Still more recent experiments have shown how these two opposite sets of results may be reconciled. From these it appears that the early effect of both anaesthetics, lasting up to the period of complete insensibility, is ordinarily an increase of the secretion of urine. This, as a rule, is more pronounced in the case of ether than of chloroform. But during full anaesthesia, however prolonged—and this is the remarkable result—the secretion of urine is almost completely arrested. By full anaesthesia I mean a degree just beyond the loss of conjunctival reflex—namely, that required in surgical operations. The depressing effect during this period appears likewise to be more pronounced with ether than with chloroform.

Upon removal of the anaesthetic the kidneys rapidly recover, and, at all events in dogs, are actively secreting once more within five or ten minutes, this activity passing on to a condition of hyperactivity which lasts for some hours.

The value of the foregoing results (obtained with dogs) has been greatly enhanced by corroboration from the clinical side. Observations on renal activity during surgical anaesthesia, kindly carried out in Mercer's Hospital by Mr. Maunsell and Mr. Seton Pringle, together with Dr. Harold Pringle, Senior Demonstrator of Physiology in this department, have yielded results in the case of ether entirely in accord with my own. These will be published *in extenso* later, but meanwhile I am permitted to say that with the onset of insensibility in ether narcosis a condition of depression of urinary secretion sets in and continues which amounts in many cases to almost complete suppression. This is preceded in some instances by a marked increase of secretion during the induction of the anaesthesia. The following are the figures from one observation:

Rates of Secretion of Urine.

- (a) For twenty-four hours ending at 9 o'clock on morning of operation—42 c.cm. per hour.
- (b) For two hours previous to ether inhalation—104 c.cm. per hour.
- (c) During the induction of anaesthesia (time 16 mins., urine 65 c.cm.)—210 c.cm. per hour.
- (d) During anaesthesia, first half-hour, 3.5 c.cm.; second half-hour, 1.7 c.cm.

It would seem, therefore, that this somewhat surprising effect is one of ordinary occurrence. That in the vast majority of cases it appears to do practically no harm is almost more remarkable than the fact itself. It is hardly necessary to say that our investigations extend also to alterations, both qualitative and quantitative, in the excretion of urinary constituents under anaesthesia. The full results will be published at an early period.

TRANSILLUMINATION OF THE ANTRUM OF HIGHMORE.

[WITH SPECIAL PLATE.]

By A. BROWN KELLY, M.D., D.Sc.,

Surgeon for Diseases of the Throat and Nose, Victoria Infirmary, Glasgow.

THE term "transillumination" (*Durchleuchtung*) was introduced by Czermak in 1858 to designate a method of examining the larynx devised by him. This is carried out in a darkened room by concentrating a light upon the front of the patient's neck, and observing in a laryngeal mirror the various parts of the larynx and trachea as they are successively transilluminated by the light applied to the corresponding region externally.

While experimenting with this method, Voltolini found that the bones of the face could be transilluminated if in a dark room a small incandescent lamp were held in the closed mouth. Although he failed to attach the proper significance to the phenomena he described, the credit of having first transilluminated the antrum (1888), and of having indicated that this procedure would be of value as a diagnostic test, belongs to him.

In the following year Heryng placed transillumination on a practical basis. He showed that when the light traverses a healthy antrum, part of the cheek and the lower eyelid become red (for convenience we shall term the bright area the *antral tache*), while in empyema these regions remain dark owing to the altered conditions in the cavity preventing the passage of light. On the other hand, he proved that when a serous cyst occupies the antrum transillumination is unaffected, while if it distend the cavity the area of brightness is increased.

Vohsen, in 1890, by using a stronger light, showed that the eye also may be transilluminated, the pupil then appearing as a red disc.

In 1892 the writer pointed out that during transillumination a person with closed eyes sees a dull red glow if the antra be normal, but if the *antral tache* be absent the subjective light sensation will also be absent.

Successful transillumination yields the three signs referred to—namely, the *antral tache*, the bright pupil, and the subjective light sensation. As to their importance the most diverse opinions have been expressed. I have, therefore, endeavoured to analyse the appearances observed during transillumination and to assign to these, individually and collectively, their proper value.

For the purposes of transillumination I have found a lamp, as depicted in Fig. 1, convenient. To the end of a suitably curved handle an incandescent lamp is fitted, over which various end pieces slip. One of these is scoop-shaped, and rests on the tongue during ordinary or palatal transillumination; another completely encloses the lamp, and has an opening on one side, which can be applied to the posterior surface of the superior maxilla inside the cheek for Escat's retro-maxillary transillumination; the third is funnel-shaped and open at the end for transillumination of the frontal sinus.

Fig. 1.

Transillumination should be carried out in a perfectly dark room. If the patient wears a dental plate, this must be removed. The lamp should be placed in the middle of the tongue and depressed sufficiently to keep it from burning the palate. The current should be gradually increased by means of a rheostat until the proper intensity is attained. Slight differences between the two sides may not be observed if too strong a light is used; while, on the other hand, a comparatively powerful light may be required to penetrate the tissues when thick.

TRANSILLUMINATION OF THE NORMAL ANTRUM.

Under ordinary circumstances the parts of the face that transilluminate are those around the lips, the cheeks, the bridge of the nose, the lower eyelids, the pupils, and the eyeballs to the inner side of the cornea. Only those bright areas or *taches* the intensity and extent of which may be influenced by the condition of the antrum will be considered.

Crescentic Tache.

It is very commonly supposed that in transillumination the light passes through the anterior wall of the antrum and produces redness of the corresponding part of the face. This is not what usually occurs.

Fig. 2.

In the great majority of persons it will be found that the illuminated area has a crescentic shape and lies above the lower margin of the bony orbit, which is indicated in Fig. 2 by a dotted line. This is at once evident if the test be practised on a cadaver with sunken eyeballs, when only the lower eyelids and tissues situated above the infraorbital margins are transilluminated. The light that produces the crescentic *tache* passes through the roof of the antrum; this may be demonstrated by drawing forward the lower eyelid, when the conjunctival sac is found to be rendered specially bright by the stream of light from below.

Infraorbital Tache.

In certain individuals, however, the light traverses the facial wall of the antrum and produces a bright area, which may be termed the *infraorbital tache*. The persons in whom this *tache* is observed are those that transilluminate well—for example, young adults, spare individuals, and those with good-sized, thin-walled antra. In short, to obtain the *infraorbital tache* the conditions for transillumination must be

more favourable than when the crescentic is alone observed, assuming that the light employed is of the same intensity.

If a good subject for transillumination be examined with a light which is at first feeble and is gradually made stronger, it will be found that the region first rendered bright is the conjunctival sac; the crescentic *tache* afterwards comes into view, and last the infraorbital *tache*. The two latter are at first separated by a curved dark area which corresponds to the infraorbital margin, but as the intensity of the light is increased they merge into one another, the characteristic crescent disappears, and the cheek from eye to alveolus assumes a red glow.

Lachrymal Tache.

Every one who examines a large number of persons by transillumination cannot fail to observe the frequent presence of a bright area beneath the inner third of the eye. This may attract attention, either because it is the only part lit up, the crescentic and infraorbital *taches* being absent, or because it is the brightest portion of the illuminated region. In the former case, especially when the condition is bilateral, the question naturally arises—Does this *tache* indicate a normal, though possibly small, antrum?

Experiments were made on cadavera in order to determine the significance of the illuminated area referred to. The writer's first impression that it corresponded to the upper and anterior angle of the antrum proved to be incorrect, for on filling the cavity with wool the *tache* still appeared on switching on the current. It was then thought that it might be produced by the passage of light from the middle meatus of the nose. This supposition was also shown to be erroneous, or, at least, to afford an insufficient explanation, for on firmly plugging, not only the middle meatus, but the whole nasal cavity, the *tache* was not obscured, the antrum meanwhile being empty. Finally, after thoroughly packing both nose and antrum, the *tache* no longer appeared in several of the subjects tested, while in others it was still present, as well as a triangular bright area to the outer side of the ala. It is therefore evident that the *tache* does not correspond to a special part of the antrum or nose, but that the light necessary to produce it may come from either, or may pass upwards through the soft tissues covering the canine fossa.

The *tache* was carefully mapped out in a number of patients, and its situation noted. In all, this was found to be the same, namely, beneath the inner third of the eye, and overlying the lower and inner part of the orbital margin, a small portion of the *tache* being above the margin, while the greater part was below. (See oval area mapped out in Fig. 2.)

On examining and transilluminating anatomical preparations with reference to this area, it became apparent that the *tache* corresponded to the lachrymal groove. Hence the term "lachrymal *tache*," which is here proposed.

The presence of this *tache* does not therefore indicate that the antrum is transilluminated. There may be a brilliant lachrymal *tache*, although the cavity is full of pus or packed with gauze.

Nasal Tache.

In transilluminating the antrum, part of the bridge of the nose is very often seen to be more or less bright. The situation of this illuminated area, or "nasal *tache*," corresponds fairly closely with the nasal bone. One or both sides may be illuminated. The presence of the *tache* and the degree of its luminosity depend upon the amount of light that reaches the under surface of the bony nasal bridge. Any condition interfering with the patency of the nasal fossa anteriorly tends to diminish or abolish the *tache*, while abnormal width, especially of the inferior meatus, tends to its increased brilliancy.

The nasal *tache* gives no direct information as to the condition of the antrum. If taken in conjunction, however, with the symptom of subjective light sensation, and with the illumination of the pupil it may assist in preventing misconceptions. Thus, an inequality in these two signs is occasionally met with in patients whose crescentic *taches* are equally bright. This anomaly may often be explained by observing the nasal *taches*, when they are seen to present a corresponding difference, which, in turn, is due to intranasal variations.

Intranasal Appearances during Transillumination.

Some authors (Robertson, Caldwell) have recommended the examination of the nasal cavity during palatal transillumination, maintaining that if empyema is present the inferior and middle turbinates will be in the shade. I have tried this test frequently, but have not found it of value. The light streams through the palate so strongly that the lower part of the nasal

fossa and the inferior turbinates are brilliantly lit up, making it difficult to determine whether any light comes from the antrum.

Pupil and Subjective Light Sensation.

During transillumination the pupil is dilated. If there is difficulty in catching sight of it, this is best overcome by looking down into the patient's upturned eyes.

In applying the subjective light test the current should be rapidly switched on and off several times while the patient keeps the eyes closed. If conditions are favourable, an impression of light is received in each eye separately. It is thus possible for the patient to say whether the light is brighter on one side than another, or is present on one side only. If the difference between the two sides is not marked, or if the patient is uncertain or unintelligent, his opinion should be accepted with reserve.

The subjective light sensation usually corresponds with the degree of illumination of the pupil; if the pupil is bright the perception of light is marked, and vice versa. This association, however, is not constant, for in a fair number of cases light was perceived by the patient, while the pupil was not illuminated; the converse was also met with, but rarely.

The greater delicacy of the subjective light test is counterbalanced, however, by the necessity of trusting to the patient's observation, and by the time needed to elicit the desired information. I therefore place more reliance on the appearance of the pupil.

Transillumination in Children and Young Adults.

In children under 10 years of age, a light of gradually increasing intensity usually first illumines the lachrymal *taches*; subsequently the whole cheek is lit up, together with the pupils. The crescentic *taches* are not differentiated, the red glow over the cheeks being uniform, with the exception, perhaps, of the lachrymal *taches*, which may be especially bright.

In those from 10 to 15 years of age the lachrymal *taches* and pupils are, as a rule, bright. In some there is an extension outwards of the illuminated area beneath the inner third or inner half of the eye.

In young adults a crescentic *tache* is usually present. This may vary in size from little more than the lachrymal *tache* to a full-sized crescentic *tache* passing to beyond the outer angle of the eye.

Thus, in young patients the extent of the transilluminated area affords information as to the degree of development of the antrum. In exceptional cases this does not proceed symmetrically on the two sides. Such, at least, is the inference one is inclined to draw when, in the absence of symptoms of antral disease, the *tache* over one cavity is smaller and fainter than that over the other.

CONDITIONS THAT MAY INFLUENCE TRANSILLUMINATION.

Extra-Antral Conditions.

Experience has shown that the antrum is transilluminated best in spare, thin-boned, fair persons, whose palate is not more highly arched than normal and whose nasal fossae are free and roomy. These conditions are best fulfilled in thin, anaemic women with a broad type of face.

Conversely, stout, large-boned, dark men, those with a high V-shaped palate, or with narrow and obstructed nasal passages, usually transilluminate badly.

Transillumination of the pupil may be prevented by purulent ulcer of the cornea, dullness of the lens or vitreous, or closure of the pupil (Ziemi). Burger thinks that the difference in transillumination of the eye may be due in a large proportion of cases to the condition of the pigment layer of the choroid.

Intranasal Conditions.

These may be either of an anatomical or pathological nature. The anatomical peculiarities which may cause the signs to be partially or totally obscured are the small size of the cavity and the presence of bony partitions. Pathological conditions, either by giving rise to the accumulation of morbid products within the antrum or by causing changes in the lining membrane, may affect transillumination favourably or unfavourably. (a) Conditions increasing the brilliancy: (1) Cysts with clear contents causing thinning and distension of the antral walls. (b) Conditions diminishing the brilliancy: (1) Collections of pus, mucus, blood, etc., which may be of intra- or extra-antral origin; (2) inflammatory thickening of the lining membrane; (3) tumours which may originate within the cavity or invade it from without.

VARIATIONS IN THE SAME SUBJECT AT SHORT INTERVALS.

It is evident that several of the conditions mentioned as influencing transillumination will vary in degree, and, consequently, in effect, from time to time. Thus, the antrum may be full of pus at one moment, while a little later—for example, after the patient has held his head in a dependent position—it may be empty; a lining membrane, which is only slightly thickened to-day, may be considerably swollen to-morrow, if an acute nasal catarrh has been contracted in the interval; the varying patency of the nasal fossae, in so far as it is dependent upon the state of the inferior turbinates, must also be taken into account.

The following experiments were made in order to find if the crescentic *tache*, pupil, and subjective light sensation could be produced by light from the nose. In a patient with a wide nasal cavity a small incandescent lamp held in the middle meatus lit up the crescent and pupil on the same side, both nasal *taches* brightly, and the pupil on the opposite side faintly; light was perceived in both eyes, but especially in that on the same side as the lamp. In another patient the lamp in the middle meatus caused the pupil to glow as brightly as when transilluminated from the mouth. In a third patient palatine transillumination yielded a very bright lachrymal *tache* and a dim crescent; on packing the middle meatus both were abolished; light perception was present with and without the packing. In a fourth patient palatine transillumination yielded a very bright nasal *tache*, a faintly red pupil and subjective light perception. All were abolished on packing the middle meatus.

While these experiments showed that the manifestations of transillumination might each and all be produced by light from the nose, the examination of another set of patients proved that the illumination of the crescent and pupil, and the subjective light sensation might be independent of the passage of light through the nose. In these patients the manifestations produced during palatine transillumination were found to be unaffected by plugging the nasal cavities.

Not one of the signs elicited by transillumination is therefore absolutely reliable. The most trustworthy is the crescentic *tache*. It may certainly be produced by light which has traversed the nose only, but so exceptionally that when bright and reaching outwards to beyond the external angle of the eye, the antrum is most likely normal, although the presence of mucous or serous secretion, or even of scanty pus, is not excluded.

The additional presence of the illumined pupil and the subjective sensation of light strengthens the impression gained from the bright crescent as to the normal state of the antrum. The ocular manifestations are, however, oftener absent, and are more exposed to disturbing factors outside the antrum than the crescentic *taches*. The subjective light sensation, although a more delicate test than the illumined pupil, is less valuable, as its proper application demands a fair amount of intelligence on the part of the patient.

To determine the practical value of transillumination the undernoted statistics were compiled:

The Comparative Frequency of the Crescentic Tache, Illuminated Pupil, and Subjective Light Sensation Noted in 100 Persons whose Antra were Presumably Normal, and in whom the Hard Palate was not Unduly High.

	Crescent.	Pupil.	Subjective Light.
Present on both sides equally	62	53	60
" but unequally	17	17	21
" one side only	8	7	9
Absent on both sides	13	23	10

Equal crescentic *taches* and subjective light sensation were thus present in about the same number of persons (60 to 62 per cent.), while the pupils were equally illumined in about 10 per cent. less (53 per cent.). Of the three signs the bright pupil is therefore the one oftener absent.

In those cases in which the two sides transilluminated unequally abnormalities were found in the nasal fossae sufficient to account for the inequality of the crescents in 7, of the pupils in 8, and of the subjective light sensation in 12 instances. If, then, these cases be added to those in which the illumination was symmetrical, totals are yielded of 69, 61, and 72 cases in which the respective signs might be considered as equal on the two sides.

INTERPRETATION OF OBSERVATIONS.

In Health.

The above figures refer to the signs taken individually. I have recommended, however, that in forming an opinion from transillumination as to the condition of an antrum, the crescentic *tache*, with at least one of the ocular manifestations, be taken into account. Proceeding on these lines it was found that both antra were apparently healthy in 55 cases, and if to these be added 12 cases in which the unequal transillumination could be accounted for by the unequal patency of the nasal fossae, a total of 67 cases is obtained in which strong presumptive evidence is afforded of the normal state of the antra. In 15 cases the manifestations were insufficient or absent on both sides, so that one was left in doubt as to whether a bilateral anatomical or pathological condition interfered with transillumination. Lastly, in 18 cases the difference between the two sides could not be accounted for by the intranasal condition, and was such as to suggest an affection of the darker side. The presence of pus was excluded by exploratory irrigation in 9 instances, but the question as to whether the unilateral darkness was due to disease or an anatomical abnormality must remain unsettled.

To sum up, transillumination gave:

1. Presumptive evidence of the antra being normal in 67 cases.
2. Indefinite or no information in 15 cases.
3. Presumptive evidence of disease or of anatomical abnormality in one antrum in 18 cases.

The influence of an abnormally high palate on transillumination was investigated by the examination of 50 cases. Without tabulating the results, it may be briefly stated that all three signs were more frequently absent when the palate was high. Thus, with a normal hard palate, the crescent, pupil, and light sensation were absent in 13 per cent., 23 per cent., and 10 per cent. respectively; but when the palate was high these numbers rose to 24 per cent., 36 per cent., and 28 per cent. respectively. The presence of this abnormality was found to reduce the value of transillumination 20 per cent. when the association of signs (crescent and one of the ocular manifestations) was taken into account.

In Antral Disease.

The above statistics deal with the transillumination of antra which, so far as known, were healthy. Let us now determine the value of the test in the presence of antral disease. For this purpose the results of transillumination in 100 consecutive cases of antral suppuration (unilateral and bilateral) occurring in my practice have been tabulated as follows:

Crescent and one or both ocular manifestations present on the healthy side but absent on the diseased side	77
Crescent present on healthy but absent on diseased side	5
Crescent, pupil, and light sensation absent on both sides	17
(Pus in both antra 13, pus in one antrum 4.)	
Crescent, pupil, and light sensation present on both sides, and pus in both antra	1

The above figures prove that transillumination is a valuable diagnostic test in antral suppuration. In 77 cases the presence of disease is distinctly indicated, and in other 5 cases, although less marked, the evidence is sufficient to arouse suspicion. In four instances transillumination pointed to bilateral disease, whereas pus was found only in one antrum, probably the lining membrane of the empty antrum was thickened in consequence of previous disease.

In one case transillumination misled. All the signs of a healthy antrum were obtained on both sides, while in reality bilateral suppuration was going on. The very small amount of pus in the cavities, and the unusually favourable conditions for transillumination presented by the patient (an emaciated lady) accounted for the miscarriage of the test.

Fallacies.

In practising transillumination a fallacy may arise in one of three ways:

1. Transillumination may be equally brilliant on both sides, and yet one antrum may contain pus. In such a case, the amount of pus in the cavity is usually very scanty, and the lining membrane is little or not at all changed. These conditions are sometimes found when the pus is of dental or extra-antral origin. This fallacy will more readily occur if too strong a light is used.

2. Transillumination may be bright on one side and darker or absent on the other, and yet on the non-illumined side the antrum may contain no pus. The unilateral darkness may be due to the following conditions: (1) Abnormal thickness of

1.—Usual appearance when both antra are normal. The crescentic taches and pupils are bright, the infraorbital taches are less so.

2.—On the right side transillumination is normal, the crescentic tache and pupil being bright, and the lachrymal tache specially so. On the left side the lachrymal tache is present although the antrum has been packed with gauze. The nasal taches are also shown.

3.—Normal transillumination of right antrum by retro-maxillary method. The crescentic, infraorbital, and lachrymal taches, and the pupil, are bright.

4.—On the right side no transillumination of antrum, owing to purulent contents. On the left side transillumination is normal; the infraorbital tache is specially bright, and is not demarcated from the crescentic.

the bony walls of the antrum and small size of the cavity (asymmetry). (2) Thickening of the antral lining membrane in consequence of previous disease. (3) Solid tumour in the antrum. (4) More or less obstruction of the corresponding nasal fossa. On the other hand, the antrum that transilluminates well may, as shown under 1, contain pus.

3. Both antra may transilluminate badly or not at all, and yet they may contain no pus. The bilateral darkness is usually due to the light being too weak, or to conditions outside the antrum influencing transillumination unfavourably—for example, thick bones, high palate, and obstructed nasal cavities.

Assistance in Prognosis.

I shall merely mention the assistance that transillumination occasionally gives in forming a prognosis. Thus, if an antrum that was previously dark, after its purulent contents have been washed out, transilluminates almost as well as the opposite normal antrum, the suppuration is more likely to yield to treatment than if it remained dark.

It is evident, from what has been stated, that transillumination is not an infallible diagnostic test. Not infrequently it suggests antral disease when none exists; on the other hand, if suppuration be going on in the antrum its presence is almost invariably indicated. On this account, and because of its easy application and the absence of discomfort to the patient, transillumination deserves to be used as a routine procedure in chronic affections of the nose accompanied by purulent or mucopurulent discharge.

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MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, Etc.

LEAD AS AN ABORTIFACIENT.

ON March 6th this year I was called to a young married woman who had had two children. She was collapsed and complained of attacks of severe colic, vomiting, and diarrhoea. She informed me that having missed a period she had taken pennyroyal, steel pills, and gin and salts. I asked about lead, but did not examine her gums. She improved at first under treatment, but on March 12th, 13th, and 14th, she again had colic and vomiting and diarrhoea, and finally miscarried on March 16th. On March 18th I read Dr. Arthur Hall's paper in the current issue of the *BRITISH MEDICAL JOURNAL*, and then examined my patient's gums and found the blue line. I also found she had some pills other than the pink-coated ones which she had first shown me. Those which I found, and which I took away with me, were evidently hand-made, and came from Derby, so medical men in that neighbourhood had better be on the look-out for other cases.

I have tested them roughly by dissolving in HNO_3 and adding water. Potassium iodide gives a precipitate of yellow lead iodide, which disappears on boiling and reprecipitates on cooling in beautiful golden scales. Potassium bichromate also gave yellow precipitate. I should think these pills are made from diachylon.

Barnoldswick, Yorkshire.

HAROLD C. CADMAN, M.B.

THE following case seems to me of interest seeing that Dr. Arthur Hall has just drawn attention to increase in the use of lead as an abortifacient. A woman, aged 32 years, complained to me of vomiting, abdominal colic, and constipation; she was markedly anaemic. Her abdominal muscles were rigid; upon flexing the thighs upon the abdomen, faecal masses, pitting upon pressure, were readily felt in the sigmoid and descending colon. Her tongue was thickly furred, and a very marked blue line was present on the gums. On

questioning her, I discovered that eight days previous to my visit she had aborted, and she acknowledged that to procure this result she had taken some pills supplied to her by a neighbour. Under treatment she recovered.

Bedford.

S. J. ROSS, M.D.

M. B., a married woman, aged 34, with four children, called me to see her on February 20th, 1904. She gave a history of pain in the abdomen, and of constipation, and amenorrhoea for three months. A blue line was visible on the gums. She admitted taking diachylon in the form of home-made pills. There was no sign of haemorrhage.

About three weeks later I received an urgent message to visit her. On doing so I found her collapsed, with cold sweats, quick feeble pulse, great pallor, and severe haemorrhage; she aborted.

On November 17th, or some eight months later, she had a return of abdominal pain, and amenorrhoea which had lasted two months; there was no haemorrhage, but the blue line was still present. She admitted taking pills but no diachylon. On December 6th she aborted again. There was severe haemorrhage, but she recovered.

A sister of hers was taking diachylon pills at the same time, and they made her very ill, but she was found to be not really pregnant.

Manchester.

W. EALES.

RUPTURE OF THE LEFT CORONARY ARTERY.

ON January 30th, at 10.45 p.m., I received an urgent summons to see a patient who was suffering great pain and vomiting continuously. The patient had a history of vertigo and slight chronic gastric disturbance. I found Mrs. H., aged 76, who complained of extreme pain in the lower part of the chest, penetrating through to the back; it came on quite suddenly, and was accompanied by violent retching and vomiting, and great shortness of breath, the patient feeling as though she were "full of wind." The pulse was 90, regular and moderate in volume and pressure. The vessels were somewhat thickened, but not markedly so. There was no sign of hernia, and nothing to suggest biliary or renal colic, and the pain was not apparently of cardiac origin, but there was marked tenderness on pressure over the epigastrium, though it was not localized to any particular point. The vomited matters consisted of unchanged food, and there was no blood with them.

I diagnosed acute dyspepsia, in the absence of any other obvious lesion, and as the symptoms did not yield to ordinary measures and the pain continued acute, I gave morphine gr. $\frac{1}{2}$ hypodermically at 12.45 a.m., and at 1.15 a.m. I left the house, as the patient was much easier, though she was not sleeping and not entirely free from pain. At 4 a.m. I was told that the patient was dead, having slept quietly till 2.30, then breathed stertorously for some seconds and died in her sleep. As I had never seen her before, I obtained a *post-mortem* examination on February 1st, and found the following condition:

The pericardium was full of fluid and clotted blood, the heart itself somewhat small and showing pronounced brown atrophy; the valves appeared competent and healthy; the aorta showed numerous calcareous plates, and both coronary arteries were very atheromatous; the tissues in the auriculo-ventricular groove were infiltrated with blood which apparently had come from a rupture of the left coronary artery or one of its branches, which was probably caused during the strain of vomiting. The stomach showed chronic catarrh, and the vessels were injected, suggesting a recent acute exacerbation.

The patient had had food at 8 p.m., consisting in part of cold rice pudding, and this, as there was no sign or suggestion of poisoning, seems to have caused the gastric disturbance.

Had I not obtained a *post-mortem* examination, I should have been forced to conclude that death was due to the very moderate dose of morphine which I had given, but the condition found was a relief to me, although a surprise, as while I was with the patient she showed no signs of collapse and no urgent dyspnoea, such as were marked in another case of haemopericardium which I have recorded elsewhere.¹ The questions arise, When did the rupture occur? and Could the condition have been diagnosed had any one been present at the time of the occurrence?

Cheltenham.

A. F. R. CONDER, M.D. Edin.

¹ *Eur. Med. Journ.*, September, 1903, p. 207.