

Sugar poisoned with Oxide of Lead By CT Jacksow MD.

During the past winter and spring season a number of persons said to amount to upwards of one hundred in number in the town of Calais Maine have suffered from a disease of the bowels of a violent character resembling colica pictonum of the severest kind. Three of the individuals have died in consequence of this disease after a protracted and most distressing illness several others are still in a very critical state and have suffered more or less from paralysis of the extremities. Through the kindness of one of the sufferers I have been favoured with the names of forty eight individuals who are still sick with this disease. The cause of this distressing malady has been carefully examined into by Dr SS Whipple of Calais and through his exertions suspicions were finally fixed upon the sugar which had been used in the families of those who suffered, and it was ascertained that the only article of which they had all partaken was sugar obtained from one importing house at St Stephens NB. It was furthermore observed that those persons in the families where the disease prevailed who did not make use of sugar escaped altogether while those who indulged most freely in its use suffered the most severely. Thus the chain of evidence was complete against the sugar and the disease supposed at first to be an epidemic is in the end proved to arise from poison.

Five or six of those persons who were subject to this colic set out for Boston for the purpose of obtaining medical advice; one a young lady by the name of Darling died on board the packet under the most distressing symptoms attended with paralysis of the limbs. The other passengers are undergoing medical treatment in this city and still bear the marks of great suffering and extreme emaciation the countenance in every one whom I have seen showing that peculiar expression which accompanies disease of the abdominal viscera. I have minutely examined four of the sufferers and from them have learned the foregoing particulars. It appears that the sugar was brought from Uarba does late last autumn and was sold by an importer at St Stephens who supplied the trade at Calais. It was also ascertained that the captain of the ship who brought out this sugar had a small adventure of the same kind and that he and those to whom he sold his sugar suffered from this disease After collecting the above evidence against the suspected sugar it was thought advisable to make a chemical analysis of it. Four parcels consisting of about a pound each were put in my hands by Mr Lee and Captain Rodgers with a request that I should make an analysis of each of them and ascertain positively whether they contained poison or not. The parcels were marked Nos 1 2 3 and 4 and were subjected to analysis in the order of their numbers. My suspicions and those of Dr Whipple were fixed on oxide of lead as the poisonous ingredient and the results of the analysis prove that this opinion was well founded. They also prove that a small quantity of this poison when taken daily although no immediate disturbance is felt produces great derangement of the system and induces a most dangerous and painful disease which lingers long in the constitution after the use of the deleterious article has been suspended,

How often do people exclaim that certain articles are not poisonous because they have

sometimes partaken of them with impunity when we know that if persevered in disease and death must be the consequence of their temerity. I annex the subjoined extract from my laboratory notes June 7th 1835. Four parcels of brown sugar were handed to me by Captain Eodgers and Mr Thomas Lee for chemical analysis. They are marked Nos 1 2 3 and 4 and weigh about a pound each No 1 is evidently from a different lot from the other samples. It is of a lighter yellow colour and coarse grained while the others are much darker and smaller grained and in lumps of a still deeper colour. There is nothing peculiar in the taste or appearance of any of the samples that would cause any suspicion to be raised against the quality of the sugar.

Analysis: The object of the analysis is to determine if the sugar contains any oxide or salt of lead or copper. Five hundred grains of the sugar No 1 burned to cinders in a platina capsule, the cinders crushed to powder in a Wedgewood mortar and then burned to ashes in the capsule. The ashes was placed in a green glass flask and digested with nitric acid and evaporated to dryness then treated with water and filtered. The filtered solution was placed in a flask and a current of sulphuretted and hydrogen gas passed through it until the liquor was saturated. No precipitate took place from which it will appear that this sample does not contain any lead or copper. I have since learned that this sugar was sent for the purpose of ascertaining if it were free from poison and was not of the kind used by the family at the time they suffered from the disease. Five hundred grains of No 2 which came from the house of Mr Lee was treated exactly as No 1 and when the sulphuretted hydrogen gas was passed through it a copious precipitate of sulphuret of lead took place which being collected on a filter washed dried and weighed amounted to 1.6 grains equal to 1.38 grains metallic lead equal to 2.337 grains oxide of lead. This will give nearly 38 grains of oxide of lead to the pound of sugar. Five hundred grains of No 3 treated in like manner gave a precipitate of sulphuret of lead the weight of which is precisely the same as that obtained from No 2. No 4 sugar from Mr Darling's family: Five hundred grains treated like No 1 gave when sulphuretted hydrogen gas was passed through it sulphuret of lead in weight equal to that from No 2. The sulphuret of lead obtained from Nos 2 and 4 was reduced before the blowpipe to metallic lead. A portion of each of the precipitates was examined by tests for copper and none discovered. The lead in this sugar may be either in the state of acetate malate or saccharate of the oxide of lead the sugar combining with it so as to form a chemical combination.

How this sugar became contaminated with lead I am unable to say. There is no suspicion of criminal design attached to any one, and it is probable that lead reservoirs were used for the syrup on account of the comparative cheapness of the metal and that the free acids in the juice of the cane corroded the lead and thus produced the poison which crystallized in combination with the sugar. The dreadful effects of this poison should by all means reach the sugar planters who distribute so noxious an article to the people of many countries and must produce consequences at which humanity shudders. If the planters continue to manufacture this poisonous compound and send it abroad regardless of the consequences after they learn how much suffering it has caused which I am not willing to suppose they will do they will become criminal in the eye of British law and liable to the severest penalties. Indeed we may feel assured that

as soon as they know the effects of their sugar they will immediately examine into the source from whence the poison was derived and prevent a continuance of the evil. Their own interest would cause this to be done even if they were not impelled by higher motives for their sugar would soon have a bad reputation which would destroy its sale in the market.

The researches into the cause of this disease eminently show the advantage of rational medicine over empiricism for the empiric would never have traced the disease to its remote cause by a connected mode of research and consequently would have been unable to learn the cause of the malady and its method of cure. The symptoms in the cases all pointed to lead as their cause and chemical analysis has confirmed the truth of this opinion. The cause is thus found out and removed and rational medical treatment will soon restore the surviving sufferers to health. It is surprising that colica pectonum is not a more frequent disease than it is considering the numerous applications of lead to domestic use. Indeed I have several times been able to trace the origin of this disease to the use either of leaden reservoirs for water or leaden suction tubes in wells where the water was charged with carbonic acid. Such wells are common in Boston and I have several times been called to witness the effects of water charged with this gas on lead pipe which had been corroded entirely through in the course of two years after it was placed in the well. Whenever water contains carbonic acid lead suction pipe should be carefully avoided and block tin substituted in its place for lead is not only soon destroyed by such water but a dangerous poison is produced capable of slowly undermining the most vigorous constitution

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