

been kept shaded for some seconds, the pupil contracts, and after a moment slightly dilates and then recontracts. A certain amount of play of this kind is normal. We judge of the condition of reaction by the rapidity and extent of the contraction and by the way the effect is maintained. Any interference with the nervous arc mentioned above will impair the reflex. Fine afferent fibres run in the optic nerve; inflammation of this nerve will interfere with the direct reflex, and often appreciably, before vision is at all affected. If only one nerve is affected the consensual reflex from the other eye may be normal, though the direct be lost.

A block in the efferent paths necessarily abolishes both direct and consensual action.

As well as the reaction of the pupil to light, there is another mechanism by which the operations of convergence and accommodation, which are always associated in the normal state, are accompanied also by a contraction of the pupil.

If the patient be directed to gaze first at a distant object and then at a finger held close to him, it can be readily seen that the pupil becomes smaller.

The reasons of these reflex and associated movements are easily apparent. The contraction to light tends to prevent an excessive amount of light entering the eye which might damage the delicate percipient elements. The associated movement on convergence has a more complicated cause. During accommodation, as has been said, the curvature of the anterior surface of the lens increases, but not evenly; the centre of the lens is more curved than the sides. To keep a clear image it is necessary that all the lens exposed should have the same curvature. If more than the central part of the lens were accessible to rays, the peripheral bundles would come to a focus at a different place to those which pass through near the principal axis, and thus the image would be much blurred. The contraction of the iris, by limiting the surface exposed, prevents the passage of the peripheral disturbing rays.

The two movements of the iris are not always present. One may be lost without the other: not uncommonly the light reflex is lost and the associated function retained. This symptom was first described by Dr. Argyll Robertson, of Edinburgh, and is often known as the Argyll-Robertson (or A.R.) pupil. It is often connected with small size of pupil (meiosis), and is an early sign of Tabes dorsalis and general paralysis of the insane. Sometimes in nervous diseases both movements are lost. Then the pupil will usually react to drugs, becoming large (mydriasis), when atropin, or similar preparations, are instilled, small (meiosis), under the influence of eserine or

pilocarpin. Hence these drugs are called respectively mydriatics and meiotics. Complete failure of all action leads us to suspect some mechanical cause, such as adhesions between the lens and iris. These can usually be seen as dark brown pigment dots at the iris margin, passing on to the lens, and causing the pupil to be slightly irregular in outline.

The pupils of the two eyes are not uncommonly unequal. It is not always easy to say which is the normal one, whether, that is, we have unilateral meiosis or mydriasis. We must observe closely, to decide this point, the pupil reactions of both eyes. Those of the abnormal one will be more or less restricted.

Not uncommonly affection of the muscle of the iris is associated with affections of the ciliary muscle, since both are supplied by the same nerve, but, on the other hand, this is by no means constant. As a sequel to diphtheria, the ciliary muscle may lose almost all its power, while the iris is very rarely affected; on the other hand, unilateral mydriasis is common, without any loss of accommodative power.

*(To be continued.)*

### Technique Employed in the Children's Orthopaedic Department of the Pennsylvania Hospital, Philadelphia.

#### PREPARATION OF PATIENTS FOR OPERATION.

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When possible the preparation of all operative cases should begin the afternoon preceding the operation, and should be carried out as follows:

1. Send specimen of urine to laboratory.
2. Give the patient a full bath, hot soap-suds, if the general health permits.
3. Shave the field of operation.
4. Scrub the field of operation as follows:—
  - (a) With tincture green soap, hot water and soft brush for ten minutes. (Do not remove the epidermis to extent of showing blood.)
  - (b) With benzine and gauze pads for three minutes. Use turpentine in place of benzine if the part is very dirty.
  - (c) With 95 per cent. alcohol and gauze pads for three minutes.
  - (d) With 1-1,000 hot bichloride solution and gauze pads for three minutes.
  - (e) In old club-foot cases, commence several days in advance, by applying flaxseed-meal poultices to feet each night; then scrub with ammonia water, pare off callosities, and use soap, turpentine, alcohol, and bi-

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