XIV. Report made to the class of physical and mathematical sciences of the french institute on the 6th of January 1806, by M. Pinel, upon the advantageous results obtained by M. Desgenettes, from the use of fumigations of oxymuriatic acid

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white vapours. What is singular is, that the nitric acid is no longer decomposed in it, notwithstanding the quantity employed; and the fat acquires neither colour nor solidity. I shall now proceed to speak of the effects of the metals on fat.

[To be continued.]

XIV. *Report made to the Class of Physical and Mathematical Sciences of the French Institute on the 6th of January 1806, by M. PINEL, upon the advantageous Results obtained by M. DESGENETTES, from the Use of Fumigations of Oxymuriatic Acid.*

M. GUYTON and myself were directed to report to the society on the use of fumigations of oxymuriatic acid gas employed by M. Desgenettes according to the ordinary processes, and upon the results he obtained from it. These fumigations seem not only to have had an influence upon the salubrity of the air, but also in the cure of diseases.

The author of these observations remarked, at first, that the military prisons of the capital regularly furnished a number of cases of adynamic fevers to the hospitals, which frequently spread to the patients in the nearest beds, and also to the nurses; he adds, that for nearly a year past no such infections have taken place. M. Desgenettes also observed that gangrenes, being common among the wounded, were also greatly checked: the specific smell of the gangrene was not annihilated, but, according to him, it was modified by the fumigations.

Another general observation made by M. Desgenettes was, that for several years the scurvy had been very frequent; that three persons, in particular, had been affected with it in a very violent manner; and, in short, one of them had been shut up from the rest on account of the insupportable infection spread by torrents of sanious saliva. Nevertheless, by means of fumigations, this specific smell was neutralized. It seemed to be concentrated, as it were, round the patient. The nurses were then permitted to sleep near these scorbutic

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patients without any bad effects, and they attended them regularly.

M. Desgenettes does not confine himself to these general remarks; he renders the favourable effects of fumigations, according to M. Morveau's method, much more manifest, by giving monthly, for these last nine months, the respective numbers of patients admitted into the military hospital, with the addition of those patients who had been there from the first; this formed a sum total, which may be easily compared with the number of those who died during the nine months. Upon turning over the registers it appears, that out of 3617 patients, 223 died; that is to say, a sixteenth, or 0.06. This report of mortality is one of the most advantageous that could be expected in an hospital; and it is so much the more conclusive in favour of mineral fumigations, according to M. Guyton's process, that the military hospital of the capital often contains serious diseases, and is, for the most part, filled with refractory conscripts, and veterans not in garrison, who never come into the hospitals until they have suffered a great deal elsewhere.

Such are the facts related by M. Desgenettes; and they confirm more and more the advantages of mineral fumigations, already established by other numerous observations collected in the work of M. Guyton. It may be inferred that these fumigations not only act as preservatives against adynamic fevers and scurvy, but also concur in the cure of the same maladies, by destroying the baneful influence exercised upon sick persons by deleterious miasma. The use of this salutary process in hospitals ought to excite a lively interest. I shall here add some facts within my own knowledge, and which have shown, in the Hospital de la Salpetriere*, that some variations in the mode of mineral fumigations are necessary, according to local circumstances.

The distribution which I made of the lunatics, to enable me to follow out, with proper attention, my object of research, was to confine in particular apartments such of them as were attacked with other incidental maladies, as agues or

* The hospital for lunatics.

chronic diseases, intermittent or continued fevers, rheumatisms, dropsies, &c., which require a particular treatment. Some of these patients were more or less affected; and we may easily imagine the cries and confusion produced by the first trials of fumigation a year ago, when the lunatics were enveloped in clouds of vapours: but experience has shown that such fumigations as were then used retard the cure of lunatic patients. At that time I employed nitric fumigations, following the usual method of throwing successively small quantities of nitrate of potash into a little sulphuric acid, put in a glass. At other times I caused to be carried into different parts of the hall a mixture of muriate of soda and oxide of manganese in the usual proportions, pouring, by degrees, into it some drops of sulphuric acid, that slight vapours only might be formed.

Such patients as exhale a fetid smell are confined at the end of the hall, and it is there where the ordinary fumigations are used. But I think I have ascertained the source of the evil by remarking, that, in general, the lunatics attacked with adynamic fevers, scurvy, or even scorbutic gangrene, who were brought to the infirmaries, came always from certain infected places, which I resolved to discover.

The first place I examined was a small room containing fourteen beds, and in which were confined such lunatics as are of a very advanced age, or in a complete state of madness or idiotism. The most of them are constantly bed-ridden, and in such a state of stupor and imbecility that they can scarcely indicate the object of their necessities. The infection must arise from the insalubrity of the air in a place inhabited by such unfortunate persons, heated in winter by a stove, and very small besides. Whatever precautions were at any time used, this place was always very unwholesome; and it was there where adynamic fevers and scurvy were continually cherished previous to the repeated use of fumigations of oxymuriatic acid gas, which were repeated once or twice a month in summer, and oftener in winter, producing little or no inconvenience on account of the state of stupor and insensibility of lunatic patients. I then mixed fifteen decigrammes of muriate of soda with three decigrammes of

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oxide of manganese, which I distributed in two crucibles placed at a certain distance from each other, and into each of which we successively poured six decigrammes of sulphuric acid.

Another place of the hospital, where the infected state of the air required reiterated mineral fumigations, was where the cells were situated for the confinement of certain dangerous or delirious melancholic patients. Some of these are confined in strait waistcoats, others are left to themselves, as experience shows that a superfluous restraint only prolongs the duration of lunacy. Their rooms are commonly very small, their dimensions not being more than two metres in length and breadth, and three metres in height: this only forms a capacity of twelve cubic metres for each lunatic. The air not circulating in these close apartments, rendered humid by frequent washings, we may easily conceive how fetid emanations are accumulated in them, as well as from the description of patients who inhabit them, who from negligence or a propensity collect around them every kind of nastiness: it was in these unwholesome apartments that the fumigations of the oxymuriatic acid gas were most frequently practised, by filling them successively with these mineral vapours, and shutting the door and window. The infectious smell is always destroyed by this method in a sure manner; and I did not perceive any inconvenience to arise to the lunatics who were lodged in them, having previously removed the worst among them into a neighbouring cell until the vapours were dispelled.

In making use of these fumigations, there is a variety which ought to be remarked. Some of these apartments are ill paved, and the urine then remains more or less between the crevices of the pavement; this causes a very disagreeable smell of ammoniacal gas. In this case I made use of fumigations with plain muriatic gas, by simply pouring sulphuric acid upon muriate of soda: this produces a rapid decomposition of muriatic acid gas with the ammoniacal gas, and forms, without doubt, a new chemical compound which does not permit the old smell to continue. We must, however, take care to remove the patient for two or three hours, emanations fumigations nation

hours, on account of the action of the muriatic vapours upon the nostrils and the lungs.

Several things may concur to diminish the number of adynamic fevers and scurvy in an hospital ; but every thing leads us to believe, that one of the most powerful means is the use of mineral fumigations ; and that they act particularly by destroying the deleterious miasmata which communicate infection.

XV. *On the Acetic Acid and its Ether. Extracted from a Letter of M. GEHLEN to M. GUYTON*.*

Berlin, 31st Dec. 1805.

YOU are acquainted with the assertion of Scheele, that the acetic acid, without the intervention of a mineral acid, is incapable of forming ether. M. Schultze, of Kiel, has proved, by experiments, that this assertion is well founded. M. Lichtenberg and myself have repeated these experiments, and found them very exact ; but it is necessary that the acetic acid should be very pure, so that the acetates of silver and barytes may have no re-action upon it. A *minimum* of sulphurous acid is sufficient to form ether. On distilling to dryness a mixture of equal parts of acetic acid and absolute alcohol, (*i.e.* prepared according to Richter, with the melted muriate of lime,) no trace remains in the retort, and no gas is formed. On mixing the acid and the alcohol they are not sensibly heated.

I found, also, that the acidity of the acetic acid is not always in direct proportion to its specific gravity. An acid, (obtained from one part of acetate of soda, deprived of the water of crystallization by means of one part and a half of smoking concentrated sulphuric acid), crystallizing at a low temperature, which had a specific gravity of 1.055, saturated much more alkali than another acid, (distilled from the acetate of copper crystallized by 0.75 of concentrated sulphuric acid), having a specific gravity of 1.075.

* From *Annales de Chimie*, tom. lvii. p. 94.