

XXVII. *An account of the effect of Mercurial Vapours on the Crew of His Majesty's Ship Triumph, in the year 1810.* By WILLIAM BURNETT, M. D. *one of the Medical Commissioners of the Navy, formerly Physician and Inspector of Hospitals to the Mediterranean Fleet.* Communicated by MATTHEW BAILLIE, M. D. F. R. S.

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IT has long been known, that in the vacuum of the barometer, mercury rises in a vaporous state at the usual temperature of this climate, and that persons employed in the mines from whence this metal is procured, as well as those who are employed in gilding and plating, have suffered paralytic and other constitutional affections, from inhaling the air saturated with mercurial vapours: had any doubt remained of mercury existing in the state alluded to, it would be effectually removed by the experiments made by Mr. FARADAY, detailed in the twentieth number of the *Journal of Science*, &c.

An unprecedented event, which occurred in one of His Majesty's ships of the line, at Cadiz, in the year 1810, a short time before I took upon me the charge of the Medical Department of the Mediterranean Fleet, has afforded me an opportunity of illustrating this subject on a very extensive scale, the details of which may not, perhaps, be uninteresting to the Royal Society.

The Triumph, of seventy-four guns, arrived in the harbour

of Cadiz in the month of February, 1810, and in the following March a Spanish vessel, laden with quicksilver for the mines in South America, having been driven on shore in a gale of wind and wrecked under the batteries, then in possession of the French, the boats of this ship were sent to her assistance, by which means, during many successive nights, about one hundred and thirty tons of the quicksilver were saved and carried on board the *Triumph*, where the boxes containing it were principally stowed in the bread-room.

The mercury, it appears, was first confined in bladders, the bladders in small barrels, and the barrels in boxes. The heat of the weather was at this time considerable, and the bladders, having been wetted in the removal from the wreck, soon rotted, and the mercury, to the amount of several tons, was speedily diffused through the ship, mixing with the bread, and more or less with the other provisions. The effect of this accident was soon seen, by a great number of the ship's crew, as well as several of the officers, being severely affected with ptyalism, the Surgeon and Purser being amongst the first and most severely affected, by the mercury's flowing constantly into their cabins from the bread-room; their cabins being, as is usual, on the orlop deck, separated from this store by partitions of wood. In the space of three weeks from the mercury's being received on board, two hundred men were afflicted with ptyalism, ulcerations of the mouth, partial paralysis in many instances, and bowel complaints. These men were removed into transports, where those more slightly affected soon got well; but fresh cases occurring daily, Rear Admiral PICKMORE, then in command of the squadron, ordered an inspection to be made by the Surgeons

thereof, and in consequence of their report, sent the *Triumph* to Gibraltar to remove the provisions, and purify the ship by ablution, the affected men being sent to the Naval Hospital ; which order was strictly attended to ; the provisions, stores, and likewise the shingle ballast, being removed on shore.

Notwithstanding the removal of the provisions, &c. and afterwards frequent ablution, on re-stowing the hold, every man so employed, as well as those in the steward's room, were attacked with ptyalism ; and during the ship's passage, and on her return to Cadiz, the fresh attacks were daily and numerous till the 13th of June, when the *Triumph* sailed for England.

After their departure from Cadiz they experienced fresh breezes from the N. E. ; and the men being kept constantly on deck, the ship aired night and day by windsails, the lower-deck ports allowed to remain open at all times, when it could be done with safety, allowing no one to sleep on the orlop deck, and none affected with ptyalism on the lower deck, a very sensible decrease in the number daily attacked soon became apparent ; but nevertheless, many of those already affected became worse, and they were under the necessity of removing twenty seamen and the same number of marines, with two serjeants and two corporals, to a sloop of war and the transports in company. On their arrival in Cawsand Bay, near Plymouth, on the 5th of July, not one remained on the list for ptyalism.

The effects of the mercurial atmosphere was not confined to the officers and ship's company ; almost all the stock, consisting of sheep, pigs, goats, and poultry, died from it ; mice, cats, a dog, and even a canary bird, shared the same

fate, though the food of the latter was kept in a bottle closely corked up.

The Surgeon (Mr. PLOWMAN) informed me, in conversation, that he had seen mice come into the ward-room, leap up to some height, and fall dead on the deck.

The Triumph, previous to this event, had suffered considerably, by having a number of her men attacked with malignant ulcer, which at one time prevailed to a considerable extent in our ships, both at home and abroad; and in many of the men who had so suffered, the ulcers, which had long been completely healed, without even an erasure of the skin, broke out again, and soon put on a gangrenous appearance.

The vapour was very deleterious to those having any tendency to pulmonic affections: three men died of pthisis pulmonalis, who had never complained, or been in the list before they were saturated with the mercury; and one man who had suffered from pneumonia, but was perfectly cured, and another who had not had any pulmonic complaint before, were left behind at Gibraltar, labouring under confirmed pthisis. Two only out of so large a number affected died from ptyalism, gangrene having taken place in their cheeks and tongue: they had previously lost all their teeth. In the case of a woman, who was confined to bed in the cockpit with a fractured limb, not only were all the teeth lost, but many exfoliations also took place from the upper and lower jaws.

The mercury showed its effects upon the ship herself, by the decks being covered with a black powder; but quicksilver was not discovered at any time in this powder in a native or globular state, though the brass cocks of the boilers,

and the copper bolts of the ship, were covered with the metal, the last to some extent within the wood ; a gold watch, gold and silver money kept in a drawer, and likewise some of the iron-work of the ship which had been kept bright, evidently showed the influence of the prevailing atmosphere, being in some places covered with quicksilver.

In a communication with which Mr. PLOWMAN, Surgeon of the *Triumph*, has obliged me, he states, that those who messed and slept on the orlop and lower decks, with the exception of the midshipmen, suffered equally, while those on the main or upper deck were not so severely affected : the men who lived and slept under the fore-castle escaped with a slight affection of the gums. The only reasons which can be assigned for the partial escape of the midshipmen, are, that the windsails were kept always in action, and that these Gentlemen were almost constantly on deck, or were more frequently employed on service out of the ship, in proportion to their numbers, than the men.

Various opinions were entertained of the manner in which the systems of the sufferers were brought under the influence of the mercury. By some, it was supposed to have originated from the use of the bread and other provisions, with which the mercury had mixed itself ; and to such an extent was this opinion carried, that I find, by reference to official documents in the Victualling office, seven thousand nine hundred and forty pounds of biscuit were condemned as un-serviceable from having *quicksilver mixed with it*.

By others, amongst whom was Mr. PLOWMAN, the Surgeon, it was considered to have arisen from inhaling the mercurialized atmosphere ; and from the preceding details, I

think there cannot remain a doubt that this opinion was the true one.

It is well known that mercury, in its native state, has often been administered in very large doses, in cases of obstinate constipation, without producing any specific effect on the system, merely removing the affection by its specific gravity. I have, however, reason to believe, from the accounts of ORFILA, and others, that if the mercury was to be retained in the intestines for some time, and thus subjected to the action of the contents of the stomach and bowels, a part might become oxydated, and being conveyed into the system by means of the absorbents, would there show its specific effects.

But after the removal of the provisions, &c. at Gibraltar, many fresh cases occurred, and many relapses amongst those who had been cured out of the ship, took place on their return to duty on board, which effectually destroys the probability of this having been the cause of the succeeding ptyalism, and other morbid affections.

It only remains for me to offer my opinion, of the manner in which the system became saturated by the mercury, and this I conceive to have been effected by inhaling the mercurial vapours; the quicksilver being then in the most perfect state of division, was readily taken up by the absorbents of the lungs, and soon showed its influence on the system generally. This idea is very much strengthened by the effect which was produced on the animals on board, already mentioned, as well as by the circumstance of a great number of men being attacked after the ship was cleared at Gibraltar, and till she arrived in a more northern latitude.

It may be considered out of place here, to give any detail of the curative means employed, I shall therefore only briefly state that sulphur, given in large quantities internally, produced no alleviation of the symptoms ; on the contrary, it greatly augmented the bowel complaints, with which many of the men were affected, and brought on a most severe tenesmus ; consequently, it was laid aside ; applied externally, it was of no use.

The only plan which produced effectual relief was removal from the ship, with the frequent use of small doses of neutral salts and detergent gargles.

W. BURNETT.