

December 20, (about a month after his admission,) distinct fluctuation was felt at the lower part of the abdomen, the upper part remaining, as usual, tympanitic. He became more feeble and emaciated, and sunk on the 26th.

On a post-mortem examination, the stomach was found to occupy the whole of the front of the abdomen, extending down to the pubes, and entirely covering the intestines and bladder. It contained an enormous quantity of fluid resembling gruel, or arrowroot, (which articles of diet he had been in the habit of consuming,) amounting by measurement to at least seven quarts. The stomach was very pale, its walls attenuated and soft, so that, on removing it, they were torn through in several places. On opening the stomach, the mucous membrane was found to be universally pale and softened; and surrounding, and almost closing, the pyloric orifice, was a large mass of scirrhous deposit in a state of ulceration, which in parts extended to some depth. The intestines were very much contracted, and the other viscera, although of small size, were of healthy structure. No peritoneal effusion existed, the fluctuation felt during life having been entirely owing to the stomach with its fluid contents.

Does the great size which the stomach sometimes acquires in cases of obstructed pylorus, arise entirely from mere distention, or is there not in some instances, as those where its walls are not thinned, a real growth and hypertrophy of the viscus, in an attempt to procure (probably through absorption by its veins) nutrition for the body?

CASES OF NECROSIS OF THE MAXILLARY BONES, WITH EXFOLIATION,

FROM INHALING THE FUMES OF PHOSPHORUS IN A LUCIFER-MATCH MANUFACTORY.

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CASE 1.—Henry C—, aged forty-nine, residing in Mount-street, in this town, has been engaged in business as lucifer-match manufacturer for the last eight years. He informs me that he found no material injury to his health or person from the work till March, 1848, when, after suffering some degree of pain, he observed a discharge of purulent matter from his mouth, arising from the front of the upper jaw. This pain he described as being of an acute character, and which he attributed to having decayed teeth. I saw him for the first time on December 1, 1848; he then presented to my notice a large portion of his upper jaw-bone, which had become necrosed, had separated, and been thrown off by the unaided efforts of Nature; it measured in length around the arch two inches and a half, and in depth one inch; it embraced, in one piece, nearly the entire of the bodies of the two superior maxillary bones, with the alveolar cavities for the four incisors, two canine and four bicuspid teeth; it formed the floor of the nostril and anterior part of the roof of the mouth, and extended backward nearly to its junction with the palatine bones. The cavity left in the mouth by this removal of bone was considerable, but by applying frequent pressure to keep the soft palate raised, and by washing the mouth with detergent and astringent lotions, it soon healed, and left much less deformity than from the first appearance was to have been expected; no reproduction of bone to any evident extent took place. At the time of his first presenting himself to my notice, he was in a very enfeebled and highly nervous state, being thin and emaciated, and having a sallow, pasty countenance. He was put upon generous diet, and had tonic and stimulating medicines administered; strict injunctions were given to keep himself from the workshops, and to take moderate exercise in the open air daily. But although under such treatment his health improved, I soon observed that the lower jaw on the right side began to swell, attended with excruciating pain; the gums were red and inflamed, and had a spongy appearance; he complained of being constantly cold and shivering, but there were no distinct rigors; great tenderness of the jaw, which he could scarcely bear to be touched. A portion of dead bone showed itself on the inner side, and close by the second molar tooth; a loosened molar tooth was extracted, local and general antiphlogistic treatment was adopted, with the external application of fomentations, poultices, &c. He now, for some short time, took medicines of an aperient and anodyne character; but his system soon became so exceedingly nervous and irritable, that he had to resume the tonic and stimulating treatment. He was fearful of having the most trifling examination of his jaw made, and he refused

to give the least hearing to any surgical treatment. Symptoms of extreme general debility and prostration of strength soon after showed themselves, attended with profuse diarrhoea and harassing tenesmus. The symptoms noted on Jan. 11, 1849, were—Great swelling of the lower jaw, extending up the side of the face; excruciating pain up the side of the head, including the ear; numbness of the lower lip, on right side, not extending past the mesial line; breath exceedingly offensive, with a profuse discharge from the mouth of saliva, mixed with foetid matter; cannot swallow more than thickened fluids; pulse feeble; bowels relaxed; urine scanty and high-coloured; suffers but little from thirst; is highly nervous; jumped out of bed in the night, in state of delirium; hand tremulous; unable to hold a spoon with any liquid. Beef-tea, jellies, &c., were given with wine, and beside the anodyne and strengthening medicines, injections with starch and opium were administered, from which great comfort and relief were derived. Some few days after, matter formed at the base of the jaw, which was evacuated. The basis of the bone was distinctly felt necrosed, but he made a positive refusal for more being done than the insertion of a probe. His health afterwards very gradually improved, although his system continued weak and unnerved. The violent diarrhoea, tenesmus, &c., subsided, and he was enabled to take his food as usual; but the wounds continued open, discharging matter occasionally mixed with blood, which at times was very profuse.

On September 25, 1849, he again came to consult me, having had, for the two or three preceding days, much pain on the left side of the lower jaw, which was considerably swollen. The substance of the bone at its base felt materially thickened, and there was every appearance as if similar mischief had commenced in the body of the bone on this side, as existed on the opposite. His pulse was quick and feeble, and his whole system indicated great constitutional disturbance; indeed, there was every reason to believe that the poison had powerfully manifested its destructive effects on this side also, although for the last ten months he had entirely withheld from work, and but seldom entered the workshops. The portion of dead bone exposed to view within the mouth, on the right side, had much increased, being at least one inch in length. The discharge from the wounds had rather decreased in quantity.

CASE 2.—James B—, aged forty-five, superintending assistant to Mr. C—, and who has the credit of introducing the system of lucifer-match making into England. Has been engaged in this work continuously for fifteen or sixteen years; he is of a sanguineous temperament; of a full, plethoric, and gouty diathesis, and habituated to excess in drinking. He was seized with pain and swelling of the lower jaw, on the left side, in the early part of the month of July, 1849. When he first came to consult me, the swelling extended far up the side of the head. I found the bone highly inflamed and thickened, being excessively tender to the touch. Upon making a careful examination of his mouth, I found the gums looking red and spongy, and separating from the teeth, having an appearance somewhat similar to when mercury has been taken in a sufficient quantity to produce ptyalism; but the marginal ulceration was not so distinctly marked; the teeth on the side affected, loosened, including two of the incisors, the whole of which were in a fearfully neglected and encrusted state, and the breath was sadly offensive. Most of the loose teeth were removed, several being easily extracted with the finger and thumb. Antiphlogistic treatment, with purgatives and salines, were prescribed, with the external application of fomentations and poultices. He continued under my care till the latter part of the month, when he left this neighbourhood, and went to his friends in London, where he soon after placed himself under the care of Mr. Simon and Mr. Dixon, in St. Thomas's Hospital, from whom I have learnt that the bone has since become extensively diseased.

Remarks.—Cases of a similar kind to those related above have fallen under the observation of, and been published to the medical world by, Drs. Heyfelder and Dietz, of Nuremberg, and F. W. Lorindser, chief surgeon in Vienna—places where the phosphorus match manufacture is carried on extensively. In this country, Professor Taylor, in his admirable work on Poisons, has briefly referred to the subject, as also Mr. Stanley, in his recent able volume on Diseases of Bones.

The work in which the two preceding individuals were engaged being of a comparatively new character, it may be desirable to show to what extent their bodies were exposed to the poisonous vapours of phosphorus, whilst occupied in their several vocations.

The duties which each of them undertook to perform were

those of "the dipper." Phosphorus, combined with oxymuriate of potash, glue, &c., made into a paste, is placed on a metal plate, at a temperature sufficiently high to keep it liquid. Into this preparation on the heated plate is dipped the bundle of matches, ready prepared with sulphur; so that the dipper has to stand over the plate, and inhale from the abundant fumes which are eliminated. So completely are the clothes and dress of the person impregnated with the phosphorus, that at night, in the bed-room, when dark, they appear incandescent. Beside the quantity which has to be inhaled during the various dippings, (which, in Mr. C——'s factory, continues for half an hour, at three or four different times of the day,) the person has to prepare the compound for the dipping, during which process much of the phosphorous acid is given off. During the drying of the matches when made and dipped, the vapour is eliminated in considerable quantities into the same room in which the usual work is carried on. Lately, however, means have been contrived, in this factory, to prevent so great an inhalation of the poisonous fumes; and I have further suggested, what in all probability will be carried into effect, that a mask be worn over the face of the dipper, which shall have at the end a tube to pass out of the building into the open air, which mask is to be provided with valves for exhaling and inhaling, like to those attached to the chloroform inhalers.

It is evident, from the two preceding cases, that phosphorus, when imbibed into the system in a slow manner, acts as an irritant poison.

How far its action is like to that of the mineral irritant poisons—more especially mercury—is worthy of the observation of our toxicologists.

Its effect is seen early upon the gums, and their after-condition shows some similarity to those which are in a state of salivation.

Inflammation, with ulceration around the teeth, were clearly marked in the early stages; also inflammation, with thickening and induration of the maxillary bones, periosteum, &c.

It will be an interesting inquiry to make as to the mode of action of the poison—whether the phosphorous acid acts locally as an irritant, extending its inflammation from the gums &c. to the bone itself? or whether it is absorbed into the system, and received by the blood as a poison, and then produces its effect, as irritant poisons, when taken into the stomach?

There was doubtless, in each case, great constitutional disturbance, and the effect upon the nervous system was very marked. At times, C—— suffered severely from nervous twitchings of a very distressing character, extending down his legs, awakening him out of his sleep. He complained of overpowering depression of spirits, being, as he expressed himself, "quite unmanned."

No excess of mercury or arsenic had ever been taken into the system in either of the above cases. M. Dupasquier believes that this disease of the bones is not dependent upon the vapour of phosphorus, (which he considers as possessing no poisonous action,) but upon the presence of arsenic, which he believes to be used in the manufacture of lucifer matches. In this opinion, I can scarcely anticipate he will have many followers; for in each case I know of there was an absence of cardialgia, vomiting, inflammation of conjunctivæ, suffusion of the eyes, &c., symptoms which would have been present had arsenic been the poison which had slowly been received into the system.

It is most assuredly a singular circumstance that phosphorus, which holds so important a part in the structure of bone, in form of phosphate of lime, should produce such a destructive action upon bone, when received into the system in excess. Professor Taylor says, "These effects have been attributed to the respiration of the vapours of phosphorus, which are supposed, by becoming acidified, to act chemically upon the bones."

A circumstance of much importance in a medico-legal point of view may result from being acquainted with the fact, that by inhaling the vapours of phosphorus, such symptoms are made manifest; in cases of suspected poisoning by mercury, the inflammation and ulceration of the gums, with its attendant loosening of the teeth, might be looked upon as strong and convincing evidence that mercury had been administered, when in reality not a particle had been taken into the system; how important, then, may it be to satisfy the mind, prior to forming any conclusion, that the occupation of the party has not been such as to expose him to the long-continued inhalation of the fumes of phosphorus!

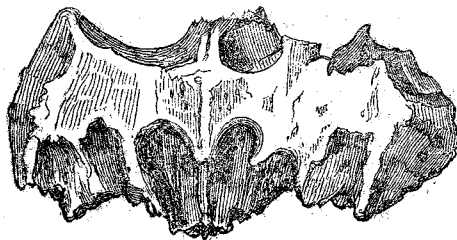
Further interest is attached, in the consideration of these cases, to know how far the combination of sulphur with the phosphorus may increase the destructive influence of the

vapour. Leopold Gmelin, the Professor of Chemistry in the University of Heidelberg, in his Hand-book, lately translated by the Cavendish Society, points out in a very extended manner the numerous combinations of sulphur with phosphorus, and shows the various compositions and decompositions which occur when they are mutually acted upon. This point I must entirely leave to the more profound knowledge of our chemists; there are, however, abundance of facts demonstrated, showing that some of the various gaseous products are extremely volatile and destructive.

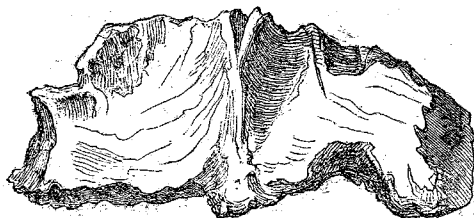
An attentive chemical inquiry may be the means of throwing some light on the rationale of the treatment which ought to be pursued in the early stages. My friend, Dr. Hutchinson, whose opinion I at all times most highly appreciate, in a note to me, says—"The more I think of the case, the more I feel inclined to believe in the importance of administering freely the muriatic acid; if in any way we are to be influenced by the effects it has upon dead bone, there is a little reason to suppose it may have some slight effect upon what appears to be the poisonous influence upon bone of an excess of phosphorus, and either circulating in the system, or locally absorbed by those bones most exposed to its influence; it may also be of service by exciting a general, beneficial, constitutional effect."

*Necrosis of portion of superior maxillary bones, (in Case 1)
Three Sketches taken at different views.*

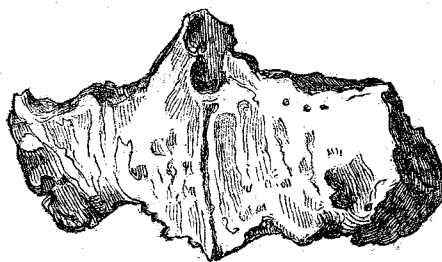
Anterior view



Floor of Nostril.



Anterior of Palate.



ESSAYS ON

PETIT'S OPERATION FOR STRANGULATED HERNIA.

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(Read before the Westminster Medical Society.)

No. IV.

HAVING in the preceding essays explained my reasons for objecting to Petit's operation for strangulated hernia, I would now inquire into the general treatment, as commonly pursued, in connexion with the usual method of opening the sac, and consider the influence likely to be exerted by such treatment over the success of the operation; but before doing so, I would briefly advert to the influence apparently exerted by the age