the ventricular movements. Finally, there is reason to believe that in the neck the event is delayed, as are the other waves and depressions of the curve.

BIBLIOGRAPHY.

- Bard: *Journ. d. Physiol. e. d. Pathol. gén.*, 1906, p. 454; *Archiv. d. Maladies d. Cœur*, 1908, No. 6.
 Brücke: *Vorlesungen über Physiologie*, Wien, 1885, Bd. 1, Aufl. 4, S. 178.
 Chauveau and Faivre: *Gaz. Méd. de Paris*, T. 8, 1856, p. 410.
 Chauveau and Marey: *Ibid.*, 1861, p. 673.
 Einthoven: *Archiv f. d. ges. Physiol.*, Bd. 122, 1908, S. 517.
 François-Franck: *Gaz. heb. de Méd. e. d. Chir.*, February, March, April, 1882.
 Fredericq: *Archiv. d. Biol. (Paris)*, T. 8, 1888, p. 497; *Archiv. Internat. d. Physiol.*, v. 1907, p. 1.
 Frey and Krehl: *Archiv f. Anat. u. Physiol.*, 1890, S. 31.
 Gerhardt: *Archiv f. exper. Path. u. Pharmak.*, Bd. 34 and 47.
 Gottwalt: *Archiv f. d. ges. Physiol.*, Bd. 25, 1881, S. 1.
 Haycraft: *Journ. of Physiol.*, vol. xii, 1891, p. 452.
 Hering: *Archiv f. d. ges. Physiol.*, Bd. 106, 1904, S. 1.
 Hunter: *A Treatise on the Blood, Inflammation, etc.*, London, 1794, pp. 185 and 187.
 Keith: *Journ. Anat. and Physiol.*, vol. xlii, 1907, p. 1.
 Lancisi: *De Motu Cordis*, etc., 1740.
 Mackenzie: *Journ. Path. and Bact.*, 1892, p. 53; *ibid.*, 1894, p. 84; *Amer. Journ. Med. Sci.*, July, 1907.
 Morgagni: *De Sedibus et Caus. Morbor.*, Napoli, 1762.
 Morrow: *BRITISH MEDICAL JOURNAL*, December 22nd, 1906, p. 1807.
 Mosso: *Die Diagnostik des Pulses*, 1879, S. 60.
 Porter: *Journ. of Physiol.*, 1892, p. 513.
 Potain: *Mém. d. l. Soc. Méd.*, Paris, 1867, p. 3.
 Rautenberg: *Zeitschr. f. klin. Med.*, Bd. 65, 1908; *Berl. klin. Woch.*, 1907, No. 46.
 Riegel: *Deutsch. Archiv f. klin. Med.*, Bd. 31, 1882, S. 1.
 Weiss and Joachim: *Archiv f. d. ges. Physiol.*, Bd. 123, 1908, S. 341.
 Wenckebach: *Archiv f. Anat. u. Physiol.*, 1906, S. 297.
 Young and Hewlett: *Journ. Med. Research*, vol. xvi, 1907, p. 427.

A CASE OF ADAMS-STOKES SYNDROME OBSERVED FOR MORE THAN EIGHT YEARS.

BY

W. J. TURRELL, M.D., and A. G. GIBSON, M.D.,
OXFORD.

GENERAL HISTORY.

T. A., male, aged 70, was formerly a postmaster; on his retirement from the service about ten years ago he devoted himself on a rather large scale to gardening. Formerly he was accustomed daily to walk to his work at the General Post Office and to return up a stiff hill in the evening, a distance each way of about three miles. The sudden change from his former active life and from his daily walk has had in our opinion considerable influence on his present condition. Until his retirement he enjoyed good health, with the exception of some moderately severe attacks of bronchitis, and occasional attacks of dyspepsia, induced, probably, by eating too much and too quickly.

HISTORY OF THE ILLNESS.

The patient was first seen in 1899, when he consulted one of us for some digestive troubles. No notes of the case at that time were taken, but the general lack of tone of his system, the flabby, distended state of his abdomen, and the weak action of his heart were obvious. It was necessary to make him walk up and down the room several times before it was possible clearly to hear his heart sounds. Nothing abnormal in the rate of the pulse attracted attention. More exercise was recommended, and he was given directions in regard to his diet.

He was next seen on September 18th, 1899, when he had had a sudden fainting attack whilst showing a friend round his garden. This was merely a fainting attack, unattended, so far as could be ascertained, by any convulsive movements. No notes of the case were taken at this period, but so far as can be recollected there was nothing remarkable about the pulse-rate.

Nothing worthy of note then occurred until July 11th, 1900, when the first of a series of the convulsions took place. These were of an epileptiform character, lasting from a few seconds to three or four minutes; for two or three days they followed one another so frequently that no record was kept of their frequency, and the patient was practically in a status epilepticus. On account of the frequency of the attacks no nourishment could be administered by the mouth, nutrient enemata and suppositories were con-

sequently administered. During this attack hope of the patient's recovery was practically given up. After this date he had no attacks of similar frequency or severity; the seizures were for the most part fainting attacks or giddiness.

Attacks twice occurred when the patient was allowed to go to the w.c. by himself; during one of these he fell and severely cut his face and lip. Later mild attacks of short duration were induced by taking food; they supervened when he took his first few mouthfuls of food, and seemed to be due to a dilatation of the portal veins and a draining thither of the blood from the cerebral vessels. After the first few mouthfuls of food he could finish his meal free from attacks. Micturition, which was performed in the recumbent position, also frequently brought on a convulsion. Another point of interest was that the patient found that, by grasping tightly the head of the bed, he could frequently ward off an attack. His hands have often been noticed discoloured by the paint from the iron work of his bedstead from his adopting this precautionary treatment.

THE PULSE.

The accurate records of the pulse-rate kept by the patient himself form one of the interesting features of the case. For just over eight years the pulse-rate was charted thrice daily, oftentimes more. The records begin on July 25th, 1900, some few days after the series of convulsions; the rate was then 38 to 40. On July 26th, 1900, it became quicker, about 53 to 55. From that date on it ranged about 60, never being below 50 and never above 72 till September 21st of the same year, when a rate of 40 was recorded. On October 1st a pulse-rate of 32 was recorded, and from that date the rate was for the most part between 30 and 40, except for intervals of two or three weeks, when it was 50 to 60. From October 31st, 1901, it was below 40, except for an isolated observation on July 22nd, 1904, when it was 68 after an attack of convulsions. During this period up to his death the rate was never observed below 16—that is, apart from convulsive attacks—and seldom above 37. The variations in the pulse-rate is graphically recorded over a period of one month during November, 1900, in Fig. 1.

During all the period of observation the pulse had the habit of dropping beats. It was more marked when the pulse-rate was quicker, but with the slow rate, though not perhaps so frequent, it was of more consequence to the patient, for when the pulse dropped beats at the slow rate the patient was always more liable to an attack. In fact the patient himself informed one of us that if his pulse missed one beat, an occurrence of which he himself was conscious, it made very little difference to him, but if it missed two beats in succession, it was often very hard work to remain conscious, and was often followed by an attack. The patient did best with a pulse-rate of about 25 a minute; if his pulse-rate rose above 30 he anticipated trouble; below 25 the pulse was steady and regular; when it reached or exceeded 30, it became intermittent or irregular.

A record of the radial pulse, the jugular pulse, and the respirations is given in Fig. 2. The analysis below shows that the auricle is beating at 72 per minute, the ventricle at 24. It is impossible to say from this record, as indeed also from the others that have been obtained at different times, whether complete heart-block is present or not, for the auricular rate is exactly thrice that of the ventricular.

TREATMENT.

Many drugs were tried, but all failed to give any marked relief, with the exception of large hypodermic doses of strychnine (m̄viii to m̄xv of the liq. strych., B.P.), and small doses (3 j to 3 ij) of brandy frequently administered when the attacks were more than usually severe.

Raising the foot of the bed also proved beneficial at these times. A flannel belt or binder tightly applied to the extremely flabby and pendulous abdomen gave no relief. Extreme flatulency was a frequent precursor of an attack, consequently various measures were taken by means of drugs and strict dieting to check its occurrence. Drugs, however, proved useless in this respect.

MODE OF LIFE.

The patient for the most part stayed in bed till an hour after his midday meal, he was then wheeled round his

garden in a chair, and occasionally was allowed to walk from 20 to 40 yards daily, hanging on to the back of his chair. He came in about 4.30 or 5 p.m., and this was his worst time for the day—he then frequently had an attack.

MODE OF DEATH AND POST-MORTEM EXAMINATION.

The patient went to bed on the evening of May 9th, 1908, apparently in his usual state, his pulse-rate for that

day being 28, 30, and 29, for morning, noon, and night respectively. On the morning of May 10th he was found dead in bed, having died, as shown by his livid appearance, in a convulsive attack. The post-mortem examination was performed in the afternoon of the same day. The internal organs were all congested, but, apart from the heart, their condition was good, considering the age of the patient. The gall bladder was obliterated by growth of connective tissue, explained by the passage some years previously of some faceted gall stones. The heart was uniformly and very greatly enlarged, but no difference in the relative proportions of auricles and ventricles was noticed. The epicardial fat

was everywhere increased, and only small portions of the ventricle muscle from the posterior aspect were visible. The cavity of the right auricle was enlarged, its walls were thickened, but no marked dilatation was present. The orifice of the coronary sinus was funnel-shaped and very large. The muscular tissue over the interauricular septum was covered by whitish thickened endocardium, which was evident on those other parts of the auricle where no trabecular structure was present. Round the entrance of the auricular appendix this tissue was arranged in lines, and in one part there was a circumscribed fibroid thickening of the endocardium. The right ventricle was little, if at all, dilated, but the walls were very thick, and on their inner aspect the trabeculae were very large. Numerous places on the trabeculae showed a whitish thickening of the endocardium often where the false cordae touched the trabeculae.

The left auricle was very slightly enlarged; the appendix was normal, but elsewhere the muscle was

thickened. The left ventricle was slightly dilated; the muscular walls were extremely thick, and the endocardium was more uniformly whitish and thickened than on the right ventricle; in the left, as in the right, the greatest thickening was the region of the junction between false chorda tendinea and trabecula. The muscular wall was enormously thickened, and as elsewhere showed no abnormal naked-eye structure. The valves, for a person of 70, were less sclerotic than normal. The aorta showed a

very few small patches of early atheroma. The pulmonary artery was normal. Both coronary arteries were sclerosed, partly calcified, but nowhere obliterated. So far as could be detected by examination from the cavities of the heart no gross change was present in the regions occupied by His's bundle or its branches.

A microscopic examination of the region of His's bundle shows a tendency to fibrosis in the region of the central fibrous body of the heart extending downwards and encroaching especially on that region occupied by the bundle. The bundle in the fibrous body itself was only represented by a few isolated strands of muscular tissue.

Fig. 1.—A graphic record of the variations in the pulse-rate during one month, November, 1900. The ordinates represent the rate of pulse per minute, the abscissae the date; three observations were made each day—morning, noon, and night.

Fig. 2.—The diagram below the tracing is an interpretation of the events taking place in the heart during the period of the tracing. The rate of the auricle is 72 per minute, that of the ventricle 24 per minute; there is therefore one ventricular beat to every three auricular beats. A, auricle; V, ventricle.

THE second French Congress of Physiotherapy will be held at Eastertide, 1909. The following is the official programme as provisionally arranged: (1) Physical agents in the diagnosis of infantile paralysis; (2) physical agents in the treatment of varicose veins and ulcers; (3) the disadvantages of the practice of physiotherapy by unqualified persons. An extra sitting will be devoted to the discussion of the physiological effects of various radiations (heat, light, ultraviolet rays, x rays, radium).

AN influential committee has been formed in Paris to promote the erection of a monument to the late Professor Cornil, at his birthplace, Cusset, near Vichy. The President of the French Republic is Honorary President of the Committee, and the ex-President, M. Loubet, is its President. The treasurer is M. Félix Alcan, 108, Boulevard St. Germain, Paris, and the assistant treasurer is M. James Combe, cours Tracy, Cusset (Allier). The Committee contains several representatives of foreign countries, and it is believed that many pupils and friends of the late professor will wish to contribute to the fund.