

2 USE OF COCAIN IN MEASURING AMOUNT OF HETEROPHORIA.

are obliged to make continuous efforts far greater than when the condition is orthophoric. Moreover, owing to the fact that in muscular anomalies an excessive amount of effort is constantly put forth by the stronger muscle or muscles, it is difficult to estimate the physiological force resident in these. For the perfect estimation of heterophoria it is consequently necessary to eliminate this impulse to fuse the doubled images of the eyes under examination.

No one, as far as we know, has so far discovered a method of overcoming the difficulties that chiefly stand in the way of rendering manifest the total amount of heterophoria.

Toward the end of 1885, when cocain had just been introduced, one of us (Prof. Guaita) published the following report of the action of cocain on the ocular muscles: "Dr. Sighicelli in a prize essay giving the results of work in the laboratory of Prof. Albertoni, in Bologna, claims that cocain produces a complete paralysis of the motor muscles of the eyeball and supports this claim by experiments on the lower animals. I have carefully observed the motility of the cocainized globe and am convinced that ordinary doses of cocain retard, although they do not entirely abolish, the excursions of the eye. Patients under the influence of cocain do not readily turn the eye in the direction indicated and this condition lasts for a short time. While their gaze is fixed upon the end of the finger they are able to follow it when the latter is slowly moved to and fro but they are not able to do so when the movements are rapid.

I have not succeeded in producing complete immobility by instilling two drops of a 3 per cent. solution into the eye every two minutes for a quarter of an hour nor by using it every two hours, for therapeutic purposes, for several days. This effect of cocain upon the eye is not a true paralysis but a state of *atony* a relaxation of the muscles. Consequently I consider that the incomplete or lazy excursions of the globe are merely results of this atonic condition. The muscles are, one may say, fatigued or enervated; although they are still under the control of the will they exhibit an indisposition to contract. So far as their *power* is concerned it still exists.

I do not wish to call in question the experiments of