Things ophthalmic new and old / by A. Freeland Fergus.

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Things Ophthalmic New and Old.[1]

By A. FREELAND FERGUS, M.D., F.R.F.P.S.G.,
Surgeon, Glasgow Eye Infirmary.

In laying down office I again desire to acknowledge my indebtedness to the office-bearers and members of this Society for the honour which they did me two years ago in electing me to the chair. I am glad to believe that the Society during that time has held its own, and I venture to think that under the able administration of the Secretary, Dr. Young, its proceedings have by no means lost in value. The president is more or less a figure-head; the actual direction of such a society is always in the hands of the secretary and other office-bearers; and I hope they will allow me to express to them my thanks for the smoothness with which the affairs of the Society have been conducted during the past two years.

When I took the chair I brought under your notice some of the leading facts in connection with the development of

[1] Valedictory address delivered to the Medico-Chirurgical Society of Glasgow on 2nd May, 1913.

the Glasgow School of Medicine. To-night I would like to dwell upon some points which I consider of great importance as regards ophthalmology. In the first place, I wish to illustrate and emphasise what I have elsewhere indicated as the difference between visual acuteness and form sense. It is almost incredible that up to the days of my own teacher, the late Professor Snellen, there had been no attempt to standardise visual acuteness, unless indeed we take such haphazard methods as the use of Jaeger's hand types, which were the only types in use when I entered the Eye Infirmary as a student in 1879.

Snellen's types have become so universally used both on the Continent of Europe and in America that they are likely to be for many years to come the standard of visual acuteness. It is quite true that the types of Landolt form a much more delicate test both for visual acuteness and as an ultimate proof of the accuracy of a refraction correction. Still, Snellen's are so convenient and so easily used that it is not surprising to find that Landolt's, although a much more refined test, have not as yet come into general use. I do not intend to say a single word to-night as to the accuracy of Snellen's types. We accept them as a standard of visual acuteness of a definite kind, but at the same time it must be remembered that they are only an arbitrary standard, and by no means an absolute measurement. This fact constitutes the chief difficulty which we have in estimating the working usefulness of an eye in terms of visual acuteness expressed in Snellen's scale. To my own mind the problem is absolutely insoluble, notwithstanding the very learned papers of Mr. Percival of Newcastle-on-Tyne and of Mr. Berry of Edinburgh. If a patient reads the types at six metres, which Snellen said should be seen at six metres, then, with a careless use of language which is not in the least justifiable, he is said to have normal visual acuteness. Snellen believed that to be the typically perfect, very much as Fahrenheit believed that the zero of his scale was the lowest obtainable temperature. Snellen's $\frac{6}{6}$ is said to be normal vision, and I fear that that phrase often gives rise in thought to the idea that that is the average for mankind. Etymologically the word "normal" may mean a conformity to a certain standard. That is not, however, the sense in which it is generally understood in this connection. Just as we say the normal temperature of the human body is 98·4, meaning thereby that that is the average for healthy mankind, so people are apt to understand when we say that the

visual acuteness is normal that that is the average visual acuteness of mankind. It is not the average; it is merely an arbitrary measurement made by Professor Snellen on certain data—that is all. The greatest confusion sometimes arises in the lay mind by taking the word normal as applied to visual acuteness in the sense of average. For example, it is not an uncommon experience to find that a certain workman is supposed to be unfit for work because he has only one-half, or say one-third, of the normal visual acuteness. A layman hearing such a statement, says to himself—"Dear me, how very much below the average of visual acuteness that man is; he certainly is not fit for very much." Now, it so happens that one-half of Snellen, or even one-third, is probably above the average of efficient mankind, and we cannot but think there might be a very serious miscarriage of justice from the careless use of language by using in this sense the word "normal," when the phrase "typically perfect" might perhaps more properly be employed. We may never be able to arrive at what is the normal in the sense of being the average vision of mankind. Notwithstanding the great respect which I entertain alike for Mr. Percival and Mr. Berry, I cannot but think that any attempt to make, so far as a man's earning capacity is concerned, a mathematical function of the visual acuteness, is entirely futile. I personally have known a man at the bottom of a coal pit with visual acuteness of only $\frac{1}{30}$ earning excellent wages. That is only one of a number of such cases that I once took the trouble to collect. They were communicated to the British Medical Association at its Toronto meeting. Individual human action based on volition after all cannot be expressed by any mathematical formula.

But the difficulty is much increased when we come to differentiate between what I have elsewhere called visual acuteness and the form sense. It is a distinction which I have made for a considerable number of years to the large classes of University Ophthalmic students it has been my privilege to teach as an extra-mural teacher, and it no doubt will ultimately find its way into the text-books. It is easily enough understood, and if you give me patient ears but for a short time I will make perfectly clear, even to the most uninitiated in the domain of ophthalmological physics, the exact difference between visual acuteness and the form sense. All ophthalmic and physiological writers up till now have failed to make a distinction, at any rate in their writings; and in 1911, when I gave evidence before the

Departmental Committee of the Board of Trade on Sight Tests, it was a distinction which seemed to be entirely new to the members of the Committee, for all their witnesses and all the members of Committee always spoke of the form sense as synonymous with visual acuteness. The two must be carefully distinguished. Visual acuteness is a function of the macular area only; it is that power by which we read and write and distinguish visually such things as music score. That is all that I mean by visual acuteness. Let me just recall an experiment which I have often shown to classes of students, and to which I directed the attention of the Committee of the Board of Trade. If a person look at a word in the middle of a page of writing he will see the word, and possibly a few letters in its immediate neighbourhood; the rest of the page he will be quite unable to decipher. Just for a little space round the word at which he is looking he will clearly see letters, but on no other part of the page, unless he change the point of fixation. That is visual acuteness. While, however, he is looking at the original fixation point steadily he also can discern quite distinctly the forms of all other objects in his immediate neighbourhood. He can see various articles of furniture. He might see that there are persons in the same apartment. He can tell quite well perhaps whether those persons are men or women, although he cannot recognise them. The power of recognition also probably depends upon visual acuteness. That illustrates what I mean by the form sense. It is this form sense which is the important function of vision for most kinds of manual employment, and which is also chiefly used in such occupations as navigation. Take, for example, a man hewing stone. If he wishes to examine the texture of the stone as a geologist would do, he will require to use his visual acuteness. If he is merely distinguishing it from other material, such as the earth and clay, from which he is getting it, then the visual acuteness is probably not used at all; it is entirely that which I call form sense. A radical blunder is made when we attempt to express the working power of any man, so far as vision is concerned, in terms of visual acuteness. Working power, at anyrate, for manual employment has very little, if anything, to do with visual acuteness; it has to do with this form sense, or, as I prefer to call it, difference of back-ground sense. Herein is just the mistake which has been made by the recent Departmental Committee of the Board of Trade. They say, in spite of all facts to the contrary, that unless a man has got visual

acuteness of $\frac{5}{5}$ in one eye and $\frac{5}{15}$ in the other, that he is not fit for navigation. Any such statement is simply not true. Navigational power so far as vision is concerned ought not to be expressed in terms of visual acuteness at all. For example, take my own sight. My visual acuteness, without correction, as measured by Snellen's scale, is something like two letters of $\frac{6}{18}$, and yet I can see a can-buoy two or three miles away perfectly distinctly and clearly. If we take the height of the can-buoy as being, say, three feet above the surface of the water, and that the distance at which I see it is only two miles away, although as a matter of fact it is a great deal more, then the angle subtended by the said can-buoy at the first nodal point of my eye is considerably less than one minute. A man who has sight like that is said by the Board of Trade not to be able to navigate a ship, simply because they have gone on an entirely wrong basis, and have tried to express navigational ability in terms of visual acuteness. I, for example, can see a bush in a park four nautical miles off. Now, if we take the bush as being 20 feet high, that means that it subtends at the first nodal point of my eye an angle of about 4 minutes. Yet the Board of Trade say that a man who has sight like that, who can see a can-buoy not more than 3 feet high at two miles, and who can see a bush in a park four miles away, has not sufficiently good sight for purposes of navigation. Snellen's $\frac{6}{6}$ gives a 5-minute angle at 20 feet; if in visual acuteness a man has perfect vision with his 5-minute angle, he is considered safe for navigation; but a man who can absolutely distinguish a can-buoy subtending an angle of only 1 minute, or $\frac{1}{5}$ of Snellen's standard, is, according to the Board of Trade, quite unfit to be entrusted with a ship. It seems to me nonsense, and the confusion has arisen because the Board of Trade have made navigation depend upon visual acuteness rather than upon the form sense. I have so recently elsewhere elaborated this idea that I do not here develop it further.

I wish, in the second place, to call the attention of the Society to that part of the field of vision which I have called the field of visual acuteness. The method of testing this is a little difficult for it requires a considerable degree of intelligence on the part of the person who is being examined. On one occasion I got a number of the students in my class each to undergo the examination, and I beg to show you some of the results. A number of letters were printed on slips of paper, and the student who was undergoing examination was

directed to shut one eye, to look steadily at a letter at the very centre of the page, and to draw his pencil round all those letters which he was able to see at the same time. That delimited the fields of visual acuteness. I do not agree that the function of visual acuteness is a function which gradually decreases as we go towards the periphery of the field; in other words, I do not accept the graph given in rectangular co-ordinates in Mr. Parson's elementary text-book. Visual acuteness in the true sense of the term is limited to the macula. There is no doubt a certain peripheral acuteness, but that depends purely on the light sense. Graphs of the field of visual acuteness are extremely interesting. I take one of the simplest that I have obtained, namely, that of Mr. H. C. S. The graph in his case is almost an ellipse, the major axis being horizontal and the minor axis vertical. The paper was held at 2 feet from his eye when the observation was made. The major axis measures $\frac{15}{16}$ of an inch and the minor $\frac{11}{16}$ of an inch, the angular opening therefore of the field of visual acuteness in the horizontal meridian for 2 feet is easily calculated; it works out at 2 degrees, 14 minutes, 20 seconds, and the vertical for the same distance works out at 1 degree, 48 minutes, 40 seconds—a very small angular opening in the field of vision. Elsewhere I hope to publish some further observations on this field of visual acuteness. As you have seen fit to honour one of the specialists by promoting him to the chair, I do not think I am trespassing on your generosity unduly by bringing a highly technical subject under your notice, but I am well aware that the treatment of a matter of this kind must be limited before a general audience, and, therefore, I do not wish to intrude it too much upon your attention. The variations are great; take, for example, another field of visual acuteness taken by me for Dr. P. when he was a student in my class. The graph for his left eye is almost a circle, but its dimensions are very inferior to those of Mr. S. Thus, its horizontal breadth is about $\frac{3}{8}$ of an inch, and the vertical one is as nearly as possible of the same dimensions. Those who know Dr. P. know that he is an excellent observer, and I have no doubt as to the correctness of his observations, although, be it said, he gives the smallest field of anybody that I have hitherto examined. Almost all these observations were made at a distance of 2 feet, and if that were so in Dr. P.'s case, although I do not find it marked as such, it gives an extremely small angular opening, namely 53 minutes, 40 seconds.

Whether this field of visual acuteness is affected in disease I know not; it will well repay, however, the attention of some workers to investigate the matter further.

At the Ipswich meeting of the British Medical Association I took the liberty of pointing out that when one eye is injured, although there may not be sympathetic ophthalmia, the other eye very frequently has a contracted field, and to that state of affairs I have given the name of sympathetic degeneration. Further years of experience have only confirmed the observations which I made at that time. There is no doubt that in many cases of injury to one eye which are not followed by sympathetic ophthalmia there is marked contraction of the field of vision in the other. This was a discovery which I made in an attempt to foretell which cases of injury were likely to be dangerous from the point of view of sympathetic ophthalmia setting in later. It is generally admitted that the virus travels from one eye to the other along the optic nerves and chiasma, and very frequently the first symptom of an impending sympathetic ophthalmitis is the redness of the optic nerve in the sympathising eye. It occurred to me that the regular investigation of the fields of vision of eyes which from injury to the other were liable to sympathetic ophthalmitis might throw some light on this very obscure and harassing problem. In that I was disappointed.

I cannot say that there is anything in the field of vision which helps us to foretell an attack of sympathetic ophthalmitis apart from some change in the blind spot region, but I came on the rather astonishing fact that in many cases injury of one eye was followed by permanent contraction of the field of vision in the other.

Whether the field of visual acuteness undergoes any changes of a similar kind I am not able to say; one thing however is certain, so far as my observations have till now gone, and that is that the field of visual acuteness is not of a generally well defined order and extent as is the case for the field of vision, and therefore if it is only investigated after injury to one eye it is quite impossible to say what like it was prior to the injury.

This difference between visual acuteness and the form sense is of tremendous importance in view of recent legislation as to workmen's compensation. You cannot possibly express a man's working power in terms of visual acuteness. As already said, I have known a man at the bottom of a coal pit with only $\frac{1}{30}$ of visual acuteness earning as good wages as

a man with full vision. It is quite true that if a person is to examine the texture of a piece of coal which he may be quarrying, in the same way as a geologist does, it is absolutely necessary for him to have some visual acuteness. A watchmaker must have visual acuteness, but the large bulk of manual labour does not require it at all, provided the form sense and sense of alignment are good. It is all but impossible meantime to say much about the form sense, for it has not yet been investigated. The conditions of labouring work are a function of the form sense and are not necessarily a function of the visual acuteness at all.

There is another matter to which I would like to refer before demitting office; it is that I consider the time is more than ripe to have a special registrable qualification for ophthalmic surgeons just as we have a special registrable qualification for dentists. This is a matter to which I called attention in the *British Medical Journal* of 27th April, 1901, and I see no reason now, with something like a dozen years of extra experience, to depart from the views which I indicated in that paper. We constantly hear of men who are called "eye specialists," and unquestionably the old regime has in this country produced many men in ophthalmic practice quite equal to those who have adorned other departments of the healing art. I have no wish to interfere in the least with the liberty of the medical profession. Let any man practise any department that he has a mind to. Any qualified medical practitioner can start practice at once as a dental surgeon, and so I would not for a moment prevent any qualified medical practitioner starting at once to practise ophthalmic surgery and medicine; but, as a matter of fact, at this moment although ophthalmic surgery was never so widely practised in the United Kingdom as it is just now, and, may I say, although I think a number of the modern practitioners are worthy of the heritage left to them in this country by such men as Bowman and M'Kenzie, yet technically speaking there is not such a thing as an eye specialist qualified by statute. In 1901 I argued for a special curriculum and a special degree or diploma, and I am strongly of opinion that such a diploma is more urgently required now than it was even then. It is true that the University of Oxford has an ophthalmic diploma, but I must say, with all possible respect to the premier British University, I think it is an extremely inadequate one, and if one of the books which has been issued for the instruction of graduates preparing for this examination is to be taken as

indicating the standard which is required, then that standard seems to me deplorable. As indicated in the communication to which I have referred, I would very slightly curtail the present medical curriculum by leaving out such subjects as midwifery, medical jurisprudence, and materia medica, for a gentleman who is going to take a special license or degree in ophthalmology. I would have him study anatomy very fully, surgery and medicine to the same extent as does the ordinary medical man. He ought certainly to have a very wide training both in pathological and physiological laboratories, and should be for two years at least a student in a physical laboratory. Even from his very start I would have a slight difference in his education. He ought to have before he begins his professional study a thorough grounding in plane trigonometry and in the elements of the calculus. A good training in geometric and physical optics is essential, and no training in these two subjects can be effective and sufficient unless there is laboratory work and a competent knowledge of the elementary mathematics on which such a training must rest. I lay the greatest stress on a proper acquaintance with physics, for without that the would-be ophthalmic surgeon is not able even to read the higher text-books on which his work is founded.

I would also lay great stress on attendance at the pathological laboratory. The modern teaching is so different from the mere cutting of sections which, in my student days, was supposed to be pathological work. These are of some use undoubtedly to help in diagnosis, but I venture to think that for all the millions of sections that have been cut, ætiological pathology was at a complete standstill till the newer science of bacteriology and the cognate studies which may be embraced under the word immunity came into vogue. Thanks to biological pathology we can now approach a case without fear and trembling, for ever since the year 1891 we have known quite well that the prognosis of a cataract case, apart from such an unpreventable accident as intra-ocular hæmorrhage, is given by the bacteriological examination of the patient's conjunctiva. It was in 1891 that I first introduced into ophthalmic practice the careful testing of the conjunctival sac before the operation, and I am thankful to say that from that day to this I have not seen a single case of pan-ophthalmitis to follow a cataract operation.

But there is another factor which causes me to emphasise this need of a proper training in ophthalmology, and that is that the State is more and more making use of ophthalmic

surgeons. They ought to be specially trained men just for the same reasons that gentlemen who hold public health appointments have to undergo a special education. No doubt for a public health appointment a great deal of the training which is undergone during undergraduate days is of great importance. Chemistry, physics, medicine, medical jurisprudence have all their bearing on the subject, but it is found necessary that certain laboratory and practical courses should be taken by a man who aspires to look after the health of the community. So also an adequate training in pathology, physics, and physiology is necessary for the man who is to be entrusted in any public capacity as an ophthalmic specialist. So strongly am I of this opinion that I entirely favour the introduction of diplomas and degrees in ophthalmology provided they are made of real value and mean thorough scientific knowledge. At present it is possible for any man to attend an ophthalmic clinic say for a period of from three to six months and to give out that he is an ophthalmic surgeon.

A spectacle vendor errs, and errs seriously, when he thinks that a knowledge of geometric and physical optics will make him competent to practise ophthalmology; so a medical man errs, and errs greatly, when he imagines that he can practise ophthalmology without a thorough-going knowledge of ordinary geometric and physical optics and without a thorough training in modern pathology. Without the former he will not be able to read the standard text-books, such as that of Helmholtz; without the latter his practice will be nothing but the dreary observance of rule of thumb.

Cuignet, of Lille, towards the end of the seventies or beginning of the eighties of last century, introduced into ophthalmic practice the method now known as the shadow test. Before that time it is true that Bowman in this country and Sichel, in Paris, had used reflections of the same kind as of service in diagnosing conical cornea. They certainly, however, never employed the method for determining errors of refraction, and Cuignet is entitled entirely to the merit of that discovery. So far as I am aware the first important paper published upon it in this country was one by Charnley, of Shrewsbury, in 1882, and I think it was there that I first became acquainted with the invention. Probably one of the best discussions on the method that has ever been written is that of Dr. Jackson, of Denver. It was either myself or my friend, Dr. J. C. Renton, who first used it in Glasgow, and I think it all the more

interesting to mention that fact because it is a method which at present I seldom employ.

For the most part I still prefer the direct measurements made by lenses behind the ophthalmoscope. Let us just for a moment consider the true limitations of retinoscopy, as it is sometimes called. To begin with, the patient is often asked to look at a mirror, which may be at 1 metre or 1½ metre from him; that instinctively calls in the power of accommodation and consequently makes the reading entirely erroneous; but if this be avoided by causing the patient to look at the other side of the room, then it is perfectly clear that the surgeon must place himself outside of the patient's direction of vision, and consequently that the refraction which he takes from the eye is not that of the refractive media in the axis of vision but is that of some other secondary axis. This of course would be all right were the media bounded by a spherical surface or even by one which is approximately spherical, but the cornea is not, and any one who knows anything of corneal measurements, to say nothing of retinoscopic practice, must know that even at so small an aperture as five or ten degrees from the visual axis the refraction of the eye is quite different from what it is at the visual axis itself. When I see any one sit down to examine a patient by retinoscopy, and I hear him request the patient to look at an object at the other side of the room, I know quite well that that examiner has never studied the physics of ophthalmology. To get a good result with the shadow test the following conditions are necessary:—In the first place, the patient, if under 40 years of age, should be thoroughly under a mydriatic. If he be a young child atropine ought to be used for a day or two previously. Secondly, the patient's fixation while undergoing examination should be directly at the centre of the mirror which the surgeon is holding; in other words, the surgeon's visual axis and the patient's should as nearly as possible coincide. And thirdly, the rotary excursions of the mirror should be very limited in extent. If these precautions are not taken the results must be erroneous, but if proper care is observed then undoubtedly the method is a good one, and especially suitable in my opinion for young children provided they are thoroughly atropinised. But yet in some respects the introduction of a method of examination which can be used tolerably well by a person who has never had a thorough education in the higher branches of physiological optics is not without its drawbacks.

There is, I suppose, no great good without some accompanying evil. Lister's discovery is, I venture to think, the most important thing that has ever taken place in the history of medicine, but it sometimes seems to have made operating dangerously easy. An easy method, such as retinoscopy, has similarly led a few practitioners, I fear, to disregard the strict limits of accuracy. It is a longer method and one which requires a greater expenditure of time than direct measurements, and yet we hear of batches of children having their eyes tested by the shadow test, under the auspices of school boards, at the rate of something like 150 children to the hour, which works out at an average of 12 seconds per eye. No doubt that will meet "the requirements of the department." As long as the department gets a report everything is well, altogether *ex adverso* of what the report contains. Not long ago one of His Majesty's inspectors visited a school, and amongst other things looked into a French class. By and by there was the usual report that matters had much improved in that particular class, that the pronunciation was better, and so on, in the usual style. The number of pupils in the class was 20, and the time that the gentleman took in their examination was, as near as may be by the watch of one of the pupils, 10 minutes.

In optics, as in everything else, there is no contrivance which will enable men to do the impossible, and it will take at least a considerable period by any method to know whether a child really requires examination or not. I myself would say that at least a period of something like four to five minutes per eye would be required before an examiner could definitely say whether a particular child required investigation or not. In the event of its requiring it, an examination will not be of much value which does not take up a period of from twenty minutes to half an hour per eye. It is a mere farce, if not worse, to say that 150 to 200 children can have their eyes examined within an hour. It may be another ingenious method which the department has invented to throw money into the maelstroem, but that is all. In this connection I must say, as an hospital surgeon, that there is a tendency to have a great deal of unnecessary operating. I do not refer particularly to very gross cases such as one that was recently brought under my notice. A child at one of the twelve seconds examinations was found to have congenital cataract, and was forthwith advised by the discoverer to have the thing operated on. Fortunately the parents of that child for once exercised parental control and took the

bairn to their own medical man, who happened to have an excellent knowledge of such matters. On examination he found that the child on whom it was proposed to do an operation had not less than $\frac{6}{6}$ of Snellen; in other words, had a kindly providence not interfered that child would have been mutilated for life. It would have lost once and for all the advantages of accommodation and would have been reduced to a sorry plight. But the thing to which I chiefly object is the continual craze to operate on children who squint. The matter is one of extreme importance, and therefore I make no apologies for again enunciating views which I have often expressed during the last twenty years. An operation for squint may readily be done for one of two purposes or for them both. In the first place, nature has endowed us with two eyes in order that we may have the intuitive perception of the third dimension of space, or in other words, binocular vision. It is impossible with a squinting eye to have that. In the second place, it is quite justifiable to put a squint straight in order to improve the personal appearance.

Let us take up the first point. If a person is to have binocular vision, amongst other things it involves that he shall originally have good vision in both eyes. Now, in the large majority of squinting children this is not the case. Probably in from 70 to 80 per cent of them there is amblyopia, or very defective sight in the squinting eye. That is a state of affairs pointed out by Donders, and confirmed by everybody since his time. The views which have been expressed as to the origin of this amblyopia have been very numerous, and have given rise to a great deal of controversy, but the following facts seem fairly well established. To begin with, if the squint has not set in till the child is 4 or 5 years of age, this blindness or amblyopia is not present. Further, in cases of squint where it is alternating, sometimes the one eye and sometimes the other being used for vision, this amblyopia is not present; but if a young child of, say, 2, or perhaps even 3, years of age takes a squint in one eye, and squints constantly and continuously with that eye, never using it for vision, then the function of vision is never developed, and the eye is permanently defective. Unless visual acuteness is possible at that period of life at which the functions of the brain are being developed, then at no subsequent time can the function come into existence. A precisely similar state of affairs is found in congenital cataract. If the cataract is so extensive and so severe in early life that it prevents the function of visual acuteness

being developed, then you may operate as you like; you will never by operation succeed in procuring visual acuteness. In eyes in which the lenses have been affected throughout their entire extent with congenital cataract you will probably get the form sense, for that depends upon the light sense. There is no case on record in which a person arrived at adolescence, with congenital cataract present to such an extent as to prevent him reading and writing, ever by operation gained the power of reading and writing. I have on various occasions mentioned two such cases that I personally have recorded. One was a student of brilliant parts. He had been allowed to grow up to the age of ten or twelve with congenital cataract present to such an extent as to prevent visual acuteness. He was operated on and the lenses entirely removed, and the eyes found to be healthy. Thereafter he went to Edinburgh, and in the classes of the University was a most brilliant student. At the time of his death from glycosuria he was studying for his M.A. degree, with honours in Philosophy, and yet it was found impossible both here and in Edinburgh to teach a lad of such mental calibre as that either to read or to write. There is not a single case on record where visual acuteness has not been developed in the first two, or perhaps three, years of life in which subsequently it has been got by operative procedure.

Now, a squinting eye which has amblyopia can very easily be put straight, and there is scarcely a week in which I am at the hospital without having one or more children sent by school medical officers to have their eyes operated on for strabismus. I say that in about 70 or 80 per cent of cases it is not justifiable. I mean that in all those patients where there is amblyopia from want of functional development a squint operation ought not to be undertaken during the early years of childhood. If it is perfectly clear that the eye is defective, then you cannot hope to restore vision to that eye by a strabismus operation, however successful. All you can do is to effect the second purpose of such operative work, namely, to improve the child's appearance. That is a matter which can very easily and well be left over till the youngster reaches adolescence; and, moreover, when parents are told to take their children to have an operation at an Eye Hospital, they certainly ought to be warned by the school medical officer that it will not improve the vision of the eye in the least, but that all it will do is to improve the child's appearance. I must have seen many dozens of such patients, but I have never yet come across one that has been warned. The

parents are simply told to take the child to an Eye Hospital and to get the eye put right, and nowadays they are liable to prosecution if they do not comply with this demand. They are not informed that, so far as the function of vision is concerned, any operative procedure is not of the slightest use, unless indeed it be one of the somewhat infrequent cases already referred to where there is good visual acuteness in each eye. But there is another consideration: it is this—after the age of 12 or 13 the squint operation of advancement can very easily be done in most cases under a local anæsthetic. Before that time of life a general anæsthetic must all but invariably be administered. The risk is no doubt small, but nobody will deny that there is a risk, and that it would be a lamentable circumstance to have a death from an anæsthetic where the operation has not in view functional benefit to the child, but merely the improvement of the general appearance. The same operation can quite easily and painlessly be performed with a local anæsthetic in most cases when the patient is a few years older. Now, the ethical question is simply this—Have you any right to subject a young patient to an operation which will not improve his function of vision, and which is accompanied by a substantial risk, simply and solely at the dictates of "The Department," and without fully informing and getting the co-operation of the young patient's guardians? I personally have answered that question in the negative, and I refuse to do it; but at the same time it would be absolutely malpraxis to refuse operation to a child when both eyes have good vision, and when the amblyopia has not made operative procedure futile. These cases, after suitable treatment, should be operated on as early as possible.

Perhaps the foregoing may appear somewhat dogmatic. I have no wish to misjudge anything. It seems to me that there has been an attempt to do the impossible, and we need not be at all astonished if an attempt of this kind has been a failure. We do not blame practitioners so much as the authorities, who think that accuracy and thoroughness can be obtained with inadequate resources. It is just the same thing perhaps in primary education. The attempt to teach children everything for the most part has succeeded in teaching them nothing. We do not for a moment question the excellent intentions of the authorities, but we venture to think, with all respect and good feeling, that they have bitten off much more than they are able to chew. I feel that I have some right to take an interest in this subject, for in

1883 I wrote a letter to a member of the Glasgow School Board, urging that the eyes of school children should be examined. I got back a reply to say that there was no need for anything of the kind. I rejoice extremely to know that something is now being done; and surely if I err it is to virtue's side in insisting that there shall be accuracy and conscientious work, at any rate in this part of our educational equipment.

Let me, in conclusion, say that I have thoroughly enjoyed my term of office, and I hope that to some extent I have discharged the duties of the Chair to the satisfaction of the members of the Society.

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