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DEATH FROM CORROSIVE SUBLIMATE.—WAS “BED-BUG POISON”
THE PREPARATION EMPLOYED? *

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At the last meeting but one of the Society, Dr. Cabot exhibited the œsophagus and uterus of a female, who had died the same day, at the Massachusetts General Hospital, with symptoms of an irritant poison. The uterus contained two fœtuses, neither of which was farther advanced than the fourth or sixth week. On the next day, Aug. 27th, the following articles were received, under seal, from Dr. W. E. Townsend, who conducted the *post-mortem* examination, under authority of Dr. Stedman, coroner:—1st. Portion of a liver. 2d. The stomach. 3d. The intestines, large and small. 4th. Some matter ejected from the stomach by vomiting, while in the hospital. 5th. Matter passed from the bowels during life.

The jar, in which the stomach was placed, contained besides that organ two ounces of an odorless, bloody fluid of the density of serum, and slightly acid to litmus. This was tested for free acids and for mercury, but it contained neither. The stomach itself had been opened along the larger curvature. Its inner surface presented the appearance of having been scorched in some places, varying from a reddish slate color to an almost perfect black, while other parts were of a bright or purplish red. The inner coat, where the color was deepest, was easily lacerated and torn up by the finger nail, and in other places seemed converted into a pulsataceous mass, resembling muddy mucus. A piece of litmus paper placed upon its interior gave a faintly acid re-action. The abdominal surface of the stomach had a natural appearance. One third of the organ was cut up into small pieces and thoroughly disorganized by means of hydrochloric acid and chlorate of potash. Hydrosulphuric acid threw down from this solution a black pre-

* The particulars of this case will be fully reported in the Transactions of the Society for Medical Improvement, in our next issue.

cipitate, which was reduced to metallic mercury. Another third of the stomach was treated according to the method of Flandin, that is, by caustic lime, and a part of the mercury thus abstracted is seen in the accompanying tube (vi. notches). Both processes yielded about the same amount of metallic mercury, from which it may be estimated that one eighth of a grain of corrosive sublimate was contained in the whole organ. Examination was made also for other metallic and the alkaloid poisons, but no trace of their presence was detected.

A careful analysis of the liver was made, but no mercury was found.

The intestines throughout their entire length showed signs of inflammatory action, with intervals of healthy tissue. In some parts, the mucous membrane was much reddened and very soft, and in others patches of the same dark color were observed, as in the stomach. They contained no other solid substance than disorganised tissue and a very little faecal matter. The fluid, in which they were lying, resembled the bloody discharges from the bowels contained in another vessel. An attempt was made to extract from a portion of it corrosive sublimate, by ether, but in vain, although the most delicate tests known were employed. The intestines themselves were not examined chemically.

The amount of vomited matter received was four fluid ounces; dark coffee color, odor of beer. Slightly acid by litmus. Some viscid matter floated upon its surface, which was found by the microscope to be disorganized tissue from the lining membrane of the stomach. A small portion was tested for the presence of mercury, and the metal thus abstracted is preserved in a tube. An attempt to abstract corrosive sublimate, as such, from the vomitus was made, but as in the case above mentioned none was obtained.

The quantity of the dejection received was one pint and a half. It was a faintly acid liquid, of a dull red color. At the bottom of the vessel was a deposit consisting of pulpy, disorganized tissue, mucus, and faecal matter. The quantity of metallic mercury extracted from eight ounces of this fluid was quite large. Corrosive sublimate, as such, however, could not be obtained from it.

From the results of the chemical analysis thus briefly stated, it will be seen that mercury in some form was present in considerable amount in the tissues of the stomach, and abundantly so in the matter rejected from that organ, and that which passed the intestines during life. Both the symptoms exhibited before and after the arrival of the deceased at the hospital, and the appearances revealed by the *post-mortem* examination, confirm the suspicion that death was caused by the action of some strongly corrosive and irritant poison. They were identical, in fact, with those generally produced upon the human system by corrosive sublimate when taken in large doses. Chemical analysis reveals the fact

that mercury had been taken in quantity sufficient to cause death, that it had been taken in some soluble and highly corrosive form, and that no other poisonous substance had assisted in its fatal work. It would seem a very easy matter, in a case like this, where the tissues are partially destroyed by the agent employed, and where the fluids passed subsequently to its exhibition are highly charged with it, to detect in them its true nature. Unfortunately, a chemist is seldom able to obtain so satisfactory a result when corrosive sublimate is given in solution. He can conclusively demonstrate the presence of mercury in the tissues and animal fluids, but beyond this it is generally a matter of inference. He may judge, too, whether the mercury has been taken in some soluble and corrosive form from the effects produced, and of this no case could be better illustrative than the present, and knows that but few of the mercurial salts possess these properties. He may also be able to satisfy himself that more chlorine is met with in the processes employed than is to be accounted for except by the supposition that it is combined with mercury in the form of a bichloride. Corrosive sublimate, when in solution, forms so intimate a union with the albuminous bodies it finds so abundant in the human economy, that it becomes, in fact, almost an impossibility to separate it from them, except by the use of re-agents so powerful as to decompose it, and thus render its detection a matter of uncertainty. That this stable compound of the bichloride and albumen does not yield up its mercurial salt to ether or alcohol by any means as easily as writers on toxicology state, is demonstrated by the present case, for the most delicate tests failed to give any satisfactory proofs of its presence in any of the matters examined, although there is not the slightest doubt that they all contained it in considerable amount. The symptoms exhibited during life, the *post-mortem* appearances, and the results of the chemical analysis, all unite, then, to furnish proof positive that Ellen Dugan died from the effects of a large dose of corrosive sublimate.

The case, however, is one of far higher importance in a medico-legal aspect than the facts presented at the previous meeting seemed to express. Members of the Society may have seen in the *Boston Journal* of last Saturday (Sept. 21), a long communication headed "A Death-bed Confession," which, to one conversant with the particulars of this tragedy, seems very like the *exparte* plea of a lawyer, prepared for a jury, had the case ever come to trial. Inasmuch, however, as some knowledge of the *real* facts is essential to a proper understanding of the scientific evidence, which played so important a part in the disposal of this case, and as many of the gentlemen present may not have read the article referred to, I will state them in a few words, as they were developed at the coroner's inquest. The deceased, it appears, was taken

suddenly ill with alarming symptoms on Sunday night, Aug. 25th, at the house of her master in Jamaica Plain, where she had been living as a domestic for three years. Dr. Severns saw her there, and brought her the same night to the Mass. General Hospital. There was violent purging and vomiting both before and after her arrival there, together with other ordinary symptoms of poisoning by large doses of corrosive sublimate. She died at 10 o'clock on the following morning. According to the statement of the attending nurse, the patient was unaware of her dangerous condition, until she told her of it, and asked her what she had been taking. She then replied, that as she was about to die, she would tell her the whole truth:—That she was in the family way by her master, and had been taking some medicine he had given her for three weeks, but that as it had not produced the desired effect, and as her mistress was to return in a day or two, she had taken a larger dose, that she might be well before then. That she had been in the same way by him a year ago, and had got rid of the child at that time by similar medicine. She died shortly afterwards, fully in the possession of her senses. The body was taken possession of by the coroner, and the matters above referred to were placed in my hands for chemical examination. The result of my investigations was communicated to the coroner on the following day, and the person thus accused by the deceased was arrested on his authority, on the charge of attempting to produce abortion by corrosive sublimate. On the day following the committal, I received a note from the counsel of the accused requesting me to give a portion of the matters placed in my hands by the coroner, to Dr. Hayes for analysis. The same legal gentleman employed a detective also subsequently, to search the house at Jamaica Plain, who brought to Dr. Hayes a preserve jar containing vomitus, which had stood several days in an open vessel in the chamber of the deceased, and a bottle nearly empty, said to have been thrown into the garden by her, and to have been found there. It was a bottle which had held "bed-bug poison;" a nearly saturated solution of corrosive sublimate in alcohol, tinged yellow by turmeric.

Aug. 3d, I received both these bottles from Dr. Hayes, who informed me that he thought he had been able to detect in the vomitus some of the peculiar coloring matter of the bed-bug poison. It was upon this opinion, then, that the able counsel employed by the accused would found their defence, and the plea was raised that the girl died a suicide. The matter was brought before the grand jury of Norfolk County, and after a very hasty examination, the case was dismissed, and the person accused discharged. I do not propose to consider here the propriety of such a proceeding or the manner in which it was conducted, except in so far as the judgment of the district attorney was influenced by the scientific testimony presented to him. If we adopt the view stated by the

writer of the communication mentioned, who seems to have been intimately connected with the affair, it was chiefly upon this testimony that no bill of indictment was found.

I will say, in the first place, that I examined the bottle marked "poison," which contained about one drachm of a pale-yellow fluid, and a white deposit. It was found by analysis to be an alcoholic solution of bichloride of mercury, and the white deposit was the same substance probably left undissolved by the evaporation of the fluid. Some of this fluid, when evaporated with boracic acid, gave a red color to the edges of the deposit, and ammonia being added to another portion produced a white precipitate of mercury and a dull claret color. These reactions are indicative of the presence of turmeric. The fluid resembled, though paler, that contained in a bottle of the same character, full of liquid, which was procured by the male servant of the accused from the apothecary, who had furnished the empty bottle to the household some time previously for the purpose of destroying vermin. A portion of this latter, also given me by Dr. Hayes, to whom it had been delivered by the boy just mentioned, was treated by hydrosulphuric acid. The mercury was thus separated from the coloring matter, which by farther purification was found to possess the peculiar odor of turmeric, and was changed to a reddish-brown color on the addition of a solution of potash. It may be well to say here that turmeric owes its coloring properties chiefly to the presence of curcumin, a resinous substance which is readily soluble in ether and alcohol, but insoluble in water. It is recognized by imparting a red tint when evaporated with a solution of boracic acid, and by the change of its bright-yellow tint to reddish-brown when in contact with solutions of potash or soda. Ammonia produces a bright claret color.

About three ounces of what purported to be the vomitus of the deceased (taken from her chamber several days after her death), was received from Dr. Hayes. It resembled closely in appearance that delivered to me by the coroner, and described above. On examination, it was found to contain more mercury than the matter rejected at the Hospital, but the most careful analysis failed to detect any corrosive sublimate, as such, in it. This fluid was agitated with the same amount of pure ether, and allowed to stand thirty-six hours. The ethereal solution, clear and nearly colorless, was then poured off and evaporated. A small amount of yellow oily matter was thus obtained, which dissolved in alcohol, and yielded, on evaporation, a very slightly-colored fatty matter. Slips of bibulous paper were immersed in the alcoholic solution repeatedly, and dried. They were not colored yellow by this treatment, nor brown by subsequent soaking in alkaline solutions. A portion (one ounce) of the vomitus received from the coroner was then subjected to the same process. The golden-yellow oil thus obtained was treated with alcohol, and the solution concen-

trated to a small bulk, and taken up on small strips of filtering paper. The papers on drying assumed a bright-yellow tint, which did not become brown when moistened by solutions of potash or ammonia. Some of the alcoholic solution was evaporated to dryness with boracic acid, but no red color was produced.

Orfila, in his toxicology, refers to the production of this yellow oily matter in the course of the processes most generally employed in the analysis of the human stomach and other organs, and states that it is colored brown on the addition of alkalis. This change of tint, it will be remembered, is the characteristic reaction of turmeric, and might easily lead to error of judgment in a case like this. Moreover, there are many other coloring matters which undergo similar changes of color under the same circumstances besides turmeric, so that no one can state conclusively that a yellow coloring matter becoming reddish-brown on the addition of an alkali is turmeric. Curcumin is so easily soluble in ether and alcohol, that they could not fail to extract it when present. The ethereal solution of the vomitus received from Dr. Hayes, which, if we look upon it as entitled to judicial recognition, would be likely to contain a larger quantity of whatever drug was taken than that collected at the Hospital, was nearly colorless, but yielded, on evaporation, a slight amount of yellow oily matter, which being taken up by filtering paper, did not change color in the least in the presence of an alkali. The ethereal solution of the matter rejected from the stomach at the Hospital, however, had a bright-yellow tint, which was readily imparted to slips of bibulous paper. In this case, too, the strongest alkalis failed to produce the slightest change of color in the papers thus prepared. It may be that this yellowness was imparted by the presence of bile, which probably flowed into the stomach in greater quantity after repeated vomiting, which will account for its increased amount in the vomitus just before death. Even supposing the deceased did take a large dose of the bed-bug preparation of corrosive sublimate, and this, as well as any other, may be purposely administered in small doses, it is very doubtful if the slight amount of turmeric contained in any quantity she could have swallowed, could be detected after the first vomiting, and it appears by the testimony given in the *Journal* alluded to, that she did vomit at least once, and threw it out of the window when she found that a physician had been called. That, however, is a matter of conjecture. A matter of certainty, however, it is, that had there been any recognizable quantity of turmeric in either specimen of the vomitus, it must have been extracted and detected by the processes employed. A yellow coloring matter was obtained; it was taken up by bibulous paper, and thus presented in the most favorable condition to the action of the alkalis. If the paper had changed to a brown color, when treated with a solution of potash, no chemist would be justified in concluding that such change was absolutely due to turmeric, but as the

papers, yellow in color, did not undergo any such change of color, though submitted for a long time to the action of the alkali, we feel bound to state that in our opinion there is not the slightest chemical evidence to show that turmeric, or the peculiar bed-bug preparation of corrosive sublimate, was taken or administered in this case.

DR. WARE'S LECTURES ON GENERAL THERAPEUTICS.

LECTURE VIII.—(Concluded.)

THIS consideration of the method of managing the bowels suggests a similar view of the management of the urinary discharge. This is equally to be made the object of constant attention and superintendence. It is not sufficient to attend to it when its condition and mode of discharge is a principal element in the case, but in all cases to know how this function is going on. The character and quantity of the secretion and the mode of its discharge may have an important connection with diseases that in themselves do not proceed from or have any original relation to the kidneys or bladder. They may also admit measures of relief that will aid the system very much in its efforts, and on the other hand the neglect of such measures will often counteract these efforts and render them of no avail.

I do not propose to speak of the absolute diseases of the kidneys and bladder, these belong to a different part of our subject, but simply of those conditions that may arise in the course of ordinary diseases and may affect the comfort or state of the patient, although they may be only accidental.

The urine, in health, ought to be discharged at least three or four times every day. There are few persons in health in whom it takes place less frequently than this, and very many in whom it occurs oftener, particularly infants and young children. In old persons it may also often occur more frequently, but this is from a different cause; not from any necessity dependent on the quantity of secretion, but from an irritability of the bladder which incapacitates it from retaining its contents for any great length of time. In sickness we ought to be assured that the evacuation takes place at least twice a day, and if less than this, the state of the patient should be carefully watched in this particular. If this continues only a few days, and no symptom presents itself indicative of evil connected with it, no special interference will be necessary, particularly if opiates have been taken, because these at once diminish the secretion and the sensibility of the bladder to its presence, so that it tolerates a considerable accumulation. But whenever this deficiency exists, from whatever cause, the patient should be called upon to make voluntary efforts. These are usually sufficient. Where they are not, an enema or cathartic will often an-