VII. Extract of a letter from Dr. Sam. L. Mitchill, Professor of Chemistry in Columbia College, to Mr. Tilloch

Sam.L. Mitchill

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further from each other. The blow-pipes *b, i*, also turn at *k, l*, in the tubes *f, g*, to enable the operator to alter the direction of the streams, and make them fall on the charcoal *m*, at any angle he pleases. The double blow-pipe just described was that employed in all the experiments, from the 8th to the 31st inclusive.

VII. *Extract of a Letter from Dr. SAM. L. MITCHILL, Professor of Chemistry in Columbia College, to Mr. TILLOCH.*

SIR,

New-York, Dec. 3, 1800.

..... CONSIDERING all things, I really trust that the western world is doing its part in the philosophical work of the day. We have great and excellent opportunities of observing phænomena here, and some among us are diligent to let no opportunity be lost. The following points we think fully established :

1. There is proof as pointed as it needs to be, that the sickly seasons which afflict our cities are accompanied with, and occasioned by, noxious exhalations, *locally* produced either on board sea-vessels, or in stores, cellars, dwelling-houses, and sinks, in our towns.

2. When existing in ships, these noxious productions are not received on board in the ports of the West Indies, or other places beyond sea, as is vulgarly believed, but universally are produced within the sides of the vessel itself, from nastiness and corruption there.

3. Not only are the exhalations from our *corrupting fish, beef, and hides*, and from our *abominable privy-pits*, very injurious to health, and destructive of life, but these very vapours are so *acid* as to be smelled and tasted by the repackers of provisions.

4. In the alimentary canal of such persons as feed upon beef and fish, and, generally speaking, of *lean animal substance*, there is formed a *familiar acid*, whose presence has been detected, and of a strength sufficient to curdle milk, to excoriate the fundament, and to effervesce with carbonats of alkaline salts.

5. The

5. The same *acid* product, or some modification of it, which, when volatilised and spread through the atmosphere, produces our *endemic* fevers (for our annual distempers are not *epidemics*), of the various grades from intermittent to *yellow* and *pestilential*, does, when engendered in the intestinal canal, stir up *dysentery* and its concomitant symptoms.

6. The excellency of alkaline remedies, especially the neutral salts, in which soda is combined with a weak acid, evinces the existence of an inflaming and corroding sourness, which being overcome either by alkalies *per os* or *per anum*, gives the patient great and speedy relief.

7. The application of the same mode of reasoning to *the human mouth*, which has been employed with respect to the stomach and bowels, will explain the generation and noxious effect of a *similar acid* among the teeth and around the gums, of their corrosion and destruction by it, and of the utility and importance of alkalies as dentifrices and sweeteners of the mouth.

8. An explanation is, on the same principles, given to the manner in which *human garments* grow foul and *pestilential*, the excretions lodged in them degenerating to *acidity* by exposure to the air, and thus becoming *fomites of infection*. This infection never possessing any *specific* quality, but merely being the acid offspring of common putrefaction. And on this depends the theory of *alkalies*, and *leys* and *soaps*, in destroying infection if present, or in preventing its formation, and their wholesome and purifying power in washing, scouring, and housekeeping.

9. Experiments lately made in the New-York hospital have proved to me that *foul and ill-conditioned ulcers*, especially of the *sphylitic* kind, contain an acid so considerable as in *three or four hours* to turn *litmus-paper* red. I have found *alkaline remedies* of admirable use in such surgical cases locally applied. We are thus possessed of a clue to explain much of the nature of *corroding malignant and infectious ulceration*; of the *manner of stopping it by alkalies*; and of the explanation of *bedic fever* from an absorption of this *acid virus*.

10. It is rendered plain of what materials *cities* ought to

be built and paved to be most healthy, to wit, the *calcareous*; and that a wise policy should introduce marble and limestone into general use.

II. The use of *pit-coal for fuel* has an additional recommendation. During combustion it affords much *ammoniac*; and this volatile alkali is capable of neutralising *abundance of septic acid*. Commonly, where the burning of coal is general, pestilential distempers are more rare than they use to be. But my paper fails me before I have finished my enumeration: I must therefore conclude, and leave the rest for a future communication, though not without assuring you that I remain yours, with much regard and respect,

To A. Tilloch, Esq.

SAM. L. MITCHILL.

VIII. *Extract of a Letter from Professor ABILDGAARD, Secretary to the Royal Society at Copenhagen, to C. HUZARD, Member of the French National Institute, on the Quantity of Carbon in the Blood**.

I SHALL give you the result of some experiments which I made and repeated to discover the quantity of carbon that exists in the blood, and which gave me less of that substance in the arterial than in the venous blood.

1st, A hundred parts of the venous blood of a horse, when dried in a moderate heat, gave 26 parts of a substance so dry that it could be pulverised.

2d, A hundred parts of arterial blood of the same horse gave 25 parts of dry substance.

3d, To alkalis, in the manner of Kirwan, an ounce of nitre by detonation (the ounce being 480 grains), required 192 grains of venous blood, and only 160 of arterial.

4th, An ounce of venous blood, after being dried and decomposed in a close vessel, yielded 115½ grains of charcoal.

5th, The same quantity of arterial blood gave only 87½ grains of charcoal.

6th, To decompose 480 grains of nitre, required 148 grains

* From the *Annales de Chimie*, No. 106.