had been more or less inflamed for about two months. The child's mother suffered from phthisis pulmonalis, and one of her brothers had died at 9 months "with lungs badly affected." The patient herself "had brought up blood" on one occasion. On Admission: Weight, 4 st. 4 lb.; temperature remittent; general examination, including *x* rays, negative. Right eye: Tension minus 1. Vision, fingers at 2 metres. Slight photophobia and patchy ciliary redness. Several curious looking deposits lay at different levels in the substance of the cornea, where they formed a kind of mosaic. Their colour was greyish-white, and they might be compared with drops of cold mutton fat. In addition, the rest of the cornea was more or less hazy. No deposit, such as those on which great stress has recently been laid by Dr. Stock,⁸ could be recognized on the anterior surface of the iris. The pupil responded imperfectly to atropine, which disclosed the existence of posterior synechiae. Although a reflex could be obtained through the upper part of the pupil, yet no details of the fundus could be made out. *Provisional Diagnosis*: Tubercle of cornea, probably secondary to a similar condition of the iris and ciliary body. The injection of 100 mg. of tuberculin T.R. on June 19th and 25th yielded no definite result, but a rise in temperature to 100.8° F. followed a third injection made on June 28th. On June 20th the cornea had cleared sufficiently to allow of an ophthalmoscopic examination of the fundus, when areas of yellowish-white exudation, probably of tuberculous nature, were found in the peripheral parts of the choroid. On September 21st, under treatment by injections of 100 mg. of tuberculin T.R., sight had risen to 3/6. On the following day, serum was applied to the unaffected eye by Dr. Chisolm. A reaction was noted in five hours, and this had disappeared completely thirty-one hours after the serum had been used to the eye.

7. *Chronic Irido-Cyclitis*.—If there be one class of case more than another in which tuberculosis is believed to play a prominent rôle it is in insidious and recurrent irido-cyclitis in young adults. According to Stock's recent investigations,⁸ of 59 patients suffering from chronic irido-cyclitis no fewer than 61 per cent. showed a general reaction after the injection of Koch's older tuberculin, T.V. I have submitted two patients to the tuberculin test and obtained the ophthalmic reaction in both. The essential facts follow: (a) G. B., aged 9 years, came under notice on January 14th, 1903, with the history that she had been treated at the North-Eastern Hospital for Children for four years on account of "tuberculous disease of the left knee." On examining her eye, which were free from obvious evidences of inflammation, it was found that the right pupil was both "excluded" and "occluded" and that numerous posterior synechiae were present in the left eye, as the result of irido-cyclitis which had wholly escaped the attention of the child's parents, who declared that the eyes had never been bloodshot. Patient, eldest of three children, was well nourished, but she presented arthritis of the left knee and dactylitis of the left little finger. On February 23rd iridectomy upwards was performed on the right eye and nine days later upon the left eye. On June 18th, 1904, there was much pigmented keratitis punctata; right vision equalled perception of light, and left, fingers at 0.5 metre. From that time to the present the child has been subject to slight attacks of redness of the eyes, sometimes associated with temporary hypopyon. The injection of 0.005 mg. of tuberculin T.R. on March 28th, 1907, was followed by no reaction, local or general. On May 2nd, 1907, the aqueous humour was withdrawn from the left anterior chamber, but bacteriological examination of the fluid was negative as regards the *Treponema pallidum* and the tubercle bacillus. On June 25th, 1907, the injection of 75 mg. of tuberculin T.R. was succeeded by a slight rise in temperature, together with pain at the site of the needle-prick. On September 23rd a slight reaction was obtained nine hours after Dr. Chisolm had applied the Calmette serum to one eye. It had disappeared seventeen hours after the application. (b) Mrs. P., 35 years of age, consulted me on September 23rd last for a dullness of the sight of her right eye of fourteen days' duration. No recent illness. General health stated to be good. On examination, I found the right eye affected with a painless irido-cyclitis, the stress of the inflammation falling on the ciliary body, as evidenced by the symptoms, which included bad sight (6/60),

punctate keratitis, and raised tension. The fundus could not be seen owing to the cloudy condition of the cornea. The other eye showed slight choroidal disturbance at the yellow spot, evidently of long standing. A sister of the present patient, aged 28 years, had been under my care nine years ago for unilateral irido-cyclitis, and during the course of the illness what was believed to be a tubercle of the choroid developed in the inflamed eye. A drop of the Calmette serum placed in Mrs. P.'s left eye on September 24th, produced in sixteen and three-quarter hours a feeling of stiffness and tenderness in the lids, and when she was seen twenty-three and a quarter hours after the application, the appearances were those of a rather marked acute catarrhal conjunctivitis. The reaction had not wholly subsided in four days.

The further history of the case was most instructive.

On September 28th the cornea had cleared enough to allow me to identify a tubercle of some size that lay in the choroid not far from the right optic disc below the superior temporal artery and vein. On the same day the anterior chamber of the left eye was tapped and the aqueous humour examined bacteriologically. Smears stained with carbol blue were found to contain few formed elements—merely pigment particles, together with a scanty number of endothelial cells and degenerated leucocytes. No bacteria could be recognized. Preparations treated by the Ziehl-Neelsen process, however, included a few slender rods stained red. A careful search was necessary before a single tubercle bacillus was found. The total number in all the preparations examined was extremely small.

In conclusion, it should be added that, according to Calmette, neither ordinary tuberculin nor Koch's older tuberculin (*Alt-tuberculin*) must be employed in the test, since their contained glycerine is apt to irritate the conjunctiva and thus to mask any proper reaction. Calmette advises 1 part of dried tuberculin, precipitated by alcohol, dissolved in 100 parts of sterilized water, and of this liquid he places one or two drops in the eye to be tested. The Pasteur Institute, Lille, France, prepares suitable tuberculin in two forms: (1) as dry tuberculin in small glass phials, to which the surgeon adds ten drops of water; and (2) as a solution in hermetically sealed glass tubes, each of which contains several drops of the product ready for immediate use. The price of neither preparation* is prohibitive.

REFERENCES.

- ¹ A. Calmette, *La Presse Médicale*, June 19th, 1907. ² Prouff *Gazette des Hôpitaux* August 6th, 1907. ³ Grasset and Rimbaut, *Ibid.*, August 31st, 1907. ⁴ Painblan, *L'Ophthal. Provinciale*, August, 1907. ⁵ Brunetière, *Ibid.* ⁶ Aubaret and Lafon, *Gaz. Hebdom. des Sciences Méd. de Bordeaux*, August 4th, 1907. ⁷ Brunetière, *L'Ophthal. Provinciale*, September, 1907. ⁸ Stock, *Tuberculose als Aetiologie der chronischen Entzündungen des Auges und seiner Adnexae, besonders der chronischen Uveitis*, Leipzig, 1907.

A CASE SHOWING THE STOKES-ADAMS PHENOMENA.

By CLIFFORD BEARDS, B.A., M.B., B.Ch. Oxon.,
HOUSE-PHYSICIAN, CHARING CROSS HOSPITAL.

Cases showing the Stokes-Adams phenomena—a slow pulse and occasional syncopal attacks—have recently become of greater interest, owing to the elucidation of the path for impulses from auricle to ventricle by the work of His, Tawara, Keith, and other observers. It now seems probable that cases of the Stokes-Adams syndrome are due to some lesion in this auriculo-ventricular band, allowing the auricles to beat at the normal inherent rate, but so blocking the passage of impulses to the ventricles that the latter beat at a slower rate. This condition, to which the term "heart-block" has been applied, has been studied recently on clinical cases by Gibson and Russell.

At this interesting stage of our knowledge of this condition, a record of a case at present in this hospital may not be out of place.

History.

J. L., a man aged 62, a cricket-ball maker by occupation, came to the hospital on April 22nd, 1907, complaining of "fits." Dr. Fenton, recognizing the nature of the case, sent the man into the wards under the care of Dr. Galloway.

* Can be obtained from Mr. Martindale, 10, New Cavendish Street, London, W.

TRACINGS OBTAINED BY DR. MACKENZIE'S POLYGRAPH. MAY 19TH, 1907.

a = Auricular. v = Ventricular. c = Carotid pulsation.

This record shows the transmitted auricular pulsations in the apex tracing synchronous with the auricular pulsations in the jugular tracing.

a = Auricular. v = Ventricular. r = Radial pulsation.

The apex tracing in this chart shows the ventricular pulsations (v), and in some of the intervals the auricular pulsations (a) transmitted to the apex.

a = Auricular. c = Carotid. r = Radial.

This tracing shows the auricular pulsations to be 3 to 4 times as numerous as the radial.

It appears that the patient was quite well until two years ago, but that in the winter of 1904-5 he began to suffer from "fits." These seizures, which were occasionally but not always preceded by a "buzzing" noise in the head, which gradually increased in intensity until the patient suddenly lost consciousness, occurred at intervals of a few weeks, and lasted a varying time, from a few seconds to a quarter of an hour. He had scarlet fever at the age of 16; he had not had rheumatic fever nor syphilis. He had been a moderate drinker. There was no family history of epilepsy.

Condition on Admission.

The patient is a well-nourished man, who looks his age. There is a well-marked arcus senilis in both eyes, and the radial and brachial arteries are unduly degenerated. The examination of the cardio-vascular system reveals several interesting features. The radial pulse is 24 per minute, and slightly irregular in rhythm. There is evidence of enlargement of the heart, and there is a mitral systolic murmur propagated into the axilla. Occasionally, at the base, faint sounds suggestive of the auricular contractions can be heard in the interval between the ventricular sounds. The remarkable feature, however, is that the jugular veins in the neck can always be distinctly seen pulsating at the rate of 72 a minute, while the radial pulse is only 24 a minute.

Progress.

The patient has been examined with the screen (x rays), but it was found impossible to see distinctly whether the auricles were or were not beating independently of the ventricles. An ophthalmoscopic examination revealed the fact that the retinal veins were pulsating at exactly the same rate as the radial arteries. This, of course, does not disprove the idea that the auricles were beating more frequently than the ventricles, for the pulsation of the retinal veins is almost certain to be a pulsation transmitted from the retinal arteries and not due to a reflux wave from the distant auricles. The blood pressure, as is usual in these cases, is high, averaging about 180 mm. in the brachial artery.

On May 19th, 1907, the patient was seen by Dr. Mackenzie, of Burnley, who took several tracings of the jugular, carotid, apex, and radial pulsations by means of his new polygraph instrument. These records show quite clearly that while the jugular pulsation is at the rate of 72 per minute, that of the apex and of the radial and carotid arteries is only 24 per minute. The apex tracing is particularly interesting, as it shows in each of the

intervals between the large excursions due to the ventricular contractions, two small ones undoubtedly due to auricular contractions transmitted to the apex, because they are synchronous with the jugular pulsations taken at the same time and on the same record.

The syncopal seizures, until treatment was begun, recurred at irregular intervals of about three or four days. The usual type of seizure is that the patient, while sitting or standing, suddenly becomes unconscious, and remains so for 30 seconds to 1½ minutes. On one occasion the result was that the patient, who was walking in the ward at the time, fell down and sustained a severe scalp wound. Occasionally the patient perceives the aura already mentioned, and has time to sit down on a chair before the attack comes on. These attacks have always been true syncopal attacks; they have never been epileptiform in character. The pulse has never been observed to alter before these attacks, but has often been found to be 40 to 50 per minute immediately after. The only other occasion on which the pulse has reached 40 per minute was after the patient had suffered the slight exertion of being taken (in a cab) to a medical meeting.

Treatment.

After being kept in hospital without any drug treatment for about five weeks, during which time his condition remained unaltered, the patient was put on medicinal doses of strychnine. In a week his pulse had gone up to 35, at which level it now remains. The frequency of the seizures has also diminished; in fact, the man has only had two or three minor attacks since treatment was begun.

From an analysis of the tracings obtained it would appear that the case is one of complete heart-block. In many of the classical cases reported the bradycardia has varied in degree; in this case the pulse rate has been wonderfully constant day and night week after week.

I am greatly indebted to the kindness of Dr. J. Galloway and Dr. W. J. Fenton, of this hospital, for permission to publish this case; and to Dr. J. Mackenzie, of Burnley, for his courtesy in allowing me to make use of the tracings he obtained.