the other end brought in contact with the magnet. Immediately the metallic click was felt, and the bit of metal was readily extracted. If one needs it one has in the Haab magnet an instrument sufficiently strong for almost any purpose.

Dr. Johnson. In regard to the question of the current for the use of magnets, the alternating current must necessarily be transformed into a direct current. For the Haab magnet a dynamo is required that furnishes about thirteen ampères of current, and for Dr. Lippincott's instrument I should think it would require about two ampères; my own requires about \( \frac{1}{2} \) ampère. The majority of small cities use the alternating current for lighting purposes, and that must be transformed into the direct for the use of any magnet. An apparatus for this purpose would cost about $100 for my magnet, while one for the Haab would cost perhaps $250. I suppose there would be very little difference in cost between one for my own and one for Dr. Lippincott's magnet.

A CASE OF TRANSIENT SPASTIC CONVERGENT STRABISMUS.

By Samuel Theobald, M.D.,

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Spastic convergent strabismus, or strabismus from tonic spasm of the internal recti muscles, a condition to be sharply differentiated from ordinary concomitant convergent squint and from squint due to paralysis of the abducens, is one of the well-recognized ocular manifestations of hysteria; but, apart from this, it would seem, deserves to be regarded as a rare anomaly, to which, as a rule, the text-books upon diseases of the eye devote but scant attention.

De Schweinitz, in the paragraph of less than five lines which he devotes to "spastic strabismus," * says that it occurs only under rare circumstances in hysteria and brain diseases (meningitis). It is difficult of diagnosis, periodical concomitant squint

* Diseases of the Eye, third edition, p. 554
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in hypermetropia being sometimes inaccurately described as due to spasm of the internal rectus (Mauthner).” Jackson, in a paragraph of equal brevity, says “deviations of the eyes due to spasm of the ocular muscles attend hysterical seizures and some forms of brain disease. They may assist in the general diagnosis; but have little localizing value, and require no treatment apart from that of their cause.”* Fuchs, though he states that “tonic spasms of the ocular muscles are extremely rare,” adds that “many cases of intermittent strabismus belong under this head,” and he mentions two cases of this character which he had observed in hysterical women.† Roosa says children in whom optic neuritis is found to be present are often brought to ophthalmic clinics with strabismus in its early stages, which is non-paralytic. “Every careful observer,” he adds, “will take great pains to determine in a given case of suddenly-occurring strabismus, that there is not some cerebral lesion. During dentition certain children are apt to squint.” This, he thinks, “may fairly be ascribed to cerebral irritation.”‡ Duane, in his chapter upon “Movements of the Eyeballs and their Anomalies,” in De Schweinitz and Randall’s American Text-Book of Diseases of the Eye, Ear, Throat, and Nose (p. 511), treating of paretic and spastic squint, says “spasm, which is much less frequent than paralysis, is due to irritative lesions (meningitis, etc.), chorea, epilepsy, and hysteria; rarely is idiopathic.” Noyes, Norris, and Oliver, Fick, Nettleship, and Swanzy, so far as revealed by a glance through their respective treatises upon diseases of the eye, make no mention of the subject of spastic strabismus.

In Norris and Oliver’s System of Disease of the Eye, Pari-naud, treating of the ocular manifestations of hysteria, considers at some length the “anomalies of convergence” occurring in this condition. If we would understand the anomalies of the movements of the eyes in hysteria we must, he says, “consider that neither muscles nor nerves, but nerve centers, and, indeed, the higher centers, are affected — those whereby the movements

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* Diseases of the Eye, p. 234.
‡ Diseases of the Eye, p. 553.
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themselves are brought into unison with psychic action;” and, he adds, “another fact connected with a study of hysterical disorders of the ocular apparatus is that they are almost always of the nature of contractures, even when they present the objective characteristics of paralysis.”* In the same volume (pp. 708 and 710) Santos-Fernandez, writing of the “ocular manifestations in influenza,” mentions cases of paralysis of the third and sixth nerves, and of “convergent strabismus” as having been observed in this affection, while Culver, in the chapter upon “Anomalies of the Motor Apparatus of the Eye,” says, “Changes in the centers of innervation as primary causes of strabismus are admissible only in certain definite cases,” and, again, “Convergent strabismus may be due also to a spasm of convergence, independently of accommodation and refraction. We have observed cases of this kind in hysteria. It is perfectly admissible that the same phenomenon is produced in consequence of other irritations of the center of convergence.”†

Briefly described, the case which I wish to report is as follows:

A little girl, seven years of age, convalescing from a pronounced attack of influenza, a marked feature of which had been persistent and severe headache, and during the course of which an otitis media had developed in the right ear, complained of diplopia, and on the following day exhibited an evident squint. At the request of the attending physician, Dr. W. D. Booker, I saw the case on the second or third day after the squint manifested itself.

There was present at this time in both distant and near vision a very decided convergent squint of the left eye. There were no signs of paresis of either rectus externus — each eye could be rotated outward farther than is commonly possible, and neither the extent of the squint nor the diplopia was influenced by the direction in which the head or the eyes were turned. The ophthalmoscope revealed a hypermetropia of rather more than 2 D, and, as I had previously performed a tenotomy upon the little

* Vol. IV, p. 754.
patient's mother for a pronounced esophoria, I concluded that the influenza had been the straw which had broken the camel's back, and developed a concomitant squint in a child who had, probably, inherited insufficiency of the external recti muscles and who was decidedly hypermetropic. That the trouble would be overcome without glasses or an operation seemed to me highly improbable. Dr. Booker had already prescribed iron and quinine and a nourishing diet, and the general condition of the patient was improving from day to day.

At my second visit, four days later, although the mother reported that the eyes had been straight at times during this interval (?), I found the squint unchanged except that it showed, perhaps, a greater tendency to alternate. Thinking that suppression of the accommodation might favorably influence the squint, I directed a two-grain solution of atropia to be dropped into the eyes twice a day. Two days subsequently, the eyes being thoroughly under the influence of the atropia, the squint seemed somewhat less marked. My next visit was five days after this, and, to my gratification, I then found no trace of the squint remaining. Not only so, but even with the cover test it showed no disposition to recur, and an esophoria for distance of only 4° was shown by the Maddox rod. A decided change for the better in the general condition of the patient was also evident.

After another interval of four days, the eyes meantime having remained quite straight, the atropia was discontinued, although, I confess, I still had serious misgivings as to what would occur when the ciliary muscles began to regain their activity. However, my apprehension proved to be groundless, for a week elapsed without any recurrence of the squint, by which time she had recovered her power of accommodation sufficiently to be able to read ordinary print. The Maddox rod now showed an esophoria for distance of only 3°, while, more noteworthy still, the vertical diplopia test showed at 12" a so-called exophoria of 4° — a practically normal muscle balance. Since then the eyes have given no further trouble.

A few days since (April 26th), nearly two months having
elapsed since the disappearance of the squint, the muscle balance was tested with the following result:

\[
\begin{align*}
\text{Esophoria,} & \quad 20' = 1^\circ. \\
\text{No hyperphoria,} & \quad 20'. \\
\text{Exophoria,} & \quad 12'' = 1^\circ. \quad \text{(Vertical diplopia test.)}
\end{align*}
\]

That the squint in this case was a purely spastic one, due, doubtless, to an irritation (of influenzal origin) of the innervation center which controls the associated action of the internal recti muscles, is, in my judgment, not open to question. Had it been a concomitant squint, precipitated by the attack of influenza, as I at first supposed, it might, indeed, have disappeared under the influence of the atropia and with the improvement in the patient’s general condition; but, under such circumstances, a normal muscle balance would certainly not have been re-established in the space of a few days, as actually happened. On the contrary, a marked and probably persistent esophoria would certainly have been encountered.

As to abductor paresis, I have already said there were no signs whatever pointing in this direction; but, apart from this fact, the rapid return of the lateral muscles to a condition of practical orthophoria, is as little consistent with this view of the case as it is with the view that the squint was a concomitant one.

An incomplete search through the literature of the subject has revealed only one case which bears a close resemblance to my own. In the Archives of Pediatrics, Vol. I, p. 634, Dr. Samuel S. Adams, of Washington, reports an interesting case of convergent strabismus as a sequela of diphtheria, in which paresis of the external recti muscles was excluded, and which he attributed to “a spasm or over-action of the internal rectus,” due to an irritation of the center of ocular adduction. The squint disappeared completely within a few days of its onset.

\textbf{DISCUSSION.}

Dr. Howe. To corroborate what I said this morning I wish to observe that Theobald’s case shows that our tests for the dis-
Discussion.

Discipline are not reliable. If one will take the trouble to test not only with the Maddox rod, but also with the prism and the phorometer, and then to compare the results, he will find that a very large proportion of cases, especially when the accommodation is not at rest, give contradictory results. I would call attention now to these diagrams which illustrate some of the differences between such tests (showing diagram), and hope to bring up the subject again later.

Dr. Harlan. It may be of interest in connection with this case to refer to one of regularly intermittent strabismus that I reported to the Society some years ago. A child four years of age had a convergent strabismus of 3 or 4 lines every other day, lasting throughout the day, while on the alternate days the axes were apparently quite parallel. I was unable to detect any refractive error by the ophthalmoscope, but another surgeon who saw the case thought that he found a low degree of hypermetropia, and convex glasses were worn for some time without result. This regular intermission lasted for more than a year, when it was suddenly broken by the occurrence of the squint on an off day. Afterwards there were only occasional and irregular intermissions.

Dr. Allyn. I recall a case of squint in which every other day the child showed a strabismus of 2 or 3 lines. The suggestion to my mind was that it might be due to malaria, and under the use of quinine it promptly disappeared.

Dr. Jackson. A few years ago I saw a case of spastic squint that recovered under atropine. It had followed diphtheria. I have also noticed very marked loss of accommodation following influenza.

Dr. Thomas. Dr. Harlan will perhaps remember a case he saw with me about twenty years ago, a boy about four years old who had intermittent squint. After a year it became a settled strabismus, and operations were performed, first a complete tenotomy, and then graduated ones during two or three years, until perfect muscular balance was obtained. The young man is now twenty-four years of age, and within the last month I have seen him, the eyes remaining perfectly orthophoric.

Dr. Theobald. I should have said in my paper that there was no disturbance of the pupils or of the accommodation in this case, and that the vision was quite normal. In regard to Dr. Howe's observation, I may say that I do not confine myself to the Maddox rod, but use the Maddox prism and the vertical diplopia test as well. I have not found anything comparable to
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The examples of contradictory results which his tables show. Dr. Verhoeff, working with me at the Hopkins Hospital, tells me that he finds some cases in which the Maddox rod used to measure esophoria gives an exaggerated result, but I have not found this to be the case myself. As to the cover test, of course, the question of personal equation comes into play, since some observers may detect slighter movements of the axes than others.

CLINICAL STUDY OF THE OCULAR SYMPTOMS FOUND IN SO-CALLED POSTERIOR SPINAL SCLEROSIS.

By CHARLES A. OLIVER, A.M., M.D.,

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The following broad generalizations of the ocular symptomatology found in so-called posterior spinal sclerosis (a disease according to the newest teachings dependent upon an atrophy or degeneration of the sensory neurones, followed by sclerosis, though most probably antedated by varying degrees of low-grade inflammation) are the results of a series of most carefully applied studies extending over a period of more than five years. Much of the clinical work has been obtained from the services of the two great hospitals with which I am connected. Every case studied, now amounting to more than one hundred properly made uncomplicated diagnoses, has been submitted to a routine examination embracing every detail of relevant value, while several have been carried to the post-mortem room and the microscope table for further examination as to the histological and pathological changes in the ocular structures.

Given in this way, as a brief résumé of the entire work, and a crystallization of the whole, as it were, the subject-matter may be fairly assumed as having some weight in scientific medicine and of being of working value to the clinician. As such it is offered.

Recognizing, even from the ocular standpoint, the broadness of the subject and its many ways of approach, the main and most