A FATAL CASE OF ACUTE MERCURIAL POISONING.

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CASES of acute mercurial poisoning are so rare and the literature so sparse that I think it desirable to place on record this well-marked case.

A young lady, 23 years of age, on October 1st swallowed, mixed in a tablespoonful of milk, a "headache powder," procured from a local chemist's shop. Immediately after taking the powder she was seized with a severe burning pain in the throat and with vomiting; she vomited again in a few minutes.

I was called to see her about twenty minutes after the powder had been swallowed. She was then sitting up in bed retching and vomiting a small quantity of white stringy mucus; she complained of a severe burning pain and feeling of tightness about the throat, slight burning pain in the epigastrium, and severe burning pain about the mouth, tongue, and lips. I found that the tongue, tonsils, and mucous membrane of the lips and cheeks were white and corroded; the face was slightly swollen and flushed; there was some tenderness over the stomach and slight general swelling of the abdomen; all parts of the mouth were exceedingly painful and tender.

Having administered as an emetic an apomorphine tabloid, $\frac{1}{4}$ gr., hypodermically and caused more vomiting, I gave magnesium carbonate in milk and washed the mouth with olive oil, and also induced her to swallow a tablespoonful of the oil; no eggs were obtainable at the time. Some collapse ensuing, I gave a cup of strong coffee. These remedies gave some relief to the patient, and she dozed off to sleep. About two hours later diarrhoea set in, two motions being passed mixed with blood; during the following night about six motions were passed, the later ones being almost entirely composed of blood; vomiting continued at intervals. There was total suppression of urine for twenty-four hours after taking the powder, but after that no trouble with the urine. Treated with mouth washes of tincture of myrrh and glycerine and borax, and small doses of bismuth and soda, and plenty of white of egg, milk and barley water, the vomiting and purging ceased, and all except the soreness of the mouth seemed to go well until nine days after taking the powder.

On October 4th (three days after poisoning) a haemorrhagic rash appeared on the skin of the face, and gradually spread all over the body and limbs; this was accompanied by a good deal of swelling of the face and soreness of the eyelids, and followed by free desquamation. On October 10th vomiting of blood set in, and I stopped all food by the mouth and fed only with nutrient enemata for a week. The vomiting soon stopped, and about October 16th the patient was able again to take a little barley water and Benger's food. The ulceration and sloughing of the mouth, however, was very troublesome, and on October 17th and 18th several haemorrhages occurred from the mouth and throat, and were accompanied by tympanitis of the abdomen and a rise of temperature to 101° , and the patient became much weaker. Painting with adrenalin solution stopped the haemorrhage, but swallowing gradually became impossible. After a temporary improvement the patient died very suddenly from heart failure on the evening of October 23rd, twenty-two days after swallowing the powder.

On October 1st I obtained six of the headache powders from the chemist and, along with the vomit, sent them to Mr. E. Davis, analyst, of Liverpool.

A large amount of mercury was found in the vomit, and the powders (which should have contained acetanilid, caffeine, and sodium bicarbonate, amounting to 5 gr. in all), were found to contain, in addition to the other constituents, a quantity of corrosive sublimate. The largest amount of corrosive sublimate found in one powder was 2.67 gr. How the corrosive sublimate got into the powders is a mystery which was not cleared up at the inquest. I was present at the *post-mortem* examination conducted by Dr. Nathan Raw of Liverpool, whose notes are as follow:

Body well developed and nourished. Rigor mortis pronounced. Pupils equal and dilated. There is considerable recent burning of the lips, nose, and lower eyelids, having the appearance of corrosion. The tongue, mucous membrane of the mouth, and fauces are of an ash-grey colour, with, in places, extensive sloughing. This appearance is also seen in the upper and lower portions of the oesophagus, the mucous membrane of which is corrugated and eroded.

The stomach shows intense congestion around the cardiac orifice. The mucous membrane is swollen and softened and of a bright-red colour with numerous ecchymoses. The small intestines here and there show intense injection, but in the caecum the mucous membrane is of a dark-brown colour with indication of intense haemorrhage.

Lungs.—Both engorged, 27 oz. each in weight. Scattered throughout both lungs were numerous thromboses, due to alteration of the blood. These varied from a point to the size of a shilling, and, according to Kauffman, are essential for the diagnosis of corrosive sublimate poisoning.

The liver and kidneys were enlarged and fatty.

The other organs appeared normal.

The chief features of this case were the comparatively small amount of corrosive sublimate in the powder—probably not more than $2\frac{1}{2}$ gr.—and the length of time the patient survived—twenty-two days; the longest recorded case I can find being nineteen days.

CASE OF ACUTE STRYCHNINE POISONING IN A CHILD: RECOVERY.

By JOHN R. POOLER, M.B., Ch.B.,

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N. S., aged 8, came under my care at the end of January, 1904, for post-diphtheritic paralysis, affecting the legs, and, to a slight extent, the palate and pharynx. She was treated with a mixture containing liquor strychninae hydrochlor. π ij t.d.s. for the first fortnight, and at the end of that time the dose was increased to ν t.d.s. The child progressed favourably, and the signs of paralysis were disappearing gradually. About 5 p.m. on March 1st I was urgently summoned to the patient's home by the message that "the little girl had taken an overdose of the medicine and had been in fits for two hours." On arriving at the house I found the child in a state of collapse—face flushed, lips cyanosed, swollen, and bleeding; tongue also swollen and bitten through; pulse frequent and weak; pupils dilated. There was then no rigidity of the limbs or trunk, and she was fully conscious.

The history of the case was that at 3 p.m. the father of the child had proceeded to administer the medicine to her, and, with almost criminal carelessness, had remarked that as the bottle was nearly empty she might as well finish the lot. Notwithstanding a protest from the mother, he emptied the contents of the bottle (a large dispensary one) into an egg-cup, and the child drank the whole amount. Five minutes later the mother, hearing a cry in another room, went to ascertain the cause, and found the little girl in strong convulsions. Her description of them to me was, that the back and head were arched, the teeth clenched, the arms and legs either rigid or "working," no loss of consciousness, but a complaint of great pain during the fits, during which she cried out that she was dying.

The dispensary being a considerable distance from the house, I was not sent for till two or three medical men in the immediate vicinity had been summoned, but none of them were able to attend. No real attempt at appropriate treatment was therefore started till my arrival two hours and a quarter later. The fits had continued with great severity during the whole of that time, but were then gradually subsiding.

Treatment.—Thirty grains of zinc sulphate were immediately administered in warm water, followed by strong freshly-made tea, and as no vomiting occurred, more of the drug was given a few minutes later. The fits not being severe just then, the stomach tube was also introduced and the stomach washed out with fair success. At the end of twenty minutes to half an hour, during which time the child remained free from convulsions, except for one slight attack, free vomiting set in. At the end of forty-five minutes the child, though collapsed, appeared to be much improved. No fit, except the slight one which I witnessed, had now occurred for an hour; the pulse was slower and stronger, the breathing normal; there was no rigidity of the limbs, and the mental state was quiescent. I therefore deemed it safe to leave the patient, but returned in an hour and found her still vomiting, somewhat weak and exhausted, but otherwise out of danger. Except for a slight rise of temperature during the next thirty-six hours (99° to 100° F.) recovery was speedy, and in two days she was running about as usual. I procured the same eggcup that had been used by the father and carefully measured out with water the approximate amount which on the man's own admission he had given the child. It was

three-parts of the eggcupful. This was corroborated by the mother and by the little girl herself, who is quite intelligent and old enough for an independent opinion. It came to over eight teaspoonfuls—roughly 3*ix*. The dose she was taking at that time was *m.v. aquae ad 3j t.d.s.* The liq. strych. hydrochlor. of the *British Pharmacopoeia* contains 1 gr. in 110 minims of water; the regulation dose of the liquor being 2 to 8 minims, and of the alkaloid $\frac{1}{10}$ to $\frac{1}{5}$ gr. The child took at least 45 minims of the liquor—that is, an amount equivalent to something between $\frac{1}{2}$ and $\frac{1}{4}$ gr. of the pure drug.

REMARKS.

There are, I venture to think, one or two points of interest about this case.

First, the practically spontaneous recovery of the patient. I am inclined to think she would have survived without any treatment whatever. It was over two hours before she received any medical aid, and by that time the fits had to all intents and purposes subsided.

Secondly, the comparatively large dose of the poison—at least for a child—though the fact that she had been taking the drug regularly for over a month must certainly have produced some amount of immunity, and this probably saved her life.

Taylor, in his book on *Poisons*, says: " $\frac{1}{2}$ gr. operated as a poison on a child 2 to 3 years old, and caused death in four hours, the symptoms coming on in half an hour." He also quotes Dr. Darwin, who reported a case in which $\frac{1}{2}$ gr. killed a child aged $7\frac{1}{2}$ in half an hour. Taylor considers the fatal dose for an adult is from $\frac{1}{2}$ to 2 gr.

Dr. Husband, in his handbook, gives the fatal dose as "from $\frac{1}{2}$ to $\frac{1}{4}$ gr., but large doses have been taken, followed by recovery."

The *Encyclopaedia Medica*, in its article on poisons, puts down the fatal dose as " $\frac{1}{2}$ gr., which caused death in twenty minutes"; a little over a grain has frequently proved fatal, but recovery has taken place after 10 or even 20 gr.

The sublime contempt in which a certain section of the lay public hold the average doctor's "bottle of medicine," whether it contains a dangerous drug or not, is, I think, also a point worthy of mention.

THE CORRECT ANATOMICAL FORM OF BICYCLE PEDALS.*

By R. A. LUNDIE, M.A., B.Sc., M.B., F.R.C.S. EDIN.

MUCH thought and ingenuity have been expended in trying to adapt the bicycle *saddle* to the body which is to ride upon it. I do not know that the corresponding question with regard to bicycle *pedals* has ever been raised in this country; yet I hope to show that it also deserves to be considered.

My first interest in the subject was an acutely personal one. I had at one time suffered from corns, but by properly-adapted shoes had practically got rid of them a good many years before 1893, when I began to bicycle. Within a year or so corns began to appear in parts symmetrical on the two feet where they had never been before, and in a situation where corns are not very common, namely, at the junction of the sole with the lateral aspect of the foot opposite the fifth metatarso-phalangeal joint. They became gradually but steadily more troublesome; at their worst each of the affected areas had at least three or four eyes, and was often very painful, in walking even more than in bicycling.

Though my previous refuge—modification of the shoes—proved unavailing, it was long before I suspected any connexion between the corns and the bicycle. During 1902, however, I chanced to hear a lady remark that she had never had corns till she began to bicycle. This suggestion put me on the right track. I modified my pedals, and since September, 1902, when I began to use the improved form, the corns have gradually lessened, without any other change in my habits or footgear. Now—January, 1905—the last of the eyes is just disappearing.

Stand on the ground with the feet close together and the toes pointing forward. The transverse axis of the soles is at right angles to the line of the leg (Fig. 1). Place the feet 6 in. apart, but still parallel, and this is no longer the case; the transverse axis of the soles is in the same direction as before, but the line of the leg is inclined to it; in other words, the

foot is slightly inverted (Fig. 2). Pressure exerted through the leg is, therefore, no longer directly downwards, but downwards and slightly outwards. Now this is precisely the position of the foot (if we neglect the movement of flexion and extension at the ankle) on the ordinary bicycle-pedal at the lower part of the stroke; and at the upper part the inversion is somewhat increased. The foot is thus, when pedalling, being constantly pressed downwards and slightly outwards against the shoe.

It was this lateral component of the pressure which gave me so much trouble. How can it be eliminated?

Instead of standing on the ground, sit in a chair or lie on a couch, with the heels supported and the toes pointing upward (Fig. 1). Now separate the feet six inches as before. Being free from constraint, they retain their previous relation to the legs, the soles look a little outward, and there is no inversion (Fig. 3).

Figs. 1, 2, and 3 represent diagrammatically the positions of the feet and legs described. For the sake of clearness, the obliquity is considerably exaggerated.

Fig. 4.—Bicycle (of 1888) with pedals devised to avoid discomfort in ankles and joints of feet.

Fig. 5.—Bicycle (of 1904) with pedals devised to avoid cycling corns.

This at once suggests the proper position on the bicycle and the correct form of pedal. The tread should not be in a plane at right angles to the mesial plane of the machine, but slightly oblique, so that the outer side of the foot is a little higher than the inner (Fig. 5). On a pedal with the correct inclination the foot presses squarely and evenly, as in walking on level ground. I find accordingly that in sloping pedals the usual tabs at the outside, to prevent the feet slipping off, are quite unnecessary.

It is easy, by suitably arranging lengths of board upon the floor, to demonstrate that the position above described is more comfortable than the position on ordinary pedals, *when one is walking with the feet kept 6 inches apart*; and therefore that it should be more comfortable in bicycling.

The pedals I have described are just as easy to make as the ordinary patterns, and, if manufactured wholesale, should be just as cheap. They wear better, as there is much less slipping and grinding of the foot upon the tread. At present, however, any one who desires to try them will have to get a pair specially adapted by a mechanic. No question of loss of power can arise if the slope of the pedal is at the angle indicated. The leg necessarily occupies a position not perpendicular but somewhat oblique to the axis of the pedal;

* Demonstrated before the Edinburgh Branch of the British Medical Association.