. In trachoma cases this is particularly distressing, as the good which prolonged and patient treatment has effected often becomes rapidly undone if it is prematurely relaxed. To meet such difficulties the Committee has recommended that the Board of Education should consider the question of seeking additional powers to enable a local education authority to require a parent to submit a child suspected of suffering from chronic external eye disease to medical inspection and adequate medical treatment where the Authority deem such inspection and treatment necessary.

In view of the general decrease of contagious eye diseases in London, it seems doubtful if it is desirable to substitute such a compulsory system for the present voluntary one. The odium which might arise from the compulsory detention of children in an ophthalmia institution, against the wish of the parents, might in
the long run defeat its own end by leading to the concealment of contagious eye affections.

Though trachoma is now decreasing in amount in this country, the Committee has foreseen the possibility of its reintroduction from abroad, and to facilitate the working of the Aliens Act it recommends:—that in sanctioning appointments as medical inspectors under the Aliens Acts, the Ministry of Health should endeavour, as far as possible, to secure that such officers, if they have not already had experience of contagious eye diseases and particularly of trachoma, should be afforded the opportunity of acquiring it.

It must be remembered, however, that many hotbeds of trachoma are parts of the British Empire, and that British subjects coming from them, who are not liable to inspection under the Aliens Act, may introduce the disease into this country. In connection with this matter it would have been well if the Committee had allowed themselves to think Imperially. Even if they considered it necessary to restrict their inquiries regarding blindness to England and Wales, they might have suggested the appointment of other Committees, with similar powers, to take up the question in other parts of the Empire.

The Medical Officer of Health in Liverpool told the Committee that there is no exceptional incidence of trachoma among the Irish who arrive there. Anyone, however, familiar with the eye clinics in London, who visits those in Ireland, cannot fail to notice the greater number of cases of trachoma and its sequelae, which are seen in the latter country.

The amount of economic inefficiency from impairment or loss of sight in India is colossal, and much might be done to mitigate it by a searching investigation as to its causes, such as has been carried out in this country by this Committee.

In connection with myopia the Committee recommends that further provision should be made by education authorities for the education in myope classes or by similar methods of children with serious defects of vision requiring such facilities, and that steps should be taken to discover these cases at such an early age as will allow of preventive measures being adopted.

The terms “myope schools” or “classes” and “blind schools,” which seem rapidly coming into use are not altogether happily selected names for such institutions. Schools for defective sight, grade 1, grade 2, would seem preferable.

The measures which the Committee recommends with reference to industrial eye injuries consist of; the adoption of improved types of machinery; the adequate provision of suitable first aid; the provision of suitable goggles or masks; and most difficult of all, inducing workmen to wear such protection.
The pressing necessity for the provision of suitable first-aid in connection with eye injuries is obvious, for the Committee states that the practice still prevails in mines of a fellow-workman endeavouring to remove a foreign body from the eye with the point of a knife or candlestick or even by licking the eye with the tongue. Its recommendation on this matter is:—That the Mines Department should require all ambulance stations, above and below ground, to be provided with equipment for the first-aid treatment of eye injuries, and should take steps to ensure that all cases of eye injury receive adequate first-aid treatment at the earliest possible moment.

The provision of goggles or masks, suitable for each of the various industrial pursuits in which they may be required, is dealt with at length in the Report. In 1914 the Royal Commission on Metalliferous Mines and Quarries laid down a complete form of protection which should satisfy the following requirements:

"(1) It should prevent all injurious particles from reaching the eyes from in front, from either side, or from below—practically none come from above.

"(2) It should be light and allow free play of air, so that moisture does not condense on the transparent medium.

"(3) It should not impede vision.

"It should not become obscured by the impact of particles."

The Committee concurs in these general principles, adding to them the importance of the fit of the glasses. From what it says it is evident that the most suitable form of protection for each different industry still requires further consideration. In this matter the Ophthalmological Society might render some assistance by organizing an exhibition in connection with one of its meetings of the various forms of masks and goggles employed, not only in this country but also in the United States of America, where, the Committee says, great advances with regard to all matters affecting the design and use of face protectors have been made of recent years. Opticians and others might also be invited to exhibit any improved pattern or designs which they can suggest.

It would be interesting to ascertain if the chain face guard, designed by Sir Richard Cruise for protection of the eyes from flying missiles in warfare, could be suitably adapted for protection from flying fragments of metal in industrial pursuits.

In the Committee's opinion progress in persuading workmen of the merits of goggles is most likely to be brought about through the educative influence of their own organizations, and it considers that an opportunity here lies before the Joint Industrial Councils, District Councils, and Works Committees. Joint Industrial and District Councils, which have already been set up in several industries, consist of representatives of Associations of Employers
and Trades Unions in the respective industries. Works Committees similarly are constituted of representatives of the management and of the employees in a particular works. The functions of these bodies are in general to secure the largest possible measure of joint action between employers and workpeople for developing the industry and improving the conditions of those engaged in it. For the last-mentioned purpose, it has been contemplated that Councils and Committees should include in their functions the consideration of health questions and the prevention of accidents. The Committee recommends that all possible steps should be taken to encourage the development of Works and Safety Committees with regard to the prevention of accidents, the use of safety devices and methods of propaganda among which questions relating to eyes would have their place.

In conclusion the Committee expresses its great indebtedness to its Secretaries, the late Dr. R. A. Farrar, Dr. J. Pearse, and Mr. P. N. R. Butcher for the efficiency and helpfulness of their services.

In concluding this review it is well to state the great indebtedness of the community to the Members of the Committee, for their prolonged and painstaking investigation into the causes, and means of prevention, of one of the most trying afflictions.


E. TREACHER COLLINS.


"More than a generation has passed since the appearance of von Arlt's treatise on ophthalmic operations in the first edition of this Handbook. Remarkable advances in surgery have been made during this period, inseparably connected with the researches of Lister, Pasteur and Koch. Ocular surgery has followed the progress of her sister somewhat tardily."

These lines form the introductory paragraph of Vol. I of "Ophthalmic Operations" in the present edition. A comparison of von Arlt's work with that now before us is not without interest
and affords some indication of the forward march of ophthalmic surgery since 1874.

The section on "Operationslehre" in the first edition occupied roughly half a volume. It was wholly written by von Arlt and extended to 252 pages; there were 27 illustrations in the text, and, at the end, 2 full page plates of instruments.

In the edition now before us 22 authors have collaborated; their work fills two large volumes totalling 2164 pages; illustrations in the text number 1142. It must be borne in mind, however, that Arlt's work concerned ophthalmic operations only, whereas the present volumes contain chapters on procedures in general cerebral and spinal surgery, on operations on the nasal cavities and adjoining sinuses, and one of 38 pages on the artificial eye.

The impression gained by a necessarily rapid survey of these two large volumes is that of a work carried out with the same care and thoroughness which characterised the first edition of the Handbuch, in its day, without doubt, the most reliable work of its kind. Each chapter is a treatise dealing with its subject in both the present and past tense, for nearly every writer devotes introductory paragraphs to the history and development of the operations comprised in his section. As shown by the figures already mentioned the letterpress is liberally illustrated, and with few exceptions the illustrations are well executed and helpful to the student. A table of contents of the whole work is given in Vol. I, while Vol. II has a general index of 44 pages and a list of authors quoted, which fills 31 pages.

In a work of this kind by many writers, overlapping is unavoidable, and is not, perhaps, more than might be expected. The prolixity for which German professors are noted is obvious throughout, and it appears to the reviewer that these volumes might be considerably curtailed without detriment and without loss of clarity.

Vol. I. opens with a "general section," in which the author writes very clearly, but with much detail, on instruments, operating theatres and their illumination, sterilization of instruments and dressings, preparation of patients, clothing of attendants, anaesthesia, general and local, methods of fixation of the eyeball, control of haemorrhage, sutures, bandages and after treatment. It forms a thorough and sound introduction to the "special sections" which follow. These begin with a chapter on the eyelids and terminate with one on the surgery of the nasal and adjoining sinuses. This is succeeded by a supplementary chapter on various surgical procedures, e.g., ligation of the carotid artery, removal of the superior cervical ganglion, operations for wry neck, for the relief of increased intra-cranial pressure, cerebral abscess, tumours of the hypophysis, etc.

It is noteworthy, as indicating the wide extent of the subjects dealt with, that several of the chapters have been entrusted to more
than one writer. Thus the first "special section" on operations on the eyelids is the work of five surgeons, while three writers have collaborated in the chapter on operations for glaucoma.

The reviewer makes no claim to have read through these volumes, but he has studied them with care and interest, and while holding the opinion that most of the sections are unnecessarily lengthy, he has nothing but praise for the erudition and meticulous care displayed by the authors. The seeker will not find an account of all operations on the eyeball and orbit, but he will find all recognized and established methods of operating described and generally illustrated. As a book of reference on ophthalmic operative surgery this work is without a rival.


A book which is based on a surgeon’s personal experience can hardly fail to be interesting. This little work contains the personal impressions of one who has had to rely on himself and has not been in a position always to discover what has been said and done by others. While this may be a gain, in so far as it makes for originality of thought, in other respects it is unfortunate. There will arise misconceptions—and this book is not free from them—which a handbook of ophthalmic pathology would clear up. It follows that the author’s opinions are not equally valuable on all the points which he discusses. His views on trachoma may give help to those who have to treat this disease in mass.

His method of intracapsular removal of cataract is precisely that of Gradenigo, described in 1895.


The present volume comprises the proceedings of the Ophthalmological Society of the United Kingdom during its Forty-Second Session, May, 1922. It also includes selected papers read at meetings of five of the six affiliated societies. No communications appear from the sixth affiliated society, namely, the Scottish Ophthalmic Club.

The volume is equal to its predecessors in the interest of the cases shown and papers read. The absence of coloured figures is readily accounted for by the excessive price such now cost to reproduce. The discussion was upon industrial diseases of the eye (excluding accidents, miners’ nystagmus and glass-blowers’ cataract). The opening papers were by Dr. T. M. Legge, C.B.E., Mr. A. Bernard Cridland, Professor Edgar Collis, Mr. N. Bishop Harman, and Mr. Charles Killick. Dr. Legge gave figures to
show that lead poisoning has diminished by more than one-half since the year 1900. As regards epileptiform attacks, mental defect, and optic neuritis, there had been corresponding results, due largely to locally applied exhaust ventilation by means of fans to remove dust and fumes from the point where they are produced and so prevent their inhalation by the workers. The same object may be achieved in other ways. For instance, by the use of mechanical means to reduce hand labour, the conversion of white lead into paint without first drying into a powder, the substitution of low solubility glazes for raw lead glazes in pottery, etc. During the war T.N.T., which accounted for much illness and dermatitis and toxic jaundice, did not affect the optic nerve as does di-nitro-benzol. Legge quotes a case by Dr. W. G. Sym where tobacco amblyopia occurred in a young woman who had been employed for many years in the leaf room of an Edinburgh tobacco factory. Mr. Cridland considered the various kinds of industrial cataract and advised an examination of the sight of firemen on railway locomotives and of men who work with bright tin. Professor E. Collis discussed: (1) The effect of visual acuity upon industry, and (2) the effect of industry upon visual acuity. The conclusion of the matter seemed to be that while there was a little information, but not much, as to the former, there is a lack of any sure information as to the latter. In both respects there was a wide field for investigation in order that knowledge may be obtained upon which advice could be given to those who possess different degrees of visual acuity, as to what occupations and processes are suited to their individual capacities. Mr. N. Bishop Harman dealt with myopia and produced figures to show that the risks of myopia are heaviest with those patients whose occupation entails habitual close eye work. Mr. C. Killick reported an interesting case of anthrax of the eyelids of one eye. He quoted his friend Dr. Eurich, of Bradford, as having seen nineteen cases of ocular anthrax during a period of seventeen years. Mr. Healy spoke of tinplate workers' cataract. He suggested the possibility that men who worked in heat and perspired profusely and therefore imbibed large quantities of fluid might develop arteriosclerosis, and that this might be a factor in the production of cataract. Dr. Brinton had occasionally met with posterior polar cataract in goldsmelters and the assayers in gold-mines. A prolonged discussion followed Mr. T. Harrison Butler's paper on 'Refraction without Cycloplegics.' Mr. Butler himself suggested that refraction without a cycloplegic is as accurate as that with one if only correct methods are skilfully employed. The tyro, however, would be well advised to use a cycloplegic frequently. Gullstrand, speaking of retinoscopy, said the use of the silver mirror with a hole in it made the observer uncertain as
to what he saw. The best method of retinoscopy was by means of slit-lamp and a non-silvered mirror, i.e., a plate of glass with two plain faces. If that plan were followed it would not be necessary to use a cycloplegic. Mr. W. H. Brailey thought that the manifest hypermetropia should be taken first, and that when there was a large discrepancy between it and the final result a cycloplegic was indicated. He considered that mydriatics were too much used in myopia; they were seldom necessary. Mr. Ernest Clarke had tested one hundred consecutive cases without a cycloplegic, and had then put them under atropin or homatropin and found that in seventy-six cases the results were different. Mr. N. Bishop Harman was convinced of the value of an oily preparation of homatropin and cocain as a cycloplegic in suitable cases. Mr. A. C. Brinton, who practises in Johannesburg, spoke of the asthenopia often found at that altitude in patients with a small amount of ametropia. Mr. A. Hugh Thompson did not believe that the refraction between the macula and the disc was the same, at any rate, in myopia. Mr. Traquair believed all Edinburgh ophthalmologists thought that the use of a cycloplegic had to be determined in each individual case. The Edinburgh practice was to use a cycloplegic for children, but not for adults. Mr. Stack said one reason for using a cycloplegic was when hyperphoria was present. Before ordering a prism it was advisable to ascertain that hyperphoria was still present under the cycloplegic.

It is gratifying to note the continued prosperity of the Society, of which there are 482 subscribing and five honorary members. One criticism on the balance-sheet may be permitted. The Nettle-ship Prize Fund, which is vested in four trustees appointed for the purpose by the Society, is not provided, as it should be, with a separate balance-sheet apart from the accounts of the Society.

S. S.

CORRESPONDENCE

TEST TYPES

To the Editor of The British Journal of Ophthalmology

SIR,—Many readers of the journal will have appreciated the patient work of Drs. Hartridge and Owen, as shown in the paper on “Test Types” which appeared in the December issue.

Having at one time given a great deal of time and thought to the subject, I was particularly interested in the authors’ experi-