Headaches of Different Kinds.*

No more frequent ailment of a nervous character presents itself for treatment to the refractionist than cephalalgia or headache. The sufferers from this affliction are everywhere. Subjects of chronic headache have often inherited the tendency and are of a highly nervous temperament. They have tried all kinds of treatment, sometimes with partial relief, but never with permanent benefit, because the underlying cause of the trouble has not been removed. Hence, on slight excuse, the old trouble has returned.

Headache is of various kinds, according to the exciting cause. Thus there are catarrhal, gastric, and nervous headaches; and again, some headaches are caused by tumors of the brain. In most cases the seat of the pain is in the scalp, or the occipito-frontalis muscle, which lies just beneath the scalp. For this reason pressure or hot or cold applications give temporary relief. In no case, however, is the trouble local, except when there is intracranial disease. The pain is always of a reflex character, and we must look to a point more or less remote for its origin. Again, in those cases where the trouble frequently recurs, there is, besides the direct exciting cause, some deeper seated predisposing agency. Anything which reduces the reserve nervous power to such an extent that it is insufficient for an emergency may be the underlying cause of headache. Rectal disease, female complaints, secret vice, and a score of lesser evils act in the manner indicated. There is, however, no more frequent source of nerve waste than that which comes from some defect in the refraction, accommodation, or convergence of the eyes. The organs of sight are in constant use, adapting themselves instantly to every change of position and distance of the object looked at.

If an eye is defective anatomically—too short from before-backward, as in far-sightedness (hypermetropia), too long, as in near-sightedness (myopia), with an irregular curvature of the cornea, as in astigmatism, or if the two eyes are not evenly balanced in muscular development (heteraphoria), we have in such cases a causative factor of headaches which is permanent, is usually inherited, and is a constant source of waste of nerve power, and the removal of which in ninety-six cases out of a hundred has been found to relieve a coexisting chronic headache. Hence, from practical results, we are warranted in saying that every case of headache should apply to the skillful refractionist, before wasting time and money and nerve power in seeking relief with medicine. Our present civilization and school system have a marked influence in producing and perpetuating neuropathic tendencies. The close room into which threescore children are packed at the period of physical development, the close application to books which is expected of them, the defective light, the bending position which from very weariness they assume, and the incentive to stand at the head of their class to which neurasthenic children always respond, are potent factors in producing eye strain and its many reflex disorders. It is to this period of youth that most sufferers with chronic headache can point as the time at which their trouble began.

Symptoms.—Pain in temples, over eyes, and at the back of the head, rarely on top. Paroxysmal, either at regular intervals, or after some especial excitement, care, work, or strain. In women there is often great pain at the seventh cervical vertebra at the base of neck and also at the lower point of shoulder blade or scapula. Others have pain between the two scapulae or in the lower part of the back. In men the pain is in the occipital muscle, and is spoken of as if at the "base of the brain."

Chronic headaches cause a feeling of lassitude, incapacitating the person for mental labor and often causing them to exclaim: "I fear I am going insane."

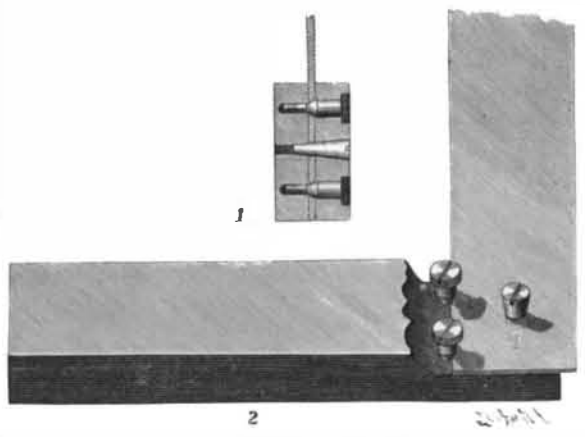
Migraine, or sick headache, is a more severe form of the trouble and recurs with great frequency. The eyes become painful, especially when turned quickly or pressed upon. There is often dimness of vision, glimmering or even momentary vanishing of sight, so that the patient speaks of the attacks as "blind headaches." The torture usually reaches the point where the patient must go to bed in a room protected from light, noise, or a draught of air, which sometimes become unendurable. Occasionally the pain is so intense as to draw the head backward between the shoulders, and it may result in total nervous prostration for the time being. Temporary relief is at times obtained from traveling, from medicine, or from prolonged rest. After years of suffering, the form of the disorder may change to a neuralgia, asthma, or other ailment, but this is not a cure. Nothing will cure the affection permanently until the underlying cause is removed. Unlike ordinary headache, migraine does not so often yield to refractive correction, because it is more often due to a muscular heteraphoria and can only be cured with higher prisms or by a tenotomy.

IT is proposed to erect a monument over the grave of the electrical discoverer, Georg Simon Ohm. Subscriptions will be received by the Königliche Filiabank, Munich.

* By E. T. Allen, M.D., Ph.D., editor of the American Jeweler.

AN ADJUSTABLE SQUARE.

Nothing can produce more vexation and unnecessary labor in mechanics than the use of a square which, through some accident or defect in manufacture, is slightly out of truth. Its effects are cumulative and it compels the workman to perform his work by the cut and try method, which belongs to the past. Our engraving shows a square devised and made by Mr. D. H. Dugar, a mechanician of the Watertown Arsenal. This square has a blade pivoted on a conical screw and adjusted by two conical screws inserted in the heavy part of the square and bearing against the inner edge of the blade, as shown in Fig. 2, in which a portion of the square is broken away to more clearly show the construction. By slightly turning in one of these screws



AN ADJUSTABLE SQUARE.

and unscrewing the other the blade may be adjusted as desired, and when so adjusted it is securely clamped by the pivotal screw.

A NEW BALL BEARING INSPECTION CAR.

At the recent roadmasters' convention at Niagara Falls the Railway Cycle Manufacturing Company, of Hagerstown, Ind., exhibited two of their Hartley and Teeter inspection cars. A novel experiment was tried with one of them on the famous Gorge road. The car was run down the steep incline to the cantilever bridge and back. Our engraving shows the general appearance of the double seated inspection car. Ball bearings are used, the car being provided with a self-contained bearing case which covers the axle. In this case are placed the ball bearings, composed of two parts. All side strains caused by the weight of the rider are thrown upon the bearing case and do not bind upon the bearings or the axle. The axle itself is independent of the frame and can be removed by loosening the set screws

THE NEW HARTLEY & TEETER BALL BEARING INSPECTION CAR.

on the sprocket wheel and removing one nut. The car is light, but is exceedingly practical and durable.

How to Prepare Calcium Tungstate for X Ray Screens.

BY C. E. TENNANT, M.D.

As the readers of the Electrical Engineer may be interested in the subject, I give the results of my recent experiments with the calcium tungstate. I find that the compound made after this manner gives the most satisfactory results of any fluorescent substance now known, especially on large screens, the size of the body, and these screens can be made for a price not to exceed 25 cents each, by any novice.

The spreading of the calcium tungstate evenly over the surface offers the greatest difficulty, but with a little practice can be readily overcome.

To two parts of sodium tungstate add one part of calcium chloride; fuse the mass to a red heat. A resulting compound of calcium tungstate and sodium chloride is formed. This latter salt exerts active hydroscopic properties and, as a result, renders the calcium tungstate quite negative to the X rays. But immersing the fused mass in water for an interval of forty-eight hours disposes of the salt, as well known by its property of solubility, while the insoluble calcium tungstate remains a precipitate. This latter is now separated by filtration, and when dry assumes a crystalline formation and is very sensitive to the X rays.

An amorphous preparation of calcium tungstate may be obtained by adding a saturated solution of sodium tungstate to a solution of calcium chloride, which results in the precipitation of the calcium tungstate, but this amorphous crystalline form is absolutely worthless for use with the X rays.—The Electrical Engineer.

The Amount of Water in the Earth's Crust.

In order to ascertain the amount of mechanically contained water in the earth's crust, I recently made the following computation, says W. B. Greenlee, of Ithaca, N. Y., in the American Geologist.

I considered it safe to assume that the crust of the earth is filled with water and that the maximum porosity of rocks which can be obtained in the laboratory, though not the greatest possible porosity, is less than that of the crust of the earth for a distance of one mile from the surface.

One mile is taken as an approximate thickness, since that seems to be a fair average of the thickness of sedimentary rocks over the surface of the earth.

Assuming, then, that the earth is saturated with water to the depth of one mile, we have next to determine the relative amounts of its constituent rocks and their respective porosities.

The surface of the earth may be divided into two divisions, first, that covered with sedimentary rocks, and, second, that covered with igneous and metamorphic rocks. To ascertain the relative areas, the United States and Europe were selected as typical of the land surface. The United States was divided into three regions: (1) that east of the Mississippi River; (2) that between the Mississippi and Colorado; and (3) that between Colorado and the Pacific. The first region was divided as to the relative amounts in each State and the results added. The central region was bulked as sedimentary rocks, and the western region was called half sedimentary and half igneous and metamorphic. The results showed that 31·2 per cent of the surface of the United States is covered with igneous and metamorphic rocks.

In Europe each country was separately divided and the percentage of the respective sums taken. This proved to be 19·8 per cent. An average of these results, by coincidence, is 25·5 per cent, or, roughly speaking, three-fourths of the land surface of the earth is covered with sedimentary rocks having an average thickness of one mile.

Difficulty was encountered in ascertaining an average porosity. Sections were taken in various parts of this country, notably the 127,000 feet generalized section of the Rocky Mountains, a generalized section through New York, Pennsylvania and Ohio by various authorities and Fairchild's section at Rochester, N. Y. A mean and average rock would appear to be a fine-grained sandstone or limestone.

The most accurate determination of the porosities of rocks has been made by Prof. Bauschinger, of Munich. He found the average porosity of upward of 300 specimens of sandstones and limestones to be 20 per cent of their volumes. Two per cent may be taken as a low average for igneous and metamorphic rocks.

The most recent and careful computation of the respective areas of sea and land on the earth's surface is that by M. Thoulet in his "Oceanographie." This he gives as 368,000,000 kilog. for the sea and 142,000,000 kilog. for the land, or, reduced to square miles, 142,084,860 and 54,826,200 respectively. Three-fourths of the land is 41,119,650 square miles and one-fourth 13,706,550 square miles. Taking 20 per cent of the former and 2 per cent of the latter and adding we get 8,498,061 cubic miles of water.

Thoulet estimates the volume of the oceans at 1,347,874,850 cubic kilometers, which, reduced to English measure, equals 318,191,728 cubic miles.

The estimated amount of mechanically contained water in a section of a mile over that part of the earth's crust covered by land is thus 2·7 per cent of the water now on the earth's surface, or a layer 88 feet deep over its entire surface.

There is undoubtedly a large amount of water below one mile, but we can only conjecture as to the amount, nor does this estimate include that chemically contained. No estimate was made of the amount of water beneath the bed of the ocean, as we have no way of knowing of what it is composed or how thick the permeable layer is. This, too, would increase the total.

IF castor oil is applied to a wart once a day for a month the wart will entirely disappear. In many cases it will not require so long a time.