

by numerous pearly fibres concentrically arranged. It had under the microscope an indistinctly fibrous structure, but acetic acid developed quantities of round and elongated nuclei, the latter with their long axes in the same direction. In a word, it was a most typical specimen of a fibrous tumour. The growth in the liver, on the other hand, differed from the two preceding ones, in having the properties, not of a fibrous, but of a *fibro-plastic* growth. It was about the size of a filbert, cut hard with a section of a uniform dead white, with points of translucency here and there, and devoid of any sanguineous staining. A mass of fibres was seen in the field of the microscope, and after the addition of acetic acid, a number of nuclei, some spheroidal, some fusiform and narrow. In the lungs were some irregular deposits resembling exudation-matter, consisting of a great many fibres, mostly of an elastic nature, and what appeared to be a few oat-shaped nuclei.

(11) EPITHELIAL CANCER. (Paget, Schuh.) Epithelial growths agree with the general characters of cancer in three particulars:—

1. Their infiltrating character, irrespective and destructive of the natural tissues met with in their progressive evolution.

2. Their tendency to the production of the same disease in the adjacent lymphatic glands.

3. Their tendency to recurrence after surgical operations.

Now, if of these three cancerous attributes it could be proved, that the two latter are dependent on, and mere consequences of, the first, a great step would be made in the surgery of the disease. That epithelial cancer of the tongue and lips should so constantly recur after operations, need not surprise us; indeed, any one who has dissected these tumours, and observed how marked their infiltrating nature is, would feel more surprised if they did *not* return. If, on the other hand, it can be shown that epithelial cancers of the extremities do not return when amputation is performed early (and before any trace of glandular swelling has manifested itself) above the next joint, it becomes a question, whether complete removal of the tongue and lips, although an operation of extreme severity, would not be more in accordance with the principles of surgery than any partial operation on those organs?

CASE. *Epithelial Cancer of the Foot; Amputation at the Ankle-Joint; no return of the Disease three years after the Operation.* Mary B. was 71 years of age when she was admitted into the University College Hospital for a malignant ulceration of the foot. She had hitherto always enjoyed good health: no cancer was to be traced in her parents. Many years ago she had a corn about the size of a florin, near the little toe; this she had been in the habit of soaking and cutting from time to time, when, from its size, it prevented her walking. Last January, in going up stairs, she struck her corn, and felt severe pain in it. From that time forwards it had gradually been getting into its present condition. On the outer side of the anterior half of the left foot was a malignant looking ulcer, which extended an inch and a half back on the dorsum, and three inches into the sole of the foot, and rose about half an inch above the general level of the adjacent sound skin. The surface of the ulcer was very rugged from prominent shreds of concreted discharge; and where this was absent, pale red warty excrescences came into view. The margin of the ulcers was thick and rounded. The skin around had a slight blush, but felt natural. With the exception of the little toe (which was involved in the ulceration in its posterior half), the toes of the foot were sound. The discharge had a foetid smell; she compared this at times to that "of a water-closet". It had bled several times. During the day she suffered comparatively little pain, of a "gnawing" character; but at night a most intense pain was superadded, which she described as of "a plunging nature, as if a bundle of forks were driven into the part".

She was, considering her age and sufferings, a remarkably healthy looking old woman, with a tolerable amount of flesh on her extremities, her mental faculties most per-

fect, her spirits excellent. Two days after she had been in the hospital, Mr. Marshall removed the foot at the ankle-joint.

*Anatomy of the Growth.* Its most marked character was that, by gently insinuating the handle of a scalpel, the growth could be split up into several portions: a section through its substance shewed this to depend on the columnar structure it possessed, allowing its separation into papilliform shreds. Some portions, however, consisted of a mere granular pulp of broken up structures. The general colour of the section was dead white, but the individual papillæ had a degree of opalescence. Portions of these were examined microscopically, and then found to consist of epithelium scales, similar to those of healthy cuticle; but in some fields of view multitudes of nuclei were alone seen, the outlines of the epithelium cells been concealed, when in several layers.

After a prolonged stay in the hospital, several abscesses and sinuses having formed in the course of the healing of the operation-wound, she ultimately made an excellent recovery.

August 14th, 1856. The stump continues perfectly sound, being constituted by a firm thick pad of flesh: about an inch above this there is in front a very narrow firm cicatrix. She feels "throbbing" pains in the stump, similar to those she felt formerly in the corn, before the weather changes. She walks once a week to St. Pancras Work-house and back with the aid of a stick. She told me she was seventy-four years of age the 16th of last March, and continues in excellent health.

Here we have a case of, what the German pathologists would call, the most "exquisite" epithelial cancer, which has not returned three years after amputation.

The only objection that arises is, How are we to explain away those cases, where, after removal of the primary disease, the disease returns not in its original situation, but after perhaps a considerable lapse of time in the adjacent lymphatic glands?

Yet we have two important points in support of the non-constitutional nature of the disease. 1. That these growths appear to kill by their purely local effects: involvement of vital organs, pain, discharges, and hæmorrhages. I do not remember ever having seen a cachectic state produced independent of such effects. 2. That it is extremely rare to find secondary deposits in the viscera in *post mortem* examinations of cases of epithelial cancer, of however long duration.\*

## ON FÆCAL FERMENTATION AS A SOURCE OF DISEASE.

By C. H. F. ROUTH, M.D., Physician to the St. Pancras Royal General Dispensary; Assistant-Physician to the Samaritan Hospital for Women and Children; Vice-President of the Medical Society of London; etc.

[Read before the Medical Society of London, May 17th, 1856.]

### PART III.

#### INJURIOUS INFLUENCE OF FÆCAL EMANATIONS.

In my first paper, I alluded to some of the contingent phenomena which accompany the evaporation or emanation of miasmata. I dwelt particularly on four of these: 1. A comparatively high temperature for the period of the year. 2. A light atmosphere. 3. Moisture in the air. 4. The co-existence of ammonia, always present in the decomposition of animal and vegetable matters, and in contagious diseases.

The co-existence of the first two phenomena is also insisted upon by an able writer as co-operative in coal mine explosions. I allude to the very interesting paper by Mr. Dobson of Cambridge, on the influence of revolving storms in the escape of inflammable gas in coal mines. The propinquity of these storms is always marked by a *rise in the*

\* Velpeau has seen epithelial cancer of the lip recur in the thickness of the lower jaw, in the upper jaw, and in the liver; Paget, in the lungs, in the liver, and in the heart; Rokitsansky, in the liver.

*temperature and a fall in the barometer.* These storms have generally a south-west direction, and as they pass over a country, so, under the diminished atmospheric temperature, the inflammable gas in the mines escapes. In an opposite state of atmosphere, i. e., a fall in the temperature and a rise in the barometer, explosions seldom occur. And so it is with emanations productive of disease; only that moisture and ammonia are superadded. Indeed, I think it may be stated as a law in nature, that, whereas a moderately low temperature, dry weather, and a heavy state of the atmosphere, favour the deposition towards the ground or into water of poisonous miasmata, so a warm temperature, damp weather, and a light atmosphere, favour the ascent of these as emanations. But I believe more than this, that at certain low temperatures emanations are impossible. When I made this statement in my last paper, the truth of it was called in question; yet the statement is in accordance with fact and experiment; for then the fourth condition which I spoke of, is impossible, viz., the evolution of ammonia. Neither vegetable or animal matters will decompose at a temperature below 32° Fahr., and even many degrees above that temperature. The ammonia which will not rise in vapour will be kept to the surface of the earth, even if found at all; and the same is true of watery vapour, though not to the same degree. A cubic inch of air, which at 0 Fahr. can only contain 0.856 grains of moisture, at 95° Fahr. contains 17.009 grains. The amount contained at 11° Fahr. is almost 0, while at 50° Fahr. 2.5 grains are contained. Hence the reason that in wet or damp weather the offensive vapours of a town are greatest. These odours, as I stated in my former paper, are, if smelt powerfully, conversely a sign of rain. What holds for vapour is equally true, therefore, of miasmatic emanations. This view explains readily why it is that in very cold weather, when the atmosphere is always most dense and heaviest, driest and most free from ammonia, we have precisely those circumstances present which are most unfavourable to the spread of disease arising from poisonous emanations, etc., which, experience proves, usually disappear at such periods. We may, therefore, I think, safely conclude that in proportion as the barometer is high or low, and the atmosphere dry or moist, so will miasmata remain on the ground or rise, and the diseases arising therefrom decrease or increase. But I think we may be justified in going further still, and reasoning from these antecedents, to lay down *à posteriori* this additional rule, that if a disease spreads in very cold weather, that weather being dry and the barometer high, the said disease cannot be generated by *miasmata* in solution with air, but is either contagious or propagated by poisoned water or other ingesta; and *vice versa*, that if a disease spreads in damp hottish weather, with low barometer, it is most probably generated by *miasmata*.

So true is the concurrence of dampness in the generation of many epidemic diseases, that Dr. Barton, of the United States of America, has been led therefrom to form a theory on yellow fever, which is very ably supported by Dr. Hunt, of Buffalo, in the recent number of the *Transactions of the American Medical Association*. Without the conjunction of dampness, and what he calls *terrene* causes, no epidemic can occur. These *terrene* causes are any which may give rise to miasmata, such as upheaval of soil, decaying vegetable and animal matters, filth, low stagnant recesses, etc., etc. This theory has, moreover, the advantage of reconciling facts which were before in apparent contradiction, but which now appear to be in strict accordance one with another.

My friend Dr. Snow, I believe, while he does not deny that emanations may give rise to cholera, yet believes they have been raised in the air by watery vapour, in which water they had acquired their poisonous character, having been first voided in the evacuations of affected persons. This may or may not be true, but it at any rate directs attention to *watery vapour* as a chief agent in the transmission of the poison.

Together with this watery vapour, and ammonia, there

are probably other gaseous compounds which, by their presence and quantity, influence or modify the character of the malarious poison in its action upon man. Unfortunately their precise nature has been of late but little studied specially, which is the more to be regretted, since organic chemistry has progressed so much. No doubt, like the perfumes in the atmosphere, of which we may become sensible from the sense of smell, and yet which we may be unable to detect by chemical agents, they are too subtle to be made out. Still there are particular symptoms which concomitant gases produce, which so far resemble these in their effects, that we are warranted, I think, in referring some of the results produced by contagious poisons, at least, to their concurrent action. This is especially true with regard to sulphuretted hydrogen; but carburetted hydrogen and also phosphuretted hydrogen may produce analogous effects. Of the two poisonous gases which occur in common sewers, described by Thénard, and before alluded to, the results of the first (oxygen, 14; nitrogen, 81; carbonic acid, 2; and sulphuretted hydrogen, 3) are not necessarily fatal, unless their inspiration is long continued; and the symptoms are those then of poisoning by sulphuretted hydrogen, being gradual prostration of the physical powers, giddiness, sickness, and general debility, finally emaciation and low fever; but the *post mortem* appearances are very similar to those observed in the worst forms of typhus. The second variety of gas found in common sewers (oxygen, 2; carbonic acid, 4; and nitrogen, 94; with more or less ammonia) produces its effects more suddenly, being of course quite irrespirable if it contain much carbonate of ammonia; or, if this be absent, killing by asphyxia, from the oxygen being in insufficient quantity.

A great deal is as yet unknown as to the effects of carburetted hydrogen and phosphuretted hydrogen when in a more or less diluted state in the atmosphere. That both should prove fatal if breathed singly can be readily understood, but in what manner they prove injurious when diluted with various proportions of atmospheric air, is not made out. Carburetted hydrogen breathed in small quantities has been recommended in cases of phthisis, catarrh, and hæmoptysis, though upon what theoretical grounds I cannot tell. As it is always present among the gases disengaged from swamps and stagnant waters, although in these cases mixed always with carbonic acid and nitrogen, it has been considered by some as the active agent in the production of fever from malaria. I believe this opinion is entirely without proof; but it is probable some of the effects of it might be inferred from the diseases peculiar to coal miners.

Of phosphuretted hydrogen still less is known. There are three compounds of phosphorus and hydrogen at least. The more inflammable, the phosphuretted hydrogen, which is emitted in the putrefaction of organic bodies containing phosphorus, which is the cause of the peculiar odour of decayed fish. Phosphorus we know to be a deadly poison; and if we were to reason from the analogy of arseniuretted hydrogen, we should be led to attribute very deleterious influences to any emanation containing it in admixture.

In connexion with the action of phosphuretted hydrogen, it is interesting to remark that a peculiar low fever is often said to be induced by the decomposition of fish and seaweed on the sea-shore in certain watering places at certain seasons of the year, in which emanations the phosphuretted hydrogen exists. Liebig denies that this gas is ever generated in the decomposition of animal bodies, either in disease or in the putrefaction of dead bodies; and what is more important (he adds), "the human body contains no phosphorus in such a state as to yield by any process during life or after death phosphuretted hydrogen gas." (Liebig's *Letters*, Spont. Combust.) The presence of some phosphorised vapour is however undoubted, as it exists occasionally around parts in a state of ulceration, or rapid decomposition, as in dissecting rooms when accompanied with light, or in rare cases of phthisis with luminous breath. At any rate, from Dr.

Ayre's experiments, we may infer that these gases are present in the atmosphere around putrefied faecal matters.

According to M. Pariset, however, "The immediate products of decomposition are not simply elementary bodies, as hydrogen, carbon, and nitrogen, but, on the contrary, vapours, the organised condensable molecules of which are capable of being completely disorganised by a combination of heat and moisture, drawn along by gases, aqueous vapours, currents of air and dust, dispersed without being destroyed by pure water. Desgenettes believed that, expelled by sulphuric acid, they are only neutralised by the powerful alkaline bases, lime, potass, soda, ammonia, cinders of vegetables. They are condensed, on the contrary, and not decomposed by porous bodies, among which fine sand may be classed. While they preserve their peculiar organisation they can serve as ferments, and consequently act upon living beings to disorganise them, finding in them the degree of heat and humidity which ought to destroy them; they are not destroyed and do not undergo these metamorphoses but by making the being who has received them a partaker, whose life is thus compromised, sometimes destroyed. . . . When the elevation of temperature makes the ferments evaporate, man receives them by the superficial absorbent vessels, or by those of the lungs in the act of respiration." (*British and Foreign Medical Review*, vol. xxiv, p. 249.)

The precise amount of heat required for the development of this fermentation varies probably with each disease; it may, however, be generally stated, that a very high temperature destroys it, as well as a very cold. In yellow fever, Chisholm makes the temperature from above 60 to 90, below or above which it is inert.

There can be no doubt, however, that something more is required even in the due development of these diseases, and it is probably to be found in some *electric condition*. We know, for instance, that every man possesses electricity in his organism. The skin gives positive, the mucous membranes negative electricity. The atmosphere likewise possesses one kind of electricity, while the earth possesses the opposite. Man lives thus between these two in a kind of intermediate state, in which both electricities are in equilibrium, and thus escapes injury. This is especially true in dry weather. But there are at least three causes which may interrupt his immunity—all connected with several natural processes in action.

1. *Vegetation* develops positive electricity. Now, as before seen, this kind of electricity favours decomposition. Hence, if it be abundant, as in those instances where vegetation is rank and rapid, in a moist atmosphere, then disease may be rapidly developed.

2. *Evaporation* also develops in the same way positive electricity with the same deleterious influences; the earth remaining negative. Hence usually pestilential miasmata arise with evaporation; when this is greatest, disease is most rife, as when a hot season follows heavy rains. It may be opposed to this view, that positive electricity also augments with height, and yet mountainous regions are, as a rule, healthiest; but then, the temperature is also lowered, the air more rarified, and therefore containing less oxygen in a given volume, and lastly, more agitated by winds. Hence the miasmata, being weaker and not stationary, cease to be injurious.

3. Under certain circumstances, *clouds heavily charged with electricity* approach the earth. These, by disturbing unduly the equilibrium of man's organism, prove injurious. We may explain in this manner the peculiar sensations experienced by some persons in thunderous weather. If this disturbance persist long, and especially if the air contain much moisture, so that the electricity is easily communicated to persons, then the chemic-vital relations of the body may be seriously influenced, and disease result. Mists and damps are frequently associated with typhus; and in typhus, the normal electricities of the skin and mucous membranes are reversed. It may hereafter, perhaps, be shewn that the fermentative and diseased changes of mucous membranes are connected in this disease with the

kind of electricity they have acquired. (See *Brit. and For. Medical Review*.)

We are now in a position to speak generally upon this part of our subject, reserving the individual instances where specific disease is generated for more particular inquiry when we speak in order of the individual diseases themselves. That town refuse and night soil give rise to the most fatal emanations is, I think, fully established by the researches of Mr. Grainger, Drs. Lewis and Sutherland; and yet, as Mr. Grainger informs us, many of even the educated classes believe now that they are innocuous and also curative of disease; innocuous, because many have been exposed to them, and yet have escaped disease; and curative, because the atmosphere of a cesspool is said to cure whooping-cough, and that of a cow stable consumption. So far may popular prejudice deceive even the most educated. Here are a few instances taken from the *Reports on Cholera* of the Board of Health (p. 41). Immediately opposite Christ Church workhouse, Spitalfields, belonging to Whitechapel union, and only separated from it by a narrow lane, a few feet wide, there was in 1848 a manufactory of artificial manure, in which bullock's blood and night soil were desiccated by dry heat on a kiln, or sometimes by mere exposure of the compost to sun and air, causing a most powerful stench. The workhouse contained about four hundred paupers. Whenever the works were actively carried on, particularly when the wind blew in the direction of the house, there were produced numerous cases of fever of an intractable and typhoid form; a typhoid tendency to menles, small-pox, and other infantile diseases; and for some time a most intractable and unmanageable and fatal form of aphthæ. From this cause alone twelve children died in one quarter. In Dec. 1848, when cholera had already appeared in the union, sixty of the children were seized with violent diarrhoea in the early morning. The proprietor was compelled to close his establishment, and disease ceased among the inmates. Five months afterwards, the works were recommenced. In a day or two subsequently, the wind blowing from the manufactory, a most powerful stench pervaded the workhouse. The night following, forty boys were seized with severe diarrhoea, while the girls, whose dormitories faced in another direction, escaped; and the suppression of the nuisance resulted in the disappearance of the diarrhoea, and it has not since recurred. A similar effect was observed in St. George's, Southwark, in the summer of 1847, where a similar manufactory was established, and which also gave rise to most offensive effluvia. Diarrhoea, extensive and severe in type, soon appeared, which only entirely gave way when the nuisance was suppressed.

In the Potteries of Kensington there were kept, in 1849, 3,000 pigs, and as the process of fat boiling was also extensively carried on, an area of half a mile round was tainted by foul odours. The inhabitants there lived in a state of misery and filth which is indescribable. The houses were close to a pool of stagnant water, called the Ocean, which was covered with filthy slime, and bubbled with a poisonous gas. This Ocean was fed by the drainage of the pigstyes and privies. In this place, out of 1,000 inhabitants, in ten months of 1849, 50 died; 29 of fever, and 21 of cholera, *i. e.*, a mortality of 6 per cent. per annum. Some twelve or thirteen hundred feet off, says Dr. Lewis, is situated a row of clean respectable houses, called Crafter Terrace, Lattimer Road; the situation, though low, is clear and airy. On Saturday and Sunday, the 8th and 9th Sept. 1849, the inhabitants complained of an intolerable odour, the north-east wind blowing directly upon the terrace from the Potteries. Till this time, there had been no cholera among the inhabitants of the place. The next day, the disease broke out. Indeed, wherever there are faecal emanations, it may be laid down as a rule that the place is unhealthy, and its effects debilitating to a degree. In such places, if a poisonous ferment be introduced, it will speedily develop and increase, and produce disease among those who are exposed to its action. Dr. Sutherland

gives an instance in point in the case of the Witham suburb of the town of Hull, a space of some three acres, two acres of which are used as a deposit of the night soil and other manure. The town of Hull generally gives as the average age of death in other parishes, 23; in Witham it is 18.

All who visit among the poor must admit this; and here it may be as well to answer an objection to the argument made use of by Parent-Duchatelet, in regard to the healthiness of the inhabitants who live near Montfaucon in Paris. We are all aware that Montfaucon is the great receptacle of the fæcal evacuations of Paris, and dead horses, etc., which are all brought there in carts. Now it is alleged, that if fever could be generated from such a cause, the health of the workmen employed would be very bad, and they would be very obnoxious to fever, which is contrary to the fact. Indeed, if their state of health was to be taken as a criterion of its salubrity, this trade would be one of the healthiest for workmen. These *débardeurs*, it is stated by that author, are very rarely liable to intermittent fever; and those amongst them who have it were ancient soldiers of Africa, Spain, and Russia. It is not true that they are liable to cramps. Their colics are due to bad wine. The mania with which some are affected (those of Bercy) is due to white wine mixed with perry, drunk to the extent of six litres (about seven quarts) daily. Atonic ulcers are very rare among them; the only disease to which they are liable is *grenouille*, a peculiar affection of the extremities when placed in water. Typhus is very rare in this district as compared with others. The epidemic that prevailed in 1814 stopped on April 17th of the same year, and has not since recurred, though Montfaucon still exists. Duchatelet published his work in 1836; and I have not seen any statistics to prove the comparative amount of typhus and low fevers in Montfaucon now as compared with other districts. Assuming that these statements are true, and even applicable to the present day, the exemption is to be otherwise explained. These *débardeurs* are, as compared with other Parisian workmen, *unusually well fed*. They have animal food—most Parisian workmen live exclusively on vegetables: and although this animal food is horseflesh, and therefore may be distasteful to an Englishman, it is not the less a wholesome food. Now wholesome food is as powerful a prophylactic against fever, as bad food and fatigue, and mental depression, are favourable to its development. I believe Dr. Alison looks upon such influences as directly causative of fever. Dr. Corrigan, in writing to me on this subject, says: "We have lost six or seven clinical clerks within the last three years, and in every case, I believe, from exposure while the system was in a depressed state. In one case, the student went into the wards after sitting up all night; in another, after great exhaustion from three or four hours skating, etc.; and so impressed are our old porters with this, that they constantly urge upon the young clerks not to go into the fever wards when relaxed, exhausted, or tired out; and I always warn them *against going in fasting*."

Again, whatever effects the emanations have on the spot, it is notorious that puerperal fever is frequently generated in the lying-in wards of St. Louis's Hospital, in the Faubourg St. Antoine, when the wind blows from Montfaucon. This fact I have before mentioned, in my paper on Puerperal Fever. Whether these emanations acquire in their transit through the air the amount of oxygen and moisture necessary to ferment and putrefy, I cannot say, but the fact is undeniable. The spread of contagious diseases generally through fomites and the emanations arising therefrom, if soiled, is asserted on too many sides to admit of complete denial; and the liability of washerwomen to catch the diseases of those for whom they wash is almost universally admitted, and yet remarkable instances are given to the contrary. Washerwomen, says Dr. Corrigan, certainly do not suffer from their employment; nor do the nurses or ward maids employed in changing the linen, making the beds, etc. This contradiction of facts can be reconciled by two suppositions founded on fact, that either the parties exposed to the emanations therefrom are not fit recipients,

or in great measure to the chlorine employed, but particularly the strong alkali, the soda with which they wash, which destroys the poison effectively.

[To be continued.]

## ON ARSENIC-EATING.

By W. B. KESTEVEN, Esq., F.R.C.S.

[Concluded from page 759.]

PARTICIPATING in the incredulity with which the story of the alleged arsenic-eaters has been received in this country; seeing that the effects said to be produced are utterly at variance with all previous knowledge of the action of arsenic; and finding, furthermore, that these statements have received no support in the published writings of the most distinguished foreign toxicologists; I have endeavoured to learn what additional confirmation thereof could be obtained from medical practitioners residing in Styria.

By the favour of Mr. Cousins, of Camden Town, who has himself visited Styria, I have addressed myself to Dr. Vitzthum, of Ems, and to Dr. Kaltenbrenner, of Obersdorf, Styria.

When in Styria, Mr. Cousins made inquiries respecting the arsenic-eaters, and received statements similar to those published by Von Tschudi. Some of Mr. Cousins' informants asserted that they themselves were arsenic-eaters. This passing visit, however, was obviously insufficient for testing the accuracy of these representations.

Through the kindness also of my accomplished friend, Mr. Robert Chambers, jun., of Edinburgh, I have been put in communication with the author of the articles on "Poison-Eaters", in *Chambers' Journal*.\*

To these gentlemen I addressed the following questions, and have received replies; the substance of which I now submit to the reader, accompanied with such free criticisms as the importance of the subject appears to call for:—

*Question 1.* Have you any personal knowledge of the practice of arsenic-eating and its effects?—that is to say: Have you seen individuals take arsenic in the manner alleged; and if so, in what doses?

*Question 2.* Do you know how, or where, the peasantry procure the arsenic?

*Question 3.* Have you ever analysed the so called arsenic?

*Question 4.* Have you any personal knowledge of the administration of arsenic to the lower animals?

1. The first question, to a great extent, tests the value of the information received. None, however, of my informants satisfactorily assert that they have personally witnessed the arsenic-eating, or had opportunities of ascertaining the doses taken.

Dr. Vitzthum merely says that, as long as he has been in practice (seventeen years), he has been *aware* of the existence of the practice in Styria, Salzburg, and Bohemia, by persons who have daily taken small doses, and retained their health. The case of an imperial forester is forwarded to me; but has not been witnessed by Dr. Vitzthum, having been received by him in correspondence only, although attested by a clergyman. This, it may be added, is not direct personal testimony.

Dr. Vitzthum confesses to personal knowledge of only one instance of arsenic-eating; and even this case rests solely upon the man's own assertion that he was in the habit of taking this poison. Dr. Vitzthum does not assert that he had himself watched the taking of the poison, or its effects upon the so called "eater" thereof.

Dr. Kaltenbrenner has given the following particulars of the only arsenic-eater whom he has himself known. This was an individual holding the position of an imperial dis-

\* Mr. Charles Boner, of Ratibon, author also of "Chamois Hunting in Bavaria", "Cain", etc.

† The italics are mine.