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AS AN AID IN THE TREATMENT OF
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OCULAR MUSCLES.

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HOSPITALS; OPHTHALMOLOGIST TO THE INFIRMARY FOR
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IN recent years unusual care has been bestowed upon the study of the ocular muscles, and their relation to the production of headache, asthenopia, and reflex nervous disturbances has afforded the subject of many researches. The older tests for the detection of muscular troubles have been believed to be imperfect, and we have for use the ophthalmodynamometer of Landolt, the useful modification of this instrument by Alleman, the phorometer of Stevens, the method of Holden, the obtuse-angled prism of Maddox advocated by Randall, and the ingenious adaptation of Crêtes's revolving prism by Risley for measurement of the degree of discovered deviation. After lack of equilibrium in the ocular muscles has been demonstrated by any or all of these means, the important problem for solution consists in the proper method for the restoration of the disturbed balance.

Here, again, we have a variety of measures at

hand, depending upon the degree and character of the defect—decentration of the correcting lenses, the use of prisms, tenotomy, combined or uncombined with advancement, and the method of “graduated” or “partial tenotomies” revived and advocated by Stevens, Ranney, Webster, Standish, and other surgeons. Perfectly aware of the fact that where high degrees of insufficiencies, especially of insufficiency of convergence, exist, surgical treatment is the only one which is efficacious, and also fully alive to the fact that, especially owing to the work of American colleagues, the correction of minor degrees of heterophoria by means of partial tenotomies has become more and more a satisfactory operative procedure, there are none the less a class of cases in which operation is either impossible, from lack of consent, or inadmissible owing to complicating circumstances. It is, perhaps, only necessary to refer to the instances of so-called neurasthenic asthenopia associated with great reduction in the amplitude of convergence, cases in which Landolt has so well shown that surgical treatment, without perhaps being entirely excluded, must be associated with general invigorating methods. It is in those cases, then, of muscular troubles in which an operation cannot be performed, or, having been performed, has proved insufficient, and in which the use of correcting lenses combined with prisms has failed to relieve the symptoms, that I wish to call attention to the relief that is afforded by the use of ascending doses of *nux vomica*.

Ophthalmic surgeons have long been accustomed

to employ *nux vomica* or *strychnia* in the treatment of various forms of ocular disturbance. Since Nagel, in 1871, called attention to the value of *strychnia* in the treatment of nerve atrophy, it has been largely employed with varying degrees of success in the treatment of atrophy of the optic nerve. *Nux vomica* has been much used in forms of functional disturbance of the retina, associated with a lack of general bodily tone, in which at once a bitter tonic and stimulant to the trophic centres and a vaso-motor excitant were indicated. Naturally, weakness of the external eye muscles has called for its use, exactly as lack of tone in the general muscular system has always been one of its most important indications. It is not the purpose, therefore, of the cases which follow to show any new use for the drug, but only to describe a method of administration which has proved successful in my hands.

CASE I.—Private patient, female, æt. twenty-one. Painful eyes; supra-orbital neuralgia; violent frontal and occipital headache; general health good; no lesion of the fundus; refraction error a compound hypermetropic astigmatism; insufficiency of the internal recti of seventeen degrees in the act of accommodation, and five degrees at five metres. Correction of the refraction error afforded partial relief, but the headaches returned when any close application with the eyes was practised. Ascending doses of the tincture of *nux vomica* were begun as follows: Ten drops three times a day, to be increased on succeeding days by one drop at each dose until some physiological action of the drug was manifest.

When the dose had reached twenty-five drops

three times a day, eye-tire had greatly lessened. At thirty-five drops three times a day the headaches had ceased, although the occupation of the patient was that of a school-teacher. The remedy was pushed until forty drops were taken three times a day, then gradually decreased to twenty-five drops, and finally discontinued, with the direction to renew the remedy should headaches reappear under the stress of work. The amount of insufficiency varied; the lowest that it reached was ten degrees. Prisms were never used.

CASE II.—Private patient, male, æt. twenty-two. Exceedingly nervous, and the subject of occasional attacks of hepatic congestion; marked asthenopia; pain in the eyeball; frontal and occipital headache; in the fundus of each eye slight retinal haze, otherwise no changes; myopia of one dioptry; insufficiency of the internal recti of eighteen degrees in accommodation and eleven degrees at twenty feet. Adduction three degrees; abduction eleven degrees. Nux vomica, in the method already described, was employed, and under its influence a severe winter of work was successfully undertaken, during which the patient was practically free from headaches, using at the same time three-degree prisms with their bases toward the nose. The prisms alone failed to give relief, but the prisms with the nux vomica were successful.

CASE III.—Private patient, female, æt. nineteen. In good general health, but somewhat mentally depressed owing to domestic troubles; blurred vision during reading; eyes easily tired; severe frontal headache aggravated by all near work. The refraction a simple hypermetropia; insufficiency of the external recti of eight degrees. Correction of the refraction error produced almost entire relief for a

number of months, then the headaches returned and were stubbornly present for a long time. Under the use of *nux vomica* they speedily improved. The maximum dose was thirty five drops three times a day. The insufficiency through the correcting lenses became as low as three degrees.

CASE IV.—Private patient, female, *æt.* thirty-four. In poor general health; of gouty ancestry; had recently recovered or partially recovered from pelvic peritonitis; was the subject of the most atrocious occipital headaches occasioned by any use of the eyes. The refraction a compound hypermetropic astigmatism. Insufficiency of the internal recti of twelve degrees. The use of the correcting lenses, together with prisms, afforded some relief, but eye-work instantly brought on the headache. During a period when it became absolutely necessary for the patient to use her eyes at sewing and similar work, ascending doses of *nux vomica*, while they failed to give the relief recorded in the previous cases, lent sufficient aid to enable the work to be performed. During a similar necessary period of eye-work on another occasion, without the use of *nux vomica*, the patient had a complete eye-breakdown.

CASE V.—Private patient, male, *æt.* thirty. In good general health; occasional attacks of blurred vision; some asthenopia, and now and then severe orbital neuralgia. Refraction error a simple astigmatism. Insufficiency of the internal recti from eight to ten degrees. During certain seasons of the year this patient is obliged to perform much night-work, during which time the supra-orbital neuralgia has usually been much aggravated in spite of the use of prisms. Ascending doses of *nux vomica* have never failed to give marked relief, so much so that it is with difficulty that he is persuaded during the

administration of the drug to make use of any optical therapeutics. The maximum dose has on a number of occasions been fifty drops. The usual dose is thirty-five drops.

CASE VI.—Private patient, female, *æt.* twenty-three. A slender woman in delicate health, a school-teacher by profession; aggravated a thenopia; occipital headache; occasional attacks of migraine. Refraction error a compound hypermetropic astigmatism; no disease of the fundus; slight haze of the retinas. Insufficiency of the internal recti of ten degrees. The usual treatment with *nux vomica* has been productive of much relief, enabling the patient to perform long periods of eye-work with comparative comfort. The maximum dose was twenty-five drops; beyond this point there was production of disturbance of the alimentary canal and wakefulness at night. Although the comfort of the patient was increased by the use of the drug, no lessening in the amount of the insufficiency was observed, nor was the relief from headache perfect.

CASE VII.—Private patient, female, *æt.* forty. A florid woman, but with flabby muscles; easily tired; much headache; eye-pain and inability to perform any lengthy work requiring tension on the accommodation. The refraction a simple hypermetropia of one dioptre. No disease of the fundus except a slight patch of old choroiditis in the nasal half of the left retina. Insufficiency of the internal recti of eight degrees. Ascending doses of *nux vomica*, the maximum dose being twenty-five drops, beyond which amount the drug produced great restlessness and some nausea, greatly increased the eye-comfort and improved a very troublesome symptom, namely, an appearance as if the lines on a printed page were broken.

CASE VIII.—Private patient, female, æt. nineteen. Of large frame and fine proportions, but intensely nervous, at times hysterical, and subject to intervals of great mental depression; much headache, chiefly in the morning and usually in the occiput, sometimes above the brow. Inability to read for more than a few minutes at a time without great aggravation of the symptoms just detailed. Refraction error a slight compound hypermetropic astigmatism. Insufficiency of the external recti of six degrees; the fundus of each eye reasonably healthy. Her symptoms were practically unrelieved by the use of correcting lenses and prisms. All manner of general treatment was tried with but indifferent success. Finally the use of *nux vomica*, in ascending doses, was followed by surprising improvement. No lessening in the degree of the insufficiency was detected, but the relief to the eyes was evident and gratifying. The maximum dose was forty drops, without the development of any unpleasant symptoms.

These eight examples will suffice to show the class of cases in which this remedy thus applied has proved useful. I could quote many others with similar results. I could also quote instances which, under apparently exactly similar circumstances, have not been benefited by the drug. The method of using *nux vomica* in this manner was suggested to me by the paper of Dr. John H. Musser.¹ In his experiments, in which he desired to demonstrate the influence of age on the dosage of *nux vomica*, he came to the conclusion that the effect of the drug was in inverse

¹ Therapeutic Gazette, vol. ii., 1886, p. 9.

proportion to the age of the patient; the susceptibility increased with the age. The manner in which Musser administered the drug was to give ten drops three times a day, and increase three to five drops every second day until some physiological effect was produced. That very full amounts of the remedy can be safely employed in this way is attested by the fact that one of his patients took 200 drops three times a day, and between the ages of fifteen and forty forty-five drops were well borne. It may with perfect reason be asked, What is the use of giving large doses of an exceedingly bitter tincture, when the equivalent amount of its active principle could be gained by the administration of a small granule of strychnia, five minims of a good tincture being equal to $\frac{1}{200}$ grain of strychnia? I have often employed strychnia in precisely similar cases, and it has not seemed to me that the same satisfactory results were obtained. The *nux vomica* in this class of cases, in the form of the tincture, seems to act somewhat analogously to the use of Fowler's solution in ascending doses in chorea and anæmia. At all events, the clinical fact remains that under this method of administration, distinct improvement in asthenopia and headache occasioned by ocular insufficiency, especially in neurasthenic cases, is distinctly manifest, precisely as it improves the general tone of the muscular system, aids digestion, and corrects the action of the alimentary canal. One very curious fact which I have observed, is that it never seems to do good if the insufficiency exists in the vertical

muscles. As an example of this I may quote the following case :

Private patient, female, æt. twenty-nine. A highly nervous woman, a school-teacher by profession ; the subject of menstrual disorders and atonic dyspepsia. The two latter difficulties were greatly improved after a course of regulated diet, tonics, and dilatation of the cervix of an anteverted uterus. She was the subject of the most aggravated asthenopia. All manner of glasses had been prescribed without avail. Occipital headache was constant ; reading, sewing, and similar occupations had become impossible. The refraction was a low compound hypermetropic astigmatism. There was an insufficiency of the superior recti of three degrees—right hyperphoria of Stevens's classification. Decentration of the lenses, and prisms were productive of no benefit (operation was declined). The persistent use of *nux vomica* signally failed to give relief.

This is not a single example on which I base my opinion that the use of this drug will not be found to be of value in the treatment of the various forms of hyperphoria. I have tried it in a number of cases, and it never had one particle of effect, unless, perhaps, the good of a bitter tonic upon the stomach.

Another point of interest in the administration of *nux vomica* and of *strychnia*, for this and for similar purposes in disturbances of the eyes, is the condition of the retina. It is a well-known fact that irritations of the nerves contraindicate the use of full doses of *nux vomica* or its alkaloid. It is a therapeutic law which must not be broken, that this drug should not

be administered in paralyses from cerebral hemorrhage until all irritation produced by the clot has passed away. On precisely the same principle, nuxvomica and strychnia are contraindicated in ocular insufficiencies associated with headaches, if at the same time there is much retinal irritability, characterized by dread of light, manifest haze and thickening of the fibre layer, and the presence of numerous lymph reflexes throughout the eye-ground. I have more than once not only not seen the drug relieve the patient, but distinctly aggravate the headache. This was beautifully illustrated by the following case :

Private patient, female, *æt.* ten ; very anæmic ; of rapid growth ; much headache, worse during school hours. The refraction was a simple hypermetropia. There was a slight insufficiency of the internal recti, and marked retinal irritation sufficient to produce decided photophobia. This somewhat subsided under the prolonged use of atropine and afterward of the correcting lenses, but still remained, and the headaches failed to disappear. The child had long been taking a tonic from her family physician. Upon investigation this was found to contain very full doses of strychnia, the exact amount of which I am unable to state. When this was discontinued and simply iron substituted, the headaches rapidly disappeared, and, so far as I am aware, they have never returned.

This is not a mere coincidence, for I have over and over again tried the experiment in patients who had markedly irritable retinas, and have always suc-

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ceeded, when I pushed *nux vomica*, in aggravating their pain.¹

In conclusion, I would say that in those cases of ocular insufficiencies affecting the lateral muscles, where surgical interference is either impossible or contraindicated, where the use of correcting lenses and prisms has not been sufficient, and where the retina is quiet and dread of light is absent, ascending doses of a good tincture of *nux vomica* will afford, in most cases, marked relief. If the method be tried, the drug must, however, be pushed up to its full physiological effect, and, according to the experiments of Musser, between the ages of fifteen and forty, a dose of forty-five drops will readily be borne. In fact, very much larger doses, if watched, may be administered without hesitation.

¹ I have heard my colleague, Dr. B. Alexander Randall, bring out this point with much force in a discussion in the Neurological Society some years ago, during the presentation of the subject of Tobacco Amblyopia, contrasting the remarkable facts that on the one hand irritations of the optic nerve and retina were usually aggravated by the use of strychnia, while on the other, when tobacco was the poison which had produced an axial neuritis, this was speedily and often remarkably relieved by the administration of the drug.

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