tion attended the wound, but in about three weeks it was entirely healed and the man was able to take a short walk out of doors. He was then placed upon the chloride of gold and sodium. A month subsequently he expressed himself as feeling better than before the fall. The heart was stronger, his breathing was less short, his appetite was good and his general condition equal to that of most men of his age. There had been no return of the vertigo. He was cautioned against hearty eating and especially against long walks. He then went into the country and spent some months, taking carriage rides and walking but short distances. The use of the gold was continued during this period. Upon his return he informed me that during the interval he had remained entirely free from vertigo.

In disorders of the genital apparatus gold has a sphere of usefulness. Amenorrhœa not dependent upon obstruction will often yield to the influence of gold. The double chloride is the preparation which I have used in treating this condition, but Oesterlen reports equally good results from exhibition of the cyanide, which he preferably gives made into tablets with chocolate. Functional dysmenorrhœa is notably relieved by the use of gold. Chronic inflammation of the womb or ovary is also benefited by the employment of this remedy. Cases have been reported in which it served a good purpose where a habitual tendency to abortion was present, the fœtus being carried by its aid to full term and a living child being born. Gold is advantageously used in the treatment of functional impotence.

From the beneficial effect which this metal has upon nutritive processes it exerts a reconstituent influence in a number of constitutional disorders. First among these may be named syphilis. Gold is efficacious in the treatment of the secondary manifestations, but it is more especially in the later stages of the disease that its value is most apparent. It may very serviceably replace, alternate or be combined with the corrosive sublimate, and is of signal service in those cases in which the mercurial is badly borne. In syphilitic ecthyma, rupia, ulcerated syphiloderm or gumma, and in syphilitic ulcers of the throat, the chloride of gold and sodium has been found of utility. I have often employed this remedy in these conditions, and generally with advantage. In ozœna, syphilitic disease of bones, muscles and viscera gold should be thought of whenever the patient is not benefited by the remedies more usually employed. Syphilis of the lung or nervous system is often remarkably relieved by the administration of gold.

The double chloride of gold and sodium is an efficient remedy in scrofulous adenitis. If caseous change has not yet occurred the swellings are reduced in size, the patient gains in weight, the flesh becomes more firm, appetite and digestion improve. If degeneration has taken place the work of repair is promoted and the scarring is reduced to a minimum. The case of a girl aged fifteen years, affords a good illustration of the value of gold in scrofuloderma. She had been subject for two years to glandular enlargements in the neck. Many of the glands had degenerated. Several sinuses, the floors of which were covered with cheesy material, were in existence and communicated with each other. Upon both sides of the neck glands were found exhibiting different stages of disease. A thorough operation seemed

unquestionably demanded, but to this the patient would not submit. The double chloride was administered for several months, and at the expiration of that period the sinuses had healed and suppuration was arrested. The tumefied glands shrank to a size approaching the normal. The result, as far as healing was concerned was satisfactory, though the disfigurement was greater than if the case had been seen earlier or operative measures had been allowed.

The administration of gold is productive of good results in ulcerated lupus. The surface of the obstinate sores exhibit more activity, the granulations become more healthy in appearance and ultimately cicatrization is accomplished. Dr. Joseph Drzewieck of Warsaw, Poland, also testifies to the efficacy of gold in lupus. The author quoted administered the chloride of gold in doses of $\frac{1}{150}$ grain three times a day. The same writer states that gold is now being used in the hospital at Warsaw in the treatment of phthisis.¹ The chloride of gold and sodium enters into the plan of treatment of tuberculosis proposed by Drs. Shurley and Gibbes. Alternating hypodermic injections are made of the double salt and iodine. The authors have reported a series of cases in which their method was attended with improvement of the signs and symptoms of the disease. Favorable communications have been published in regard to the efficacy of this method by other observers.

The chloride of gold or the chloride of gold and sodium may prove of service in the treatment of the alcohol habit. Injections of the metallic salt will probably do good by exerting a corroborant influence upon the nervous system and weakening the craving for alcoholic drink. Dr. E. M. Hale has reported a case of chronic tobacco poisoning accompanied by a condition of extreme prostration and a state resembling incipient delirium tremens. The chloride of gold and sodium was administered in the dose of $\frac{1}{60}$ grain before each meal and upon going to bed. The serious condition was entirely overcome. Dr. Hale has also made use of the same remedy with advantage in the treatment of morphine addiction.

The subcutaneous injection of gold is said by Calmette to be antidotal to the poison of the cobra di capello. This observer made fifty-two experiments upon various species of warm-blooded animals. He is of the opinion that the venom may be neutralized even after it has been absorbed, and that the treatment may be successfully applied to human beings.

Cases of diabetes mellitus have been reported in which the employment of gold has restrained the excessive thirst and discharge of saccharine urine. The remedy is said also to be of service in checking the advance of premature senility.

SQUINT AND ITS TREATMENT.

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We understand by squint or strabismus that condition of the eyes in which the visual axis of one deviates from the visual axis of the other, when in a position of fixation upon an object.

¹ Annual of the Universal Medical Sciences, Vol. v, 1892.

The normal position of the visual axis is parallel when the eyes are fixed upon a point at an infinite distance, and more or less convergent when fixed upon any object nearer than infinity.

Paralysis of any individual or group of the extrinsic muscles of the eye would give rise to a disturbance of this adjustment of the visual axes and cause paralytic strabismus.

In this, the movements of the affected eye would be more or less restricted in those directions controlled by paralyzed muscle, and there would be a corresponding deviation of the axis of the eye; while in movements in other directions it would follow the sound eye and the axes would be normal.

In the condition known as concomitant strabismus, which it is the purpose of this paper to consider, there is no paralysis, for the squinting eye follows the other in all its movements. Furthermore, the same angle of deviation from the axis of the sound eye is maintained in any position the eyes may assume, whereas in paralytic squint, the difference between the two becomes more marked when the eyes are moved in the direction of the paralyzed muscle. In concomitant strabismus the sound eye takes a faulty position whenever the unhealthy one fixes upon an object. For example, if the healthy eye is covered with a card, and the squinting eye compelled to fix upon a certain object, as the surgeon's fingers held up at a distance of a foot or two from the face, the sound eye will be noticed to deviate from the normal position, and in fact to deviate to the same extent that the unhealthy one does when both are uncovered.

This secondary deviation, as it is called on the part of the sound eye, is always equal to that of the squinting eye.

We have furnished here one of the most characteristic differential points between concomitant and paralytic strabismus, for in the latter the secondary deviation is much greater than the primary.

Concomitant squint may assume any one of four directions—inward, outward, upward or downward, of which the inward, the convergent form, is by far the most common while the next most frequent is the outward or divergent variety.

In looking for the cause of convergent strabismus, several factors have to be considered. In a large majority of cases, as was first shown by Donders, there exists a certain amount of hypermetropia and on account of this the relation between accommodation and convergence is disturbed. The same nervous impulse that brings about the act of accommodation, also excites the act of convergence in order that there may be binocular vision. In hypermetropic eyes the impulse to accommodation necessary to focus rays coming from a near object would require to be stronger than if the eyes were emmetropic, while the degree of convergence required would not have to be increased. Hence results a lack of harmony between accommodation and convergence and for a long time this was adduced as the dominant cause of convergent squint.

Although this may be one of the influential factors in the production of squint, there are some very potent objections to the view that it is the only cause, among which are the facts that all eyes affected with hypermetropia do not squint; and that even in the high degrees of it in which, according to the theory of Donders there should be extreme strabismus,

there is very often none. Further, this theory does not explain the convergent strabismus occurring in myopes or emmetropes who make no excessive efforts of accommodation.

Schweigger's theory sets forth that the cause of the convergent form is to be found in the lack of equilibrium between the internal and external recti muscles and that there is an insufficiency of the externus owing to lack of development or an abnormal thickening and shortening of the opposing muscle.

Hansen Grut considers that the shortening and thickening of the internus is one of the main factors in the production of convergent squint and that this is brought about by excessive and prolonged innervation of these muscles.

The size and shape of the eyeball and orbit may also play a role in the production of this condition; if the eyeballs are short and widely separated from each other, and the orbits deep, it can readily be understood how such eyes would have more of a tendency to converge than eyes with long antero-posterior diameters placed in shallow orbits.

In a very great number of these cases, according to Schweigger 30 per cent., to Nagel 70 per cent., there is defective visual power or amblyopia of the squinting eye, amounting in some cases to almost complete blindness, so that the patient is unable to see even the largest letters. In such cases there is very little change in the ophthalmoscopic appearance of the eye; perhaps a bit more pigment around the disc, or a faint discoloration of it, or a slight stippled condition around the yellow spot, that in other cases would hardly attract attention.

It is quite fair to assume that in many of these cases the amblyopia is congenital, and not the result of want of use resulting from defective refractive conditions of the eye, for in many the error is so slight that it is scarcely conceivable how such a change could be effected thereby. But in other cases the refractive element seems to be a prominent cause of the amblyopia, as well as of the strabismus and it is in this class that real improvement in visual acuity may result from wearing glasses that fully correct the ametropia.

The true cause of the amblyopia in many cases is possibly to be sought for in a lack of development of the perceptive centers; so, it is not unlikely that the delicate nerve centers that preside over the innervation of the muscles of accommodation and convergence may be at fault so that an incoördinate action of the extrinsic muscles of the eye results.

Defective outward mobility, particularly of the squinting eye, is frequently seen, showing the weakness of the externus; and examinations in numbers of cases go to prove that defective abductive power is a very prominent factor in the causation of converging strabismus.

The cause of divergent squint is most frequently to be found in myopia. The myope, being compelled to hold objects very near to get the best vision, weakens his interni muscles by excessive use and allows the externus to draw the eye outward.

A squint may be permanent or it may be periodic, in which case it occurs usually when some great effort of accommodation is made.

It may be monocular or it may be alternating, in which case either eye will be able to fix upon an object, the other squinting in the meantime. In the

latter variety it is usual to find that the vision is fairly good in both eyes, while in monocular squint the unsound eye is frequently amblyopic.

Treatment.—The results aimed at in the treatment of squint are the relief of the unsightly deformity and the restoration of binocular vision, if this has ever existed. The value of a full correction with suitable lenses, of errors of refraction in children or older patients who show a tendency to squint, has become very widely recognized among specialists. Children as young as two years may be provided with glasses, and by this means many of them will be prevented from acquiring the habit of squinting. In many cases of the periodic and alternating forms of the affection it is very probable that the anomalous refractive condition of the eye is largely accountable for the establishment of the squint, and that if the error be corrected by proper glasses, an important exciting factor will be set aside. Furthermore, it seems probable that in a considerable proportion of the cases belonging to the above mentioned classes, a part if not all of the amblyopia is dependent upon the error of refraction, and is the result of imperfect functional development of the retina, or of the perceptive centers occasioned by imperfect visual impressions. Such a view is suggested by the fact I have repeatedly seen demonstrated, that a full correction of hypermetropia and hypermetropic astigmatism in cases in which the vision is considerably impaired, has often the effect of markedly improving the sight. Such cases go to sustain the theory that the amblyopia is "ex-anopsia," and that because since birth the retina has never received distinct images it has failed to develop its complete function. Accordingly in all cases showing any tendency to development of squint, glasses that fully correct the hypermetropia and astigmatism should be constantly worn. We can not promise that in all cases the result will be satisfactory; probably it will not be so, in those in which congenital amblyopia not due to refractive error exists.

It is in children that the test known as retinoscopy or sciascopy is peculiarly valuable as a means of determining the refractive condition of the eyes. With it the total amount of ametropia together with the astigmatism can be estimated more accurately than can be done with the ophthalmoscope and the ophthalmometer, although the value of the latter instrument for determining the degree and the meridians of astigmatism is a settled matter.

In conjunction with the treatment with glasses, the child may wear a bandage over the sound eye for several hours a day to compel the weak one to exert itself and to fix upon objects, in the hope that the vision may thereby be improved.

In many of these cases, however, nothing short of operative treatment will avail, but before this is attempted a careful consideration should be given to certain points. As stated above the refraction should be examined, and if the patient is old enough to read, a test of the acuity of vision should be made with the test letters, and also an examination to determine the presence or absence of diplopia. If the latter exists it indicates that the sight of the squinting eye is still good, and there may be hope of restoring binocular vision by the use of correcting glasses after the operation. The angle of deviation should also be carefully measured with the perimeter, and at the same time and in the same way the lateral

mobility of the eyes, especially the mobility outward of the squinting eye, should be estimated. It is not considered advisable to operate on children under the age of six years, and even after that age not until glasses have been given a thorough trial. Particularly is this true in cases of alternating squint, in which it is probable that the difficulty is occasioned by a hyperopic condition of the eyes. In quite a number of such cases the squint disappears before the age of puberty is reached, so that if an operation of dividing the tendon of the internal rectus were done early in life a deviation outward might subsequently develop. The operation for the relief of convergent strabismus may be either a tenotomy of the internus by which the adductive power is diminished, or an advancement of its opponent the externus, by which the adductive power is increased; or a combination of both may be practiced. If the deviation amount to 15° or less and the outward mobility of the squinting eye is good, a tenotomy of the internus will correct the error; while if the squint measure between 15° and 30° , tenotomy of both interni will be needed, or in the event of the externus being too weak, tenotomy of the internus combined with advancement of the externus. Division of the internus will usually effect a correction of 15° , but this may be still further increased by loosening the attachments of the capsule of Tenon. This, however, should be cautiously done, lest the power of the internus be permanently weakened by the muscle slipping too far back.

In very many of these cases the externus is either abnormally weak, or it has its attachment so far back that it has not the control over the eye that it should have. It is certainly more rational to strengthen the weak muscle than to attempt to correct the deformity by weakening a muscle that, in very many of the cases, is only relatively too strong. I think, too, it is possible to gauge the effect more accurately by this procedure, even in a low degree of squint, than by making a complete tenotomy on one eye with possibly a subsequent one on the other. This applies especially to those cases in which one eye is distinctly amblyopic and in which the deviation is 25° or 30° or more. To do a double tenotomy in such a case would not be as rational treatment as to operate on the affected eye alone with a tenotomy of the internus combined with advancement of the opponent.

De Wecker practices what he calls capsular advancement, which consists in bringing forward the capsule of Tenon at the point of attachment of the opposing muscle, without dividing the tendon itself. In slight cases this answers every purpose. It is better to leave the eye slightly convergent after operating, as the effect of the treatment is likely to increase.

In the divergent strabismus of myopia, caused by the weakening of the interni from excessive use, as was mentioned, the most scientific treatment is an advancement of the internus rather than a division of the externus, which would still further limit the mobility of the eyeball. That this unsightly deformity of squint can be safely and satisfactorily removed there can be no question; and it has also been indubitably demonstrated in the experience of many that in a fair proportion of cases the restoration of useful binocular vision is quite possible.

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