A radiograph then showed extensive change in the neighbourhood of the sella Turcica. One anterior and both posterior clinoid processes were destroyed.

The development of the hemianopic symptoms in this case show that both before and after the operation, in spite of the long duration of the disease, the affection of the chiasma was not so definite and advanced as in the first two cases.

In this case the first definite symptom observed pointing to hypophyseal disease was, as in the first case, the loss of equilibrium accompanied by weakness of the feet. The headache, which in these cases is always felt on the top of the head, was due, as in the second case, to the pressure of the tumour. As there was no other definite symptom of disease of the hypophysis, had it not been for the operation, the diagnosis might well have been one of cerebral syphilis.

Conclusions

1. The importance of bitemporal hemianopia as a symptom of disease of the hypophysis.
2. The nature of the headache which radiates from the central parietal region to the top of the head.
3. The unsteady gait accompanied by weakness of the feet.
4. In cases in which diabetes insipidus is present the constant sensation of cold, especially in the feet.

Other symptoms, anhydrosis, loss of hair, absence of sexual appetite and acromegaly are not always present. The physiological function of the hypophysis must be a very complex one, either in itself or in its relations to the other endocrine glands and the nervous system.

COUNCIL OF BRITISH OPHTHALMOLOGISTS—
REPORT ON SIGHT-TESTING BY OPTICIANS

In 1906, and again in 1919, opticians have made application to the Legislature that their craft may be legally recognized for the purpose of sight-testing, and it is consequent upon these efforts that the Council of British Ophthalmologists has thought it desirable to consider the matter in the interests of the general public.

Training of opticians

The Council would warmly welcome any scheme which would lead to greater efficiency in the making and fitting of spectacles. It fully recognizes that there is a very definite need for a greater
supply of properly trained opticians, and ophthalmic surgeons often have cause to deplore the inefficiency displayed in carrying out their prescriptions for glasses.

Sight-testing by opticians

In a recent petition (1919), the British Optical Association claimed that opticians should be recognized as capable, not only of carrying out the optician's art of making and fitting glasses in conformity with prescriptions, but also of measuring and determining what glasses are required to compensate for defects of vision in any member of the public who may apply to them. Paragraph 10 of the petition stated:—"In a very large majority of refraction cases which can be treated by glasses, members of the public do, in fact, visit an optician rather than an ophthalmic surgeon or medical man, and the association humbly submit that it is eminently in the public interest that the optician should be a skilled man and under suitable supervision. A qualified optician, especially when holding a Fellowship Certificate of the Association, would recognize a case in which the eye, through disease or otherwise, could not be properly treated by glasses, and would direct the patient to an ophthalmic surgeon or medical man. An ignorant optician would be likely to supply the patient with glasses which might do great harm."

Training necessary for sight-testing

The Council, however, considers that no course of training short of that required for full medical qualification can produce the skill and judgment necessary to secure the requirements stated in the above paragraph. Every medical man dealing with ophthalmic cases must be equipped with the knowledge necessary for ordinary qualification in medicine and, in addition, with special knowledge of the most delicate and complex sense organ in the body. It is the opinion of the Council that any State recognition of sight-testing by persons possessing only an optical qualification would not be in the interests of the community.

The scientific principles of sight-testing

The art of prescribing glasses can be divided into two periods—the purely empirical period preceding 1850, when only subjective methods of testing were available, and the period following 1850, when accurate objective measurements began to be used. (See Appendix.) Those scientific methods have been developed by medical research, and to a great extent they are not available to the optician. The statement that where defective vision is due to other than optical conditions it should be treated by a duly
qualified medical practitioner (see petition of the British Optical Association, par. 10, quoted above) is in itself sufficient argument against the optician's claim, since it is well known that changes in the refraction of the eye are often produced in the early stages of serious eye disease. In many such cases an optician may be successful in raising the acuteness of vision to a normal standard, but he would almost inevitably fail to recognize the disease which is the cause of the refractive error. In fact, disease very serious to the eye, or threatening even life, may occur in an eye with perfect acuity of central vision.

Use of drugs

An adequate examination of the eyes and a correct determination of the error of refraction cannot be made in young children, especially in cases of squint, while the accommodation (i.e., focussing power) is active. The absence of accommodative effort can only be ensured by the use of certain drugs, which also dilate the pupil. These drugs must not be used in an indiscriminate manner. In certain conditions of the eye their employment is attended by grave risk to sight. In some individuals they produce serious constitutional disturbances. As dilators of the pupil their use is frequently essential in order to determine the presence or absence of changes in the retina or optic nerve. Such changes may be the first indication of general disease, by the prompt treatment of which the life of the patient may be saved or prolonged.

Eye defects and general disease

The treatment of headaches, associated with errors of refraction, demands not only the use of glasses, but also constitutional treatment, which can only be determined by a medical man. In some cases of defects of the muscular balance of the eyes, the use of prisms is necessary. The correct estimation of these and a complete investigation of the case are most difficult problems, since some of these muscular defects are among the earliest signs of serious diseases of the nervous system.

Changes in the refraction of the eyes are often produced in the early stages of eye disease. For example, myopia ("shortsight") often appears in the early stages of cataract, or of chronic glaucoma, a disease which untreated inevitably leads to blindness. Hypermetropia ("longsight") may be met with in the early stages of a malignant tumour. In such cases glasses may bring visual acuity up to a normal standard, but an optician will fail to recognize the disease which will thus be left to run its course.

Optical defects and disease constantly overlap; the former cannot be differentiated with certainty from the latter, nor the latter
definitely excluded by any but a medical practitioner who has had special training and experience.

**Optician's standpoint**

The "sight-testing optician" endeavours either to supply spectacles with which the customer considers he can see to his liking, or to provide such lenses as will convert optically imperfect eyes into accurately focussing instruments. All are agreed that the former procedure is indefensible: the latter needs further consideration.

The eye is an integral part of the human body. Developmentally it is, in its most essential elements, an off-shoot of the brain. There is practically no organ of the body which does not react upon it to its advantage or its detriment. Without exposing it to the gravest misfortune it cannot be dealt with as an inert, isolated optical instrument, yet it is in this way only that the optician can view it, and in this way only can he adapt mechanical apparatus to such of its optical defects as his limited means may enable him to recognize. Without the use of drugs to dilate the pupil or paralyse the focussing muscle, in many cases he cannot measure accurately the error of refraction, or be in a position to identify the cases which demand medical advice and treatment. If he were allowed to use such drugs he would become an even greater danger to the community by reason of serious disease which he in his ignorance might produce.

**Ophthalmic Surgeon's standpoint**

The ophthalmic surgeon approaches his refraction work from an entirely different standpoint. To him the eye is an optical instrument, but it is also an integral part of the human body in complex inter-relation with the other parts. Its anatomical proportions and its physiological activities are before his mind. Its pathological disturbances, both local and those dependent on general disease, are known to him. He has at his disposal the use of all drugs necessary for his purposes, and of the indications for and against their employment he is fully aware.

In the investigation of diseases of the eye, the measurement of the acuteness of vision, both with and without lenses, is one of the first steps in the examination of the patient. In refraction work the surgeon takes into consideration the physiological activities of the normal eye. The hypermetropic eye he regards as developmentally imperfect. Astigmatism may be due either to developmental malformation or to disease. Presbyopia (loss of focussing power associated with advancing age) is a physiological condition, but undue rapidity in its progress may herald glaucoma, and
apparent recovery of focussing power may indicate the earliest stage of cataract. Myopia is in many instances pathological, and the myopic eye is exposed to grave disorders. With a comprehensive knowledge of facts such as these, the ophthalmic surgeon decides in a pure refraction case what lenses should be prescribed. With what lens the patient sees best is only one point he takes into consideration when prescribing. His aim is not only to improve vision, but also to secure the health and comfort of the patient. No case is dismissed until full opthalmoscopic and other examination has excluded all objective signs of disorder.

If disease be present, its causation, whether local or general, has to be ascertained, and this demands a knowledge of the diseases of the other organs of the body which produce changes in the eye. The ophthalmic surgeon must have an adequate knowledge of diseases of the brain and central nervous system, of the blood vessels and vascular system, of the kidneys, of the nose and its accessory sinuses, of the various ductless glands, etc. In fact, there is no branch of medicine which is not in close relationship with this special domain, nor is there any specialty in which a general medical knowledge is of greater importance.

The public interest

It cannot be in the interests of the community to allow such grave responsibilities to pass into the hands of men with no medical training, and to hall mark by official recognition a practice involving such dangers.

Many people in the past have gone to opticians to obtain glasses for failing vision under the impression that they are fully qualified to prescribe. Official recognition of sight-testing opticians would encourage the practice and would increase the feeling of security which our arguments show to be unwarranted. There can be little doubt that this impression has been fostered by such "qualifications" as F.S.M.C., F.B.O.A. (Fellowship of the Spectacle Makers’ Co., Fellowship of the British Optical Association), etc. It is the duty of the State to guard against legislation which may in any way entail detriment to the community.

APPENDIX.—HISTORICAL

An enquiry into the history of the science and art of refraction will show that this branch of ophthalmic work has been initiated and developed by medical men, and that even at the present day the optician works and must of necessity work largely on the more purely empirical lines of the early part of the nineteenth century.

The discovery of spectacles as an aid to vision dates from the thirteenth century. There is no absolute certainty as to their first inventor, but the probabilities point to Roger Bacon (1214-1294), who, in his "Opus Majus," wrote of the enlarging power of a plano-convex glass and of its value "senibus et habentibus oculos dubiles." Either directly from Bacon, or from some other monk, the discovery
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became known in Italy, and at the end of the thirteenth century, spectacles were being made by Alessandro de Spina, a Dominican Friar, of Pisa. He did not claim to be the actual inventor, but had seen glasses made by someone else who was unwilling to reveal the secret. It may have been from Salvino d'Armato, of Florence, that Spina obtained the secret, since Armato's tombstone bears the inscription:--


If Roger Bacon invented spectacles it was probably sometime before the year 1267, when the "Opus Majus" was written for Pope Clement IV.

By the middle of the 14th century, convex glasses had become fairly common. Concave glasses seem to have come into use first in the sixteenth century, and early in the seventeenth century Kepler wrote the first important scientific work on the use of spherical lenses.

The next important discovery did not take place till the beginning of the nineteenth century, when Thomas Young, the distinguished physician and physicist, in his "Memoir on the Mechanism of the Eye" (Phil. Trans. Roy. Soc., 1801), gave the first description and measurement of astigmatism and a table of optical constants in close agreement with modern determinations. He had previously (1793) written a paper on the mechanism of accommodation which secured his election to the Fellowship of the Royal Society. His observations were subsequently confirmed by Airy in 1823, but remained practically unknown to opticians.

Until the year 1853 the prescribing of spectacles was entirely empirical. It was known that men, as they reached middle life, had difficulty in seeing to read, and that their difficulty was relieved by wearing suitable convex glasses. It was occasionally found that younger people also were helped in reading by the use of convex glasses, and they were said to have "old sight," a phrase still to be heard in use amongst opticians.

Another group of people was said to have "weak sight," and it was found that they were enabled to see more clearly in the distance by the use of concave glasses. The sale of spectacles was often in the hands of country peddlars, and people chose from the stock what seemed to suit them best.

With the discovery by Helmholtz of the ophthalmoscope and the ophthalmometer in 1853, the scientific investigation of the refractive media of the eye became possible, and the work of Donders, the great Dutch surgeon, speedily laid the foundations on which all modern refraction work is built. He showed the way in which a hypermetropic eye and a myopic eye depart from the normal, and the liability to disease existing in a myopic eye. He showed the relationship between the long-sighted eye and squint, and the essential difference between long-sight and old-sight. He discovered the frequency of astigmatism and laid down the rules for its detection and estimation, and showed how to determine the strength and position of the cylindrical glasses necessary for its correction. Donders also established a standard for normal vision, and for the first time rendered accurate "sight-testing" possible. He reconstructed the scale of lenses, substituting the metre for the inch as the unit of measurement.

This work has been continued and extended, corrected and amplified but the progress has been entirely due to the work of medical men.

In 1873 Cuignet, a French military surgeon, discovered an additional method of measuring the refractive condition of an eye, which rendered the ophthalmic surgeon still less dependent on the subjective methods previously in use. By the method of retinoscopy the skilled ophthalmic surgeon is enabled to make accurate measurements of the static error of refraction. These measurements can only be accurate in the absence of any accommodative effort on the part of the patient under examination. This condition of absence of accommodative effort can only be ensured by the use of drugs which paralyse the ciliary muscles.

At a later date the use of prismatic glasses was introduced by medical men to alleviate symptoms due to errors in the muscular balance of the two eyes, and the determination of the conditions under which prisms should be ordered is one of the most difficult problems an ophthalmic surgeon has to solve. It involves the knowledge not only of the inborn defects of musculature, but also of acquired defects, and of the pathological causes which may produce them.