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ON THE SYMPTOMS AND POST-MORTEM APPEARANCES IN A CASE OF SUSPECTED POISONING BY OXALIC ACID.

Read before the Society for the Promotion of the Sciences connected with Medicine, by Dr. JAMES C. WHITE, November 2d, 1869.

History.—On the 16th of January, 1869, Mrs. X., a large woman in middle life, fell and broke the head of her femur within the capsule. She was placed on her bed and never rose from it again. She remained comfortable except upon motion of the leg until the 26th. Upon that day she complained of some heat in the stomach, and in the evening an enema was given, as on other occasions during her illness, which was followed by a discharge of hard fæces. Later in the evening, at ten o'clock, she became uneasy and felt nausea, and at twelve she vomited, and again at one, at four, and at six o'clock, the morning of the 27th. The quantity each time was said to be about a teacupful, and was liquid. It was said to have stained the clothes upon which it fell yellowish. During the day (the 26th) she had eaten a custard and drank tea, broth, and at least a tumbler of lemonade. She said during the night each time she vomited that she felt very bad, and once as if she were going to die. She was also very thirsty, and slept scarcely at all.

On the 27th, the second day, she was seen during the forenoon by her physician, who found her in a very low and feeble condition, with a pulse of 130 and respiration at 25 to 30. Her mind was dull, but yet conscious. She seemed to him to be in a state of collapse or partial paralysis. Her skin was very red, and her mouth, throat and lips presented the same appearance, that of lividity or a lilac color. The skin was nevertheless cold and clammy. Stimulants were given. At three o'clock, P.M., her pulse was still feebler. At ten o'clock she was again visited, and her pulse was at

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160. There was no response to the stimulants. He gave her an opiate without visible effect, magnesia and carbonate of ammonia. During this day there was more or less flow of fluid from the rectum, soiling the bed, but there was no purging at any time. Burning at the epigastrium was also spoken of early in the day. During the night she complained of violent headache, and was still thirsty.

At eight o'clock on the following morning, the 28th, the third day, Dr. — found no change except a gradual sinking. There was a complete absence of all voluntary power, and the insensibility became deeper and deeper throughout the day. There was no longer any complaint. The pulse was a mere thread and high. She died at four o'clock in the afternoon, forty hours after the vomiting began. Such is the clinical history of the case as minutely as can be obtained.

SECTION.

Post-mortem Appearances.—Twenty-four hours after death the following organs were removed from the body and brought to me for examination:—the stomach and œsophagus, intestinal canal, spleen, kidneys, liver, and part of the pancreas. Subsequently the brain was examined and found to be healthy; the fracture of the femur was also found free from all traces of inflammation. The organs were examined by me forty-eight hours after death, and presented the following appearances:—

The *stomach*, which with six inches of *œsophagus* attached, was tied at both extremities, contained ten or twelve ounces of greyish fluid of the consistence of gruel, with an acid smell and reaction. It was marked externally by dark streaks corresponding to the position of the bloodvessels, and by large stains of a scorched appearance near the *œsophagus*. Within, its lining-membrane for an inch or more surrounding the *œsophageal* opening was of the same black color as that tube, and the bloodvessels in the depending portions filled with black blood were visible through it. Elsewhere and generally the mucous membrane was of its natural color or paler

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than usual. The structure of the mucous membrane and other tissues was unchanged, except in the lower portions, where it was soft and thin (probably a cadaveric change). There was more or less mucus attached to its inner surface.

The *œsophagus* exteriorly was of a uniform deep slate color. Its interior surface was stained of a deep black, the same color penetrating in parts to and through the muscular tissue. The lining-membrane was not materially softened, nor easily separated from the tissues beneath.

The *intestinal canal* was filled with bile in the upper portion. In the ileum, near the colon, and in the upper large intestine there was considerable black faecal matter of the consistence of marmalade. Below this and along the rectum were faecal masses of natural consistence. There was nothing unnatural in the condition of the intestinal tract besides the usual cadaveric softening of the mucous membrane and reddened patches.

All the *other organs* were apparently healthy; the blood contained within them being generally bright red.

ANALYSIS OF ORGANS AND CONTENTS.

An analysis of all these organs and their contents in whole or part, conducted by the most delicate chemical processes known, but which it is not necessary for the purpose of this paper to describe, failed to show the presence of a trace of any mineral or alkaloid poison. In the examination for the latter the physiological tests were also employed, and with the same negative result.

In the absence, then, of any positive proof by analysis that poison was administered in this case, what is there in its history or the *post-mortem* appearances as just given to indicate the cause of death? May they be explained by the possible existence of any disease with which we are acquainted? It is well known that there are certain cases in which it is impossible to determine without the aid of analysis whether death is produced by natural causes or by poison. In this instance we have the symptoms of an irritation or inflammation of the alimentary canal, and also others which might be caused by or occur in the course of various affections, but taken as a whole they point much more strongly to the action of a poison than of any known disease. The pain and heat in the stomach, thirst and vomiting, are signs of irritant poisoning, but might otherwise occur; the collapse, stupor and partial paralysis are

indications of narcotic poisoning, and yet might be produced by natural causes. Taken together, the two sets of symptoms cannot be referred to any one known disease, but they are such as follow the administration of so-called irritant narcotic poisons. If now we interpret these symptoms by the light furnished by the *post-mortem* appearances, no doubt as to their cause can longer exist. There is no disease which can produce such a blackening of the tissues of the *œsophagus* and stomach as was found in this case and is still preserved in the specimen exhibited. The occurrence of black spots within the stomach cannot be looked upon as an infallible sign of poisoning, as Christison was inclined to believe. Some degree of dark brown or even black coloring as the result of acute idiopathic softening, and of changes after death, caused by the action of the acid of the gastric juice upon the blood either within its vessels or extravasated, has been observed. Such appearances, however, are more diffused and general in their distribution, not in the form of distinct streaks, spots, or points. Melanosis, too, may give rise to black discoloration, but its histological elements are easy of recognition. In this case the intense black color penetrated in many parts the muscular coat of the *œsophagus* and gave to the whole tube externally a dark slate color. The interior of the stomach surrounding the *œsophageal* opening presented the same appearances, while the corresponding portion exteriorly, it will be remembered, was marked by large stains, as if scorched.

If, then, these appearances are such as could not have been produced by any natural disease, are they also sufficiently characteristic to indicate the particular poison which did produce them? Many of the irritant poisons produce more or less blackening of the tissues of the alimentary canal. The concentrated alkalis and mineral acids act in this way, but they likewise cause great disorganization and destruction of the parts with which they come in contact, so that they could not have been the agent used in this case. Oxalic acid is loosely and incidentally spoken of in some works as occasionally producing such discoloration, but to its action upon the stomach I shall return. Phosphorus produces ecchymotic patches at times. Corrosive sublimate and other mercurial salts stain the tissues of the alimentary tract, as is well known, a dark slate color, but they cause at the same time great inflammation, and are always easily recognized by chemical

tests in the parts thus colored. They therefore must be excluded from the case. The same may be said of the salts of silver, which chemical analysis could not fail to detect. The vegetable irritants, too, will sometimes produce deep and extensive blackening of the lining membrane of the stomach, at least, but in such cases there is a proportionate intensity of inflammation accompanying with corresponding symptoms during life and characteristic appearances after death. The substance employed could not have been one of them.

Fortunately the organs were not the only materials furnished me for examination. Two pails had also been brought for analysis. No. 1 contained a sheet and some pieces of cotton cloth in a moist condition, which had been taken from a large tub of water in which they had been soaking several days. No. 2 contained towels, pieces of cloth, a mustard poultice, a cotton batten fomentation and a fomentation of herbs (wormwood) in a flannel bag. The sheet and towels had been used on the bed and about the person of the deceased during the last days of her illness, and were stained apparently by intestinal discharges or vomiting. These stains were examined for the presence of mineral poisons with negative results. Small portions were also tested for oxalic acid, but no perceptible quantity was obtained.

March 9th.—The water in pail No. 2, which had been frozen solid when brought, and in which the towels, fomentations, &c., had been soaking, some two quarts in quantity, was filtered and subsequently condensed by evaporation. It was neutral. Hydrochloric acid was added to it and a solution of sulphate of lime. It was then neutralized by ammonia and allowed to stand over night, when it was found to contain a great number of very large and beautifully formed octahedral crystals of oxalate of lime. These crystals gave all the characteristic reactions of oxalic acid. The filter through which the water had run was examined chemically, but contained no oxalate of lime, showing that the oxalic acid in the pail was present as some soluble oxalate in the water, and not as oxalate of lime or magnesia.

The entire sheet from pail No. 1, said to have been taken from the tub of water, was then examined in a similar way, and from it a very little oxalic acid was also obtained in the form of some soluble oxalate. The amount of oxalic acid extracted in this way from the water in pail No. 2 and from the

sheet and towels was from one to two grains.

It will be seen, therefore, that there was obtained from the bed-clothing and towels stained by discharges from the body of the deceased a small quantity of oxalic acid. These articles had been soaking in a tub of water, and must have given up to that the greater part of the acid they at first contained when they were removed from it. The quantity left behind in the tub was not ascertained. Moreover, these articles were not those which received the first discharges of the deceased, as the bed-clothing used during the first night of the illness, when the only vomiting occurred, was removed and washed. The amount of oxalic acid obtained by analysis, therefore, in no way represents the quantity voided during life. (The herbs used in the fomentation found in the pail contained no oxalic acid.)

That oxalic acid was not found in the analysis of the stomach and contents and in the other organs in no way weakens the theory that the deceased died from its effects. Taylor says the residuary quantity in the stomach is generally very small. A case is reported where death occurred only two hours after *ziss* was taken, and only thirteen grains were found. Another in the *Medical Times and Gazette*, April 25th, 1868:—a person took three-fourths of an ounce, and died in ten minutes. The tissues of the stomach contained only two grains, its contents none at all. The *Dublin Quarterly*, vol. xxxiv., p. 220, gives a case in which the patient survived two and a half days, and not a trace could be found. Christison says none may be found in the stomach or its contents, even if no vomiting occurs, if the patient survives any length of time. These instances are sufficient to show that the failure to find oxalic acid after death, especially in such a case as this, does not at all invalidate the theory of its administration.

How closely then do the symptoms and *post-mortem* appearances recorded in this case agree with those attributed to the action of oxalic acid in works on toxicology? Poisoning by this substance in Germany and France is so extremely rare that the accounts of it in the works published in those countries are almost wholly derived from English authorities. In this country it has seldom been employed as an agent in criminal poisoning, and but little attention accordingly has been given to its effects upon the system. Its *action* is peculiar; at times producing all the symptoms

of the most powerful corrosive, at others causing almost instant death, like the most deadly narcotics. Its first and local effect is to be explained by its chemical action on the gelatinous structure, according to Van Hasselt, dissolving these tissues easily, and causing softening of the muscles and nerves. Its later and constitutional action is mainly sympathetic. Even in a very dilute condition, by which its local effect is entirely prevented, it acts as a powerful poison on the nervous centres, the heart, spinal cord, and brain, according to this author, by which the rapidity of its action in some cases is explained. According to Orfila, "the more dilute, the more powerful its action." In very large doses, according to Christison, in animals it acts upon the heart, causing paralysis cordis, in medium doses upon the spinal cord, giving rise to convulsions and asphyxia, while with the smallest fatal doses the brain is principally affected, causing stupor. Nearly all our knowledge of its physiological action is limited to Christison's observations made forty years ago.

It may be as well, while speaking of its action, to refer to the quantity required to produce death. $\mathfrak{Zi}$. has killed a boy of 16 years, and this is the smallest fatal dose on record. Three, four and six drachms have also killed, the first named quantity a woman of 28 in an hour; but recovery has taken place after $\mathfrak{Zss}$. and $\mathfrak{Zi}$., its action of course depending upon the amount retained and absorbed.

COMPARISON OF SYMPTOMS.

Taste.—Oxalic acid is extremely sour, and this property, together with the great burning sensation it produces in the mouth, it might be thought, would prevent its employment in criminal poisoning. In this case it will be remembered no complaint at all was made, and no suspicions apparently excited in the deceased that she had taken anything wrong. She drank a tumbler of lemonade during the day; could this have contained and disguised the presence of a fatal dose of oxalic acid? To determine these points, $\mathfrak{Zss}$. of the acid was put into a tumbler of water (six ounces). It readily dissolved. This, sweetened with as much sugar as the solution easily took up while cold, gave a taste quite acid, like citric acid lemonade, putting the teeth on edge, but in no way unpleasant, and producing no smarting or burning. Held in the mouth in considerable quantity and for a minute, it caused a slight burning sensation, and a faint whitening of the tips of the lingual

papillæ. It was such a liquid as might be easily mistaken and swallowed for very sour lemonade. In such a way a fatal dose of the acid could be easily given.

Taking the symptoms in the order of their occurrence, the first complaint was of some heat at the epigastrium in the afternoon, which increased during the evening, and was accompanied by great pain in the same region during the night. These symptoms ceased twenty-four hours before death. They are common to all irritant poisons, and differ from the ordinary effects of oxalic acid in their mildness and the tardiness of their approach. The same may be said of the *vomiting* which, it will be remembered, began on Tuesday night at 12 o'clock, and was preceded by two or three hours' *nausea*. The lemonade was slowly taken probably between noon and the beginning of the nausea in the evening. Emesis occurred four times only between midnight and 7 o'clock on the following morning. There was nothing distinctive in its appearance, about a cupful of yellowish liquid each time. *Vomiting* takes place after the administration of oxalic acid generally either immediately or in a few minutes, and its color is greenish, brown, or black, consisting of mucus and altered blood. Often the vomiting is incessant until death. In some cases little or none has taken place; in one, reported by Christison, it was delayed seven hours after taking $\mathfrak{Zss}$. in five ounces of water. The more dilute, the longer is this symptom delayed.

There was great *thirst* in this case, as is common.

Purging did not occur at all in this case, although Dr. — thought there were several small watery dejections on the second day. During the night of the vomiting there were certainly several discharges of hard fecal matter, and the same was found in the rectum after death. It is a symptom recorded as sometimes present in the later stages, if life is prolonged.

Abdominal tenderness is generally a prominent symptom, accompanied by great pain; here there was some degree of pain complained of during the first night, but no tenderness was produced on pressure over the abdomen at any time. In a case reported by Dr. C. T. Jackson an ounce of the crystals was taken, and death resulted in ten days, but there was at no time any tenderness.

The *tongue and lips* are often swollen and sometimes covered with white patches; in this case both were of a liquid or lilac color. The local action upon the mucous membrane

of these parts varies, of course, according to the method of administration.

The *skin* is described by observers as livid and cold, and covered with a clammy perspiration, as cyanotic even in rapidly fatal cases; in this instance it was suffused and of a livid redness, also cold and clammy.

The state of the *pupils* is not alluded to in any toxicological work; they were here not dilated, but sluggish.

The *respiration* in poisoning, so far as the books allude to it, is generally deep and slow (Tardieu and Taylor); in this case it was 30 in the minute on the second day. Wormley, however, says the respiration is hurried, and Guy makes the same statement.

The *pulse*, too, differs in this case remarkably from the accounts of authors. On the second day it was reported as small, and from 120 to 140 per minute; on the next day 160 and scarcely perceptible. Tardieu describes the pulse as small, irregular, and scarcely perceptible; Van Hasselt, as slow and scarcely perceptible; Wormley, as small, fluttering and feeble; Taylor, as small, irregular, and scarcely perceptible; Werber, in his Handbook just published, as small and slow; Falck, as weak and scarcely perceptible; Christison says circulation is depressed and pulse always very feeble; Oesterlen, as weak, slow, and imperceptible some hours before death; Orfila says nothing of the pulse, and Caspar makes no mention of it; Briand and Chaudé, as feeble and imperceptible. It will be noticed that some of the leading toxicologists fail to speak of the rate of the heart's action, although all agree with regard to its feebleness. Two of them only speak distinctly, and they say that it is slow. This illustrates how much remains to be done in the way of accurate observation, even with some of the most common poisons. In the *Lancet* of February, 1842, there is a case reported in which it is stated that there was no failure of the pulse. Christison also mentions that in one of his experiments, "contrary to the general fact, the pulsation of the heart in a dog was so strong as to be audible at a distance of several yards." Guy, however, in his forensic medicine, unlike all other writers, makes the statement that the pulse is small and frequent.

The state of the *nervous system* is a peculiar feature in poisoning by oxalic acid. The patient is described as affected by a sort of stupor and semi-unconsciousness from which he is with difficulty roused, and by lassitude and numbness of the limbs, approaching paralysis. In some cases there

are cramps and convulsions. In this instance the mind was recorded as dull, but not incoherent, and the patient as in a state of partial paralysis at first, with complete absence of all voluntary power and increasing insensibility on the day of her death.

The most prominent symptoms which generally occur and were entirely *absent* in this case, and which have not yet been alluded to, are *spasms* and *dysphagia*. According to Tardieu, all symptoms but those of vomiting and collapse may be absent.

The *fatal period* varies greatly with the amount and concentration of the dose. An ounce has killed in ten and in thirty minutes; possibly once in three minutes. Where more than half an ounce has been taken, it is generally fatal within an hour. Persons have lived, however, after large doses for five, seven, and even twenty days. In this case, death took place forty hours after the vomiting began; just two days, probably, after the poison was first given.

A comparison of these symptoms, then, with those which have been recorded as previously produced by oxalic acid, leads me to the conclusion that, with the single exception of the pulse, they correspond closely to the effects produced by this substance given in a dilute condition, or through an interval of several hours. How far this apparent exception is an exception to the real toxicological action of oxalic acid is a matter, I think, of uncertainty. Allowing its full validity, I have no doubt that oxalic acid was taken by the deceased in the manner above alluded to, and that the symptoms in the case were wholly due to its presence in the economy.

Let us now see how the *post-mortem appearances* agree with those known to be produced by this poison. The only change worthy of note in the organs brought to me for examination, as will be remembered, was the extraordinary condition of the *œsophagus* and stomach. How far up the former this color extended is not known, as the fauces and tongue were not removed nor examined after death. The six inches seen were uniformly affected. It is only to these organs, therefore, that my comparison will extend. Taylor describes the mucous lining of the stomach after death as "pale and softened, without always presenting marks of inflammation or abrasion, if death has taken place rapidly. This membrane is white, soft, and brittle, easily raised by the scalpel, and presents the appearance which we might suppose it would assume after having been for some

time boiled in water. The small vessels are seen ramifying over the surface, filled with dark-colored blood, apparently solidified within them. The lining membrane of the gullet presents the same characters." Nearly the same description may be found in most works on Toxicology. It in no way, however, resembles the condition of these organs in this case, and would seem, if applicable without exception, to exclude oxalic acid as the agent in it altogether. A more general examination of the literature than Taylor has made will show, however, that oxalic acid is as remarkable in the variation of the appearances it may produce after death as in its physiological phenomena. It has caused death without giving rise to any morbid appearances. Its action, as we have seen, when diluted, is directed more to the nervous system than towards local irritation. We do find, however, allusion in some toxicological works to a blackening of the tissues. Most writers mention the black appearance of the blood within the vessels of the stomach, and Christison states that after concentrated doses the "stomach is found to contain black extravasated blood, exactly like blood acted on by oxalic acid out of the body;" "the inner coat shows streaks of black, granular, warty extravasation;" and again, the "inner coat of the stomach was pulpy, in many points black." Van Hasselt says the mucous membrane is sometimes colored brown from altered blood. Wormley states that "the lining membrane of the œsophagus is sometimes much softened and the bloodvessels congested with dark blood," and that "in a few instances the coats of the stomach presented a dark or nearly black appearance." In another case, which proved fatal on the twenty-third day, he says the "muscular coat throughout the gullet and stomach presented a dark appearance." Guy states that the epithelial lining of the œsophagus is sometimes detached, leaving a brown surface. These are the only references to such a remarkable appearance in the long list of toxicological authors quoted above. In the cases reported in the medical journals during the past twenty years, however, we find a few instances bearing a strong resemblance to or identical with this case. In the *Lancet* of Oct. 19, 1844, the stomach of a girl 22 years old, who died from the effects of oxalic acid, is described as "blanched and with black spots." In the same journal of Dec. 1, 1855, after a rapid death, the stomach is reported as "black and congested." That our case is not unique may be seen by

reference to a plate published in the *Edinburgh Medical Journal* for July, 1861. The striking resemblance to the appearances of the œsophagus and stomach, as hitherto described and as seen in the specimen preserved, will be apparent at a glance. The specimen from which this colored drawing was made was removed from an infant 12 days old, which had died within an hour after a large dose of oxalic acid in solution had been administered by its mother. "The gullet near the cardia was of a deep ashen color," and "the mucous membrane of the stomach generally was of a dark color." Perforation had taken place, as in three other cases on record.

In order to test farther this action of oxalic acid upon the tissues of the stomach and œsophagus, the following experiments were made. On the 8th of April a stomach was removed at an autopsy. It appeared healthy. On the following day a solution of the acid, 3ss. to ʒi. of water, was poured into it and into the œsophagus, which was shut off from the stomach by a ligature. On the 10th, the vessels of the stomach were seen externally to be blackened and the organs darkened, the œsophagus being much darker than the stomach. On the 12th they were opened. The lining membrane of the œsophagus was much darker than that of the stomach. The mucous membrane was everywhere white, but the coats beneath were dark and had a scorched look in places. On subsequent exposure the whole internal surface of the stomach blackened at the tips of the rugæ. This latter circumstance confirms Christison's observation, and is interesting in connection with the fact that the towels and sheet spoken of, in parts where stained by the discharges from the deceased, gradually turned to a dark brown on drying on the tops of the folds exposed to the air. The change was very striking.

April 16th, another stomach was taken from a person dead not twenty-four hours. It was healthy within and without. A solution of oxalic acid one half the strength of the previous solution, gr. xv. to ʒi., was turned into it. On the following day the exterior of the œsophagus was blackened, closely resembling in appearance that in our case. The exterior of the stomach was not at all changed, except the bloodvessels were seen to be darker. On opening it, the mucous membrane of the œsophagus was not so white as in the first specimen. The whole tube, where it had been in contact with the liquid, had a dark-brown or dark slate color. The tissues beneath the

lining membrane were not softened. The inside of the stomach was scarcely at all blackened; the mucous membrane was pale. The portion of the duodenum included within the ligature was also not at all blackened inside.

Such are the effects which may be produced upon the tissues after death, and when containing but little blood. For an opportunity of testing its action upon living tissues I am indebted to Dr. Amory, who most kindly furnished the material and assisted in the following experiments at his physiological laboratory.

April 19, 3ss. of oxalic acid in 3j. of water was injected by a tube into the empty stomach of a large and healthy pup, six weeks old. In a few minutes vomiting began, and was repeated several times. There was no purging. Six hours afterwards there were remaining no symptoms of illness. Section in twenty-four hours after killing showed the stomach and œsophagus pale and healthy; there was nowhere any reddening or blackening of the tissues visible.

At the same time a pup of the same litter, also strong and healthy and in a fasting condition, had injected into the stomach the same quantity of the same solution, the œsophagus being immediately tied just below the pharynx. Immediate attempts to vomit followed, which continued for some time. Death took place in two to four hours. Section twenty-four hours afterwards. The stomach was found inflated by gas. Externally it was reddened in parts, and the bloodvessels of the cardiac portion were visible and of a black color. It contained a dark colored liquid and mucus. The lining membrane was reddened in parts and covered with a dark colored mucus, easily removed by the finger. Near the cardiac orifice it had a dark-brown, scorched appearance, not to be wiped away. The interior of the œsophagus was pale, and generally stained of a dark blackish color. These appearances, as will be seen, closely resemble those presented in the stomach and œsophagus in this case, and strongly confirm the theory that they were produced in the same way.

Blood.—All authors speak of the black color of the blood in the vessels of the stomach, owing to the local action of the acid, but Tardieu is the only one who lays any weight upon its condition elsewhere. Christison speaks of its universal fluidity, but the former says, "J'insiste sur une particularité qui ne me paraît pas avoir été signalée, c'est la coloration généralement vermeille du sang et de tous les tissus pourvus d'un

système capillaire très-apparent. Dr. —, in his testimony, particularly mentioned the vermilion or reddish hue of the blood. In this connection it is interesting to remember that oxalic acid cannot be detected in the blood, and that if injected into a vessel it is so readily decomposed that it cannot be recognized even after a few minutes.

Conclusions.—From a consideration of all the facts in the case as thus presented, and from information derived from the analysis, experiments, and the observations of others, I am led to the following conclusions:—

1st, That the *symptoms* are those of an irritant-narcotic poison, and closely resemble those produced by oxalic acid; the delay in the appearance of the pain and vomiting as well as the general features of the case indicating that it was administered in a dilute form.

2d, That the *post-mortem appearances* are such as can be accounted for only by the action of a poison; and correspond in their striking peculiarities more closely to those sometimes caused by oxalic acid than by any other known agent.

3d, That the failure to detect other poisons in the tissues and fluids of the body, and the discovery of oxalic acid in a soluble form (and not as oxalate of lime) in matters discharged from the body can, in connection with these symptoms and *post-mortem* appearances, be interpreted only by the theory that death was caused by its administration.

CRITICISM ON "TWO CASES OF DOUBLE SPONTANEOUS DISLOCATION OF THE LENS."

THESE cases are reported by Dr. H. W. Williams, of Boston, in the number of this JOURNAL for Jan. 6, 1870. I think the treatment in the first case and the diagnosis in the second are open to criticism.

A man, æt. 35, noticed a quivering of the irides when 18 years old. Eighteen months ago the lens of the right eye was dislocated into the anterior chamber, which accident has repeatedly occurred since, "not generally accompanied with pain." When he applied, the lens had been four days in the anterior chamber, "giving him a dull pain in the globe, and causing very slight injection." Dr. Williams reports the vision of the other eye to be one third, using concave six; and for reading, "good." We are not told whether the patient was myopic before the quivering of the irides was noticed; i. e. whether the