tremely rare (except in case of transposition of the heart), this idea is negated by the further facts that the aortic second sound is nearly free from rumble over the aortic cartilage and sometimes quite free from any murmurish sound below the apex in recumbency, whereas there is no second sound at all over the area of maximum murmur.

FIG. 3.

With regard to the visible pulsation in the arteries, I do not know of any reference to it in other cases of this sort. Probably this is due to its usually slight degree. It should be remembered, however, that patent ductus arteriosus is itself a form of aortic leak—not, indeed, into the left ventricle, but into the pulmonary artery—and may, if free, be expected to produce a sufficient difference between the systolic and diastolic pressures to cause visible arterial pulsation. But these pressures would both be probably low as they are here, since the systolic pressure is not reinforced by the contraction of a powerful hypertrophied left ventricle (as is the case in ordinary aortic regurgitation) and the leak is continuous through both systole and diastole.

It may be asked how one can be sure that the divided second sound over the lower spaces is pulmonary. For a full exposition of the reasons I must refer to a previous paper.³ The current explanation of the division of the second pulmonary sound in mitral stenosis, or other diseases which increase the pressure in the pulmonary artery, can be easily disproved by mapping out its area of audibility and often by palpating the shock of the closure of the pulmonary cusps, which, like the sound, is reduplicated. The sound is produced by asynchronous closure of the pulmonary cusps themselves. This fact has a real value, as in such a case as this, in distinguishing a second pulmonary from a second aortic sound, because, owing to its thicker walls, the aorta rarely dilates at its orifice sufficiently to put its cusps on the stretch. Unequally-sized cusps when the orifice is stretched must become unequally deep and so cause their thrust of closure asynchronously.

But it might be suggested that the rumble here is really a double murmur due to regurgitation accompanying a congenital pulmonary stenosis. That is excessively rare. Also the rumble does not in the least resemble a double murmur. Further, the maximum of the diastolic murmur would not be in the second space. And lastly, the second pulmonary sound would require explaining; its accentuation and reduplication make any regurgitation there extremely improbable.

Prognosis.

Prognosis is the most important point in the case. Patent ductus arteriosus is the one congenital lesion which ever undergoes spontaneous cure. But that is in early life. Cases which persist into adult life may, however, live to considerable ages; 30 does not appear to be a very unusual age, and Walsham⁴ has recorded a case which died

at 47, and Hale-White⁵ one which died of angina at 53 with a ductus as large as the anterior tibial artery. Other cases at lesser but considerable ages are mentioned in Abbot's able article in Osler and McCrae's *System of Medicine*.⁷ Will this patient live so long? The pulmonary artery tends to become atheromatous under the strain, and sometimes begins to leak, as was clinically followed in Thayer's⁶ case, quoted in Laubry and Pezzi's valuable work on congenital heart disease. Here, as has just been said, there is no evidence of regurgitation.⁸ Some die, as in Hale-White's case, of angina, and here anginoid pains are present. The serious feature, indeed, is that disabling symptoms are already in existence. But the conditions of strain of work have been very bad, and his improvement, since he has rested, is considerable. In any form of congenital heart disease one must never forget the curious special liability to infective endocarditis. We can only hope that, with continued rest (seeing that he looks robust), the existing symptoms may subside.

Treatment.

The treatment has been by rest, at first in bed, now at home, avoiding all strain, good feeding, and, in the way of drugs, small doses of sodium iodide, arsenic, and digitalis, with larger doses of strychnine.

Lastly a word about the effect of change of posture. I have seen four cases of patent ductus. The first was shown by the late Dr. Gibson at a meeting of the Association of Physicians at Edinburgh, when he corroborated the effect I found—namely, that the practically continuous murmur heard in the erect position became definitely discontinuous in recumbency. Another case, seen last May at the London meeting of the same association, showed the same change, which was verified by several present. In the other two cases, this and that of a boy seen in private some years ago, posture made no change in the duration of the murmur. The point is not merely academic, for in recumbency the murmur, if it is discontinuous, is less distinctive and might be mistaken.

I have to thank my colleague, Dr. Miller Muir, for the trouble he has so kindly taken with the x-ray examination, and my house-physician, Dr. Durran, for the pulse tracings.

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THE MENTAL CONDITION NINE YEARS AFTER MENINGITIS TREATED BY FREQUENT VENTRICULAR PUNCTURE.

BY

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THE following is an account of the mental condition of a child who was under my care in the Royal Free Hospital in 1917, suffering from a severe attack of meningitis at the age of 5 months. She recovered, and is now 9 years of age.

The onset, with pyrexia, constipation, and fretfulness, was not recognized as that of cerebro-spinal fever until towards the end of the first week, when the tense fontanelle and staring eyes suggested the diagnosis. Lumbar puncture was then performed and abundant fluid with large numbers of pus cells and meningococci was obtained. Antimeningococcal serum was given intrathecally and puncture was repeated on the second and fourth days. Unfortunately on the fifth day no fluid could be obtained from the spinal canal, and it became necessary to relieve the tension by puncture of the right lateral ventricle through the lateral angle of the fontanelle. During the next three weeks the intracranial pressure remained very high, and the ventricle was punctured almost every day, yielding sometimes as much as 100 c.cm. of fluid; this was partly replaced by small doses of antimeningococcal serum. In all 30 c.cm. of serum were given. After the first few days meningococci ceased to appear in the fluid, which gradually became clearer. As the tension relaxed ventricular puncture was made at longer intervals, and was stopped at the end of five weeks. By this time a fair degree of hydrocephalus was noticeable, the head measuring 17½ inches, but the pyrexia and vomiting had ceased and the general condition was much improved. The only complication was a fluid swelling of the right knee-joint. The infant was sent home in good condition.*

* The case was described in a paper on cerebro-spinal meningitis by Dr. Helen Mackay (*Lancet*, January, 1920).

I saw her again when she was about $3\frac{1}{2}$ years of age; she was a bright little thing, but with an unduly large head, happy, and clean in her habits, though decidedly backward, talking and acting more like a child of 18 months than a normal child of 3.

I did not see her again until last summer, 1925, when she was 8 $\frac{1}{2}$ years of age. She then appeared well grown, robust, and inclined to be too fat. She had a squint and her vision was obviously defective. Unfortunately she had been taken to an optician and supplied with glasses which were quite incorrect. Hearing was good. The limbs seemed perfectly normal; there were no signs of spasticity or weakness, etc.

Mental Condition at 9 Years.

Beyond observing that she was a great chatterbox, an untrained person might have been in her company for some time without noticing any abnormality. The child evidently enjoyed life very well, had bright eyes and a frequent smile, laughed easily and scarcely ever cried. Her chatter was incessant, but had very little novelty in it, as she constantly repeated herself and would ask the same questions over again, making little attempt to record the answers in her mind. She was immensely inquisitive. She was imitative, and often in speaking to adults would exactly imitate the tone and attitude they adopted towards her. The result was sometimes exceedingly funny. She had a good memory, both for incident and for words and figures learnt by heart, but her reasoning powers were very poor. She evidently disliked having to make the necessary effort to reason, so avoided it as much as possible. When asked an unexpected question she would often turn to someone else for an answer rather than trouble to think it out herself. The same may be said for her powers of concentration; nothing occupied her mind for more than a few minutes. She was an affectionate child, sweet-tempered, and eager to please, but fickle and overtrusting.

Her upbringing had not been on the right lines. She was the eldest of the family, and from an early age had been given all kinds of domestic work to do in the house, including the care of her brothers and sisters. She was willing and able in her household jobs, but unfortunately none of the work called for any exercise of the mind. Her parents' social status was such that the school attendance officer did not step in, and any attempts at education were home-made and spasmodic. Six months ago she had barely mastered the letters of the alphabet. Her mother was affectionate but dominating, and asked for implicit rather than reasoned obedience.

During the last six months the child's mental outlook has definitely improved. She has been living away from her family, among children older than herself, attending a day school and at the same time having the help and individual attention of a good teacher. Her reasoning power is being deliberately stimulated and encouraged. She can now read and write easy words and sentences. She is learning to play games with other children. Music has always been a delight to her, and she is now being taught to play the piano; to this she gives all the power of concentration she possesses, and is evidently going to do well. The error of refraction has been corrected with suitable glasses. I have tested her with some of the intelligence tests. According to Binet's series she has a mental age of about 8, but I consider that these tests have too low a standard and do not require much reasoning power. On the other hand, she gets low marks in Ballard's picture tests for children of 6, obtaining only 35 out of a possible 100 marks. These tests demand considerable powers of accurate observation, and accuracy is not the child's strong point. As a matter of fact, her development has been irregular and therefore not comparable with any particular age. It is not a case of simple retardation—indeed, this rarely is so with mentally deficient children.

The prognosis seems to be very fair. The child will probably never have much depth of character and must always have someone to lean upon. Her chief danger when she passes puberty will be her affectionate trusting nature and her desire to please. The morality of the mentally defective is only on the surface, and the child could easily be led astray. She will, however, be able to carry out all the ordinary duties of a woman's life. Her parents are both exceptionally clever and intellectual people, and there seems no reason why she should not marry and have clever children. She reminds one of the mental condition of a mild case of spastic diplegia, in the tractability of temper, absence of any tendency to viciousness, and good response to treatment. She has an equally hopeful outlook if her education can be continued on sensible lines.

It has seemed worth while to record this case, which occurred at the time that frequent withdrawal of cerebrospinal fluid and daily administration of antitoxic serum were first being practised in the treatment of cerebrospinal meningitis. The case is exceptional—first, in having recovered at all after such an early attack, and secondly, in having suffered comparatively little brain damage in spite of repeated ventricular puncture. There can be little doubt that, if the fluid had been allowed to collect, the resulting hydrocephalus would have produced a hopeless imbecile.

A CASE OF HYDATID CYST OF ORBIT:

REMOVAL OF CYST WITH PRESERVATION OF EYE AND VISION.

BY

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I TAKE the above title from Mr. J. B. Lawford's paper, read before the Ophthalmological Society of the United Kingdom in December, 1894 (vol. xv of the *Transactions of the Ophthalmological Society of the United Kingdom*)—it so accurately fits the case I now describe. In this paper Mr. Lawford says: "It probably falls to the lot of few men to operate on many cases of orbital hydatid cysts."

A healthy-looking Kaffir girl, aged 8, was sent to me by Dr. J. de Villiers, medical officer of health. Her parents accompanied her, and gave me the following history. About two years ago they noticed an enlargement of the right eye. It gradually increased, without any complaint of pain or discomfort from the child. On inspection the right eye was protruded about half an inch, and also displaced down and outwards; it was limited in its upward and inward movements, and showed a marked external strabismus. The upper lid was puffy and oedematous, mostly to the nasal side, but could cover the eyeball completely. Backward pressure caused no pain, and did not reduce proptosis; nor was the latter perceptibly increased with the head below body level. Tension was normal; no pulsation or bruit present; pupil active and normal, as also were conjunctiva and cornea. Right vision=6/9 (about), left vision=6/6. The ophthalmoscope showed the media clear. The only abnormality was a haziness of the edge of the right disc as compared with that of the left. A swelling of bony hardness was felt about the right trochlea.

On admission to the Settlers' Hospital she was x-rayed by Dr. R. Temple Harrison, who reported a uniform shadow in the right orbit with porosis of bone at the inner side above. The whole right orbit was about three-sixteenths of an inch below the level of the left. On further examination I felt a soft, bag-like mass upward and inward where the swelling was greatest. This could just be grasped by fingers pressed deeply above the lid, but slipped quickly away—a factor I thought definite enough to allow a diagnosis of hydatid, even with absence of the usually associated symptoms.

Under a general anaesthetic an incision 1 inch along the upper orbital margin was made. Cautious dissection disclosed at the inner side a pearly grey, glistening, flaccid structure, closely surrounded by orbital fat, with numerous fibrous attachments. A syringe was ready, and about a teaspoonful of clear watery fluid was withdrawn. Immediate boiling showed it to be albumin-free. So deeply and firmly was the cyst attached to the orbital apex that I feared to go beyond a gentle effort at removal, though I got down fairly close to its origin.

With a small Volkman's spoon I scraped it out thoroughly. The inner lining came away in pieces like coagulated white of egg. Even after this scraping moderate traction failed to move the sac. I wiped it out freely and firmly with gauze moistened with tincture of iodine, going down to the base, inserted a rubber drain, and sewed up. A small amount of orbital fat was unavoidably lost. The bleeding, though troublesome, was perhaps less than one would expect. Dissection was kept as close to the orbital roof as possible so as to avoid injury to the muscle cone.

I estimate the cystal capacity at about two teaspoonfuls. The sac showed little progress in closing, even with a gradually shortened drain, and, in about three weeks, swelling in the original position, with oedema of the lid, again appeared, and so closely resembled the first picture that I suspected a similar cause. However, on opening up again, I could find nothing but the old sac, which, I concluded, had become obstructed and distended. This time I removed it thoroughly, though to do so meant much more disturbance to the orbital apex than on the first occasion. The muscle origins of the superior rectus and levator palpebrae superioris from the annulus of Zinn surrounding the optic foramen, with their nerve (oculomotor), within the annulus, could hardly escape injury when the implantation area was dealt with.