

long-standing or incurable diseases of the skin; the milder forms, as acne, herpes, urticaria, etc., as also some of the parasitic diseases, including scabies, may be treated with reasonable prospect of recovery in a short time, and the men accordingly should be held to service. Ulcers may be produced and purposely kept open with the view of evading service under conscription. Suspicion will naturally be aroused when an otherwise healthy man claims exemption from service on account of an ulcer of long standing, as this lesion is seldom seen except in persons of broken-down constitution, and generally in middle or advanced age. The appearance of the ulcer, and the tissues surrounding it, will furnish some evidence as to its age, active inflammation pointing to voluntary irritation and a recent lesion, while an old ulcer presents characteristics the reverse of this. Such cases should be placed under close observation in hospital, and every means taken to prevent the patient from keeping up any irritation of the parts, the fact being borne in mind that an almost endless variety of foreign substances are used for this purpose, and that the finger-nails are especially convenient for such use; it may even become necessary to put the patient into a straitjacket before a correct diagnosis can be made.

The Head.—Abnormally large head; considerable deformities, the consequence of fractures; serious lesions of the skull, the consequence of complicated wounds or the operation of trephining; caries and exfoliation of the bone; injuries of cranial nerves; tinea capitis; alopecia, disqualify.

Any injury of the skull affords ground for suspicion of consequent injury to the brain, and the existence of epilepsy or some disorder, greater or less, of the mental faculties; hence all such injuries should be carefully examined as to their extent and seat. It is well known that the skull may receive extensive injury without any subsequent impairment of the faculties, and also that very slight injuries may be followed by serious consequences, more especially by epilepsy; hence, although no positive disease may be detected, it is safe to reject any applicant who has evidence of considerable injury to the skull, if for no other reason than that its presence affords the man an opportunity for evasion of duty, and, if he choose to make it, a claim for discharge from the service on account of some alleged nervous affection, should military duty become distasteful to him after joining his command. With the evidence of an injury to the head before him, it would be difficult for a medical officer to disprove any assertion by a malingerer of the existence of disease.

Wounds of the scalp, especially if non-adherent, should not reject; *injuries of the cranial nerves*, producing paralysis or impairment of function in the parts to which they are distributed, are causes for rejection; *tinea capitis* is laid down in many works on recruiting as a disqualification. It is a disease almost exclusively confined to childhood, and is very rarely met with at a recruiting station. In the examination of several thousand men at the depot at Columbus Barracks, Ohio, the writer did not see a case, nor has he ever seen one among the soldiers with whom he has served. The discovery of any disease of this genus in the hairy scalp would be cause for rejection, not only on account of its contagiousness, but because it is both unsightly and offensive. The *papular eruption of syphilis* is frequently situated in the hairy scalp, and may be easily felt by an examination of that part with the fingers. *Alopecia* is occasionally met with in recruits, and has given rise to much difference of opinion among army surgeons as to its being a disqualifying cause; if it is the result of a pre-existing disease, which will be manifest by the appearance of the scalp, if the loss of hair is total, or if but a few tufts remain about the back of the head and in the neighborhood of the ears, the man is unfitted for service; the head coverings issued to the soldier not being sufficient, in the absence of the natural covering, to protect him from accidents resulting from exposure to the heat of the sun or to the inclemency of the weather; partial loss of the hair, either over the

crown or above the forehead, is not cause for rejection; *in time of war* baldness is not cause for exemption.

The Spine.—*Caries; spina bifida; lateral curvature of the cervical, dorsal, or lumbar regions; lumbar abscess; rickets; fracture and dislocation of the vertebrae; angular curvatures, including gibbosity of the anterior and posterior parts of the thorax*, disqualify.

Lateral curvatures of the spine are often the result of some particular trade or occupation; if the curvature is slight, and unaccompanied by signs of constitutional weakness, it should not disqualify. An appearance of lateral curvature frequently results from undue development of the muscles of one shoulder. This will be readily detected by making the recruit stoop forward from the attitude of attention, stretching out his hands over his head, and curving the back until his fingers reach the ground. A glance at the recruit's spine, when so bent, from before backward, will enable the surgeon to estimate the extent of lateral curvature, if it really exists.¹⁷ The following good rule for the determination of the degree of curvature which demands rejection has been suggested by Major Daingerfield Parker, U. S. A. The recruit standing erect, draw an imaginary line from the base of the skull to the end of the spine; if the spinal prominences are curved one inch either side of the line, reject. Any pronounced angularity of the spine (gibbosity) sufficient to impair the symmetry of a man's figure, or distortion of the chest interfering with respiration, should reject. The fact that knapsacks and other heavy weights are no longer carried by soldiers upon their backs in modern campaigning removes the objection formerly made to men having this defect in a moderate degree. In young men posterior curvature may be overcome by attention to drills and gymnastics, but in men beyond twenty-five years of age it is useless to attempt an improvement.

In time of war slight curvatures, lateral or angular, should not exempt.

The Ear.—*Deafness of one or both ears; all catarrhal and purulent forms of acute and chronic otitis media; polypi, and other growths or diseases of the tympanum, labyrinth, or mastoid cells; perforation of the membrana tympani; closure of the auditory canal, partial or complete, except from acute abscess or furuncle; malformation or loss of the external ear, and all diseases thereof, except those which are slight and non-progressive*, disqualify.

Diseases of the ear inducing deafness are not often symmetrical, and affections of one ear are much more likely to be met with than those of both; hence the fact should be borne in mind that while an applicant for enlistment may apparently hear perfectly, a careful examination of both ears will show that he may be deaf in one.

To properly make a preliminary examination of hearing power for the voice, the examiner should stand at the side and in rear of the applicant, at least forty feet distant, while the recruiting sergeant closes the external meatus of one ear by pressing the tragus gently backward and inward. A few words are then to be addressed to the applicant, distinctly, in a middle tone, and not too rapidly. If there is any defect in the hearing of the uncovered ear, it will at once be discovered by the failure to repeat what is said; the same manœuvre should be practised with the opposite side. The voice may be heard at least fifty feet distant in a closed room when both ears are normal; should there be deafness of either ear, the applicant must be rejected.

It will be found that deafness is occasionally caused by the accumulation of cerumen in the ear; in which case, should the recruit be otherwise desirable, it would be proper to defer final action, and an opportunity given him to have the obstruction removed, when, if hearing is restored, he could be accepted.

In time of war deafness is frequently simulated. Real deafness cannot be concealed, but the detection of simulated deafness is at times a somewhat difficult matter. Here every artifice which ingenuity may suggest will be employed to deceive the examiner, whose opinion of the case must be made up of negative evidence entirely, the

only positive evidence available being the motive of the conscript, if this can be styled evidence.

Besides that by means of the voice there are three methods to be employed in testing the power of hearing, viz., the watch, the tuning-fork, and the double stethoscope of Cammann, although an opinion should not be formed from any single test, but from the results obtained by all.

In using the first test, the applicant should be blindfolded while one ear is closed; the watch is to be held in the air at various distances from his head—above, below, in front of, and behind the unclosed ear. The distance at which its ticking can be heard by the normal ear may be determined by the operator's sense of hearing. This being used as a standard, the degree of hearing by the applicant can be approximately determined. Each ear should be carefully tested by this method, and the result noted.

To use the second test, uniform sound can be obtained by striking the tuning-fork on the knee while the leg is flexed upon the thigh, or even by extending the palm of the hand and striking the tines of the fork upon its fleshy part. In the normal ear the tuning-fork, when placed on the central incisors, is heard equally well in both ears; the same is true if the fork is placed on the vertex or on the centre of the forehead; if placed on the mastoid process, it is heard better in the ear of the same side; it is heard longer when placed in the air near the meatus, than on the teeth, etc.

When there is some defect in the hearing dependent on disease located in the middle or external ear, the tuning-fork placed by its base upon the teeth, or on any of the central portions of the skull, will be heard better in the diseased ear. If placed in the air near the ear, it may not be heard as well as in the previous position. In doubtful cases, if the fork is laid a little to one side of the median line, it assists to confirm the diagnosis. For instance, the patient thinks he hears the fork best in the right ear, and it is then moved to the left side a little. If he still hears it as well in the right ear, or even hears it equally well in both ears, there is no question of his hearing it better in the right.¹⁸

In diseases of the labyrinth having a nervous origin these conditions are reversed, and the tuning-fork will be heard better in the good ear—both ears being stopped. Hence the examiner must be on his guard, when investigating a case of suspected simulation, that he does not have a case of labyrinth disease before him. In such instances ocular inspection of the middle ear will be of value in completing a diagnosis.

The third test, by the use of Cammann's binaural stethoscope, is a very ingenious one, and is best described in the language of its originator, Dr. David Coggin.¹⁹ It is, however, serviceable only in simulated absolute deafness of one ear: "The patient affirmed that he was deaf of the left ear. I therefore inserted a tightly fitting wooden plug into the right caoutchouc tube, and then put the two caoutchouc tubes into the metal ones. When I tried the instrument on myself, I found that words spoken could not be understood by the right ear. After the patient had adjusted the stethoscope, he repeated without hesitation the words which I had whispered into the bell of the instrument, which served as a mouthpiece. The tube containing the plug was then taken out of the right ear, which was firmly closed by pressure on the tragus. When I again spoke into the stethoscope, which was still in connection with the left ear, the patient positively assured me that he could no longer distinguish the words. He was, of course, aware that the tube through which he had before heard was no longer in connection with the right ear."

It is more than probable, before the examiner has completed these tests, that the simulator will have become so confused as to betray himself, when, of course, the examination would cease. He must, however, be prepared to find men very obstinate, who have made up their minds to deceive, and he may, therefore, be obliged to employ all the methods at his command in making a diagnosis.

The preference of the writer is for the tuning-fork, about the use of which men are ordinarily ignorant, although the tests by the watch and stethoscope give excellent results. Careful inspection of the meatus should be made for evidence of inflammatory affections or for morbid growths.

In time of war cases of otitis may be placed in hospital for observation, to be exempted from service if subsequent treatment develops the fact that organic changes have taken place, or that permanent deafness has resulted; deafness of one ear is not an objection, but when both ears are thus affected the man should be exempted.

The Eyes.—Class 1. *Loss of an eye; total loss of sight of either eye; conjunctival affections, including trachoma, entropion; opacities of the cornea, if covering part of a moderately dilated pupil; pterygium, if extensive; strabismus; hydrophthalmia; exophthalmia; conical cornea; cataract; loss of crystalline lens; diseases of the lachrymal apparatus; ectropion; ptosis; incessant spasmodic motion of the lids; adhesion of the lids; large encysted tumors; abscess of the orbits; muscular asthenopia; nystagmus.*

Class 2. *Any affection of the globe of the eye or its contents; defective vision, including anomalies of accommodation and refraction; myopia; hypermetropia, if accompanied by asthenopia; presbyopia; astigmatism; amblyopia; glaucoma; diplopia; color-blindness (for the Signal Service only)*, disqualify.

For convenience of examination the foregoing list of disqualifications has been separated into two classes: the first including those defects which may be discovered by the unaided eye; the second requiring for their detection the use of special instruments. Loss of sight of the right eye, or loss of the entire globe, as well as other defects interfering with the vision, has been held by the War Department as cause for rejection. The writer is of the opinion that these disqualifications should apply to either eye, exceptions thereto being confined entirely to men desiring to re-enlist. Aside from the disfigurement, there are certain manœuvres in the drill and other exercises in military life which cannot be properly performed by recruits unless they have the perfect use of both eyes. Old soldiers are so well instructed in their duties and familiar with drills that nearly all military movements may be exercised by them without the use of both eyes, dependence being placed upon the word of command.

The acceptance of one-eyed men has been advised, provided the sight of the remaining eye is perfect, and it is asserted as a fact that some of our best rifle shots among frontiersmen are thus mutilated. This may be true, and there could be no objection to such enlistments if the terms of the proviso could be made continuous; but it is a well-known fact that when one eye has been permanently injured or diseased, the remaining organ is more or less liable to attacks of sympathetic ophthalmia, to avert which enucleation of the defective eye is often the sole resort. The slighter forms of injury or disease which may affect vision, if uncomplicated by an affection of the iris or ciliary body, are not followed by this result; but it is after the more severe injuries and diseases, particularly when these bodies are involved, that sympathetic inflammation is to be anticipated. It is not always possible for the surgeon to form an opinion as to the cause of blindness in these severe forms of injury without careful ophthalmoscopic investigation, to make which it is neither desirable nor proper for him to spend time. The fact that a disease affecting the integrity of the sound eye is likely to occur at any time would seem sufficient reason for objecting to the admission of such cases to the army. The writer is, therefore, of the opinion that loss of sight of either eye should in time of peace disqualify. Catarrhal affections of the conjunctiva, whether acute or chronic, are causes for rejection, as it is impossible to predict what their terminations may be; a very mild conjunctivitis may develop into a most violent disorder, attended with total loss of the eye; or a chronic affection may linger for years, producing trachoma, affections of the lids, etc. Pterygium, if large and encroaching upon the cornea to an extent that interferes

in the slightest degree with vision, and strabismus, either convergent or divergent, if decided, reject. Any affections of the globe of the eye, as keratitis, scleritis, retinitis, iritis, etc., whether acute or chronic, should reject. Careful examination should be made for the divergence of one or both eyes, when the applicant is required to look steadily at an object (asthenopia), or their oscillation (nystagmus); both of which conditions are likely to become more pronounced from the nervous excitement incident to the examination.

Examination of the *sight* should be made with the utmost care, as perfectly clear vision is demanded for rifle practice as conducted at the present day. The medical examiner should have a reliable sergeant to assist him. The applicant should stand facing the surgeon, and twenty feet from him, with his face to the light, as in this position the iris is moderately contracted, and opacities of the cornea, which may cover any part of the pupil, will be more readily discovered; the sergeant should cover one eye with a card, instead of the hand, as is directed in most instances; if the hand is used, undue pressure is, unconsciously, liable to be made on the globe, the circulation is interfered with, and more or less discomfort and dimness of vision experienced when the eye is uncovered; or a careless sergeant may, when covering the eye, so spread his fingers that the applicant can see the objects placed before him with the so-called covered eye, should the one uncovered be defective.

The instructions given by the War Department for conducting this examination are contained in a general order, from which the following extract is made: "1. *Range of vision necessary in recruits.* Hereafter no recruit shall be enlisted who cannot see well, at six hundred yards, a black centre three feet in diameter on a white ground. This test will be made by means of cards prepared under the direction of the surgeon-general of the army. The black spots on the cards will be circular, four-tenths of an inch in diameter, and the recruit must be able to count them with facility at twenty feet distance."²⁰ In compliance with that order the surgeon-general issued instructions from which the following extract is made: "These test cards are ten in number, with black spots arranged like those on playing-cards, and ranging from one to ten on each card; . . . the surgeon . . . exposes successively the faces of two or three of the cards to the applicant, who must be able to state promptly the number of dots on each. This examination must be made with each eye separately, and may be varied by showing to the applicant one of the higher numbers, such as the nine or ten card, and covering up a part of its face with another card so as to expose one or more spots at a time. This test does not represent absolutely perfect vision, but admits recruits with minor degrees of refractive anomalies. It has been thought best, however, that recruits with these minor anomalies should not be excluded on account of them, provided their eyes are healthy in other respects."

If there should be any doubt upon the subject with this simple test, the test types of Snellen should be used.

To determine the degree of errors of refraction, either the simple optometer or the test glasses should be used.

The writer is free to confess that he has failed to obtain any satisfactory results with the optometer, and has been compelled in all cases to resort to the trial glasses for the desired information. Astigmatism may be determined by the optometer, or by the use of the astigmatic charts furnished with the cases of trial glasses. To detect color blindness a set of test wools is required, which should be used in accordance with the directions published by Holmgren, reprinted in Jeffries' work on "Color Blindness," p. 210 *et seq.*

In time of war the following defects, which disqualify in time of peace, should not exempt drafted men from service: *Loss of either eye; loss of sight of either eye; opacities of the cornea; strabismus, unless extreme; diseases of the lachrymal apparatus; ptosis, unless complete and indicative of serious brain lesion; asthenopia and nystagmus, unless excessive; anomalies of refraction, un-*

less extreme. The most common defect of vision among persons in this country is myopia, the degree of which to disqualify in time of peace, or exempt in time of war, has not been determined for the United States Army. Dr. Baxter, in his "Report of the Medical Statistics of the Provost Marshal General's Office," states that "near-sightedness does not exempt"; Dr. Bartholow states, "Myopia . . . is not a ground for exemption under the Enrolment Act, unless decided."²¹ Tripler says, "Myopia is an objection to a recruit."²²

As has been stated, the range of vision for recruits, determined by the test dot cards, admits them "with minor degrees of refractive anomalies"; so far as myopia is concerned, these degrees are such as to admit men from whom efficiency as riflemen cannot possibly be expected. A man whose degree of myopia is as high as $\frac{1}{4}$ can, with each eye separately, count the dots at twenty feet, although he does it with difficulty; but it is not possible for him to read the test types of Snellen, that should be normally seen at that distance, nor to see the bull's eye on a target at any of the ordinary firing ranges, and if accepted as a soldier, he is therefore useless as a rifleman. Even with so low a degree of myopia as $\frac{1}{8}$, the target is seen very indistinctly, and it is a question admitting of considerable doubt whether in such a case the soldier would ever become efficient as a marksman without the aid of spectacles; his vision would, however, be sufficiently acute for all ordinary purposes, and hence, if otherwise a desirable man, he might be accepted. The order promulgating the vision test is so worded that but few recruiting officers would feel themselves compelled to exact a literal compliance with its requirement for the recruit to "count with facility," and considering that he could "see well," if able to count the dots even with the difficulty encountered by a myope of $\frac{1}{4}$ degree, they would accept him.

In time of war, however, higher degrees of myopia may be admitted without serious detriment to the service, especially if a system were adopted by which men so defective could be utilized in branches of the service other than the line, as is the case in foreign armies, where, for example, as in France, myopes of $\frac{1}{2}$ and higher, and those of $\frac{3}{4}$ and higher in Italy, Austria, Switzerland, and Holland, are accepted; to do this, the use of spectacles would, of course, be necessary. In the English army recruits are admitted to the general service, and without being graded, with $\frac{1}{4}$ myopia; although Professor Longmore states it "to be very questionable whether any man with myopia = $\frac{1}{4}$ ought to be accepted as a recruit."²³

When the facts are considered that the character of our service necessitates acuteness of vision in the use of the rifle, and that we have a vast population from which to recruit a small army, it seems proper that the highest standard of vision should be insisted upon, and that recruits should not be accepted in time of peace unless they have normal vision, as determined by test types, or are myopic to a degree not exceeding $\frac{1}{8}$, when otherwise very desirable men. In time of war all degrees of myopia above $\frac{1}{8}$ should exempt, unless the use of spectacles is permitted, in which event, of course, most higher degrees could be accepted. A very simple method for roughly determining the higher degrees of myopia in cases which are free from astigmatism and other defects of vision is to ascertain the distance at which ordinary newspaper type can be read by the myope. With the normal eye this type is distinct at forty or forty-eight inches, and the distance less than this at which vision is distinct in the myope will express the denominator of a fraction indicative of the degree of his myopia; for instance, if the type can be read at fifteen or twenty inches, the person examined is about $\frac{1}{3}$ or $\frac{1}{5}$ myopic, etc.

As in the case of deafness, the surgeon must be prepared, in the examination of a conscript's vision, for the most artfully laid schemes of deception; but if he has patience, and works systematically, he will, in a large majority of instances, be able to ascertain the true state of the case, and expose deceit if it be attempted.

Several excellent tests for the exposure of simulated

defects of vision have been published, of which, doubtless, the most convenient for use at a recruiting rendezvous is that suggested by Dr. Howard Culbertson, U. S. A., and styled by him "the prismometer." He describes it as follows: "The prismometer detects errors of refraction by means of the displacement of the false image seen through a prism. Its essentials are: a perforated disc carrying a prism which covers one-half of the perforation, its truncated, thin edge dividing the perforation into two equal parts, and a sharply outlined, dead-white disc, about 22 mm. in diameter, on a black, lustreless ground placed at a distance from the prism of 15' to 20'. This distance and the strength of the prism must be in such proportion that when an emmetropic eye is placed back of the perforation and directed to the white disc, a true and a false image will be formed, whose peripheries will be exactly tangent.

"In case the examined eye is hypermetropic the images will stand apart to a degree varying with the degree of hypermetropia; in the case of myopia, on the other hand, they will overlap. The degree of ametropia in either case is measured by the lens, which, when held before the perforation, will render these discs tangent. By revolving the disc bearing the prism through an angle of 180° the false image appears to revolve about the true, and in case of astigmatism the separation or overlapping is greatest in the meridian in which the astigmatism is greatest. Its axis may be determined by an index pointing to a graduated arc in contact with the disc; its degree by the spherical or cylindrical glass which renders the discs tangent in the meridian in which they varied most from tangency."

Professor Longmore²⁴ describes the prism test of von Graefe and the test by the stereoscope suggested by Mr. Lawrence.

All of these tests depend for their success on the confused statements of the simulator, when compelled to look with his normal eyes through a prism, or to describe objects especially prepared for view through a stereoscope. The stereoscopic objects require special preparation, and while a most excellent test upon men of more than ordinary intelligence, who may understand the effect of prism on vision, it is not always practicable; any test by a prism is a good one, but that proposed by Dr. Culbertson is not only simple but effective, both against simulation and in the detection of refractive errors; besides these are the Snellen test with colored glasses and test types; the use of various trial glasses, the ruler test, etc., the description of which may be found in most works on diseases of the eye. Valuable information may be gained by a careful examination of the pupil in simulated blindness of one eye; in an eye suffering from complete amaurosis the pupil is moderately dilated, and but feebly responds, or not at all, to the stimulus of light falling into it; but does respond to the stimulus of light thrown into the other eye. In the simulator, of course, the pupil is normal. Other defects of the eye mentioned in the foregoing list should not exempt a conscript from duty, unless the vision is very materially interfered with, or, as in the case of disease of the lachrymal apparatus, the irritation produced by them keeps up a chronic inflammation.

The Nose.—*Loss of the whole or part of the nose; deformities of the nose disfiguring the face, sensibly altering the voice, and impeding respiration; stenosis and atresia of the nasal cavity; chronic rhinitis (ozæna); polypus; purulent and fetid discharge from the nose, whether due to old and incurable ulcerations, or to any other lesion of the nasal mucous membrane, disqualify.*

Loss of the nose or parts thereof may be congenital, accidental, or the result of syphilitic or scrofulous ulcerations; in the two former instances, unless the mutilation is of sufficient degree to make a noticeable disfigurement, or interfere with respiration, it is not cause for rejection; in the latter instances it would, of course, disqualify. Deformities of the nose are generally produced by accident or by disease, congenital deformities being rare; the nasal bones may be so flattened, distorted, or destroyed

by caries as to interfere with respiration and speech. Syphilis creates great havoc in this location, hence these deformities should lead to suspicion of that disease, and careful investigation of the case. Stenosis and atresia are either congenital or due to alterations in the natural position of the septum, or to hypertrophies of the erectile tissue lining the cavity; in which latter condition the overgrown tissue covering the turbinated bones is forced against the septum, or projected in comb-like growths into the naso-pharyngeal space; the breathing of persons laboring under this defect is entirely by the mouth, and their facial expression is often vacant and silly; the irritation produced by the hypertrophied tissue keeps up an excessive mucous secretion, to relieve which there is an incessant hawking and spitting, and unless the cavities are cleared, decomposition takes place and is attended by its peculiar and nauseous odor. Deflection of the nasal septum is probably the most common cause of stenosis and atresia, the bone, in some instances, being forced against the side of the nostril, to which its mucous tissue may become adherent. Chronic rhinitis (ozæna) is readily detected by the horrible stench which patients carry about with them; it is generally an evidence of a low grade of constitution, and aside from its disgusting local symptom would require rejection. Polypi, purulent discharges, etc., are all causes for rejection. *In time of war*, losses and deformities of the nose and ozæna, are the only defects which should exempt from military duty.

The Face.—*Navic; unsightly hairy spots; extensive cicatrices on the face, disqualify; "their presence would subject the man to the impertinent jests of his comrades, to his personal annoyance, and to the prejudice of good order in his corps."*

The Mouth and Fauces.—*Harelip, simple, double, or complicated; loss of the whole or a considerable part of either lip; unsightly mutilation of the lips from wounds, burns, or disease; loss of the whole or part of either maxilla; ununited fractures; ankylosis; deformities of either jaw, interfering with mastication or speech; loss of certain teeth; cancerous or erectile tumors; hypertrophy or atrophy of the tongue; mutilation of the tongue; adhesion of the tongue to any parts, preventing its free motion; malignant disease of the tongue; chronic ulcerations; fissures or perforations of the hard palate; salivary or bucco-nasal fistula; hypertrophy of the tonsils sufficient to interfere with respiration or phonation, disqualify.*

At the present day the army surgeon has to consider only the number and condition of teeth required for the proper mastication of food; the question of bygone days as to their utility or necessity in biting cartridges having been settled by the introduction of breech-loading rifles, and the substitution of metallic for paper cartridges. It is probable that for many years to come the majority of our army will be stationed in the sparsely settled Territories, and be compelled to make annual campaigns, as has been done in the past, for the protection of settlers from the lawless people and disaffected or vicious Indians among whom they have cast their lot. These campaigns, from a food standpoint, are as trying to the digestion of the men engaged in them as can be any campaigns in civilized countries in times of war; for, as the men are moving constantly from one camp to another, there is but little opportunity for the preparation of soft bread, and the hard biscuit must be used instead thereof; if cattle are driven with the command, they soon become poor from constant travel, scanty food, etc., and their meat is so tough and stringy that the best of teeth can make but little impression upon it, and the strongest stomachs have difficulty in digesting it. Since the abolition of the paper cartridge, the tendency among military writers on this subject has been to underestimate the necessity for sound teeth, apparently forgetting the fact that the soldier is often placed in circumstances in which they are an absolute necessity for his health, and certainly indispensable for his comfort. The statement made by Dr. Baxter²⁵ that, "as a matter of fact, there are not many days in which the soldier is not supplied with soft bread," is a grave

mistake; if he had plenty of soft bread the mastication of commissary beef in the field would still require the assistance of a goodly number of sound teeth; hard biscuit can be softened by a variety of processes, but no amount of cooking will ever succeed in doing this for the beef referred to. It has been within the experience of the writer that men have been disabled through sheer debility, while on a protracted "scout," because of their inability to masticate the food on which the command was obliged to subsist. The molars and bicuspid, as the principal agents in mastication, should therefore be in good condition; it is not necessary that they should all be present, but the smallest number should be six, viz., two upper and lower molars, and one upper and lower bicuspid on the same side, all sound, and opposed to each other; if the incisors and canines are perfect, but the molars and bicuspid gone, or extensively carious, rejection is demanded. Caries of a large number of the teeth, particularly if advanced, with destruction of considerable portions of the crowns, should reject, because it is probable that, before the expiration of an enlistment, they will be so far destroyed as seriously to interfere with mastication. The irritation of the gums caused by carious teeth is also frequently followed by abscess and troublesome swellings of the face and jaws. If artificial teeth are worn, the fact should be noted on the enlistment papers, but the artificial substitutes cannot be regarded as taking the places of the natural teeth, nor as removing the disability for the military service arising from their loss. Lesions of the hard and soft palate must be carefully looked for, and the tonsils thoroughly examined; ulcerations and consequent perforations of the hard palate are often situated in the anterior part of the roof of the mouth, and unless the head is thrown well back, and the jaws are widely separated, they may be overlooked. Ulcerations of the cheeks and gums, and especially on the sides and back of the tongue, must also be carefully searched for; in the latter situations they are often difficult to see, unless attention is called to them by the patient, as their location, either between the papillæ or following the course of the muscular fibres, conceals them from ordinary observation, especially if the tongue lies quiescent in the floor of the mouth, with its sides protected by the teeth. The subjects of excessive hypertrophy of the tonsils are undesirable as recruits, because of the likelihood that, at most inopportune times, they may be seized with an acute attack of inflammation of the parts, it being a well-established fact that previous attacks, of which the hypertrophy is the sequel, predispose to subsequent and more severe ones at any time; phonation, too, is materially interfered with, unfitting the man for certain important duties, especially while detailed as a sentinel.

In time of war, simple harelip, loss of teeth, cicatrices, hypertrophy of tonsils, should not exempt.

Exemption on account of loss of teeth is frequently claimed by conscripts, and has been regarded as good cause; men with such defects can, however, be made useful in the various administrative departments of the army, where the necessity for having sound teeth does not exist; therefore exemptions should not be granted for this cause; the wearing of artificial teeth may, under these circumstances, be favorably considered.

The Neck.—*Goitre*; ulcerations of the cervical glands; cicatrices of scrofulous ulcerations; tracheal openings; wry-neck; chronic laryngitis, or any other disease of the larynx which would produce aphonia; stricture of the œsophagus, disqualify.

Goitre is not often met with among the class of men who are applicants for enlistment; should it be recent and growing, or of sufficient size to interfere with respiration, or with the hooking of the coat collar, or buttoning of the coat, it is cause for rejection. The cicatrices which are found in scrofulous subjects, who in childhood have had suppuration of the cervical glands, are both unsightly and liable to become irritated in hot weather by the coat collar; of course, as being indications of the presence of scrofula either in the past or present, they render it necessary that a careful inspection should be

made of the person for other signs of that disease; if none exist, and the cicatrices are healthy, the applicant, if otherwise desirable, may be accepted; but if they are numerous, purplish colored, or adherent, rejection is demanded. Any ulceration about the neck, either of the lymphatics or in the tissues, is cause for rejection; wry-neck, if permanent from any cause, should reject. Any chronic inflammation of the larynx, producing a huskiness of voice sufficient to render speech indistinct, or to induce actual aphonia, should reject. Of course the simple hoarseness of ordinary colds is not to be considered, but any well-marked alteration of the voice should lead to an examination of the larynx in which the existence of organic changes would be cause for rejection.

In time of war, only very extensive cicatrices, active ulcerations, or tracheal openings, should exempt; the presence of goitre, unless very large and unsightly, and wry-neck, if caused by rheumatism or any curable disease, should not exempt.

The Chest.—*Malformation of the chest, or badly united fractures of ribs or sternum sufficient to interfere with respiration; caries or necrosis of ribs; deficient expansive mobility; evident predisposition to phthisis; phthisis pulmonalis; chronic pneumonia; emphysema, chronic pleurisy; pleural effusions; chronic bronchitis; asthma; organic diseases of the heart or large arteries; serious and protracted functional derangement of the heart; dropsy dependent upon a disease of the heart*, disqualify.

In obtaining measurements of the chest the movements of inspiration and expiration should be confined entirely to the muscles of respiration; the applicant should be required to inflate the lungs to their fullest extent by an easy, though complete, inspiration; expiration should be made in the same quiet manner, and is most completely accomplished by requiring the applicant to count aloud until the necessity for a fresh supply of air compels him to inspire again. No contortions of the body should be permitted—such as throwing the chest forward and shoulders backward during inspiration, nor forcing the shoulders forward during expiration,—as these movements can do nothing more than produce erroneous results. The measurements are to be taken when the man is stripped; the arms are extended above the head, the tape is brought around the chest in such a manner as to fall just below the points of the scapula behind, and the nipples in front; the arms are then to be brought down by the sides of the body, and while the tape is held tight enough to lie snugly against the skin, the man is directed to respire after the manner before related.

Attention must be paid to the proper proportion of the chest; the fact, however, being borne in mind, that certain occupations have a tendency to change its shape without producing any lesion of the lung tissue; the lateral flattening of the chest walls so often found in tall, slender men, or those of slight frame, with projection of the sternum—the "pigeon breast"—is more likely to be associated with organic changes in the lungs than is the flat or hollow chest—the antero-posterior flattening. Malformations of the sternum and cartilages of the ribs are less likely to be present in the puny or phthisical subject, and have little or no significance in pulmonary disorders. It should be the object of the medical examiner to accept only men who have well-formed chests, or, as it is expressed in the Army Regulations, "whose chests are ample"; any deviation from the typical healthy thorax being considered good ground for suspicion of changes in the normal character of its contents.

It is entirely beyond the scope of this article to go into the details of a physical examination of the lungs; hence it will be sufficient to say that both auscultation and percussion should be performed before the examiner is satisfied to pronounce upon the availability of his patient for the military service; with the exception of the examination of the heart, there is none other which demands the exercise of so much care. Close questioning should be made into the family history of every applicant, as well as into his own life and habits, for any evidence of a pre-

disposition to phthisis or the occurrence of attacks of pneumonia or pleurisy; for a general susceptibility to changes of climate, weather, etc.; for the occurrence of asthmatic attacks, spitting of blood, etc.; in fine, for anything which would bring out a clew to the previous existence of any affection connected with the pulmonary apparatus. Particular stress is laid upon this subject, because it is no uncommon thing to find men seeking army life with a hope that its supposed freedom, regularity of habit, and their own location in particularly salubrious climates, might benefit an already existing lung trouble. Parents consent to the enlistment of their boys under the impression that the life of a soldier will "harden their lungs," and recruiting officers will often urge the acceptance of applicants whose skin is suspiciously clear, upon the ground that the service will "bring them out"; "make new men of them," etc.; the medical examiner must, therefore, be especially on his guard against the admission of such men into the service, and recollect that he is not required to diagnosticate any particular lesion of a lung in order to reject an applicant, but, if he has reason to suspect a predisposition thereto—unhesitatingly to reject.

Dr. Tripler quotes very aptly from Bézín, as follows: "It is true we run the risk of rejecting men who may afterward become very robust, and who, by a long and successful life, may contradict the prognosis we may have pronounced in their cases, but . . . you will be astonished at the number of young men who, received because no determined lesion of the thorax was recognized when they were inspected, succumb afterward with phthisis, or whom it was necessary to send back to their friends and families with broken health, after their strength had been exhausted." (*Aide-Mémoire*.)

Of organic diseases of the heart, those affecting the valves are easily detected, and require no detailed notice here; there is occasionally heard, however, a cardiac murmur which is not indicative of any disease of either heart or lungs, and about which the text-books on the general subject are silent. It has been described by Dr. Hamilton Osgood, in a paper read in March, 1883, before the Boston Society for Medical Improvement, and published in vol. cviii., No. 13, of the *Boston Medical and Surgical Journal*. Dr. Osgood gives to it the very appropriate name of a "misleading cardiac murmur"; it is heard during the respiratory act, with a portion of which it is synchronous (especially inspiration), and is located at the base of the heart. When respiration is temporarily suspended it may be heard, although not so distinctly as during the normal act; its true nature is to be discovered by auscultation during forced collapse of the lungs; mere ordinary expiration will not uncover the heart, and the patient must be instructed to force out all the air possible, continuing his efforts until air can no longer be expelled from the lungs; after which the lungs must be kept immovable. By this procedure the heart is brought more closely in contact with the ear, and is freed from the presence of lung tissue, which, in the inflated lung, partially covers it; the "misleading murmur" will now be found to have disappeared. Aside from its value in determining this point of doubt, forced expiration of the lungs is a valuable adjunct in the examination of the heart under any circumstances; when that organ is uncovered, the natural as well as morbid sounds are more sharply accentuated, and deviations from the normal will be more easily discovered. If the patient is required to put the anterior chest wall on the stretch by standing with his back against a door or post, and his hands carried forcibly behind his back, the results will be much more satisfactory.

In the diagnosis of cardiac hypertrophy, associated or not with dilatation, the inexperienced medical examiner may be easily misled. The movements of the heart are so largely under the influence of the sympathetic nervous system that any cause acting directly through that system may produce such alterations of its rhythmical action as will lead to the opinion that they are the result of organic change. When the hand is placed upon the chest

of an applicant who has just passed through the preliminary questioning, and has been stripped for examination, the heart will probably be found in tumultuous action; in some instances so violent as to produce a feeling of faintness. The excessive use of tobacco and coffee, or either, will also produce so much functional disturbance, irregularity of action, and palpitation, that organic changes may be suspected. The powerful, rhythmical action of the enlarged organ in true hypertrophy, taken in connection with the permanent change in the location of its apex beat, will supply the evidence mostly to be relied upon in forming a correct opinion of the case presented. It is not, however, always possible, in the short time allotted to the preliminary examination, to decide whether the abnormal action is functional or organic, and in all cases of doubt the applicant, if otherwise desirable, should be kept under observation for two or three days, in order that he may become accustomed to his surroundings, and recover somewhat control of his nervous system. Should it become apparent that even a functional disorder of the heart is persistent, or so serious as to interfere with the usefulness of the applicant, he should be rejected. The sequelæ of cardiac lesions, dropsies, pulmonary engorgements, etc., will require close consideration, particularly in their earlier stages; but it is a rare occurrence for men in a state of disease so far advanced as these symptoms would indicate, to come to a rendezvous. In all cases of suspected cardiac lesions, the urine should be carefully examined.

The directions stated in the "mode of examination," on a previous page,—viz., to auscultate the heart before requiring the applicant to go through the violent exercise of running, jumping, etc.,—were given for the reason that the sounds of the heart are best heard when the patient is at rest. The lungs are best examined while rapid breathing is induced; hence the directions for their examination after the exercise mentioned. Should any lesion of the heart have been suspected, its rapid action after exercise will tend to bring out more prominently the abnormal sound. Advantage should be taken of this excessive action to examine the course of the blood-vessels in the neck and other parts of the body, with a view to the detection of aneurisms.

In time of war all diseases of the heart and lungs should be cause for exemption, without exception.

The Abdomen.—*All chronic inflammations of the gastro-intestinal tract, including diarrhoea and dysentery; diseases of the liver or spleen, including those caused by malarial poisoning; ascites; obesity; dyspepsia, if confirmed; hemorrhoids; prolapsus ani; fistula in ano; considerable fissures of the anus; hernia in all situations*, disqualify.

Among the list of disqualifications mentioned by Tripler and Baxter are engorgement of the mesenteric glands, chronic peritonitis, stricture of the rectum, and tænia. The first three of these diseases are exceedingly rare, and their diagnosis is a matter of considerable difficulty at best. It is not very likely that the subjects of them will present themselves for enlistment, and they are accordingly omitted from the disqualifying list, because they fall within the list of general affections impairing the efficiency of men for military duty, the mere mention of which would extend an article into the limits of an elaborate treatise, and the discovery of which would naturally be cause for rejection. The existence of any species of tapeworm is not considered a disqualification, their expulsion from the intestine being so easily accomplished, and their presence producing so little constitutional disturbance in the adult. To ascertain whether chronic inflammation of the gastro-intestinal tract, or dyspepsia of an aggravated form, is present, the medical examiner will be compelled to rely largely upon the statements of the man himself. Accuracy of diagnosis cannot be expected except after observations conducted for a greater or less period of time; many instances terminating only in negative results. The grosser signs of these disorders may lead to suspicion of their existence, but in men anxious for enlistment, all evidence tending to establish the fact will be concealed, although the emaciation attendant