

Medico-legal reports.

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Medico-Legal Reports.

No. I.—POISONING BY PRUSSIC ACID.

Extracted from Dr Cormack's Journal of Medical Science.—Sept. 1845.

IN consequence of the fearfully energetic properties of Prussic Acid having become well known to the general public, it has, in not a few recent cases, been employed for the perpetration of murder and suicide. It is therefore more necessary than ever, that the Symptoms, Treatment, Morbid Appearances, and Tests, should be thoroughly understood.

Under this impression, we give, as succinctly as possible, the principal medico-legal facts connected with the recent cases; along with a few remarks.

SYMPTOMS.

CASE 1. The first case to which we will allude is that of J. C. Belany, a surgeon, who was tried for the murder of his wife, and *acquitted*. The following was the statement made by the prisoner to Mr Garratt, surgeon, who was called to the assistance of Mrs Belany, but arrived too late, (and to whom the credit is due of procuring an inquest on this highly suspicious and mysterious case.)—"On the previous Saturday morning, he (the prisoner) was about to take some prussic acid, which he was in the habit of doing for an affection of the stomach. In endeavouring to remove the stopper from the bottle, he used some degree of violence to it with the handle of a tooth-brush, thereby breaking the neck of the bottle. Some of the acid was spilt; the remainder he put into a tumbler, which he placed on the drawers at the end of the bed-room. He went into the front room, for the purpose of getting a bottle, wherein to place the acid. Instead of doing so, he began to write some letters to his friends in the country. He had not been there but a few minutes, when he heard a scream from his bed-room. He immediately went in. His wife exclaimed, 'Oh dear! I have taken some of that hot drink; give me some water—some cold water!' Immediately after which she was convulsed."—The prisoner likewise stated, that when he entered the bed-room, his wife told him what had occurred, and that he took the tumbler, from which she had drunk the poison, out of her hand. It is necessary to state, that this account was given *after* the cause of his wife's death had been fully ascertained.

It appears, from the evidence of the landlady of the house in which Belany had taken up his residence, that the unfortunate sufferer had continued to breathe for more than twenty minutes after swallowing the dose. A circumstance is also sworn to by these parties, which deeply affects the question of the guilt or innocence of the accused. Both swear, that on entering the room in which the deceased lay, no smell of a peculiar character was observed. Now, according to the account of the accused himself, part of the contents of the phial was spilt on the floor of the apartment, and the remainder poured into a tumbler, and allowed there to remain for a short time. Parties, as will appear afterwards, are differently affected by the smell of this acid; but we are convinced—and that by repeated experiment—that under the circumstances stated by the prisoner, few persons possessed of ordinary olfactory nerves could have failed in detecting a peculiar smell.

Dr Letheby stated at the trial, that he spilt a teaspoonful of the same acid which the deceased had taken, in a tolerably large room, and that the smell remained for more than an hour.

CASE 2. The next case to which we call attention is that of Sarah Hart, for whose murder the wretched hypocrite Tawell suffered the extreme penalty of

the law. The reporter, Mr H. M. Champneys, says: "On Wednesday evening, January 1, 1845, about seven o'clock, I was hastily summoned to see Mrs Hart, living two hundred and forty yards from my house. I immediately went, and on entering, found her extended on the floor, with her head on a pillow. The countenance had a dusky appearance, the eyes were brilliant, the pupils equally dilated, and quite sensible to the stimulus of light. I applied my hand to the region of the heart, but found no pulsation. The only symptom of life, just before I entered, was a slight movement of the lower jaw. I could detect no characteristic odour in the mouth. The neighbours could give no account, further, than that she was well at two o'clock the same day. The previous history of this case is afforded partly by the confession of the murderer, and partly by the testimony of one of the neighbours. Tawell, before conviction, stated: "This unfortunate woman was in my service some years ago, and I had been in the habit of sending her money. I was pestered by her writing to me for money. She had been a very good servant while in my service, but was a bad principled woman. I went down to her house, and said, I would not allow her any more money. She asked me, if I would give her a drop of porter. I went for a bottle of stout, of which each of us had a glass; she held her hand over her glass, and said, 'I will, I will;' and she poured something from a phial, not much bigger than a thimble, and drank part of it,—the remainder being thrown in the fire. She then began to throw herself about in a violent manner, and then lay down on the hearth-rug. I went out, and did not call assistance, as I did not consider her in earnest."

The victim (Hart) was seen returning from a public house with a bottle of porter, and appeared to be in good health and spirits. Shortly afterwards, a neighbour, residing in an adjoining apartment, heard a moan, or stifled groan, proceeding from Hart's room. She immediately laid down her work, and taking her light from the table, proceeded to ascertain the cause of the noise. She saw the prisoner coming out of the deceased's house; and as she walked down the path through the garden in front of her cottage to enter that belonging to the deceased, she said to the prisoner, "I am afraid my neighbour is ill;" but he made no reply. On going into Mrs Hart's house, she found the deceased lying on the floor, her head not far from the door, her legs near the fire, and her clothes in a disordered state. Her clothes were up to her knees, the left stocking was down to the ankle, and the left shoe off. Her gown was torn, her cap was off, and at a little distance from her, and her hair was loose. She was making a noise, ("Oh! oh! oh!"), and her eyes were fixed, but she did not move her limbs. On raising her up a little, some froth came out of her mouth, and the witness thought she was dying. She soon expired.

CASE 3. Mr Pooley describes a third case.¹ He says, "On the evening of the 23d January, I was summoned to the aid of Mr H—, a medical gentleman of Stratton, near Cirencester, who was reported to have poisoned himself. I found him lying on his back on the hearth-rug, his head supported by a folded shawl. His countenance was placid, and free from any contortion; his eyes closed, and the pupils not largely dilated; a fresh healthy colour was on his cheeks. His limbs were quite supple, and his body warm. Life had been extinct about ten minutes. From the statements made to me in the room, and which afterwards appeared in evidence at the inquest, I learned, that he had returned home from a long round of visiting, much fatigued, and feeling a pain in his chest, took the bottle of acid from its place in the surgery, and went into a parlour adjoining, for the purpose of taking a minim dose to relieve it,—a remedy he had more than once had recourse to before, for the same purpose. While there, he was heard to stagger, and as the housekeeper rushed into the room, he fell, and an ounce phial, about half-full of hydrocyanic acid, of Scheele's strength, corked, dropped from his hand. She rang the bell violently, and gave the alarm, and in five minutes, his brother, who is a medical man, was on the spot. He was then breathing, and his pulse was distinctly felt at the

¹ Medical Gazette, 1845.

wrist. Notwithstanding every means tried to counteract the effects of the poison, he expired in a few minutes without any scream, and quite tranquilly.

CASE 4. Mr Hicks of Newington narrates the following case.¹ He was sent for, to see a patient who had been taken suddenly ill. He found a female, of about 22 years of age, lying on her back, perfectly insensible, foaming at the mouth, the teeth clenched, and the face so greatly congested, as to be almost purple. "The breathing was slow, laborious, and at long intervals; the pulse gone, and the action of the heart but feebly to be felt. The eye-lids were partly closed, and the eyes appeared as if pushed forward between them, while the pupils were dilated and quite insensible to the stimulus of light. The whole body was under such strong spasmodic action, that the head seemed buried between the shoulders, and the arms nearly turned round by the action of the pronators." These symptoms had appeared immediately after taking a dose of medicine, which by tasting and smelling, was found to contain prussic acid. The breathing became gradually slower, and in a few minutes the patient expired. Death appeared to be caused by the inability of the patient to inspire, "the muscles of the chest, as of every other part of the body, being under strong tetanic spasms." The girl had swallowed by mistake about 20 drops of Scheele's acid while sitting, and immediately afterwards, started up, "throwing her hands over her head, uttering, at the same time, a loud gasping sound, *but no scream or shriek*; she stood still for a second or two, then running forward about two yards, fell with her head first to the ground, after which she never moved, but continued to make a sort of moaning noise for five minutes."

CASE 5. The following somewhat singular case occurred in the practice of Mr Hicks some years ago.² A girl having quarrelled with her lover, expressed a wish to leave the room, on account, as she stated, of feeling faint; but she had not done so more than a minute, when she was observed to throw her hands over her head, and then fall to the ground; the breathing for a time was quite imperceptible; and, after making a few gasps for breath, she died, five minutes after taking the poison, without having been in the least convulsed from the first.

CASE 6. A coroner's inquest was recently held in Leeds, on a case of poisoning by this acid. It appeared that a gentleman, labouring under chronic disease of the membranes of the brain, bought an ounce of the acid, of Scheele's strength, from an apothecary, from whom he had frequently made purchases. He retired to a tavern and reading-room, where he seems have swallowed the dose in an apartment adjoining the bar. The attention of the servant was first attracted by some one going quickly into a room up stairs. In about three minutes afterwards, he was found lying upon a sofa, but immediately sat upon the end of it. Shortly afterwards, when asked if a doctor should be sent for, he said, "Oh, no; it is too late—it is too late!" Mr Nunneley, surgeon, saw him in about fifteen minutes after the acid was taken. He was lying on the sofa, alive, but unable to speak. Water was dashed on his face, and ammonia was administered. The water had an effect for several successive times; it roused him, and he took a deep inspiration. He gradually became stiller, and sank; his legs, arms, and chest, were convulsed slightly, the upper extremities more than the lower, and the jaw was fixed; the eyes were prominent and staring, and the pupils widely dilated, but before death they became much less so:—they were glassy. The countenance was puffed up, dark, and rather purple. There was some foam about the mouth; his breathing was slow and convulsive, —something like violent sobbing. An ounce phial was found in the deceased's pocket, secured with the stopper. He lived about three quarters of an hour.—*Provincial Medical and Surgical Journal* for July 1845.

Such, then, is a brief account of the symptoms excited in six cases by this poison.

In the first case we have adduced, the husband states that he broke, by accident, a phial, and to save the contents, placed them in a tumbler; that his wife poured some water into the same vessel, and without knowing the nature of the

¹ Medical Gazette, 1845.

² Ibid. vol. xxxvi., (1845), p. 462.

poisonous substance it contained, swallowed it. That on hearing the scream he rushed into the bed-room, when she told him of the occurrence. Leaving altogether out of consideration the improbable nature of the accident, as detailed by the husband, and the absence of any peculiar smell in an apartment in which this acid had been so long, and so freely, exposed, we come to the consideration of the important question:—

After the shriek or scream described, was the deceased capable of narrating the nature of the occurrence, and handing over the tumbler from which the dose was swallowed? While we admit of the possibility of acts of volition after the scream, we consider the occurrences, as here narrated, to be extremely improbable. In the case of Sarah Hart, all volition was gone, immediately after the scream which alarmed the neighbour. In Mr Pooley's case, there is some suspicion of an act of volition after swallowing the dose, for the corked phial was observed to fall from the patient's hand. But it is hardly to be supposed, that a professional person would take a dose of such a medicine hap-hazard from the mouth of a phial; some other vehicle may have been used by him; and the phial corked before the dose was swallowed. The patient whose case is narrated by Mr Hicks seems to have taken about 20 drops of Scheele's acid, and after swallowing it, was able to raise her hand, uttering at the same time a loud gasping sound; she then ran forward a few yards and fell.

Dr Letheby, examined in the case of Belany, states in reference to this question,—“I have made numerous experiments with prussic acid upon the lower animals. The first effect which the administration of prussic acid produces upon the lower animals is the appearance of a peculiar giddiness, of a disposition to run round, as if the head were affected; then the respiration becomes irregular; subsequently, there is a scream. Perhaps before that scream is uttered, the animal drops; at the same moment, after two or three violent respiratory efforts, which produce a cry, a shriek, or a scream, convulsions follow, with foaming at the mouth; and in a longer or shorter time, according to the quantity of the acid administered, death ensues. I have not had an opportunity of seeing its effects on the human subject. After the shriek or scream, all sensibility and volition ceases. *In my judgment, a person after giving that shriek, would not be able to walk or converse.*”

Dr Thomson, another witness in the same case, says—“The effects of taking it are those which have been so clearly explained by the last witness; giddiness, faintness, convulsions resembling those of tetanus or lock-jaw, and screaming. When the symptoms have advanced to a scream, the powers of volition are gone. After the scream, it would be impossible for a party to talk, so as to describe what had happened.”

These opinions, given after much painful deliberation, probably made a strong impression on the minds of the jury; the effect, however, must have been greatly impaired by part of the charge which the Judge felt bound to make. He said,—“The medical men had told the jury, that with the scream that was spoken of, all volition and power of speech would cease; but then, it must not be forgotten, that the judgment of these gentlemen must be tempered with the caution, that none of them had ever witnessed the effects of prussic acid on the human body.” Belany may thank a merciful Judge, who lost no opportunity of turning every point of the evidence in his favour.

Dr Glover, who came forward, at the suggestion of the friends of Belany, in his defence, says,—“The shriek is not the last act of volition in animals, because I have seen animals poisoned by prussic acid *rush about uttering those shrieks or yells, i.e., after a shriek, the animal was still able to run.*” This statement is in exact accordance with many experiments which we witnessed nine years ago;—but it does not prove much in favour of Belany. Mr Hicks' patient ran forward about two yards after making a gasping sound; but such an act, depending altogether upon mere physical power, is very different from giving a detailed account of the accident, and making a demand for cold water:—acts evincing a full command of mental, as well as of physical, power. We have no hesitation in asserting that the prisoner's account is totally at vari-

ance with the present belief of the profession, as founded upon experiments and observations.

CASE 7. A commercial traveller was recently found dead in Glasgow, and in his repositories was discovered a letter, stating that he intended to commit suicide by this poison, and throw the phial out of the window, that no one might know the cause of death. On examination, fragments of the phial were found under the window. In this case the phial must have been thrown out immediately before the poison manifested its operation.

In large doses, even, the effects are not instantaneous¹—*some time always intervenes before the giddiness, the hurried respiration, or the scream takes place; BUT AFTER THE OCCURRENCE OF SUCH A SCREAM, ALL FACTS ARE AGAINST THE PROBABILITY OF ACTS OF VOLITION.*

CASE 8. The following case is perhaps the most remarkable on record, and deserves to be carefully studied in reference to this point. On the morning of December 15th, 1843, Mr Godfrey (of Bristol,) was summoned to the shop of a druggist, to a person who was said to have poisoned himself. He found a tall well-made man, about 44 years of age, placed in an easy chair, and was informed, that it was supposed, that he had taken a large dose of prussic acid before he came into the shop, as he had purchased half an ounce at the same shop two days before. Mr Godfrey found him in a quiet easy posture, evidently dying—insensible, pale, and cold; the jaw was fallen; the tongue slightly protruding; the pulse perceptible; he gave a faint forcible respiration, which was repeated after an interval of 5 or 6 seconds; the eyes were of almost natural appearance, dull rather than bright, not prominent—the pupils large. There was no convulsion nor apparent venous turgescence; no perceptible smell of prussic acid about the mouth. Appropriate treatment was adopted, and the efforts at restoration were continued for nearly an hour. Mr Godfrey believes, however, that death took place within four, probably within three minutes after his arrival, and perhaps within from ten to twelve minutes from the time of swallowing the poison.

The deceased had been in a distressed state of mind for some time. Three days previously, he came to the druggist's shop, for half an ounce of prussic acid, and having had a partial medical education, and been furnished with the medicine before, as well as with other medicinals, the druggist had no hesitation in supplying him, removing half an ounce from the usual stoppered ounce phial, and giving him the remainder. On the fatal morning, one of his daughters accompanied him to his office, where they were seen standing together; he sent her away with a message, and taking off his great coat, proceeded to a room up stairs. After a short interval, he was seen to walk rather quickly out of the house in the direction of the druggist's shop. He must have swallowed the poison on proceeding up stairs, for the bottle was found in the fire-place on the following morning, and the stopper on the table. It is presumed, he took the acid before placing the bottle in the fire-place, as no glass nor other drinking vessel was found in the room: He must have gone to the head of the stairs, a distance of ten average paces, descended the stairs, seventeen in number, and proceeded as described to the druggist's shop, making a total of fifty-five paces and seventeen stairs. He entered the shop in his usual manner, which was slow and easy; the druggist (a personal friend of his), asked him how he did?—he replied in his usual tone of voice, "I want some more of that prussic acid." The druggist passed round the side and end of his counter to speak to him, and then perceived that he was in the act of placing his hand upon him, as if for support, his eyes being fixed upon him with a stare. The druggist said to him, "you

¹ DR CORMACK mentions an interesting illustration of this statement in a note at p. 81 of his Treatise on Creasote, published at Edinburgh in 1836. "I was present," says Dr C., "at an experiment, along with Dr J. Reid, and Dr James Y. Simpson, when an ounce of Scheele's acid was administered to a dog. Death did not ensue for about a minute; and other dogs of the same size were killed on that occasion, as rapidly, by six drops of acid from the very same bottle!"

have been taking the prussic acid;" he could make no answer; the druggist backed him towards a chair, placed him in it, and ran to the door for help. Before he could return, the unfortunate man had fallen to the ground, with his head lying against the counter.

DOSE.

The melancholy accident which occurred in one of the Parisian hospitals, a few years ago, when seven epileptic patients were poisoned by an over-dose of this acid, fixes, pretty accurately, the smallest quantity which will prove fatal to man. They each took a draught, containing two-thirds of a grain of pure acid, and several survived for forty-five minutes. It is highly probable, that a dose materially less would not have proved fatal. In the 8th vol. of the *Dublin Med. Journal*, a case of recovery after a dose of two-thirds of a grain is narrated by Dr Geoghegan. In all cases, much must depend on mental condition, the state of the constitution, and the amount of ingesta in the stomach.

POST-MORTEM APPEARANCES.

On this part of the subject it is not our intention to dilate. We will confine ourselves to the accounts recorded of two of the recent cases.

Dissection of Sarah Hart, 18 hours after death.—"On stripping the body, we carefully noticed the absence of all external injury or violence whatever; the back of the shoulders down to the buttocks was of a livid blue; the rectum had been emptied during the last moments of life. The extremities were extremely rigid, and the lower jaw fixed so that it required considerable force to depress it. On making an incision through the integument, I immediately perceived an odour of prussic acid. Mr Pickering also distinctly recognised it. Mr Norblad could not. The cavities of the thorax and abdomen were then exposed. There were old adhesions between the pleura pulmonalis and costalis of both sides, particularly of the right, but no effusion; the lung itself was healthy throughout, but there was *slight venous congestion*. The pericardium was natural, and contained no fluid; the heart was of natural size, contained dark fluid blood in the right side, but not the slightest appearance of coagulum; the left side was quite empty, and appeared as if *washed*. The liver, spleen, and kidneys, had no appearance of disease whatever, they all contained fluid blood; the latter had a *pinkish* appearance. The contents of the stomach consisted of partially digested food, having a *strongly acid odour of beer*, but not the least smell of prussic acid could be detected; the internal coat of the stomach presented no appearance worthy of notice. The vessels of the membranes of the brain contained dark fluid blood; the substance of the brain was natural; there was no extravasation of blood or effusion of serum, either between the membranes, in the substance, or cavities of the brain. I also recognised the odour of prussic acid here, and called Mr Pickering's attention to it *several times*, but he could not satisfy himself of its existence."

Before leaving this case, it is necessary to state, that some degree of misunderstanding appears to have existed amongst the medical reporters. Mr Norblad, whose name was alluded to in the above report, says—"there was no odour differing from that of an ordinary dead body, in the thorax or abdomen. The *closest possible attention* was paid to this point by the two other medical men who were present, and we all agreed on this point." Can the apparent contradiction be reconciled?

In reference to the *post-mortem* examination of Case 4, Mr Hicks says—On examination ninety hours after death, there was considerable lividity of the body, the teeth were firmly clenched, and there was foam about the mouth. The dura mater and sinuses were much congested, the substance of the brain was dotted with blood, blood fluid and black, but without any odour of prussic acid. Lungs congested; heart small; all its cavities were filled with fluid blood of a very dark colour.

The odour of prussic acid, on opening the heart, was very evident, not so much from the smell, as from the sense of constriction produced in the fauces.

The stomach contained a little undigested food, smelling strongly of prussic acid. The liver and other organs in the abdomen were healthy.

The blood, in cases of poisoning by this acid, is usually fluid, but not invariably so. This diversity depends upon the different degrees of rapidity with which death takes place.

The existence of the odour of prussic acid in the stomach, or in any of the cavities or secretions of the body, must depend upon the ventilation of the apartment, the quantity taken, and the period the patient has lived, to throw it out of the system. No odour could be detected in the bodies of the Parisian epileptics, in consequence of their having so long survived the fatal dose.

TREATMENT.

On the trial of Belany, Dr Letheby stated, "I have since made experiments with the prussic acid I got from Mr Donahoo (the druggist of whom Belany purchased the poison,) upon animals, and restored them by the application of ammonia, and the affusion of cold water. By these means I restored a cat in ten minutes. I had given that cat between 10 and 20 drops. I also tried an experiment upon a horse, to which I administered prussic acid twelve times the strength of the two per cent. acid, and by the same means restored the horse, though it was lying upon the ground in convulsions, and in the incipient stage of death. I continued the remedies for about 20 minutes, and the horse was restored."

Practical writers consider with Dr A. T. Thomson, "that if a person lived twenty minutes after taking prussic acid, the probability would be in favour of recovery, if remedies were applied." It will be recollected that the unfortunate Mrs Belany was sworn to have breathed 20 minutes; but no efficient treatment was resorted to.

What ought a Practitioner to do in so fearful an emergency?

We have no difficulty in answering this all-important question. 1. He ought in the *first* place, to dash cold water on the face, the naked anterior part of the chest, and dorsal spine. Care must be taken not to soak the clothes of the patient. The object is not to chill the patient: but to produce a sudden shock on the external respiratory nerves, for the purpose of inducing a sudden expansion of the thoracic walls, and a full inflation of the lungs as a consequence thereof: and farther, by getting the lungs thus expanded, we enable the right side of the heart to unload itself. 2. Diffusible stimuli may be given. 3. A small, but sudden abstraction of blood *pleno rivo*, from the jugular vein must be practised if the heart has ceased to beat, or beats very feebly. 4. If the cold affusion, diffusible stimuli, and bleeding from the jugular, are not sufficient to restore the action of the heart and lungs, then artificial respiration must be resorted to.

We need say nothing in favour of the cold affusion, as every one believes its employment in poisoning with prussic acid to be orthodox. The same remark will apply to the exhibition of diffusible stimuli and trying artificial respiration.

With regard to the "small but sudden abstraction of blood from the jugular vein," it is necessary to say something in the way of explanation, as very few of the numerous writers on poisoning with prussic acid, whom recent events have called into print, seem to be aware of the object for which it is resorted to.

The recommendation and explanation of this treatment was given incidentally by Dr Cormack, in 1836, at pages 84 and 92 of his Treatise on Creasote. He there endeavours to show, that in poisoning, both with creasote and prussic acid, the right side of the heart becomes rapidly unable to contract, from mechanical distention with blood, and that if this state be averted for a comparatively short time, recovery may take place. Dr Cormack has also some remarks on this topic in his Prize Thesis on Air in the Organs of Circulation, published in 1837. But the fullest exposition of the subject is that afterwards given by Dr Henry Lonsdale in his admirable "Experimental Inquiry into the Physiological Action, Poisonous Properties, and Therapeutic Effects of the Hydrocyanic Acid," a paper which formed the author's Thesis on the occasion of his graduating at Edinburgh in 1838, and was afterwards published in No. 138 of the *Edinburgh Medical and Surgical Journal*. He says:—

“ Though the value of those remedies commonly advised has been considered at some length, I am strongly impressed with the belief, that an important part of the treatment of such cases still remains to be noticed. Looking at the mode in which death takes place,—the continuation of the heart’s action for a short time after the respiration has ceased,—the gradually increasing distention of the right side of the heart by venous blood, and then the final arrestment of the movements of this organ;—the renewal of the contractions of the pulmonic heart after the withdrawal of a small quantity of blood from its auricle, are all circumstances of the utmost importance, as suggesting the principles of treatment. It has already been stated, that the acid, although having a direct influence on the central organs of the nervous system, also affects the contractility of the heart, and that this effect on this organ varies from a slight diminution to complete suspension of its contractility, according to the amount of the dose and other circumstances. In those cases in which coma is induced, without much, if any diminution in the contractile power of the heart, the blood, notwithstanding, becomes congested in the right side of that organ, from the imperfect manner in which it is transmitted through the lungs, as occurs in all cases where the respiratory movements are imperfectly performed; bleeding from the jugular, by relieving the engorged state of the right side of the heart, may be expected to favour the remedial agent, such as dashing cold water upon the face, applying ammonia to the nostrils, &c. employed to revive the patient and cause him to breathe. It also appears, that when the effects of the acid upon the heart are transitory, and produce only a temporary diminution of its contractility, the right side of the heart becomes engorged during the partial suspension of its movements, and that when it would renew its usual contractions, it is prevented from doing so by the mechanical distention of its walls. By opening the jugular, in these circumstances, we may hope to relieve the engorgement of the right side of the heart, and thus materially favour the renewal of its contractions. It needs no remark, that in those cases where the acid acts with sufficient energy to arrest primarily the contractility of the heart, all remedial agents will be applied in vain.

“ I have often observed, that the puncturing of the subclavian vein in the lower animals had the desired effect, and am therefore led, *à priori*, to believe, that the opening of the jugular vein in the human subject will serve the same purpose—that of unloading the right side of the heart. But Haller has shown by experiment, which was afterwards confirmed by Spallanzani, that the right side of the heart could be emptied of its blood by opening the jugular vein. This was attributed by Haller entirely to the derivation of blood, as is observed in the flow of this fluid from vessels opened at a great distance from the heart. These experiments of Haller have been more fully illustrated by my friend, Dr John Reid, in the 127th number of the *Medical and Surgical Journal*. He is of opinion, that the flow of blood from the lower orifice of the jugular vein depends on the contraction of the right side of the heart; but in cases where the heart is extremely congested, he believes the derivation of Haller to come first into operation. Connecting Dr Reid’s observations with what I have witnessed in thirty experiments, there appears little doubt in my mind, as to the mode of proceeding in cases of poisoning with hydrocyanic acid. But as in practice we must be governed by more than theoretical opinions, experiments were instituted to ascertain the value of bleeding from the jugular vein. Before detailing these, it may be well to notice the opinions of authors. Hume observed that bleeding was useful in ‘relieving the violent symptoms’ in a dog poisoned by the acid under consideration. Of its *modus operandi* we are not informed. Orfila repeated Hume’s experiments, but without success. Dr Paris says, ‘bleeding seems a decidedly fatal measure;’ while Dr Christison remarks, that ‘venesection is probably indicated by the signs of congestion in the head.’ The discrepancy of opinion stated by the above authorities appears to be attributable to the want of physiological data.

“ *Exp.*—A ligature was passed around the left jugular vein of a small, lean dog, of the bull-terrier breed, five months old. The animal was made to swallow ten drops of prussic acid, he became violently affected before the thirtieth

second, and in ten seconds more, there was complete tetanic rigidity of the whole body, with expulsion of the urine. As these two symptoms were very generally observed to be the immediate precursors of death, the jugular was now freely opened, and the blood flowed in a forcible stream to the extent of two ounces, when it was stopped. As the ligature had been drawn tight before the vein was opened, the blood could only come from the larger venous trunks leading directly to the right side of the heart. After the bleeding, we felt more distinct contractions of the heart, and the respiration returned. In three minutes, the respiration became more active, and there were some signs of returning sensibility. In ten minutes, his state resembled that of drunkenness. Before the twenty-fifth minute, he walked across the room; and in half an hour, he was perfectly recovered.

“In this remarkable experiment, there was realized more than my most sanguine reliance on the treatment by venesection had ever anticipated. The dose, as proved by previous experiments, would have produced death in two, or at the farthest three minutes after being taken. That bleeding in this experiment was not beneficial by relieving cerebral congestion, is quite apparent, because the ligature on the vein prevented the return of blood from this quarter.

“In a second experiment, where a ligature was also placed on the jugular vein as in the previous experiment, bleeding was equally successful. It was observed in a third experiment where the dose of the acid was so large as to preclude all hopes of recovery, that bleeding from the jugular vein prolonged life, and thus afforded time for the application of other remedial agents.

“The following experiment was made by Drs J. Reid and Duncan, and Mr Spence. To a large-sized dog, a strong dose of diluted acid was given. The animal was soon affected with convulsions, which continued for two or three minutes, and he was apparently dying. The cold affusion had little or no effect. The external jugular vein was now opened, and the blood had scarcely commenced flowing, when the convulsive movements began to diminish, and continued to diminish rapidly, during the flow of the blood from the vein. After losing a few ounces of blood the animal recovered.

“Dr Cormack has detailed a similar experiment, in which the effects of relieving the distention of the heart are strikingly illustrated. After the acid was administered the animal seemed to be in the agonies of death, but whenever the jugular vein was opened it began to revive, and seemed quite well at the end of an hour.

“From these experiments, I feel no hesitation in saying, what might indeed be inferred *à priori*, from an acquaintance with the physiological action of the poison, that bleeding from the jugular vein is of essential service in the treatment of poisoning with hydrocyanic acid. It evidently acts by unloading the congested cavities of the right side of the heart, which enables this viscus to renew its contractions until the coma subsides.

“The following case, related by Magendie, is further confirmation of the utility of bleeding from the jugular vein. A young lady, eighteen years of age, through the neglect of her physician, swallowed a large dose of an extemporaneous mixture containing prussic acid. A few minutes afterwards, she was seen by Magendie, who found her labouring under drowsiness, convulsions, and ‘cerebral congestion.’ A large quantity of blood was abstracted from the jugular vein, and several drops of ammonia diluted with water were administered; these measures were followed by a sensible amelioration; consciousness and tranquillity returned.

“In my opinion, the relief of cerebral congestion was not what proved of advantage, for when a ligature was placed above the opening of the vein, as in two of our experiments, benefit resulted. There cannot, however, be the slightest doubt that bleeding is rendered still more efficacious, by allowing some blood to come from the head.”—*Lonsdale*.

In citing the experiments of Drs Cormack and Lonsdale, Dr Christison, (in his last edition), remarks—“It is probable, that bleeding from the jugular vein deserves more attention as a remedy, than it has yet received. The right side of the heart is almost invariably found much gorged with blood, in animals

examined at the moment of death; and the contractions of the heart, in such circumstances imperfect or arrested altogether, have often been observed by experimentalists to be instantly restored, on promptly removing the state of turgescence."—*Christison on Poisons*, ed. 1845, p. 780.

TESTS.

In the recent trial of Tawell, much stress was put, by the counsel for the prisoner, on the absence of smell of the acid in the contents of the stomach; but the learned Judge who presided, very properly directed the jury, "That smell was a proof of its presence, but that the absence of smell was no proof of its absence." It will be recollected, that the poison was administered in a draught of London porter, a mixture which covers the odour of the acid to a very great extent. Mr Taylor says, in a recent paper on poisoning by this acid, that, "So readily may persons be deceived on this point, that one of the witnesses for the prosecution, and another for the defence, at the very trial, (Tawell's,) were unable, in an experiment afterwards performed by me, to detect the slightest odour of prussic acid in three ounces of porter, containing a dose of this poison sufficient to kill an adult, *i. e.* two-thirds of a grain of anhydrous acid. My experienced colleague, Mr Aikin, was unable to perceive the least trace of it by smell; and on another occasion, a person, not knowing the object of the experiment, was unable to detect the odour in a tube containing one drachm of an acid of one per cent." Such facts prove the fallacy of placing dependance on the odour, and indicate the propriety of testing for the acid in suspicious cases, whether the smell be present or absent. In the celebrated case of Donellan, the odour was the only evidence of the poison having been swallowed; no chemical evidence was tendered; but now a jury would not convict on such testimony, unless supported by very strong collateral evidence. According to the experiments of Dr Lonsdale, the odour is sometimes very persistent in the cavities of the body after death; he found, that it could be perceived for eight or nine days, but the acid could not be detected chemically for more than four days after death.

Owing to the extreme volatility and solubility of the poison, the odour of prussic acid disappears very rapidly, when the body is exposed to a current of air, or a stream of water; hence, much will depend on the temperature of the apartment, and the exposure to which the body is subjected.

Mr Taylor has recently instituted some experiments, to determine the delicacy of the tests for prussic acid.

"*Nitrate of Silver.*—A standard solution was made, in which each grain of liquid contained the 4400th part of a grain of anhydrous prussic acid. One grain of this very diluted liquid (1-4400th) placed on a plate of glass gave a decided milkiness with the nitrate of silver; but when the same quantity was mixed with sixty grains of water, nitrate of silver had no perceptible effect; showing the powerful influence of dilution on the action of a test; for the 4400th of a grain of prussic acid was in this instance diffused through 264,000 parts of water. Practically the limit of the silver test in detecting prussic acid must be at that point at which it ceases to produce a sufficient quantity of the cyanide of silver for the production of cyanogen by heat.

"*Mixed Oxides of Iron Tests.*—A solution was made containing the 50th of a grain of anhydrous acid in 3000 parts of water. The test produced only a faint green tinge in the liquid; but in the course of 24 hours, subsided into a visible deposit of Prussian blue, the liquid above being perfectly clear. From several experiments, I found that this was the point, both with regard to quantity and dilution, that the oxides of iron began to indicate the presence of prussic acid. The quantity here detected by the test is equal to that already described, as necessary for the production of a sufficient quantity of cyanide for the evolution of cyanogen; *i. e.* two drops of the Pharmacopœial acid, or less than a drop of Scheele's acid; but there is the difference in favour of the iron test, that it is unnecessary to collect and examine the precipitate; while this is absolutely necessary in the case of the silver test."—*Guy's Hospital Reports*, April 1845.

Tawell's counsel, Mr Kelly, who was apparently unusually interested in the fate of his client, attempted to prove, or rather to raise a suspicion in the minds of the Jury, that the prussic acid discovered in the contents of the stomach, might have been generated therein!! The following replies were given to interrogatories put by him:

Surgeon Champneys said, "I should consider, that before prussic acid could be obtained from the horns, bones, and blood of animals, that a heat of 400 or 500 degrees of Fahrenheit would be necessary."

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The stomach contained a small quantity of apples, *but no pips*; nevertheless an attempt was made to show, that the poison might have been formed from pips!!

Henry Thomas, shopman to a chemist, was made to say;—“Apple pips contain prussic acid. I have assisted in extracting it from the pips of 15 small apples. The process was a soft water bath, diluted sulphuric acid, and sulphate of iron. Two grains and a-fourth of cyanide of silver were obtained; then 12-10ths of a grain of pure hydrocyanic acid were produced. In this process two sweet almonds were used.”

We are at a loss to know why *almonds* were used in experimenting upon apple-pips. Had Mr Kelly attached much weight to this part of the defence, he would have placed in the witness-box some of the celebrated chemists he had retained to watch the progress of the trial. His mooting the point was perhaps a proof of chemical ignorance; but more probably an indication of his low estimate of the common sense of the Jury. We were lately much edified by the reply which we received from a legal friend, at whom we enquired,—“Why did you ask the medical witnesses such irrelevant and absurd questions?—“The case was so plain that my only chance lay in confusing the Jury, by introducing matter irrelevant, but apparently relevant. They were stupid, ill-educated men, and I succeeded.” We presume that Mr Kelly's apple-pips were thrown at the Judge and Jury, simply because he hoped that they were sufficiently stupid to be perplexed and staggered by them.

In compiling the above report, we have not endeavoured to write a complete article on Prussic Acid; but simply to notice the most important questions suggested by recent cases. For all other information, we refer to *Lonsdale's* able Memoir, and *Christison on Poisons*—a work which is, or ought to be, on the shelves of every medical practitioner. We are glad to observe that *Mr Nunnely* of Leeds is at present engaged in an extended inquiry into the effects of different doses, and the value of different remedies.

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The first object of the present paper is to show that the
theoretical results obtained in the preceding paper are
correct, and to give a more complete account of the
experiments which have been made to test them.

The first experiment was made with a solution of
potassium permanganate in water, and the results
were found to be in agreement with the theoretical
results. The second experiment was made with a
solution of potassium dichromate in water, and the
results were also found to be in agreement with the
theoretical results.

The third experiment was made with a solution of
potassium bichromate in water, and the results
were found to be in agreement with the theoretical
results. The fourth experiment was made with a
solution of potassium chromate in water, and the
results were also found to be in agreement with the
theoretical results. The fifth experiment was made
with a solution of potassium dichromate in water,
and the results were found to be in agreement with
the theoretical results.

The sixth experiment was made with a solution of
potassium dichromate in water, and the results
were found to be in agreement with the theoretical
results. The seventh experiment was made with a
solution of potassium dichromate in water, and the
results were also found to be in agreement with the
theoretical results. The eighth experiment was
made with a solution of potassium dichromate in
water, and the results were found to be in
agreement with the theoretical results. The ninth
experiment was made with a solution of potassium
dichromate in water, and the results were found
to be in agreement with the theoretical results.

The tenth experiment was made with a solution of
potassium dichromate in water, and the results
were found to be in agreement with the theoretical
results. The eleventh experiment was made with a
solution of potassium dichromate in water, and the
results were also found to be in agreement with the
theoretical results. The twelfth experiment was
made with a solution of potassium dichromate in
water, and the results were found to be in
agreement with the theoretical results.

The thirteenth experiment was made with a solution of
potassium dichromate in water, and the results
were found to be in agreement with the theoretical
results. The fourteenth experiment was made with a
solution of potassium dichromate in water, and the
results were also found to be in agreement with the
theoretical results. The fifteenth experiment was
made with a solution of potassium dichromate in
water, and the results were found to be in
agreement with the theoretical results.

Sequel to Description of the Application of a Totally Reflecting Prism to the investigation of Disease in the open cavities of the Body. By ADAM WARDEN, M.D., F.R.C.S.E., Aurist in Ordinary to the Queen in Scotland. (With Plates.)

Read before the Society on 24th February 1845.

In a former communication laid before this Society,* I described a new method, namely, the adaptation of a totally reflecting prism as an appendage to the speculum † for throwing light upon the nature of disease situate in the open recesses of the body; and, at the same time, I exhibited a prismatic auriscope as an example of the construction proposed. I have much satisfaction in stating, that that instrument has now been subjected to an ample test of experience, (there being at the present time upwards of 100 cases under my treatment), and its utility in enabling the operator to detect the state of disease in the ear, to watch its changing aspects, and to conduct the treatment with success, has altogether surpassed my first expectations. It is a farther gratification to me to mention, that the instrument has been highly approved of by the Army Medical Board, to whom it was submitted.

When last before you, I described the plan of construction of specula for other cavities of the body, in conjunction with one or more prisms, such as I considered suited to render this auxiliary most available; and although the description and drawing of the instrument which I now produce were furnished for your last printed Transactions, ‡ the instrument itself has not been before the Society. With permission, I

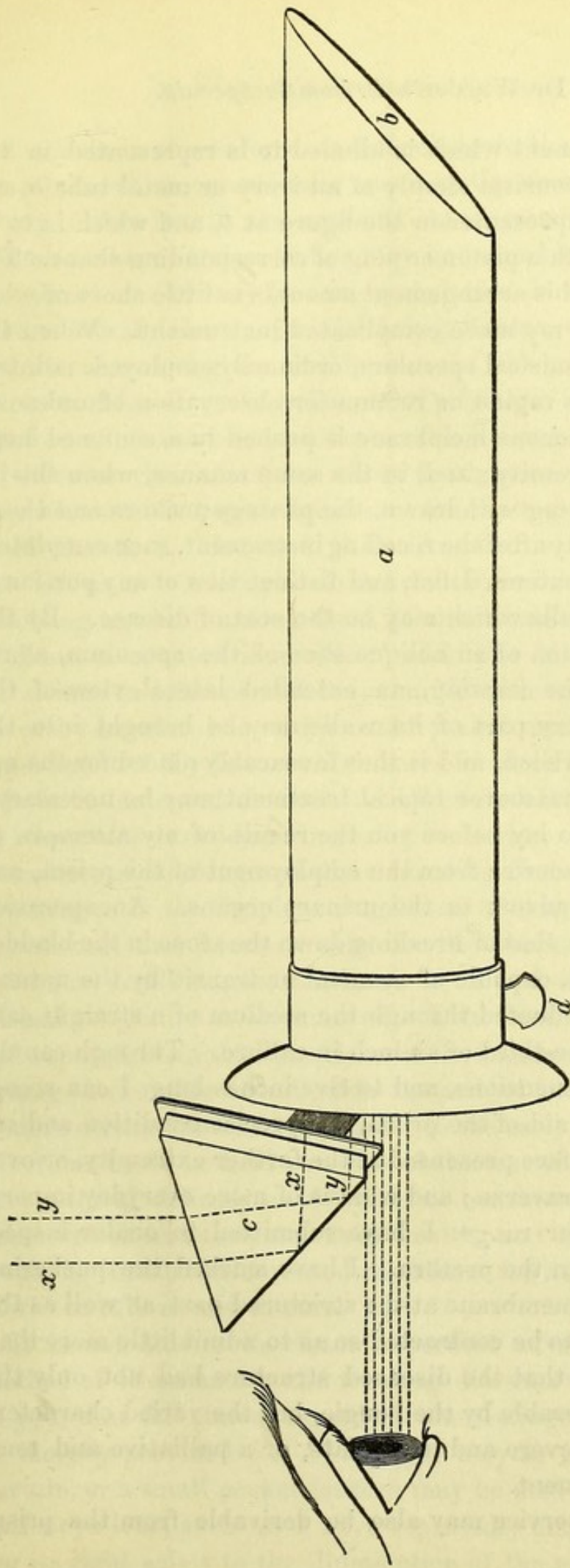
* See Trans. R.S.S.A., and Phil. Journal for October 1844.

† Specula are tubes employed by surgeons for assisting vision into dark recesses of the body. They have received that name from the circumstance of a speculum or mirror being sometimes employed for the purpose of throwing more light down the tube.

‡ Vide Trans., vol. ii., pp. 328, et seq.; also Plate XIX.

again particularize its parts and use, as given in the Transactions, an important addition to which remains to be supplied. The addition which I have since made to this instrument for the investigation of disease of greater than usual obscurity, consists of a third prism, mounted on a stalk of the same length as that of the second prism, the stalks of both being graduated in inches and eighths of inches. This third prism has one of its sides convex, so as to answer the part of a lens, and thus it is fitted to be a satisfactory test, by its magnifying power, of the picture presented by the merely reflecting prism. By conducting the lenticular prism to the depth of any ascertained pretervascular or otherwise morbid spot, the illuminated picture of it is transmitted through the walls of the glass-tube to have its features magnified to perfect distinctness by and upon the lenticular prism. I have said that this complication of the apparatus will be applicable to cases of greater than usual obscurity. Such obscurity may be owing to temporary causes, as unsubsided inflammation and tenderness of the parts, or to chronic induration and irregularities of surface, which admit of the use only of a much narrower tube than the model represents. In cases of such a description the utility of the smaller prism will be at once apparent. I must deny myself the advantage here of professional elucidations fitted to illustrate the advantages afforded by this instrument; but I may be allowed to mention, that it has met the approbation of able and experienced members of the profession in Edinburgh, Glasgow, and in London, who have testified to the advantages embraced in its construction, as well as of my mechanical arrangements subsidiary to the use of the prism in private practice.

It is to be regretted that the expensiveness of apparatus forms a bar to its general use, however its utility may be sanctioned by experience. There is some room for this regret as regards the prismatic specula, and the Society will give me leave to consign to their records the outline of an inexpensive instrument analogous in use to the above, although I have previously made it the subject of a communication to Dr Cormack's Medical Journal.



a, The tube or speculum.
b, The oblique opening of its extremity.
c, The prism. *d*, A pinching screw for adapting the same prism to tubes of different sizes and lengths.
x, *y*, Dotted lines representing rays proceeding from a light conveniently placed on either hand of the observer, and shewing how the direction of the light is diverted by internal reflection, so as to be poured as it were into the speculum.

The instrument which is alluded to is represented in the woodcut, and consists simply of an ivory or metal tube *a*, cut in the form represented in the figure at *b*, and which is to be introduced with a piston or plug of corresponding shape. The advantage of this arrangement amounts to little short of what is supplied by my more complicated instrument. When the uniformly cylindrical speculum, ordinarily employed, is introduced into the vagina or rectum for observation of unknown disease, the mucous membrane is pushed in a confused heap before its extremity; and, in the same manner, when the instrument is being withdrawn, the passage puckers and closes with all rapidity after the receding instrument, so as completely to prevent an extended, flat, and distinct view of any portion of the mucous walls which may be the seat of disease. By the simple abscission of an oblique slice of the speculum, as represented in the drawing, an extended lateral view of the passage in every part of its walls may be brought into the direct axis of vision, and is thus favourably placed for the application of whatsoever topical treatment may be necessary.

I proceed to lay before you the result of my attempts to educe farther service from the employment of the prism, and I would now advert to the urinary organs. An operation known to fame, that of breaking down the stone in the bladder into fragments, capable of removal or transit by the natural passage, is conducted through the medium of a straight canula or tube, one-third of an inch in calibre. Through canulæ of narrower dimensions, and twelve inches long, I can recognise, with the aid of the prism, the precise condition and aspect of the surface presented at the farther extremity, or over which it may traverse; and what is of more everyday importance and easier range, I have submitted to ocular inspection stricture in the urethra. I have marked the puckering of the mucous membrane at the strictured part, as well as the passage itself to be contracted so as to admit little more than a bristle; and that the diseased structure had not only the solidity discoverable by the bougie, but the varied characters demanding a severe and immediate, or a palliative and temporising treatment.

Important service may also be derivable from the prism

and canula in the unforeseen difficulties in the extraction of the stone, which occasionally occur in the operation of lithotomy; likewise, in the exploration of gunshot and other wounds, where foreign bodies may be lodged and require to be extracted. It may be anticipated that in some cases of preternatural labour, also, in fixing ligatures on polypi of the uterus and vagina, and in many of the most prevalent diseases of females, the principle of prismatic illumination is fitted to extend our acquaintance with the precise characters of those morbid affections whose treatment is unsuccessful, only because our knowledge is inexact or altogether deficient. Lord Bacon, in his work "*De Augmentis Scientiarum*," has left us a "*Catalogue of Deficients*" to be supplied by a following age, and among them he enumerates "the curing of diseases counted incurable;" and it is his injunction to physicians to attempt still to lessen the number of fatal diseases by greater knowledge and by new methods. In the department of the diseases of females to which I have alluded, it is to be lamented that morbid affections have too often had an inveterate duration before relief is sought. Opportunities therefore, of marking and discriminating their character and appearance in the incipient stages, are of comparatively rare occurrence, and barriers exist to the proper and regular treatment in all stages, which are to be wished, and yet not wished altogether to be removed. Doubtless, many afflictive and reputed incurable affections of the region referred to are among the curable or mitigable diseases of Lord Bacon; and if more certain remedies applicable to the early period of such affections could be held out, the obstacles which exist in a very natural delicacy would yield to considerations for self-preservation and the comfort of health, and the medical art would be entitled to increased confidence for its more efficient power to relieve and to cure.

It is not among the least important advantages of the method of illuminating and treating diseases now submitted to you, that the utmost regard for the feelings of the patient is thereby provided for. The light may be concealed by a curtain, or a small pocket lantern may be made use of with a bull's-eye lens, such as I have repeatedly employed, confining its light solely to the illumination of the prism and tube,

while the dress of the patient is so arranged around the tube that no part of the person is exposed excepting the diseased surface sought to be examined.

I shall now pass to some notice of the applicability of the prism to the observation of diseases in the cavities of the nose, mouth, and throat. In the case of the nose, I conceive that ozæna and other forms of ulcer, as well as early stages of polypus, might be thereby recognised, and more certainly treated or eradicated; also light may be thrown upon the forms of deafness connected with the Eustachian tube.

The Society will grant me indulgence while I bring before them, in conclusion, my imperfectly proved design for carrying observation into the regions beyond the isthmus of the throat. The prejudices which oppose the attempt would be more discouraging did I not call to mind that it is not yet twenty years since it was matter of doubtful speculation, in this country, whether it was possible to introduce a straight sound or catheter, by the male urethra, into the bladder. Dr Goddard, a contributor to Anderson's Quarterly Journal in 1825, announced, as matter of information to the profession, that he had succeeded on the dead subject in confirming the truth of the report of M. Civiale's operations in Paris, by having himself passed the largest-sized metal catheter, reduced to a straight direction, into the male bladder; and the same experiment he had divers times repeated, without leaving any mark of injury. Had the first advocates of the lithontriptic operation been less sanguine, or had the complication of their apparatus (which consists of no less than twenty-eight pieces) been regarded as an insuperable objection to its use, we should have missed one of the greatest triumphs that professional art and perseverance have achieved. It is a fact appearing to bear some analogy to the preceding, which I am enabled to state, namely, that in presence of several medical officers of the Royal Infirmary, and other members of the profession, I have proved on the dead subject the practicability of passing a straight tube, of half an inch calibre and two feet in length, by the mouth into the stomach, without leaving any mark of abrasion or injury of the soft parts in its passage. The importance of such a reach of ocular observation is not at present very obvious; but through a tube

of the size described, I am persuaded that I could depend somewhat on throwing light by means of the prism upon the character of a diseased surface presented at its farther extremity, or over which it might traverse ; and in proportion as its length was diminished, so as to bring the object nearer to accurate vision, as would be the case in stricture and other affections of the gullet, the view and indications would be proportionally clear. Many of us believe to have seen straight instruments of considerable size passed by the adroit hands of conjurors from the mouth into the gullet. Mr Anderson, who styles himself the Wizard of the North, engaged to put me in communication with several persons whom he knows *bona fide* to have performed this feat a hundred times, and I watch to avail myself of such an opportunity for testing the instruments, divested of the agitation of a patient under any real emergency.

Since I last addressed the Society, and produced an instrument combining the necessary mechanism of a prism-speculum for the throat, farther experiments soon proved to me that it fell short of answering the end intended. At the time of constructing that instrument, I had the impression generally entertained that the irritability of the fauces, and the tendency to vomit upon bringing any foreign body into contact with these parts, was a condition, to some extent, of a permanent and inevitable nature. I am now satisfied, however, that this irritability is not so insuperable an obstacle as first supposed, and to this conclusion I was led as well by reasoning as by experiment. We observe that children bolt enormous morsels of miscellaneous food, the bolus passing in its full size through the isthmus of the fauces and along the course of the gullet to the stomach. Contrasted with this, the lightest touch of a feather, or titillation with the finger, is revolted at. It was only necessary to determine what condition formed the limit between these two extremes of sensibility, that the one might be leaned to and the other avoided. It is familiar to all that vomiting, and the convulsive motions thereon attendant, are ordinarily excited by mechanical irritation of the fauces with the finger ; but if the

contact of this, or any similar agent, do not speedily induce the desired effect, it is known by experience that it is in vain to persist in this way; the parts, in the space of a minute, less or more, are reconciled to the presence and continued contact of the fingers, and remain perfectly quiescent, so as to admit of the utmost freedom of examination and dilatation extended to the epiglottis and surrounding surfaces within reach of touch. On this fact I found my confidence in taking a measure of liberty in the introduction of properly constructed instruments for observation into the region of the throat; and as this Society is more concerned with facts, and methods of coming at them, than with physiological theories, I proceed to mention the parts of which my prismatic speculum for the throat is composed; the object of the mechanical arrangement being the same, in this instance, as in the others before described; namely, the conveyance of light and ocular observation to diseased parts otherwise hidden from view, and the guiding to and facilitating remedial applications, whether medical or surgical.

The instrument, then, consists in the arranged relation of two equilateral prisms; one in advance of an argand light, on the left of the operator, subtends the opening of the mouth, and has dimensions of two inches in height, and the same over each of its surfaces; another, of three quarters of an inch,* is conveyed (being first heated to the temperature of the body, and being attached by a snap-joint to a proper handle) along a *dilator faucium*, into the pharynx, there to transmit, a second time, the light proceeding from without (see Plates VI. and VII.). By this arrangement, the parts near or more distant from the reflecting face of the internal prism, are illuminated with full brilliancy, and simultaneously throw back their picture on the glass, and offer it to the observation of the operator; the apparatus, at the same time, leaving ample space for the passage of the forceps, port-caustic, or other instruments to be employed, with the advantage of

* This is the medium size of a series of three prisms.

ocular observation through the prism;* or, where the passage of the throat was narrow, by reason of disease or the early age of the patient, I have employed a mirror in place of the prism, which, although it does not afford so much light, will, from being thin, occupy less room.

ADAM WARDEN, M.D.

3 BAXTER'S PLACE, EDINBURGH,
24th February 1845.

The Committee appointed by the Royal Scottish Society of Arts, met on Saturday the 8th instant, to take under consideration, "The Sequel to description of the application of a totally Reflecting Prism, to the investigation of disease in the open cavities of the body. By ADAM WARDEN, M.D., F.R.C.S.E."

The Committee examined the various instruments to which Dr Warden proposes to adapt the prism, and had opportunity of testing the value of the prismatic auriscope, by applying that instrument to human subjects.

The Committee consider the third prism, with its graduated stalk, to be a very important addition, in the use of each of the several specula, on account of the greater facility of ascertaining, by its magnifying properties, the existence of disease in cavities of small calibre.

The Committee hope that Dr Warden will continue his investigations, believing that great practical benefit to medicine and surgery will result from his labours.

CHARLES RANSFORD, M.D., F.R.S.S.A.,
Convener.

EDINBURGH, 18th March 1845.

* *Vide* my account of the ocular inspection of two cases of disease affecting the glottis, published in Dr Cormack's Monthly Medical Journal for July 1845, pp. 552-3. My subsequent experience leads to the same conclusion as then announced, namely, that the instrument above described can range no further than the bottom of the pharynx, and mouth of the glottis; and to the latter, only so often as it is raised from its natural depth by the contraction of the muscles employed in the act of deglutition. By this means therefore, namely, reflection from a prism or mirror placed in the pharynx, we can obtain no assistance in the investigation or treatment of disease below the pharynx. If we would carry observation further, it must be through a straight tube passing from the mouth directly into the gullet.

OCULAR INSPECTION OF DISEASES OF THE GLOTTIS.

LETTER—Dr WARDEN to the Editor of the "London and Edinburgh Medical Journal."

EDINBURGH, 19th June 1845.

DEAR SIR,—My time has been so much taken up with the treatment of affections of the ear, as to have prevented me from preparing the continuation of cases and observations promised for your Journal. It may be interesting, however, to mention that I have had two opportunities of satisfactory ocular inspection of diseases affecting the glottis, and which I beg briefly to announce to you; but, as in both cases the information of the state of disease was of a negative kind, proving the absence of suspected ulceration and polypous excrescence, there was not occasion for testing the serviceableness of the prism, for guiding the application of directly topical remedies. In both cases, I had the assistance of my friend Dr Spittal.

CASE.—Mrs J—— had been the subject of medical treatment for chronic inflammation of the pharynx, of nearly a year's duration, and which had lately spread in the direction of the glottis, attended with painful deglutition, and paroxysms of suffocative cough. On account of the latter complication supervening, she was sent from the country here for advice. On inspection, there was seen a general velvety hypertrophy, and crimson injection of the mucous membrane covering the fauces and pharynx, while, as is generally the case in chronic inflammation of the mucous tissue, the sensibility of the parts was small in proportion to their high vascularity. The fits of cough were described as accompanied with dyspnoea threatening strangulation, and terminating in the elimination of a very tenacious stringy mucus, proceeding distinctly from the upper part of the throat. The patient was placed opposite to me for observation on a common chair by the side of a table, on which stood a powerful argand lamp, with a large prism attached, so as to throw the full light of the lamp into the fauces and pharynx. After the preliminary examination, and quieting the irritability of the parts by touch with the fingers, there was no longer any impediment or inconvenience experienced from the tendency to retching. The dilator faucium was employed to depress the tongue, and expand the

isthmus of the fauces ; the port-prism, with the heated prism attached, was then conveyed along the dilator, to occupy its place in the pharynx, and complete the arrangement for observation.* The epiglottis was immediately seen to be nearly three times its natural thickness, and to be covered with vividly injected mucous membrane, similar to that which invested the neighbouring surfaces ; but it was only when efforts to swallow were made, or repeated, that the arytenoid cartilages and glottis, in a similar condition of thickening, were raised out of concealment, and brought to shew their picture in the reflecting face of the prism. Observation was thus repeated and suspended at intervals, by the momentary dimness of the prism during expiration, until full information was obtained, that there was neither polypous excrescence nor ulceration, calling for direct surgical applications, but only such a condition of disease as was still amenable to ordinary treatment by leeching and assiduous counter-irritation.

The appearances in the other case were so far similar as to render their detail unimportant, especially as my object is chiefly to communicate an illustration of the method employed in this kind of observation.† The experience afforded by both cases gives ground for the same conclusion, that the instrument made use of can have no farther range than the bottom of the pharynx and mouth of the glottis, and of the latter only so often as it is raised from its natural depth by the contraction of the muscles employed in the act of deglutition. By this means, therefore, namely, reflection from a prism or mirror placed in the pharynx, we can obtain no assistance in the investigation or treatment of disease below the pharynx. If we would carry observation farther, it must be through a straight tube passing from the mouth directly into the gullet. —I remain, dear Sir, faithfully yours,

ADAM WARDEN.

* The instrument and its several parts were some time ago exhibited at the Medico-Chirurgical Society of Edinburgh.

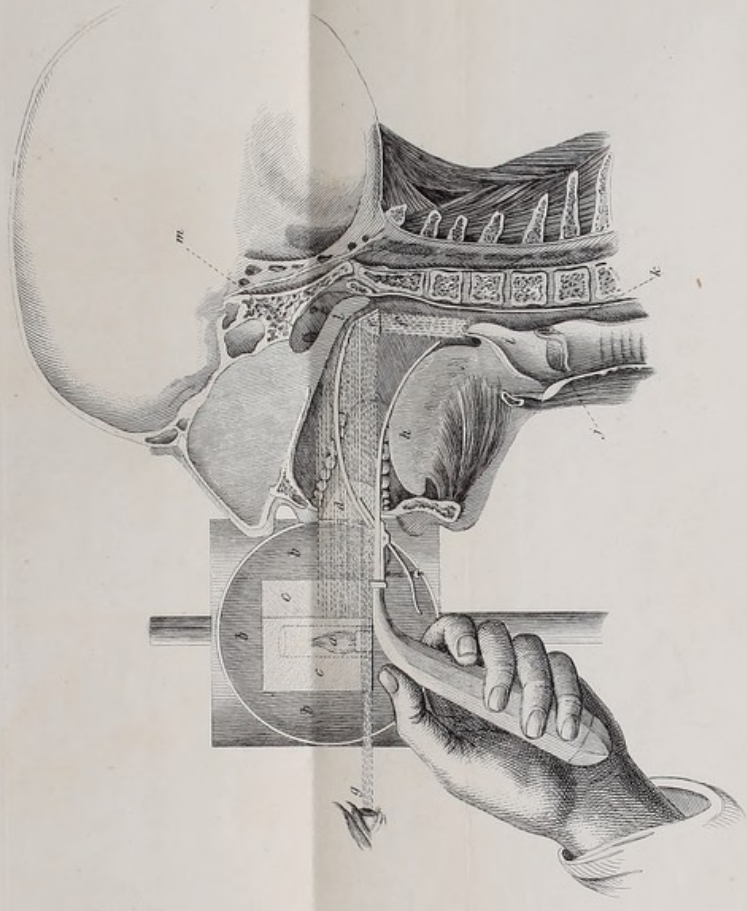
† Inflammation so far involved the constrictores isthmi faucium, as to render deglutition painful and convulsive, obliging the patient to shut his mouth, and so considerably to eclipse the view of the prism, as often as he attempted to swallow. When such an obstacle to observation occurs, as it often must, it is to be obviated by antiphlogistic and sedative applications.

...of the larynx, the portions with the heaped granular surface, was then covered along the dilator, to occupy its place in the pharynx, and complete the arrangement for operation. The operation was immediately seen to be nearly finished, the external thickness, and to be covered with visible inflamed mucous membrane, similar to that which I have described in the preceding section; but it was only when efforts to raise the larynx were made, or repeated, that the arytenoid cartilages and epiglottis in a similar condition of thickening, were raised out of concealment, and brought to show their picture in the reflecting face of the larynx. Operation was thus repeated and suspended at intervals, for the momentary removal of the parts during operation, and full information was obtained, that there was neither pyrosis, or excessive nor abnormal calling for direct surgical operations, but only such a condition of disease as was still amenable to ordinary treatment by leeching and assiduous counter-irritation.

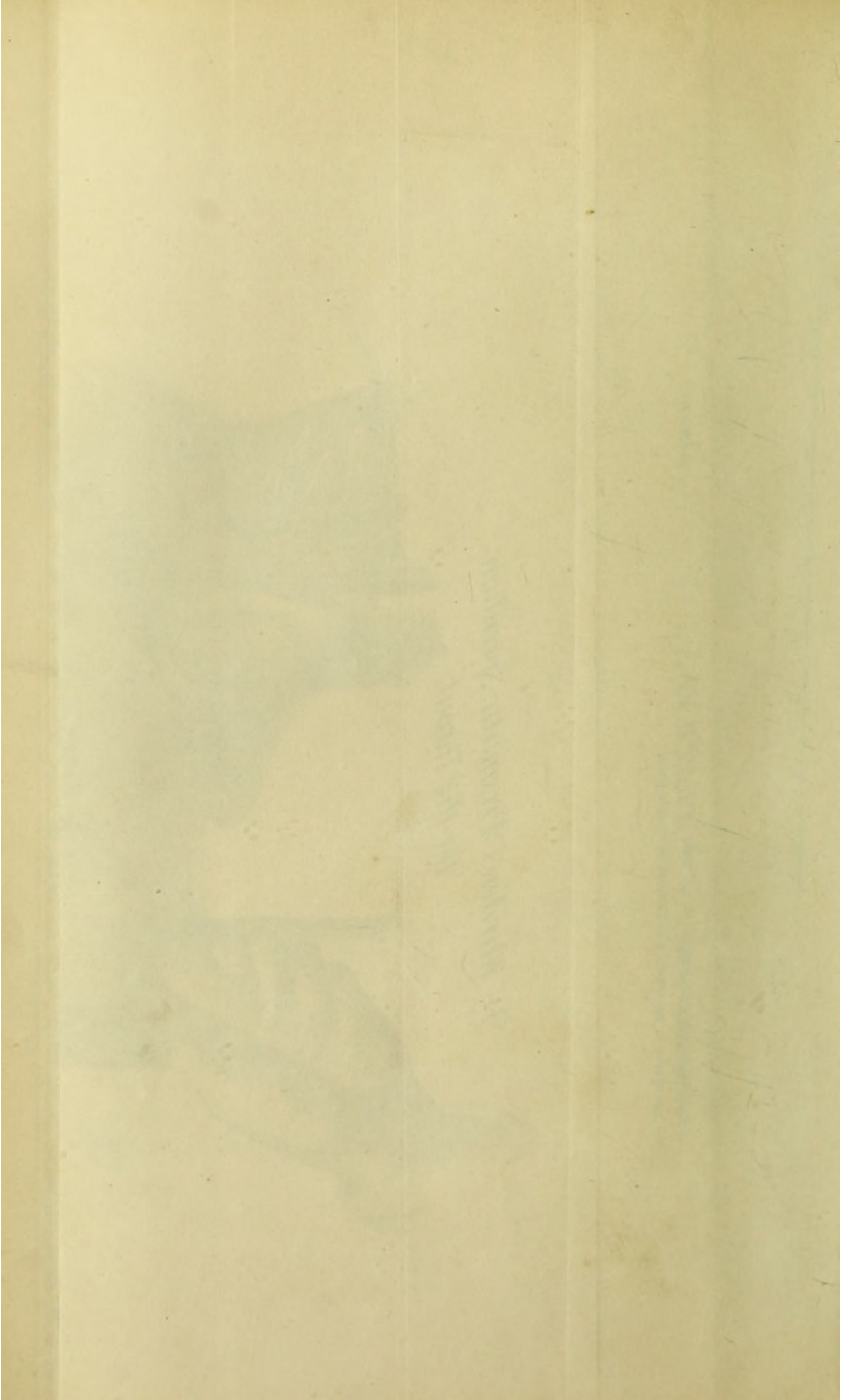
The operations in the other case were very similar to those in the first, but the operation was not repeated, as the patient refused to communicate an illustration of the method employed in the second operation. The operation was attended by both cases given ground for the same conclusion, that the nature and grade of disease of the larynx may be different from that of the pharynx and mouth of the throat, and of the latter only so far as it is raised from its natural depth by the contraction of the muscles employed in the act of deglutition. The same means, therefore, generally, will obtain a relief of the disease in the pharynx, which can obtain no relief in the larynx, in treatment of disease below the pharynx. It would early operated larynx, it must be through a surgical operation from the mouth, into the larynx.

I remain, dear Sir, faithfully yours,
 J. C. G. ...
 The treatment and its several parts were some time ago exhibited at the Glasgow Medical Society of Edinburgh.

D. Wardens Prismatic Speculum for the Throat.



- a The flame of the lamp represented in dotted lines
- b A plano-convex lens in front of the lamp
- c The first prism
- d Rays indicating the course of the light as altered in direction by the 1st prism, and passed upon the second prism placed in the Throat
- e The second prism and the rays of light once altered in direction by it
- f The rays transmitted through the second prism down the Throat and upon returning the image of the illuminated object to the reflecting face of the same prism
- g Rays of light proceeding to the eye of the observer and conveying the image reflected on the second prism
- h The lens
- i The epiglottis
- j The glottis and passage to the windpipe
- k The passage of the gutta
- l The soft movable palate
- m The Eustachian tube



D^r Warden's Prismatic Specula

