There is fibrosis and slight calcareous infiltration in the ventricle, particularly on the left side.

A block of tissue, to include the sino-auricular node, was next removed from the junctional region of the right auricle and superior vena cava, and cut in serial sections, which were mounted and stained as above described.

Examination of the sections shows that the excessive deposit of fat, already noted on the surface of the heart, infiltrates into the right auricle in the sino-auricular nodal region, causing considerable alteration. The nerve endings in this region are all conspicuous, and a considerable number of the ganglion cells are visible, but there is apparently a scarcity of the true "nodal tissue" fibres and

abundant fatty infiltration instead; there is also periarterial fibrosis.

The main bundle of the auriculo-ventricular junctional system being the path by which the auricular contractions are transmitted to the ventricles, it may be inferred from the pathological findings alone in this case that a condition of complete auriculo-ventricular heart-block was present during life. Regarding the pathological changes in the sino-auricular region, it does not seem justifiable in the present state of our knowledge to make a definite statement as to what their effects on the cardiac rhythm would be. One must simply record the facts, clinical and pathological together, and await further confirmation.

THE POSITION AND FORM OF THE NORMAL HUMAN STOMACH.

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It may be generally admitted that the normal human stomach exhibits many variations of form, dependent on temporary physiological or permanent anatomical causes.

From personal observations I am of opinion that the normal stomach is, in the majority of cases, a four-

cardia and pyloric antrum may form a definite tubular canal (Fig. 5), or it may be a deep V-shaped notch in the greater curvature (Figs. 3, 6, and 9), producing often a typical hour-glass contraction. There is usually a considerable thickening of the muscular wall of the organ in relation to the pyloric vestibule and the pyloric canal. Out of twenty stomachs taken consecutively from subjects in my dissecting-room the majority showed this form (Figs. 1, 2, 3, 4). All these subjects were preserved by the same method—an injection of a mixture of equal parts of pure carbolic acid, pure glycerine, and water.

The variations from this type are due to repression of

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

O, Oesophagus. C, Cardia. P.V., Pyloric vestibule. P.A., Pyloric antrum. P.C., Pyloric canal. P, Pylorus.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.

Fig. 11.

Fig. 12.

chambered organ (Figs. 1-12) composed of the following parts:

1. Cardia and fundus (Fig. 1, c).
2. Pyloric vestibule (P.V.).
3. Pyloric antrum (P.A.).
4. Pyloric canal (P.C.).

The constriction forming the pyloric vestibule between

one or more of the parts referred to or to confluence of one with another of certain parts of the organ.

The commonest variation is due to repression of the pyloric antrum, so that the pyloric vestibule and pyloric canal form one continuous tubular passage (Fig. 7). Less common is the form in which the pyloric vestibule is absent and the cardia and pyloric antrum are confluent (Fig. 8).

In the series are two examples of extreme conditions. In one case (Fig. 10) the stomach is contracted into a narrow thick-walled tube extending from oesophagus to pylorus, with a small thin-walled fundus to the left of the oesophageal opening. In the other case the stomach is wholly distended, with only a slight constriction near the pylorus (Fig. 11).

In any consideration of the form of the stomach, its position and connexions must always be regarded as of fundamental importance in determining its shape.

The chief alterations of form occur in the pyloric half and along the greater curvature.

Two main causes, in my opinion, are responsible for the form of the stomach and its variations. The less important factor is the relation of the organ to the vertebral column and the structures which lie in front of it—diaphragm, aorta, etc. The projection forwards of these structures may have an influence in producing lateral dumb-bell-like dilatations, with the pyloric vestibule as an isthmus between them.

The more important factor is to be found in the mechanical supports of the stomach. The organ is slung from two main attachments—on the one hand by the diaphragmatic connexions of the oesophagus; on the other hand by the connexion with the liver of the pylorus and the first part of the duodenum. It is obvious that these two points are only relatively fixed. Both undergo changes in position along with the movements of the diaphragm, and the position of the second point is influenced by the position and size of the liver. An oblique line (shown as a dotted line in the figures) may be drawn between these two points. This line may be regarded as fairly constant in position. It is obvious that any change in its obliquity will affect not only the position but also the shape of the stomach. Along this line the stomach sags. There are few alterations of importance in the form of the concave lesser curvature, whereas alterations, dilatations and constrictions, commonly occur along the more mobile and plastic greater curvature.

An hour-glass contraction of the stomach is not necessarily pathological. Indeed, it is the form most commonly found in the dissecting room.

Fig. 12 shows the outline of the normal stomach in a black line (A A), with the several varieties in dotted lines (1, 2, 3, 4).

A NOTE ON THE SHAPE OF THE NORMAL EMPTY STOMACH.

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[WITH SPECIAL PLATE.]

WHILST performing an autopsy on an elderly woman who had died from malignant disease of the ovary only a few hours previously, I had the good fortune to find the excellent example of an empty stomach figured in the plate facing page 1203, which conforms precisely to what the radiographers tell us is the real shape of the stomach in the living, but is so rarely seen in this characteristic form in the dead body.

The viscus was tubular, except for one dilatation, and its outline corresponded exactly with the J shape described by Barclay¹ and Hertz.² This dilatation, which was roughly cone-shaped, was situated at the summit of the vertical cardiac portion and obviously represented the fundus. The vertical portion of the organ *in situ* corresponded with the description of Hertz,² but I should like to draw particular attention to the direction of rather more than the terminal inch of the pyloric portion, not only because it cannot possibly be understood or appreciated from a photograph, but also because certain writers have expressed their inability to understand the relationship of the stomach to the liver if the radiographers are correct. The alteration in direction of this part of the "horizontal" limb was very marked as it passed backwards, upwards, and to the right to come into relation with the visceral surface of the liver. Great difficulty has been experienced in understanding how the recurved portion of the J reached the gastric area of the liver; and in order to believe and realize the shape and position of the stomach as seen by the radiographers, it has to be more or less presumed that

the terminal portion of the "horizontal" limb must be directed backwards, upwards, and to the right to reach the liver when the stomach is empty. On this account it is interesting and instructing to find that this was found in a case illustrating what the radiographers have shown to be the empty stomach.

The photograph shows clearly the very oblique oesophageal entrance and the incisura cardiaca between the oesophagus and the fundus.

The recent advances in radiography have revolutionized our ideas of the anatomy of the stomach, and attention is no longer paid to the "sac-like" and distorted specimens seen in the dissecting-room, as it has been repeatedly proved that they are untrustworthy and unreliable; but I consider this specimen worthy of attention, because it illustrates so well the outline of the normal empty stomach as demonstrated by the Roentgen rays.

The normal stomach is subject to the greatest variation, as is evidenced by the numerous descriptions published by anatomists; and it is only since the advent of radiography that correct differences in shape have been realized between the empty, the partially full, and the full stomach.

It is generally admitted now that a correct knowledge of the anatomy of the normal stomach can be acquired only by supplementing what is learnt in the dissecting-room by what is seen in x-ray examinations; but for reasons which have been explained many times of late it is rare to be able actually to handle a normal empty stomach that conforms to the radiographer's ideal.

REFERENCES.

¹ Barclay, *Medical Chronicle*, January, 1913. ² Hertz, *BRITISH MEDICAL JOURNAL*, September 23rd, 1912.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

TETANUS SUCCESSFULLY TREATED BY ANTITETANIC SERUM.

W. T., aged 30, was admitted into the Epping Workhouse Infirmary on the evening of April 22nd, suffering from tetanus. His body was absolutely rigid, the head immovable, the hands tightly clenched, the forearms pressing the chest, and the legs straight; the mouth could be opened about $\frac{1}{2}$ in.

He had a recent wound on the head, and a foul wound of old standing on the left shin. The history was that he had felt his jaws stiff for several days, and when walking suddenly fell down, and was unable to move. The police found him on the ground. His only complaints were of great and constant thirst, and the painful rigidity of his limbs. He could swallow liquids easily.

He was given 100 c.cm. antitetanic serum on April 23rd; this appeared to relieve his jaws somewhat. After another 100 c.cm. on April 25th he could open his mouth to half an inch, and the fingers and forearms became movable. After a third injection of 100 c.cm. on April 27th he could move his head, open his mouth with ease, move his arms, and bend his knees, the latter with difficulty; the rigidity of the back remained as before. He now developed an erythematous rash all over the abdomen, and when this disappeared on May 4th I gave him 60 c.cm., and within twenty-four hours he could move his legs comfortably and turn in his bed without assistance. All through he had no opisthotonos and very few spasms. The temperature never exceeded 99°. His further progress was uneventful. The injections were made in the anterior abdominal walls, 50 c.cm. on each side.

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THE VALUE OF EMETINE IN LIVER ABSCESS.

The patient in the following case, a woman aged 40, with a history of alcoholism, had a severe attack of dysentery about a year ago, and this had continued off and on in the form of diarrhoea up to the time I saw her. There was a clear history of excessive drink. About four months ago she had started getting high fever with rigors, and later on this fever abated a little and was unattended with