Rules regarding defects of vision which disqualify candidates for admission into the various departments of the Indian Government Service / by J. Fayrer ; with appendix containing the regulations as to range of vision necessary to qualify a candidate for admission into the Royal Navy, British Army and Civil Service.

RULES

REGARDING

DEFECTS OF VISION

WHICH DISQUALIFY CANDIDATES FOR ADMISSION INTO THE VARIOUS DEPARTMENTS OF THE

INDIAN GOVERNMENT SERVICE

BY

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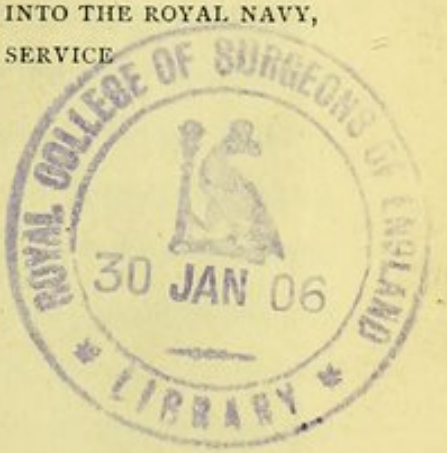
WITH APPENDIX

CONTAINING THE REGULATIONS AS TO RANGE OF VISION NECESSARY TO QUALIFY A CANDIDATE FOR ADMISSION INTO THE ROYAL NAVY, BRITISH ARMY AND CIVIL SERVICE



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PREFACE.

THE want of any authorized definition of the Defects of Vision which may exist with or without prejudice to the admission of Candidates to the various departments of the Public Service, has long been felt, not only by official Medical Examiners, but by medical men generally, who, in the absence of any recognized standard, and in ignorance of the visual requirements demanded by various departments for the efficient performance of the duties of each, are unable to form or express an opinion in cases where Ametropia suggests a doubt as to the fitness of the Candidate for the Service.

In the interests of Government and of those seeking admission, it seems very desirable that rules regarding visual qualifications should be laid down: for the Government, because it should be protected, as far as possible, against the admission of persons with unsound eyesight; for the Candidate —or for those on whom he depends—because Ametropia is not always a disqualification, and because it may be necessary to determine at an early age whether the prospect of admission be such as to justify his entering on a special and costly course of education, which may have to be commenced years

before he has to undergo the official medical examination on which his admission to the Service depends.

The object of this little work, therefore, is to lay down rules for the guidance of both Medical Examiners and Medical Advisers who have, on the one hand, to determine the fitness of the Candidate for admission; on the other, to advise him at an early stage of his career.

As President of the Medical Board at the India Office, I have for many years experienced the inconvenience above referred to, and am anxious if possible to remove it. With this view I have submitted the whole question to my friends Messrs. C. N. Macnamara and John Couper, who having most carefully considered the subject, have drawn up the following brief but simple and complete rules in reference to Visual Defects, and the methods of ascertaining them, which I trust will be found to be of general utility.

The scientific attainments and large experience of the eminent surgeons to whom I am indebted for all that is useful in the following pages, are too well known to need any comment, whilst they are an ample assurance of the practical value of the rules laid down. It has been earnestly desired, in framing these rules, to guard equally the interests of Government and the Candidate; and with the view of making the subject as complete as possible, it has been thought well to point out not only the Defects of Vision, but the methods of ascertaining them—not with any idea of dictating to Medical Examiners how they should proceed, for of course each will adopt his own method, but for the purpose of indicating the simplest and at the same time an efficient mode of testing the accuracy

of vision; and as such I trust this work will be acceptable to all who are interested. The Secretary of State for India in Council has been pleased to sanction these rules for the Indian Service under the following stipulations, that—

"These rules are printed for the convenience of those who may have to conduct medical examinations, and of those who may be intending to become Candidates for any of the branches of the Indian Service to which they refer. But it must be distinctly understood that the Secretary of State in Council, while sanctioning the publication of these rules, reserves to himself an absolute right to reject at his discretion any Candidate whom he may consider to be, for any physical reason, unfitted for the service he desires to enter."*

I desire to express my cordial thanks to Messrs. Macnamara and John Couper, and also to my colleague on the Medical Board, Brigade-Surgeon H. Cayley, whose valuable counsel has been of great assistance. To these gentlemen, it is almost needless to repeat, this work owes whatever merit it may be found to possess.

J. FAYRER.

*Letter No. M. 6560, dated July 8, 1886, from Military Secretary to Government of India, to Surgeon-General Sir J. Fayrer, M.D., K.C.S.I.

In the following pages certain signs and terms are employed which medical men are familiar with, but the meaning of which may not be understood by others.

The sign — is employed to signify a concave lens.

„ + „ „ convex lens.

„ D „ „ dioptre—that is, a lens of one metre (40 inches) focus; a lens of two dioptres is twice the strength of the former, and has a focal length of half a metre. In the dioptric system, which is now universally employed, the lens is numbered by its refracting power, and not, as in the old system, according to its focal length.

At page 10, the meaning of the formulæ referred to in the following work is explained.

Myopia (*near sight*): the rays of light are brought to a focus before they reach the retina (p. 12).

Hypermetropia (*over-sight*): the rays of light are brought to a focus behind the retina (p. 13).

Emmetropia (*normal vision*): a well-defined image of an object, at an ordinary visible distance, is formed on the retina (p. 12).

Ametropia is any condition of the eye in which parallel rays of light are focussed behind or in front of the retina (p. 1).

Astigmatism: the refractive power of the chief meridian planes of the eye differ, and so rays of light are not accurately brought to a focus on the retina (p. 15).

Diplopia (*double vision*) : the person sees an object double.

Strabismus (*squint*): the optic axes of the eyes are not directed to the same object; there is a want of parallelism in the position and motion of the eyeballs.

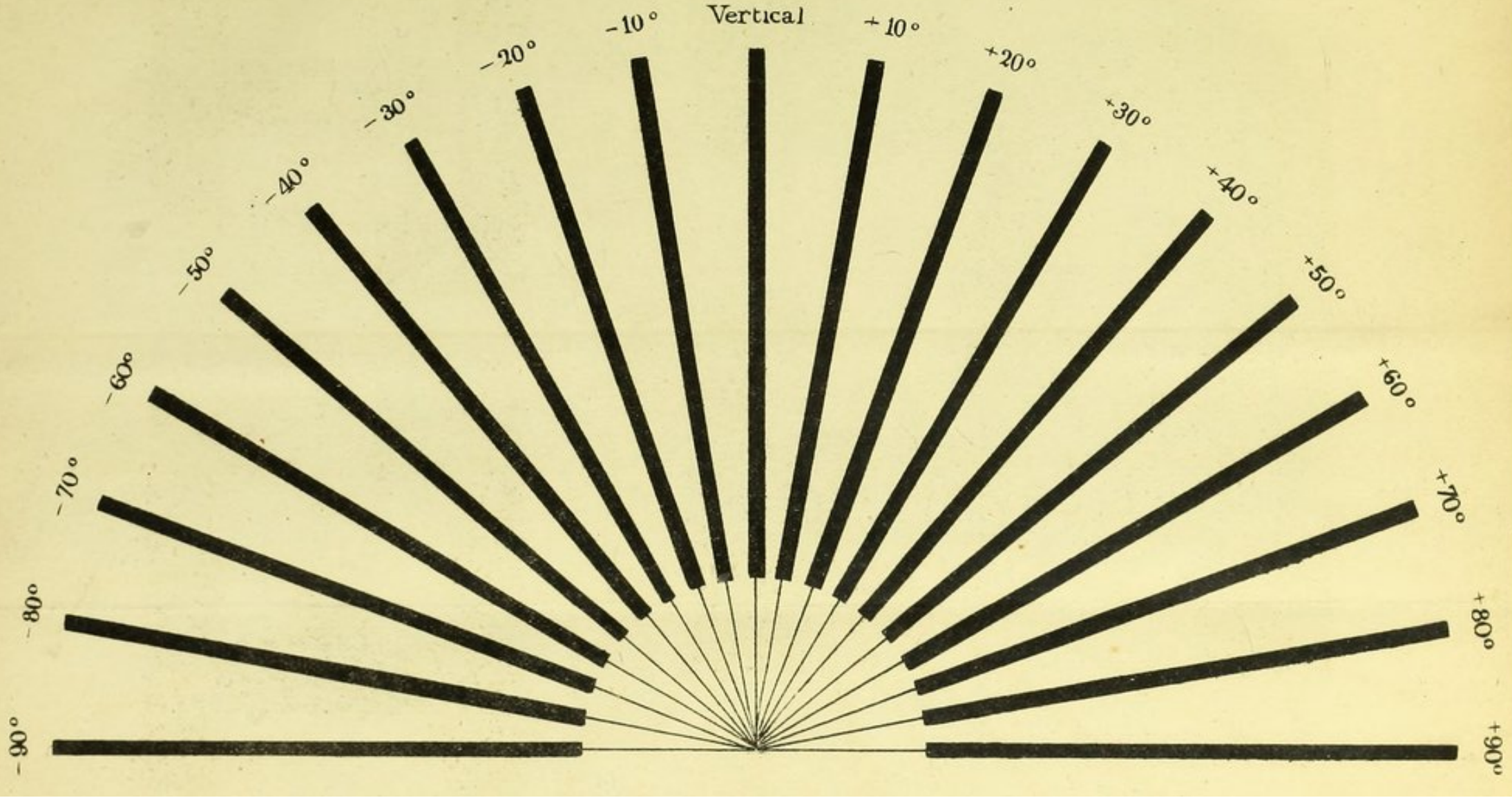
Staphyloma: a term denoting a protrusion of the cornea or of the sclerotic.

Retinoscopy (*shadow test*): a test for errors of refraction depending on the apparent movement of the light and shadow thrown on the retina from a concave mirror held about 20 inches from the eye under observation.

Achromatopsia (*colour blindness*): want of power to distinguish one or more of the primary colours.

Dischromatopsia: a difficulty in recognizing certain colours; one colour is frequently confounded for another; violet is taken for blue, orange for bright red, pink for blue, and so on.

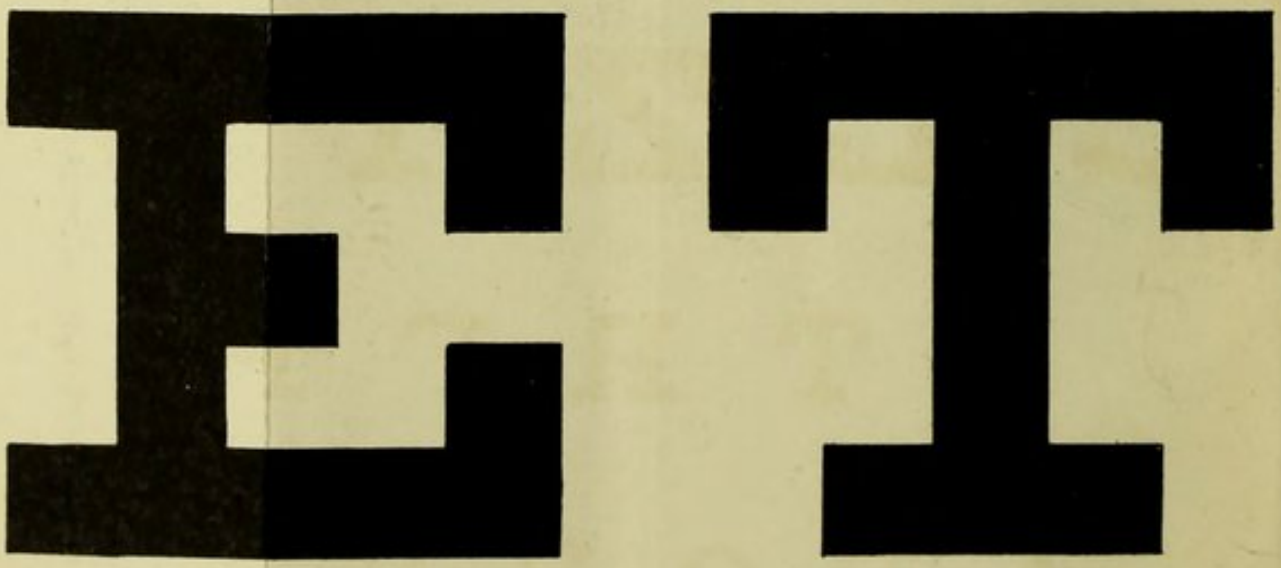
ASTIGMATIC FAN.



SNELLEN

D-60 (200)

D-36 (120)



TEST TYPES.

D-24 (80)

L A V

D-18 (60)

R T E B

D-12 (40)

D F O E

D 9.(30)

C L Z T O

D-6.(20)

L T R F P

D-5.(16)

A P O R F D

PICKARD AND CURRY, OPHTHALMIC OPTICIANS, 195, Ct PORTLAND St. W.

TEST-TYPES FOR NEAR VISION.

D = 0,6

Sometimes to give a variety to our amusements, the girls sang to the guitar: and while they thus formed a little concert, my wife and I would stroll down the sloping field, that was fragrant with wild flowers, and enjoy the breeze that wafted both health and harmony.

D=0,8

At last a young gentleman, of a more genteel appearance than the rest, came forward, and for a while regarding us, stopped short, and giving his horse to a servant who attended, approached us with a careless superior air.

D=1

The family seemed earnest to please him ; my girls entertained him with topics they thought most modern, while Moses gave him a quetion or two from the ancients, for which he had the satisfaction of being laughed at.

D=1,25

Such was the power of fortune and fine clothes, that he found no second repulse. In course of conversation

D=1,5

He let us know that he was the owner of the splendid picturesque estate that lay round us.

D=1,75

At these times our little ones always read short tales for our amusement.

D=2,25

For in this way you may always damp our ardour.

D=3

I saw no one there.

Defects of Vision which disqualify for admission into the several Departments of the Indian Government Service.

BEFORE attempting to lay down rules as to the defects of vision which disqualify for admission into the Indian Government services, it is necessary to consider the nature of the duties which the candidate proposes to undertake. For instance, a candidate for the Pilot Service should have absolutely perfect vision and accommodation; whereas a candidate desirous of entering the Civil Service may be ametropic if with proper glasses he possess normal acuteness of vision, and have no morbid changes in his eyes. We need not enter into the details which have influenced us in drawing up the following regulations on this subject, but it is for many reasons highly important that a fixed standard should be laid down as to the amount of ametropia * that should disqualify a man for the various branches of the service.

In the British army, men desirous of entering the ranks have, up to the present time, been rejected unless

* By *ametropia* is meant that condition of the eye in which parallel rays of light are focussed either behind or in front of the retina; *emmetropia*, when they are focussed exactly on the layer of rods and cones of the retina.

they could count Snellen's round test-dots at a distance of ten feet, their acuteness of vision being rather less than one-fourth, or equal to about $\frac{6}{24}$. Such men might decipher $\frac{6}{24}$ Snellen, but not $\frac{6}{18}$; the defect of sight, if arising from myopia, would probably be corrected by -2 D. A young man, however, may be able to count Snellen's round dots at ten feet, or to read $\frac{6}{24}$, and yet be decidedly ametropic. For instance, some young persons with as much as 4 and 5 D. of manifest hypermetropia can, by an effort of accommodation, decipher not only $\frac{6}{24}$, but $\frac{6}{6}$; and a case occurred in which a candidate passed into the British army with *myopia* of 4·5 D., who by practice could count Snellen's round dots at ten feet. Commissioned officers in the various Continental armies are allowed to wear glasses when on duty; and it is obvious that if a combatant officer or a civilian can see better with glasses than without them, it must be an advantage to himself and to the service that he should do so. It is said that a man may forget his glasses, or that they are inconvenient and easily broken. In reply to this it may be remarked that experience has shown that the efficiency of the German army has not been diminished, although officers and men are permitted to wear glasses. In all those departments of Government service where men are likely to be engaged in active outdoor occupations we have fixed the necessary standard of acuteness of vision at such a point, that the candidate should be able to see to ride across country, to play cricket, and to read and write without the aid of glasses, although he might see very much better with them.

Candidates for commissions in the line (British) have been permitted to wear ordinary concave or convex glasses *at the time of the physical examination*, and if with the aid

of such glasses they could count Snellen's round dots at ten feet, they have been considered fit for the service, so far as their sight is concerned. In the Royal Artillery and the Engineers the same rule has applied; but the candidate, with or without glasses, must be able to decipher more than $\frac{6}{9}$; or count Snellen's round dots at $22\frac{1}{2}$ feet. Candidates rejected on account of defective vision at the physical examination have, nevertheless, been permitted to go up for the literary examination, and if successful, to appeal to a special board of medical officers in London. Our opinion is, that candidates for military service might be accepted, provided there be absolute acuteness of vision and of accommodation with proper glasses, and that no progressive morbid changes exist in the fundus of the eyes. But this principle cannot be adopted unless officers, having errors of refraction, are enjoined to wear glasses when on duty.

MODE OF CONDUCTING THE VISUAL EXAMINATION OF CANDIDATES FOR THE INDIAN GOVERNMENT SERVICE.

It is necessary to have a fixed standard by means of which to test the acuteness of vision of candidates desirous of entering the Indian Service. For this purpose, unless in exceptional cases, the last edition (1885) of Snellen's test-types should be used. These types have been adopted by all the best authorities on the Continent, and by ophthalmic surgeons in this country. They are so constructed that the strokes comprising the letters are seen under an angle of 1′, and the whole letter under an angle of 5′ at their respective distances.

The dioptric or metric system should be used in examining the acuteness of vision possessed by candidates for the Indian Government Service. In this system a lens of 1 metric focus is taken as the unit (for all practical purposes 1 metre is equal to 40 English inches). Snellen's types for distant vision consist of rows of letters, each row having above it the distance, in metres, at which it should be read; so that 6 should be clearly deciphered at 6 metres, or about 20 feet. The formula $\frac{6}{6}$ $\frac{\text{distance from type}}{\text{number above type}}$ is designed to represent the acuteness of vision as measured by the proportion between the actual distance at which the type can be read, and the distance at which the type subtends the standard angle of 5′; for instance, $\frac{6}{36}$ indicates that 36 is read at 6 metres; $\frac{6}{5}$, that 5 is read at 6 metres. When the person to be examined cannot read, dots may be used in place of letters; but Snellen remarks, that these dots "cannot be placed on an equal footing with parallel lines of equal diameter."

The person to be examined is to be placed with his back to the light, at a distance of 6 metres from the test-types, which are hung on the wall or held perfectly upright with a bright light falling on the types. Each eye is to be examined separately; the eye not under observation being covered with an opaque disc placed in spectacle frames: this is more effectual than if the candidate, or an assistant, close the eye not under examination with his hand. If glasses be employed at the examination, they must be fixed in the spectacle frame, and not held in front of the eye under examination.

It is necessary to have a series of test-types, so that they may be changed during an examination. But the existence and degree of ametropia should be carefully noted after employing not only the types above referred to, but, when necessary, the ophthalmoscope, or the shadow test (retinoscopy), otherwise, hypermetropia may be overlooked, or low degrees of myopia mistaken for hypermetropia, and astigmatism for loss of sensitive power in the retina, and *vice versâ*.

If a person can with each eye read 0·5 type at 5 inches and $\frac{6}{6}$ with precision, (unless specially trained to pass the examination) he is probably neither myopic, astigmatic, nor has he any serious pathological changes in his eyes—at least, not in his macula; but it is quite possible, if young, he may be hypermetropic to a considerable extent, in which case he would, however, see $\frac{6}{6}$ more clearly with a convex lens. To ascertain the existence of hypermetropia—especially among young people—it is therefore necessary to employ further tests than simply deciphering Snellen's types at their respective distances.

Emmetropia (Refraction normal).

Parallel rays of light are united on the retina. The organ being otherwise healthy, an emmetropic eye can clearly define Snellen's test-types at the indicated distances. Distant vision is impaired either by a convex or by a concave lens if stronger than can be overcome by an effort of accommodation. By the direct method with the ophthalmoscope, the person's eye under examination being directed to a distant point, and the observer's eye being emmetropic and his accommodation relaxed, if the mirror of the ophthalmoscope be brought close to the eye under examination, a clear and enlarged image of a portion of the fundus is seen, which moves in the same direction as the observer's head. At a distance of a few inches, supposing the observer be emmetropic, he will not be able to see the details of the fundus of the eye with definition. By retinoscopy the shadow is absent or very faint, and if it move, it is in a direction opposite to that of the mirror. If in any doubt, the eye should be examined when fully under the effects of atropine.

Myopia.

Parallel rays are focussed in front of the retina; divergent rays alone being focussed on the retina. The myope requires a concave glass to enable him to overcome his error of refraction: the weakest glass with which he sees best is the measure of his myopia and expresses its degree. For instance, when we speak of a person being myopic to the extent of 2 D., we mean that with a concave glass of two dioptrics he can see Snellen's test-types at their correct distance. By the direct method of ophthalmoscopic examination the mirror being brought close to the myopic eye, the details of its fundus cannot be clearly defined until a concave

lens be placed in front of the observer's eye: the weakest glass with which the details of the fundus can thus be distinctly defined is the measure of the myopia. In high degrees of myopia the fact must be taken into consideration, that the lens behind the ophthalmoscope does not come as close to the eye under observation as a glass in spectacle frames would do, and by that amount gives an unduly high measure of the myopia. By retinoscopy the shadow moves in the same direction as the mirror; with a correcting concave glass in front of the eye, the image no longer moves with the mirror.

As a rule, a person having 2 D. of myopia can without glasses decipher 24 of Snellen at 6 metres in a good light. Myopia depending on a posterior staphyloma, if not exceeding 2·5 D., and presenting no evidence of active changes in the choroid or retina, is unlikely to increase after the individual is about eighteen years of age. But with a low degree of myopia, if the eye be over-corrected, spasm of the ciliary muscle and temporary impairment of sight may occur, unless the error of refraction be corrected by proper glasses.

Myopia of even 4·5 or 6 D., if unaccompanied with posterior staphyloma or other morbid change, and which can be completely overcome by glasses, is not likely either to increase or to lead to pathological changes in the eyes, if proper glasses be worn.

Hypermetropia.

Parallel rays are brought to a focus behind, and convergent rays alone are focussed on the retina in a hypermetropic eye. The error of refraction may, as a rule, be entirely corrected by proper convex glasses. Hyperme-

tropia is the most common, and appears to be an increasing cause of ametropia among all classes of our population. A young person with good accommodation may be hypermetropic to the extent of 4 D. (manifest hypermetropia), and yet able to read 0·5 Snellen at 5 inches, and also $\frac{6}{6}$; that is to say, by test dots or types his acuteness of vision may, in a rapid examination conducted by means of types or dots, appear normal. In several of the Continental armies neither officers nor recruits are rejected with hypermetropia equal to 6 D., but they are allowed to wear glasses. If this were not the case, it is evident that a young man with a very much lower degree of hypermetropia than 6 D., although when healthy and strong he could perhaps count $\frac{6}{6}$, might, under the fatigues and hardships of a campaign, find his sight utterly fail him, because his muscular power —that is, his accommodation—is for the time weakened. This is no mere theory. A private entered the Guards, with apparently good vision; he went to Egypt; but from the effects of climate and hard work his sight failed, and he was desperately wounded. This man had about 3 D. manifest hypermetropia. As hypermetropes advance in life their defective sight becomes more manifest, but does not, as a rule, lead to pathoiogical changes in the eye.

By the direct method of examination with the ophthalmoscope, the accommodation of the eye under observation being suspended, the image of the fundus under examination is indistinct, supposing the accommodation of the observer's eye to be at rest. If the observer exert his accommodation, an erect image of the fundus of the eye is seen. The strongest convex glass with which we are able to see a clear image of the fundus by the direct method of examination, is a measure of the degree of hypermetropia.

If at 9 inches or farther from the eye under examination, the observer, by aid of the ophthalmoscope, obtain a clear view of a vessel or other portion of the fundus, and if the object move in the same direction as that in which the observer moves his head, hypermetropia exists.

By retinoscopy the image moves in the opposite direction to that in which the mirror is turned. This may also be the case in emmetropia or in slight myopia, if the accommodation be not suspended; but if +1 D. be placed in a frame in front of the eye under examination, and the shadow still move opposite to the direction of the movement of the mirror, the case is one of hypermetropia or of hypermetropic astigmatism.

If a convex glass which over-corrects the hypermetropia (say 4 D.) be placed in spectacle frames before the eye under examination, and in front of this be held the weakest concave lens which will enable the individual to read $\frac{6}{6}$, the difference between the glasses will be the measure of the hypermetropia, provided accommodation be at rest.

Astigmatism.

In astigmatism there is a difference in the refractive power in the chief meridian planes of the eye. If slight, this error of refraction may be masked by accommodation; but if it exist beyond a limited degree, the rays of light falling on the cornea are not accurately focussed on the retina, and so the object from which the rays proceed is blurred. In not a few instances of hypermetropic astigmatism, when the chief meridians are oblique in direction, the individual by tilting his head to one side can see distant objects more clearly. We not unfrequently

meet with instances of both myopia and hypermetropia complicated with astigmatism.

With the ophthalmoscope we find, by the indirect as well as by the direct method, that the optic disc, instead of being circular, is elliptical; the long axis of the ellipse being in one chief meridian by direct examination, and in the opposite meridian by indirect examination. We may thus have in the same eye the disc appear horizontally oval when directly examined, and vertically oval when viewed indirectly.

By retinoscopy the shadow is clearer and moves more quickly in one meridian than in another; or it may move with the mirror in one meridian, and against it in the opposite meridian. In the majority of cases of simple or of mixed astigmatism the error of refraction can be corrected, as in myopia and hypermetropia, by means of proper glasses.

Accommodation.

The amount of accommodation is to be tested by measuring the nearest, as also the farthest, point at which the smallest of Snellen's (·5) test-types is clearly read. If the accommodation in each eye be normal, a young person will read ·5 type at 5 inches, and as far as 20 inches from his eyes, and the other types at the respective distances of the number placed above them.

Diplopia.

In making an examination for the existence of diplopia (double sight), the person whose sight is to be tested should be taken into a dark room, and his head fixed in one position during the examination. A candle should then be held some 6 or 8 feet from the individual; the light being

moved in different positions, a double image will be seen. If a deeply-coloured glass be held first before one eye and then before the other, the coloured flame will indicate the direction of the image in the eye which deviates from its fellow.

Defects in acuteness of vision arising from other causes than those of errors of refraction, are for the most part recognized by means of the ophthalmoscope; such as opacities of the media, or changes in the normal condition of the fundus of the eye. In such cases, however, the use of glasses will hardly bring the vision up to the normal standard. Whatever the defect in vision, the examining medical officer should clearly define its precise degree and nature. In doubtful cases, the eyes should be examined when fully under the influence of atropine or of homatropine.

Acuteness of Colour Sense.

For testing the colour sense, Professor Holmgren's coloured skeins of wool are to be employed. Their colours correspond to those of the spectrum, with the addition of other shades. There are various shades of each colour, and the skeins are mixed together on a table in full daylight. The examiner takes one coloured skein after another from the heap, and requires the person under examination to pick out the corresponding shade of colour. Each eye should be tested separately.

CANDIDATES for admission into the several departments of the Indian Government Service are to be examined as to their acuteness of vision by Snellen's test-types at a distance of six metres, and for their near point by Snellen's small type: the result is to be confirmed by lenses placed before the eyes, and, *if necessary*, by means of the erect ophthalmoscope image, or by the shadow test (retinoscopy). Each eye should be examined separately. Any error of refraction, together with its degree, or other defect of vision, should be carefully recorded by the examining medical officer.

THE CIVIL SERVICE

(*Covenanted and Uncovenanted*).

1. A candidate may be admitted into the Civil Service of the Government of India, if ametropic in one or both eyes, provided that with correcting lenses the acuteness of vision be not less than $\frac{6}{9}$ in one eye, and $\frac{6}{6}$ in the other, there being no morbid changes in the fundus of either eye.

2. Cases of myopia, however, with a posterior staphyloma of the non-progressive form, may be admitted into the service, provided the ametropia in either eye do not exceed 2·5 D., and no active morbid changes of choroid or retina be present.

3. A candidate who has a defect of vision arising from nebula of the cornea is disqualified, if the sight of either eye be less than $\frac{6}{12}$; and in such a case the acuteness of vision in the better eye should equal $\frac{6}{6}$, with or without glasses.

4. Paralysis of one or more of the exterior muscles of the

eyeball disqualifies a candidate for the Indian Civil Service. In the case of a candidate said to have been cured of strabismus by operation, but without restoration of binocular vision, if with correcting glasses the vision reach the above standard (1), and if the movement of each eye be good, the candidate may be passed. The same rule applies to the case of unequal ametropia without binocular vision, both eyes having full acuteness of vision with glasses and good movement.

Candidates for admission into the following Departments come under the rules laid down for the Civil Service:— Ecclesiastical, Education, Salt, and Opium.

Candidates for the Departments of Public Works, Forest, Survey, Telegraph, Railway, Factories, as well as Police, and various artificers, may be admitted into the service under the following rules :—

1. If myopia in one or both eyes exist, a candidate may be passed, provided the ametropia do not exceed 2·5 D., and if with correcting glasses, not exceeding 2·5 D., the acuteness of vision in one eye equal $\frac{6}{9}$, and the other $\frac{6}{6}$, there being normal range of accommodation with the glasses. If the myopia be associated with posterior staphyloma, and there be evidence of active morbid changes in the choroid or retina, the candidate should be rejected, however slight his myopia.

2. Myopic astigmatism does not disqualify a candidate for the service, provided the combined spherical and cylindrical glasses required to correct the error of refraction do not exceed $-2{\cdot}5$ D.; the acuteness of vision in one eye, when corrected being equal to $\frac{6}{6}$, and in the other eye $\frac{6}{9}$, together with normal range of accommodation with the correcting glasses, there being no evidence of progressive disease in the choroid or retina.

3. A candidate having latent hypermetropia not exceeding 4 D. is not disqualified, provided the sight in one eye (when under the influence of atropine) equal $\frac{6}{9}$, and in the other eye equal $\frac{6}{6}$, with + 4 D., or any lower power.

4. Hypermetropic astigmatism does not disqualify a candidate for the service, provided the combined lens required to correct the error of refraction do not exceed 4 D., and that the sight of one eye equal $\frac{6}{9}$, and the other $\frac{6}{6}$, with or without such a lens.

5. A candidate having a defect of vision arising from nebula of the cornea is disqualified if the sight in one eye be less than $\frac{6}{12}$. In such a case the better eye must be emmetropic and possess normal vision. Defects of vision arising from pathological or other changes in the deeper structures of either eye, which are not referred to in the above rules, exclude a candidate from admission into the service.

6. A candidate is disqualified if he is wholly unable to distinguish the principal colours (Achromatopsia).

7. Paralysis of one or more of the exterior muscles of the eyeball disqualifies a candidate for the Indian Military Service. In the case of a candidate said to have been cured of strabismus by operation, but without restoration of binocular vision, if with correcting glasses the vision

reach the standard given in Rule (1), "Civil Service," and if the movement of each eye be good, the candidate may be passed. The same rule applies to the case of unequal ametropia without binocular vision, both eyes having good movement and full acuteness of vision with glasses.

Candidates as guards, engine-drivers, signal- and pointsmen on the Indian railways, come under the rules prescribed for the Pilot Service.

Persons entering the Government Service on special duty must possess such an amount of acuteness of vision as will, without hindrance, enable them to perform the work of their office for the period their appointment may last.

THE INDIAN MEDICAL SERVICE

(*Covenanted and Uncovenanted*).

1. A candidate may be admitted into the Indian Medical Service if myopic to the extent of 5 D., provided that with correcting lenses his acuteness of vision in one eye equal $\frac{6}{12}$, and in the other $\frac{6}{6}$, there being no morbid changes in the fundus of the eyes. Cases of myopia, however, with a posterior staphyloma, may be admitted into the service, provided the ametropia in either eye do not exceed 2·5 D., the acuteness of vision with correcting glasses being equal to the above standard, no active morbid changes of choroid or retina being present.

2. Myopic astigmatism does not disqualify a candidate

for the service, provided the combined spherical and cylindrical glasses required to correct the ametropia do not exceed −5 D.; the acuteness of vision in one eye when so corrected being equal to $\frac{6}{12}$, and in the other eye $\frac{6}{6}$; the accommodation being normal with the correcting glasses, and no progressive morbid changes of the choroid or retina being present.

3. A candidate having latent hypermetropia not exceeding 5 D. is not disqualified for the service, provided the sight in one eye (when under the effect of atropine) equal $\frac{6}{12}$, and in the other $\frac{6}{6}$, with + 5 D. or any lower power.

4. Hypermetropic astigmatism does not disqualify a candidate for the service, provided the combined lens required to correct the latent hypermetropia do not exceed 5 D. The acuteness of vision in one eye must equal $\frac{6}{12}$, and in the other $\frac{6}{6}$, with or without the correcting glass.

5. A candidate may be accepted with a faint nebula of one cornea, reducing the vision to $\frac{6}{12}$, provided the eye in other respects be healthy. In such a case the better eye must be emmetropic and possess normal vision. Defects of vision arising from pathological or other changes in the eye, which are not referred to in the above rules, exclude a candidate for admission into the Indian Medical Service.

6. A candidate is disqualified if he cannot distinguish the principal colours, red, green, violet or blue, yellow, and their various shades (Dischromatopsia).

7. Paralysis of one or more of the exterior muscles of the eyeball disqualifies a candidate for the Indian Medical Service. A candidate may be accepted who is said to have been cured of strabismus by operation, but without restoration of binocular vision, if with correcting glasses the vision come up to the standard laid down in the above rules, and

if the movement of each eye be good. The same rule applies to the case of unequal ametropia without binocular vision, both eyes having full acuteness with glasses and good movement.

THE PILOT SERVICE.

1. A candidate is disqualified unless both eyes are emmetropic, having absolute acuteness of vision and range of accommodation.

2. A candidate is disqualified by any imperfection of his colour sense.

3. Strabismus, or any defective action of the exterior muscles of the eyeball, disqualifies a candidate for the Pilot Service.

THE MARINE SERVICE.

(*Including Engineers and Firemen.*)

1. A candidate is disqualified if he have an error of refraction in one or both eyes which is not absolutely neutralized by a concave or convex 1 D. lens, or some lower power.

2. A candidate is disqualified if he cannot distinguish the primary colours and their various shades, red, green, violet or blue, and yellow.

3. Strabismus, or any defective action of the exterior muscles of the eyeball, disqualifies a candidate for the Marine Service.

APPENDIX.

MILITARY SERVICE OF GREAT BRITAIN.

THE following instructions, taken from Professor Longmore's "Optical Manual,"* form the basis on which the Military Medical Board proceed in examining for the British Army.

"**Application of Test-dots.**—If the man under examination be a recruit, as soon as he is placed in position, the test-dots are held upright before him at the prescribed distance—ten feet in the case of a recruit for the regular army, and five feet for militia and departmental corps recruits—and he is asked to state the number of dots exposed to his view. He should be required to count and describe the positions of two or three series of dots with each eye, and if he replies readily and satisfactorily, so far as power of vision is concerned, he is fit for service."

"**Decision as to Fitness for Service reserved in Special Cases.**—Although all candidates for commissions in the army are allowed to use glasses when being tested as to power of sight, the military authorities retain the power of deciding in every instance of myopia or defective vision, according to its special characters, whether the candidate is to be declared visually fit or unfit for the military service."

"**Use of Correcting Glasses at Visual Examinations.**—No rule has been published regarding the manner in which

* The Optical Manual, or Handbook of Instructions for the guidance of Surgeons in testing the range and quality of Vision of Recruits and others seeking employment in the Military Services of Great Britain, and in distinguishing and dealing with Optical Defects among the Officers and Men already engaged in them. By Surgeon-General T. Longmore, C.B., Honorary Surgeon to the Queen; Professor of Military Surgery at the Army Medical School; Officer of the Legion of Honour; Associate of the Society of Surgery of Paris; Corresponding Member of the Academy of Medicine of France; &c. &c. &c. Third (1885) Edition.

candidates for commissions are to employ glasses in the correction of visual defects. The responsibility regarding the point appears to rest with the examining medical officer. In some instances candidates are allowed to use the glasses with which they have provided themselves prior to the examination ; in others they have been required to select the glasses which suited them from a number of pairs of spectacles placed on a table in the examination room."

"**Visual Acuteness required in Candidates for Commissions in the Royal Artillery and Royal Engineers.**—Candidates for admission into the Royal Military Academy at Woolwich fall under a special regulation. Since March 1871, by order of H.R.H. the Field Marshal Commanding-in-Chief, these gentlemen have been required to show at their physical examination that they possess a range of vision which will enable them to see clearly the 2′ square bull's-eye at 900 yards. In order to decide that a candidate for admission into the Artillery or Engineers possesses this required qualification, the examining medical officer will have to ascertain that he can count the square regulation army test-dots at a distance of $22\frac{1}{2}$ feet, instead of the distance of fifteen feet named in the instructions on the back of the card. If the order were applied to the circular bull's-eye three feet in diameter, the circular regulation test-dots in present use would have to be held at a distance of fifteen feet in order to prove the candidate's power of seeing the bull's-eye at 900 yards. The candidates are permitted to use ordinary concave and convex spectacles at the examination." [Candidates rejected on account of defective eyesight at the physical examination can nevertheless go up for the literary examination, and if successful, can appeal to a Special Board of Medical Officers in London as regards eyesight.]

"**Visual Acuteness required in Candidates for Commissions in the Line.**—Simple myopia or hypermetropia is not to be held a disqualifying condition. So long as these defects can be corrected by suitable glasses they are not to exclude from admission. The practice is, that if the candidates for commissions can count the test-dots at the ordinary distances, with or without the aid of glasses, they are accepted for service so far as vision is concerned. The test-dots are used in the same manner as with men seeking enlistment in the ranks."

"**Visual Qualification for Commissions in the Medical Staff.**—In the 'Schedule of Qualifications necessary for Candidates desirous of obtaining Commissions in the Army Medical Staff' it is ordered that a Board of Medical Officers must certify the candidate's 'vision is sufficiently good to enable him to perform any surgical operation without the aid of glasses. A moderate degree of myopia will not be considered a disqualification, provided it does not necessitate the use of glasses during the performance of operations, and that no organic disease of the eyes exists.'"

"**Rejection of a Recruit.**—If the recruit should make repeated mistakes in counting the number of dots presented to him at the prescribed distance, and there is no reason for suspecting that he is doing otherwise than his best to try to see them clearly, especially if he should succeed in counting them correctly when they are held at some point nearer to him than the prescribed distance, he is then rejected as unfit for service on account of 'defective vision.' The regulations do not require that the nature or degree of the defect should be particularly stated as regards recruits at their first inspection."

ROYAL NAVY.

The rules for visual acuteness required in candidates for commissions in the Royal Navy are, so far as we are aware, not printed; every branch of the service has its special regulations for entry, including requirements as to vision. Professor Longmore, in "The Optical Manual," states that "Candidates for commissions in the Royal Navy are not considered eligible who are subjects of any degrees of myopia or hypermetropia. They are required to have visual power sufficient to enable them to see Snellen's test-types at the full distances. Exceptions are, however, made in some special cases under particular circumstances, but the discretionary margin allowed is very limited."

It would therefore appear that for entry as Naval Cadets and Marine Cadets, the future commissioned officer's (naval and marine) visual power to see Snellen's test-types at full distances with each eye is a *sine quâ non*.

Boys for the Navy, seamen, stokers, artificers, and marine recruits, are required to have the same visual power.

Candidates for the Medical Service are also called on to have full vision by Snellen's test-types; as are engineer students, from whence the engineers of the Navy are derived.

In special circumstances a discretionary margin is allowed in the case of engineer students. The same discretion is occasionally exercised in the case of candidates for the Marine Service and for artificers.

As regards chaplains, naval instructors, and clerks (the future paymasters), a large discretionary margin is allowed.

CIVIL SERVICE.

With reference to the Home Civil Service, the Commissioners refer each case to "a competent medical adviser, leaving him to apply whatever tests he may deem suitable, and whatever standard the particular situation may require."

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