found to be free from disease. There was little blood lost. After adjusting the flaps, water dressings were applied, an opiate administered, and the patient replaced in bed.

The immediate relief which ensued was very remarkable. She slept that night soundly, without her accustomed anodyne. All symptoms of hectic vanished. Her appetite returned at once, and corresponding improvement in her aspect and condition was rapid. The parts healed favourably, she was very soon able to sit up in bed and move the limb herself, and it was not long until she could leave her bed and walk about the ward. She ultimately enjoyed excellent use of the hand; could knit and do other work, and was able to raise and command the arm so as to comb her back hair with ease.

It is beyond all controversy that no mechanical contrivance could have formed an adequate substitute for the hand which was thus preserved; but what appeared to be the most remarkable circumstance was the prompt and immediate relief from suffering which followed the operation. Immediately before it the slightest touch or motion, even the vibration of the floor, caused intolerable agony; soon after it she could bear the limb to be moved by an assistant, and that night was able to enjoy refreshing sleep, without any artificial hypnotic. There can be no question that in this case the operation proved a present boon and an ultimate benefit.

ART. XVI.—A Case of Rupture of the Oesophagus; with Remarks thereon. By J. J. CHARLES, M.A., M.D.; Demonstrator of Anatomy, Queen's College, Belfast.

I LATELY made a post mortem examination of a man who had died rather suddenly, under circumstances which occasioned differences of opinion as to the cause of death. The rarity of the case and its importance to the pathologist and medical jurist led me to examine it with great care, and to refer to all the recorded cases of a similar nature which I could find. For the greater part of the history of the case, I am indebted to the courtesy of the medical gentleman who attended the deceased during his last illness.

History.—A. B., aged thirty-five, married, of a well developed muscular frame, but of intemperate habits. For a few days previous to his death he had eaten very little, but had been
A Case of Rupture of the Oesophagus.

A Drawing of the Interior of the Stomach and Lower Third of the Oesophagus.

A—Oesophagus laid open along the middle line behind.
B B—Areolar sac around the oesophagus, containing black material.
C—Stomach.

a—Rupture of the oesophagus, and cardiac orifice of the stomach.
b—Small circular aperture in the left pleura.
c—Large irregular aperture, probably artificial.
d—Fundus of the stomach, where the mucous membrane is very soft and dark.
e—Pylorus of stomach, near which the mucous membrane is reddened.
f—Very prominent rugæ.
drinking spirits in excess. It was suspected that some of the whiskey he drank had been medicated.

At 8 o'clock p.m., feeling unwell after a light dinner, he went out to the garden, and began to exercise a horse. Here, whilst attempting to vomit, he felt something giving way in his inside. Having reached the house with difficulty, he fell on the floor in great agony. He was then assisted to his room and put into a warm bath. This seemed to relieve him, and he lay down in bed. A draught containing half a drachm each of aromatic spirits of ammonia, spirit of chloroform, and tincture of cardamoms was then administered, and a similar one given after an hour had elapsed.

He was greatly troubled with retching; and the pain which had been located in the neighbourhood of the left kidney, now ascended towards the stomach and back of the chest. Difficulty of breathing and intense thirst gradually ensued. The pain becoming more severe, turpentine fomentations were applied over its seat, and the patient was put into another warm bath, in which he remained twenty minutes. Half a drachm of liquor morphia with an equal quantity of tincture of hyoscyamus was then given, and repeated in two hours.

After the first dose he slept about half an hour, when the pain in the front and back of the chest, and the dyspnea increased to such a degree that turpentine stupes were again applied, but without relief. He then drank a cup of coffee. But he soon became delirious; and his pulse, which up to this time had kept pretty strong, suddenly failed. He died at 3:40 o'clock a.m.—about seven hours and a half after the fit of vomiting in the garden.

I may add, that in conversation with some of the friends of the deceased, after the post mortem examination, I was informed that from infancy he had been occasionally distressed with difficulty of swallowing.

Autopsy made nearly twenty-nine hours after death.

External appearances.—Body rigid and well nourished; features composed. An abrasion of the cuticle, seven inches by six, and of a brown colour, exists over the left scapula—probably the result of the application of a blister. On turning the body on its side, a quantity of dark fluid issues from the mouth, a portion of which is preserved.

Head.—Contents of cranial cavity apparently healthy, with the exception of slight congestion of the superficial veins and sinuses.

Chest.—The pleural cavities are partially filled with fluid, that
A Case of Rupture of the Esophagus.

in the left being of a dark colour and having an offensive odour, and that in the right of the appearance of bloody serum.

Left pleural cavity.---Pressure on the stomach causes gas to bubble up through the fluid in this sac. The quantity of liquid, when removed from the body, is estimated at about two quarts. Moderately firm adhesions exist on the outer surface of the lung near the apex, almost corresponding in position to the external abrasion. Along the lower two-thirds of the posterior mediastinum, the pleura is blackened and so soft that it cannot be separated as a distinct layer. About two inches above the diaphragm a circular aperture, almost of the size of a fourpenny or sixpenny piece, appears in the pleura covering the esophagus, through which, on applying pressure to the stomach, a dark grumous liquid flows into the pleural cavity. The rest of the pleura is healthy.

Right pleural cavity.—This sac contains about a quart of fluid, and the membrane appears healthy, save over the posterior mediastinum where it is slightly blackened. No aperture can be detected in it.

Lungs collapsed and somewhat congested.

Pericardium healthy. Walls of right side of heart congested, and those of the left anemic; otherwise the organ is healthy. Aorta natural.

Abdomen.—The peritoneum retains its usual lustre, and its serous secretion is of average amount. The stomach and intestines are filled with gas and contain little solid matter. The ileum is of a dark colour; but the rest of the intestines is nearly normal. Liver pale and slightly myristicate; gall-bladder distended with bile; kidneys very much congested; supra-renal capsules healthy. Urinary bladder almost empty.

The esophagus and stomach, with a piece of the diaphragm, as well as portions of the intestines with their contents, and specimens of the fluids found in the pleural cavities, are removed for more detailed examination; but none of the vomited matter could be obtained.

Stomach and esophagus.—An incision carried along the posterior surface of the stomach near the small curvature, and towards the cardiac orifice, and carefully prolonged upwards in the esophagus almost in the mesial line posteriorly, exposes the interior of the stomach and esophagus.

Stomach.—The contents consist of a black grumous liquid, of the colour and consistence of fine coffee grounds. The mucous
membrane of the cardiac end and body is very soft, and of a dark hue, especially in the former, where the membrane is so altered that the weight of the viscus is almost sufficient to tear it. Near the pylorus the mucous membrane is of a bright red tint; and though there are no obvious signs of congestion elsewhere, the substance of the organ, when held up to the light, is of an extremely red colour. In the body of the viscus the transverse and longitudinal rugæ are very prominent.

*Oesophagus.*—The mucous membrane of the lower third is slightly softened, and of a reddish colour close to the cardiac orifice. On the left side, near the posterior wall, there is a longitudinal fissure through all the coats. Superiorly, its edges are firm and well defined; inferiorly, for about the third of an inch, they are irregular and somewhat softened. This fissure reaches from immediately below the cardiac orifice of the stomach upwards for an inch and a half, but further in the mucous membrane than in the muscular and fibrous coats. No doubt it has been somewhat enlarged by manipulation. It leads into a space or kind of sac in the posterior mediastinum, which almost surrounds the lower third of the oesophagus, and extends from the cardiac orifice of the stomach to the roots of the lungs, the left one especially. This space contains grumous matter like that in the stomach, and its boundary on the inside is black, soft, and ragged. On careful examination it proves to be the ordinary areolar sheath of the oesophagus, distended and altered in character by the fluid lying in it. On the same side as the perforation in the oesophagus, but about two inches obliquely above it, the membrane (pleura) bounding the space is very thin, and presents the small aperture which has been already described as appearing in the left pleura. Below this perforation another, about an inch in diameter, is observed, which had not been previously detected. But this opening may have been artificially produced, at least in part, through the great softness of the tissues. The mucous membrane of the upper two-thirds of the oesophagus is of an opaque whiteness, and presents no abrasion of any kind. The mucous membrane of the pharynx and back of the mouth is feebly reddened.

*Portions of intestines.*—*Piece No. 1 (duodenum).*—The mucous membrane is coated with a soft, yellow, pasty material. Close to the pylorus there is some grumous matter like that in the stomach.

*Piece No. 2 (jejunum).*—Eighteen inches long. Contains a fine
paste-like substance. Mucous membrane pale, with a few of its vessels injected.

Piece No. 3 (jejunum).—Four feet long. Contents of the upper half of the same nature as in Piece No. 2; but scattered through them are small black masses, some of which are as large as split peas. Near the middle there is a dark lump about the size of a small orange. In the lower half the black matter becomes more abundant.

Piece No. 4 (ileum).—Two and a half feet long. The mucous membrane is of a dark hue throughout. Contents sparing in quantity, of a mucous consistence, and dark in colour.

Piece No. 5 (large intestine).—One foot and a half long. Mucous membrane of the upper half of this portion reddened at intervals, and coated over with a grumous layer. In the lower half the mucous membrane is pale; and the contents whitish, small in amount, and with scarcely any black material.

MICROSCOPICAL AND CHEMICAL EXAMINATION.

Fluid in left pleura.—Acid, with a sour odour. Starch and oil globules occur in it.

Fluid in right pleura.—Neutral and very feebly acid. No starch granules are observed.

Grumous matter of stomach.—Acid, and consisting of blackened blood and starch, &c.

Black matter of intestines.—Of nearly the same structure and composition as the contents of the stomach, but much less acid in reaction—some of it, indeed, being almost neutral.

White substance found in intestines.—Neutral.

Mr. J. Hunter, F.C.S., late Chemical Assistant, Queen's College, Belfast, kindly examined the contents of the stomach and the fluids in the right and left pleuræ, but failed to detect any oxalic or arsenious acid, and obtained only so much sulphuric and hydrochloric acids as might be expected to be present in the gastric contents. A portion of the stomach also was boiled previous to examination, but without any different result.

REMARKS.

There is much room for speculation as to the nature of the above case. It might be suggested that the phenomena, which have been recorded above, are capable of explanation in any one of the three following ways:—They may have been due either

1. To the action of an irritant or corrosive poison;
2. To idiopathic acute gastritis, followed by cadaveric digestion; or
3. To a rupture of the oesophagus, with more or less post mortem solution.

In discussing these hypotheses the four following points must be considered and settled:

1. The cause of the sudden accession of dangerous symptoms, and chiefly of the exclamation of the deceased immediately after vomiting in the garden, that "something in his inside had given way."
2. The precise time of the occurrence of the fissure in the oesophagus—whether before or after death?
3. The source of the fluid in the pleurae, especially in the right one.
4. The source of the grumous material in the stomach and in the various parts of the intestines; and the cause of its carbonaceous appearance.

1. Mineral Poisoning.—According to this view the blackening of the contents of the stomach and intestines, and the perforation of the oesophagus would be accounted for on the supposition that an irritant or corrosive poison had been taken; and the circumstances in favour of it might be stated as follows:

1. The sudden accession of many of those symptoms which usually attend the administration of an irritant poison in a person previously in average health.
2. Death after a short but painful illness of seven and a half hours.
3. The carbonaceous appearance and tarry consistence of the contents of the stomach and of portions of the intestines, the congestion of the stomach, the reddening of the mucous membrane of the stomach near the pylorus, the blackening of it in the fundus and body, and the prominence of its transverse and longitudinal rugae.

In opposition to this theory it may be urged:

1. That we have no account of poison having been taken or administered—though the history of the case is far from being so complete as one might desire.
2. That, according to this view, we cannot assign a satisfactory reason for the feeling of rupture experienced by the deceased.
3. That there was no diarrhea—a symptom which attends the action of most irritant poisons—sulphuric acid and a few others excepted.
A Case of Rupture of the Oesophagus.

4. That there was no inflammation, corrosion, or abrasion of the mucous membrane of the upper two-thirds or three-fourths of the oesophagus, though the mucous membrane of the throat and fauces was feebly reddened; and that the edges of the fissure were straight and well-defined, and not irregular and blackened as after the action of a corrosive.

5. That no appreciable quantity of sulphuric acid or other irritant poison could be obtained on analysis of the contents of the stomach, intestine, or left pleura.

6. That Dr. Christison states that "The throat and gullet are very rarely penetrated, since the greater part of the poison must pass into the stomach, or be rejected by vomiting. Perforation from simple corrosion never occurs."a

For these reasons, then, it is not likely that this is the correct hypothesis.

II. Idiopathic Acute Gastritis, followed by Cadaveric Digestion.—This rare disease may have supervened on a mild or sub-acute variety which had probably existed previously as a consequence of a persistent course of intemperance. The exciting cause may have been the last debauch; and it is very possible that the effect of the spirits imbibed was greatly intensified by such pernicious adulterations as oil of vitriol, &c., which are but too commonly present. The horse exercise taken while he laboured under this diseased condition of stomach may have been a still further exciting cause, and may have tended to shorten the premonitory stage of the disease. The symptoms from their first appearance increased in intensity, and were of the nature ascribed to acute gastritis, namely, acute pain in or near the epigastrium, persistent retching and vomiting (?), irrepressible thirst, and speedy collapse. Immediately before death effusion into both pleuræ occurred. After death the stomach was found to contain very little solid matter, but probably about a pint of fluid. Whether the gastric juice present in it possessed a more highly acid reaction than usual, as in the opinion of some,b happens in cases of post mortem solution, must remain a subject of conjecture; but in the present inquiry this point is not very material. Besides the body of the deceased lay on a feather bed, and was well covered with a blanket and quilts, in tolerably warm weather (47° F. in the open air) for twenty-nine hours; so that it was favourably circumstanced for post mortem digestion.

a On Poisons, p. 148. 1845.
The cardia of the stomach, especially near the orifice, seems to have been the most dependent part of the viscus, owing to its rotation upwards and forwards from the development of gases in its interior and in the intestines. There was, therefore, a preternatural tendency for the contents of the stomach to regurgitate into the oesophagus, and this tendency may have been increased by the contraction of the muscles during rigor mortis. Accordingly the lower third of the oesophagus and the fundus of the stomach were softened, and the latter blackened from the action of the gastric juice on the blood effused, and on that retained in the congested vessels of the mucous membrane. But the macerating influence of the gastric juice was mainly noticeable in the oesophagus, in which it produced the fissure already described. Having passed through this fissure, a portion of the gastric contents then made its way along the interior of the oesophageal sheath, and finally entered the left pleura, after dissolving a part of that membrane. Here it became mingled with the serous fluid present in that cavity, and on account of its diluted condition effected no further changes.

Some of the blood extravasated and blackened in the stomach was probably carried down the intestinal canal and lodged in the most dependent portions. But why the contents of the duodenum and of part of the jejunum should have been free from black matter, it is difficult to imagine, unless we consider the blood as effused principally from the intestines, and then darkened to some extent by sulphuretted hydrogen, &c.

To this theory, plausible as it may appear, there are three grave objections:—
1. It affords no explanation of the feeling of rupture complained of by the deceased.
2. The aperture or fissure in the oesophagus does not resemble one produced by gastric juice, for the perforation effected by this means has generally an irregular outline, ragged edges, and the mucous membrane around softened and digested; whilst in the present case the edges were, for the greater part, smooth, and the mucous membrane in the neighbourhood pale and moderately firm.
3. In acute gastritis, as in every other form of congestion of the stomach, according to Beaumont,* the quantity of gastric juice secreted is smaller than normal. There is, therefore, less likelihood of the occurrence of post mortem solution of the oesophagus.

* Physiology of Digestion, pp. 99 and 100. 1847.
or stomach. Moreover, there was little solid food in the stomach immediately before death; so that, for this reason also, only a small amount of gastric juice would be thrown out.

4. Idiopathic acute gastritis is a very rare disease. Dr. Brinton coincides with Abercrombie in declaring that he never saw "acute general inflammation of the gastric mucous membrane save as a result of poison." And Dr. Copland affirms that acute gastritis is "rare as an idiopathic malady, unless when it is produced by poisons, or by substances which, from their quantity or condition, act as poisons, as the regurgitation of spirits, &c." "It occurs," he adds, "consecutively upon the milder forms of the disease, owing to persistence of the causes, or to improper treatment."

From the imperfect history I obtained of the case, I am unable to say whether the disease was " ushered in by chills or rigors, or was attended by febrile reaction." And, for the same reason, I am unaware whether the deceased complained of "excessive heat and burning in the throat, or of painful and difficult deglutition" before vomiting—symptoms which are sufficient, according to Dr. Copland, to diagnose acute gastritis caused by poison, from that arising idiomatically.

In connexion with this subject, I may here mention that Dr. Budd, in his admirable Croonian Lectures, gives numerous instances of cadaveric perforation of the oesophagus opening into the left pleura; and he explains in a satisfactory manner why the left side of this canal should be digested in preference to the right.

Mr. T. Wilkinson King also records three cases of solution of the oesophagus; and Dr. Barnes, a very interesting example of cadaveric perforation of the stomach.

We shall now examine the third theory, which, I believe, will be found more satisfactory than either of the preceding.

III. Rupture of the Oesophagus, with more or less post mortem digestion.—The rupture followed softening, which may have resulted from chronic inflammation of the stomach and lower third

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*a* Diseases of the Stomach, p. 86. 1864.  
*c* Opus Cit.—Article, Poisons. Vol. iii., pp. 336 and 337.  
*e* Guy's Hospital Reports, 1842.  
of the oesophagus. The continued excessive ingestion of alcohol probably induced in chronic gastritis or gastro-enteritis—the inflammation involving also the lower third of the oesophagus. Softening of the mucous membrane ensued as a consequence. During the fit of vomiting in the garden, rupture of the oesophagus, at its weakest part, occurred, thus causing the sensation of internal laceration which the deceased felt. Immediately preceding or accompanying the vomiting there may have been temporary spasm of this tube, resembling the "hour-glass contraction" of the uterus; and, under these circumstances, the contents would be impelled against its parietes close to the cardiac orifice. Dr. Copland speaks of spasm of the oesophagus as frequently attending inflammation of this canal. During the retching that followed, some of the gastric contents were forced into the sheath of the oesophagus, and thus occasioned considerable dyspnea. Subsequently the left pleura was perforated either before or, more likely, after death.

Whether gastric juice could digest living pleuræ is doubtful. Still it should be remembered that Dr. Pavy and others have shown that living tissues can be dissolved by this secretion, especially when they have a deficient circulation or are comparatively non-vascular.

In this as in the last hypothesis, we assume that effusion into the pleuræ occurred before death, and that the blackening of the mucous membrane of the stomach and intestines as well as of their contents, resulted from the action of gastric juice after death. The only essential difference between this theory and the last is, that in the present one we suppose rupture of the oesophagus to have occurred instead of idiopathic acute gastritis. In both we take into consideration the solvent properties of gastric juice after death.

It may be alleged in opposition to this hypothesis that rupture of the oesophagus is an exceedingly uncommon lesion. But laceration of the stomach in the vicinity of the cardiac orifice has been often observed as the consequence of apparently trivial causes. Dr. Christison refers to two cases in which rupture was the result of the accumulation of gases arising from depraved digestion. In one of them "a smooth laceration, like an incised wound, three inches in length, was found in the lesser arch of the stomach." Here he

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b Pavy on Digestion and its Disorders, p. 74. 1867.
believes the rupture was due as much to weakened vital cohesion of the coats of the stomach as to the amount of the distending matters. He further states that "rupture of the stomach sometimes simulates in its symptoms the effects of irritant poisons. It is generally the consequence of over-distention combined with efforts to vomit. The cause of it seems to be that the abrupt turn which the gullet makes in entering an exceedingly distended stomach acts as a valve, so that the contents cannot be discharged by vomiting." Now if, with a relaxed cardiac orifice, we substitute temporary spasm of the esophagus for the valve referred to by Dr. Christison, his explanation will apply to the present case. It should also be recollected that the fissure extended into the stomach for a short distance, so that the cases are more nearly parallel.

But we are not obliged to depend on analogy alone in support of the probable occurrence of rupture of the esophagus. Several instances are on record. Mr. Dryden, Surgeon in Jamaica, relates the case of an officer who, after a fit of inebriation, on December 1st, 1787, was seized with nausea and inclination to vomit. To induce vomiting, he drank warm water. During the straining which followed, "he felt something give way internally which gave him the sensation as if he had received an injection of some liquid matter into the cavity of the thorax. He also brought up a little blood," and suffered acute pain "about the region of the stomach and abdomen." "The vomiting now ceased, and was succeeded by thirst, great heat in the stomach and throat, constipation, and restlessness." Emphysema of the neck then manifested itself. After passing small, lumpy stools, the pain moved to the left side, though slight pain was also felt on the right side. The breathing became very laborious, "accompanied with heavy sighs and groans." Death took place eight or ten hours after the first attempt at vomiting. [The exact length of time from the first seizure is not mentioned in the report.] At the post mortem examination a longitudinal laceration was discovered in the esophagus, just before it passes through the diaphragm, large enough to admit the fore and middle fingers. About a gallon of a mixture of wine, water, and food was contained in the left pleura, and nearly two quarts of the same kind of fluid in the right pleura. [The period which elapsed between death and the post mortem examination is not stated.] Mr. Dryden concludes that the "action of vomiting was the sole cause of this rupture."
The resemblance between this case and the one forming the subject of the present inquiry is so obvious as to need no comment.

Boerhaave details the case of a robust, gouty baron who, after vomiting, complained of a feeling of internal laceration. He died after twelve hours of intense agony. The oesophagus was found ruptured transversely, a little above the cardiac orifice of the stomach, and the left pleura contained fluids from the stomach. Dr. Monro quotes this case as an example of rupture occurring during life; but Mr. Wilkinson King thinks it was one of cadaveric solution. Dr. Monro further says that an instance like that of Mr. Dryden's was communicated to him by Dr. Carmichael Smyth.

Mr. Wilkinson King describes the case of a Mr. Curtis, who had been a very hard drinker for several years. Whilst at a public supper, he became sick and vomited slightly. He then felt a severe pain in the epigastrium. His face, throat, and chest shortly became emphysematous; dyspnea set in, and gradually increased. He sank after fourteen hours of great distress. A large rent was detected in the oesophagus where it passes through the diaphragm, and there were found portions of food at the posterior part of the chest. The fundus of the stomach was softened by digestion; and Mr. King states that it is not possible for him to say if there be a rupture, where the post mortem solution ends and where the laceration begins. He believes that the probabilities considered there was no rupture; but that death resulted from sudden inflammatory tumefaction of the larynx.

Dr. Habershon, however, details the history and post mortem appearances of Curtis as an instance

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Morbid Anatomy, p. 311. 1791.

Guy's Hospital Reports, 1843.


The superficial emphysema in these cases probably originated in the rupture of an air cell or bronchus, from the straining efforts made in vomiting. The air having thus reached the posterior media-tinum travelled upwards along the oesophagus to the neck, whence it diffused itself in the subcutaneous areolar tissue. Mr. Hilton has described traumatic emphysema as occasionally arising in this manner. Dr. Lyons gives instances of emphysema occurring in the course of measles, chronic bronchitis, &c., which well deserve perusal. The cause of the extravasation of air in his cases is, in all likelihood, the same as that I have just mentioned.

Guy's Hospital Reports, 1848.
A Case of Rupture of the Oesophagus.

which "warrants the belief that sometimes rupture of the coats of the oesophagus takes place during life." Dr. Copland coincides with Dr. Habershon's view of the case.

Other instances of rupture of the oesophagus have been published by Zeisner, Guersent, Bouilaud, Vigla, Reil, Kade, Thilow, Meyer, Oppolzer, and Sédillot.

The views of Professor Bamberger on rupture of the oesophagus may be here appropriately recorded. "Rupture of the oesophagus is in general a very rare phenomenon. In a few cases laceration has been observed in a perfectly healthy condition of the oesophagus, during bodily exertion or violent retching. . . . Perforations and ruptures may appear in either the lower or upper part of the oesophagus, but in the large majority of cases, in the former. The size and form of the opening are various, and depend upon the immediate cause. . . . The phenomena of rupture are, according to Oppolzer, undefined. Suddenly, during vomiting, there occur severe pain, vomiting of blood, agony, and oppression; whilst the food and drink rush into the mediastinum. We can, therefore, diagnose this disease only when, during a fit of vomiting, violent pain in the course of the oesophagus sets in, when vomiting can no longer take place, and when, at an earlier period, symptoms have been present which point to an affection of the oesophagus."

The opinion of Dr. Gross on this subject is almost similar. He states that "laceration of the oesophagus generally takes place during the act of vomiting, without any antecedent structural lesion. The rent is commonly transverse, or somewhat oblique, and varies in extent from a few lines to half an inch or more. The inferior portion of the tube gives way more frequently than the upper or

* Observations on Diseases of the Alimentary Canal, p. 50. 1857.
* Bulletins de la Faculté de Méd. Tome 1.
* Archiv. Génér. de Méd. Tome 1, p. 531.
* Archiv. Génér., 12 Band, s. 129 und 314.
* Memor. Clinic. fasc. 1.
* De Morb. Ventric. Halle, 1798.
* Handbuch der Speziellen Pathologie und Therapie. 6 Band. Erst. Abtheilung, s. 2.
* Quoted by Professor Bamberger, in Virchow's Handbuch der Speziellen Pathologie und Therapie. Abtheilung, s. 97.

Quoted by Dr. Foerster, in Handbuch der Speziellen Pathologie und Anatomie. 2 Band., s. 69.
middle; sometimes the rupture is situated immediately above the cardiac extremity of the stomach. The accident is characterized by violent pain, with symptoms of sinking, and usually proves fatal in from 36 to 48 hours."\(^a\)

In addition the reader may refer to the works of Lebert,\(^b\) Foerster,\(^c\) and Niemeyer.\(^d\)

Before concluding this paper, I wish to express my sincere gratitude to Professor Redfern for his kindness in bringing the above case under my notice, and for his valuable assistance, at all times most willingly accorded, during the progress of my investigations. I beg also to tender my thanks to Professors Cuming and Reid for useful suggestions.

\(^{a}\) Elements of Pathological Anatomy, p. 499. 1857.
\(^{b}\) Handbuch der Practischen Medicin, 3 Auf., 2 Band., s. 295. 1862.
\(^{c}\) Handbuch der Speziellen Pathologischen Anatomie, 2 Band, s. 69.
\(^{d}\) A Text Book of Practical Medicine. Translated by Humphreys and Hackley, Vol. i., p. 469. 1869.