

worms is merely an accompaniment, not an effect of the phenomenon; and that heat and electricity act merely like other stimuli upon the vital powers of the animal.

*Observations and Experiments on Pus.* By George Pearson, M.D. F.R.S. Read July 5, 1810. [*Phil. Trans.* 1810, p. 294.]

The author prefaces the account of his experiments and observations on the nature and properties of purulent fluids, by an etymological disquisition concerning the origin of the word *Pus*, and the various senses which philologists may discover for the word *πυος*, besides the distinct signification given to it by Hippocrates, of a thick, white, inodorous, uniformly smooth fluid, which is contained in an abscess. From the etymology, Dr. Pearson next proceeds to the history of the several opinions that have been entertained respecting the formation of purulent matters, and of the characters by which different persons have endeavoured to distinguish real pus, from such purulent fluids as ought rather to be considered as modifications of mucus. Since nothing appears to have been added since the date of Mr. Home's dissertation on pus, which was written in the year 1798, Dr. Pearson's history concludes with an outline of Mr. Home's account of the nature of pus. According to him, pus is composed of globules swimming in a transparent aqueous fluid. The globules, on which its opacity depends, are formed subsequently to the secretion of the transparent fluid. They are not soluble in cold water, like those of blood, but are decomposed by boiling water; and the fluid in which they swim is not coagulable by heat, as serum, but is coagulable by sal-ammoniac, which does not coagulate serum.

Dr. Pearson's examination of pus is divided into six sections, of which the first treats of the simple and obvious properties; and he distinguishes four different kinds of pus.

1. The cream-like and equally consistent.
2. The curdy of unequal consistence.
3. The serous, or thin kind.
4. The thick, viscid, or slimy.

Of course, as he examines, under the name of pus, fluids so different from each other, he obtains results which differ accordingly in the qualities and quantities of their ingredients.

In the second section the agency of caloric is observed.

According to the author, all kinds of pus are coagulated between 160° and 165° of Fahrenheit. By continued heat the water is evaporated, and there remains a dry brittle mass, amounting to about one seventh or one eighth of the original weight. By exposure to greater heat in a crucible of platina, the greatest part of this residuum was consumed, and there remained only the salts of the serum fused together, and amounting to  $\frac{1}{10}$ th,  $\frac{1}{100}$ th, or  $\frac{1}{1000}$ th, of the original quantity of pus employed.

These, says the author, consisted chiefly of muriate of soda, phosphate of lime, potash, with strong indication of carbonate of lime,

and a sulphate, beside traces of phosphate of magnesia, oxide of iron, and vitrifiable matter (probably silica).

The different kinds of pus are next mixed with large quantities of water, and the matter which subsides examined separately from the water. In the same manner they are next mixed with alcohol, and afterwards with acetic acid, but without any remarkable results. Dr. Pearson also made various attempts to discover a criterion by which to distinguish pus from mucus; but after trying the agency of sulphuric, nitric, and muriatic acids, he says he could by these discover no constant characteristic property of these substances by such experiments.

By alkalies also, he was not more successful; nor did the subsequent addition of acids to the solution afford criteria which could be depended upon, as has been supposed by other experimentalists. After trial of several different neutral salts, he observed the same effect from sal-ammoniac which had been noticed by Mr. Hunter, and was considered by him as coagulation: but Dr. Pearson gives it the name of inspissation, and observes, that this effect is not produced in expectorated matter by the same salt; so that this is undoubtedly a criterion, as it was supposed to be by Mr. Hunter.

From the whole of his experiments, Dr. Pearson infers that pus essentially consists of three distinct substances: first, an animal oxide in the form of fine curdy particles, not soluble in water, not coagulable into one mass by hot water; secondly, a limpid fluid, like serum of blood, and like it coagulable by heat or by alcohol; and thirdly, innumerable spherical particles, visible only by the microscope, not soluble in hot or cold water, and specifically heavier than water.

He observes also, that other extraneous matters are sometimes mixed with pus: that whenever pus is fetid, it is in the state of putrefactive fermentation; that the several ingredients in pus are products of secretion; that the varieties of purulent matter depend on the proportion of its essential ingredients; that the saline ingredients before named are dissolved in the serous fluid, and that the quantity of these is less than in an equal quantity of expectorated matter, but more than in an equal quantity of serum of blood.

That besides the consistence of pus depending upon the proportion of its essential ingredients, some difference may also arise from the mode or state of coagulation of the matter which gives the opacity.

According to the above inferences, the author conceives that a distinct and definite notion of the substance to be considered as pus is exhibited, and that it will now be readily ascertained what is and what is not pus, by a few easy experiments.

But since it is frequently disguised by the admixture of other matters, and a degree of ambiguity arises, especially in pulmonic diseases, he concludes by endeavouring to elucidate the subject, by remarks on puriform matters expectorated in different cases of pulmonary disorders.