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LECTURES ON PUBLIC HYGIENE AND MEDICAL POLICE.

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LECTURE IV.

We have, in our last lecture, considered some of the principal elements that enter into the subject of topical climate as it affects the salubrity of sites for dwellings and that of towns, deduced from the general climate of the country, and the many meteoric modifications arising from gaseous and other products, with which the local atmosphere may be contaminated. We have also pointed out some of the more obvious sources of these modifying, if not noxious, influences, and stated how they may be generally avoided, and remedied where they are already present. We shall now proceed to consider some of the special sources of insalubrity, noxiousness, and discomfort, that may arise from either want of attention to cleanliness or ventilation, or from the deleteriousness, or even unpleasantness of certain manufactures, chemical, and other works, whose drainage or gaseous emanations, if not positively injurious to health and property, at least come under the denomination of nuisances.

In all towns, and even in large hamlets, the importance of right drains and sewers cannot be doubted, for on a proper construction of them the salubrity of the inhabitants greatly depends. They should always have such a fall as will carry off all impurities, and prevent any accumulation of stagnant water; and where the inclination cannot be obtained sufficiently great, moveable weirs, flush, or sluice boards, to be opened at regular times, may be erected at spots more or less distant through the course of the sewers.

We have formerly deduced a rough estimate of the animal refuse that is daily produced in such a town as Manchester, as well as of the quantity of soot and dirt that is deposited on three square miles of this town and its immediate neighbourhood, from which it may be seen how much a suitable sewerage is necessary, and how important it is to attend to its ample and proper construction, even to preserve cleanliness, and more so when the public health is considered. Notwithstanding the

quantity of excremental matter that is carried off in a fluid or semi-fluid state by drains into the intersecting rivers, or is absorbed by the subjacent sand, an immense quantity is daily transported out of the town as night-soil, to fertilize the farms and gardens for many miles round, and especially those in Cheshire, towards Altringham. The amount of this daily exportation, if it could be correctly ascertained, would be surprising. To come to some knowledge of this interesting piece of internal economy, I enquired at the keepers of the weighing machines at Cromford and Stretford new-road toll-bars, the daily number of carts containing night-soil that passed through these gates *extra urbem*. From these two sources I found that upon an average throughout the year, 187 loads pass daily, which amount to 58,240 in the year, loads, which, at two tons per load, give for the whole weight 116,480 tons, of which the gate-keepers reckoned about three-fourths to be night-soil, which will thus amount to 87,360 tons. This exportation at one side of the town, which, indeed is the one having the most traffic of this kind, is enormous; but it is not finally exported, for the greater part, if not all of it, is again re-imported, during the course of the succeeding year, under the more pleasing aspect and valuable produce of potatoes,* corn, vegetables, and fruit, which are brought in such abundance and richness from that part of Cheshire into our markets. This waste and reconstruction, this destruction and regeneration in organic nature—arguing a great compensating action and reaction in the hands of Providence, have given rise to many interesting and hopeful views of maintenance always keeping pace with any increase of population, till a density equal to that of the Chinese population, may be equalled, if it may not be exceeded.

This emptying of privies and cess-pools and the subsequent transportation of the night-soil, is a process highly unpleasant and offensive, and in several cases is attended with asphyxia or serious attacks of illness to the persons employed—arising from the poisonous gases that either accumulate in these repositories or are attached to the soil.

* As a load of human manure will produce three loads of potatoes of 240 lbs. each, so the above amount of this fertiliser will return to Manchester in the succeeding seasons 131,040 loads of potatoes.

The principal of these gases are ammonia and sulphuretted hydrogen, the last of which is the most deleterious of all the gases. According to Thenard and Dupuytren, air containing only 1-1500th of this gas kills birds in a short time, and air containing 1-800th part will soon kill a dog. Workmen ought to be aware that sulphuretted hydrogen may be quickly fatal where lights burn with perfect brilliancy, and in places where it is apt to accumulate, the air may be wholesome only a few minutes before, as well as a few minutes after, a fatal accident. Its specific gravity is to air, as 1.1815; its best test is a bit of filtering paper moistened with a solution of lead. Its smell alone should not be relied on, as putrescent animal matter exhales an odour similar to it. A very extraordinary accident happened in August, 1831, at a boarding school, near Clapham, where twenty-two boys were seized with violent sickness, of whom two died, and the whole of the fatal and morbid phenomena were attributed to a foul cesspool that had been opened, and the materials diffused over a garden adjoining to the children's play ground.

Several plans have been proposed to absorb these noxious gases attached to privies and night-soils, and so condense them among solid and fluid materials, principally with the object of destroying much offensiveness, as well as to preserve these volatile ingredients as a nutritive manure for the land. Few of these plans have as yet been put into execution. The one that has been found most efficacious in Paris, is by mixing the night-soil with calcined mud, burned turf, saw-dust, or refuse tan, and various other similar substances. A commission of health in that city found that a large barrel of faecal matter was deprived of all smell in five minutes by this process, and even putrefied entrails, the severest test by which it could be tried, yielded equally to its disinfecting influence. As the principle in this process depends on the rapid absorption by dry and porous earths and carbonized matters of gaseous exhalations, it is very probable that powdered charcoal, if it were not for its expensiveness would answer better. At any rate, if our farmers and market gardeners were to bring in their carts a little charred peat in a rough powder, or a quantity of the fresh calcined shale that is frequently burned round the mouths of our surrounding coal-pits, and mix either of them with the night-soil, much of the offensive odour and waste of valuable manure would be prevented, instead of which they use nothing but dry straw, which has no effect of this preventive kind. The chlorides of lime or soda, or chlorine water would also act as a disinfectant by decomposing the gases and fixing them.

It is an old practice with some stable-keepers to sprinkle a little common salt about the floors of the stalls, with the object of keeping down that pungent odour which prevails so much in imperfectly ventilated stables. This effect is produced by

the affinity which the chloride has for ammonia, which is produced so plentifully from the urine of horses. Chlorine water would be more effectual, and even sulphuric acid water or the muriatic acid would act very well and be economical.

To obviate some of the labour, and remove offensive accumulations from privies, they have been constructed with a drainer at the bottom, or by a tube pierced with holes and rising up through them, and in communication with the common sewers; by these means the fluid parts are carried away directly, and the more solid portions are left and can be emptied more easily and at longer intervals. In such towns as Manchester, closely surrounded by cultivated land, requiring a constant supply of manure, there is not much difficulty in having the contents of all excremental repositories regularly exported out of the precincts, without any expense or but little to the public or to individuals; but in London and Paris they have great difficulty in getting quit of such materials, the supply being much greater than the demand within the limits in which cartage by the farmers is economical or profitable. The great bulk of these matters therefore is carried into the Thames and the Seine; and notwithstanding the enormous quantities of these faecal matters that are carried in a fluid or suspended state into the latter river, Halle and Fourcroy demonstrated that the quantity of foul and dirty matter sent into the river would be so small compared to the water in it, that it would always remain unperceived, and could in no ways be injurious to health. It is also very curious and satisfactory that, notwithstanding the immense quantities of similar refuse poured into the Thames, there is no water that is eventually found purer and sweeter, when it is taken to sea in casks for the supply of ships' crews. It first undergoes a species of fermentation from the quantity of animal matter it contains, but when this natural process is finished and the lees are precipitated, it becomes limpid, soft, and almost free from any taste. It disengages, however, much foetid gas during fermentation if the cask is opened.

Great attention ought to be paid to the construction of water closets and privies in hospitals, prisons, and lunatic asylums. The best arrangement of this nature which I have seen, and especially where cells, either for lunatics or prisoners, on the separate system, are adopted, is the having a conduit soil-pipe placed nearly horizontally under and along each range of cells or ward rooms, on each story, communicating at one end by a water cistern to keep the soil-pipe always full, and to allow the water also to ascend up a little into an upright soil-pipe of about four inches diameter, placed at the bottom of the seat or commode vessel, while the other end of the horizontal conduit communicates with a cesspool or sewer, but having a sluice valve, which is to be opened daily. By this apparatus all faecal matters and urine are washed away

daily, and the pipes again filled with fresh water. Nothing can be more effectual and cleanly than this, it requires no transportation nor cleansing out; and even every lunatic may be taught to use the convenience without any danger to himself or injury to his cell, while the smallness of the upright pipe will frustrate any attempt of a prisoner to escape by this outlet.

The proper construction of drains and sewers belongs chiefly to the province of the civil engineer, though it is also worthy of the attention of the medical man, even in the most detached dwellings and inhabited localities. However noxious and offensive may be the emanations escaping from the best-constructed drains, they would be much more so, even to positive unhealthiness, if their fluid contents were allowed to spread and evaporate on the surface, either of streets, lanes, or courts. There is nothing so obviously necessary as keeping the surface as dry as possible, and to prevent any gaseous exhalations escaping upwards from the sewers, which is often perceived after a period of dry weather. The drains should always be furnished with a trap box, made either of flag-stone or of cast-iron, which will allow of all fluid matters running through, but prevent any gaseous ones re-issuing from under the drains or sewers.

To preserve house water-closets and cess-pools free from any offensive odour, and to promote the wholesomeness of the dwelling, a portion of chloride of lime may from time to time be thrown into them; it is not very expensive, and is very effectual in decomposing the sulphuretted hydrogen and fixing the ammonia, as muriate of ammonia.

The paving of streets and covering of broad-ways belong entirely to the civil engineer, but to avoid detritus and the manufacture of dust and mud, the best material for pavement, as well as for macadamizing, is the blocks and fragments of some igneous rocks, of which green-stone, trachyte, or hornblende, is the more eligible. Clay iron-stone, or iron flag, is an excellent material for macadamizing. Sand-stone is too soft for either purpose; lime-stone also soon pulverizes into a white dust or paste; and granite, though very hard, is too brittle, and easily decomposed, but it sometimes makes a better pavement. Wood seems to be now much employed, but whether during its decay in our streets any miasmatic gases will be evolved, time and observation will show.

A great deal has lately been publicly reported on the absence and imperfect drainage and sewerage of many parts of our large towns, and even hamlets, as being exclusively generative of unwholesomeness and disease. So much has been generally advanced on this subject, that one may be led to infer a focus of malaria and fever in every pool of dirty water, and every little heap of rubbish that are observed before a cottage door, or in any of the bye streets of our larger towns. I am led to think there has been a good deal of hypothetical assump-

tion on this subject. As I have formerly remarked, we require some more precise evidence than is yet offered to us to constitute these pieces of neglect and bad economy as the sole or principal causes of insalubrity and disease. If we take a circumspective view of all the circumstances of such places and their inhabitants, we shall find that destitution and dissoluteness have also much to do with the problem. For who are the inhabitants of such places? they are not operatives on good wages, nor the moral nor cleanly part of our lower population. No, from the low rents, these houses are tenanted by either paupers or those verging on this helpless condition, or by people whose intemperance or crimes have thrown them into the lowest scale of society. The neglect, wet, and filth outside the door are but a picture of what is within; squalor, poverty and uncleanness are found, sufficient of themselves to generate disease, without attributing the principal, and, with some, the sole cause of it to the supposed malaria that reigns out of doors. Epidemic fever and diseases prevail as intensely and as frequently in the loftiest stories of the houses in Edinburgh, as in the ground flats, which may be supposed to be more, or chiefly exposed to terrestrial miasmata. This more diffused view of the causes of insalubrity and disease in these localities does not, however, exonerate public bodies and owners of the properties from properly sewerage the streets, and providing receptacles for filth and refuse; though, with the habits and destitute condition of the inhabitants, they may not be able to eradicate the germs of sporadic or infectious diseases from these localities.

A due circumspection of all the concomitant causes tending to produce unhealthiness in any of these situations, ought to be adverted to and considered before we pronounce an opinion which may lead us and others away from the truth; for we may find that in correcting the neglect or abuse to which we attributed the evil, the health of the place is not improved, and so we may be obliged to shift our ground of accusation, which would not be creditable to medical philosophy. Some have had a wonderful scent in finding out, even around cottages in the country, little foci of supposed disease. In all these cases the greatest circumspection should be used, before medical men commit themselves to any professed report; for notwithstanding the suspicious appearances of some immediate and proximate conditions of the locality, it may be found that the true cause of insalubrity or disease may be derived from more distant sources, as malaria is known to be carried a considerable way from where it is produced. The causes may even be altogether of a moral nature.

To obviate all doubtful or suspected causes of insalubrity, it should be a municipal regulation, that every street should be laid out in straight lines, and as much in the direction of the prevailing winds as possible; they should

be early paved with proper materials, having drains with trap-valves as before mentioned, and with the main sewers large and having every possible fall. The chief object in towns is the construction and regulation of the privies and refuse pits. They are the ordinary sources of much discomfort and unhealthiness, from the neglected and shamefully imperfect manner in which these things are provided for in bye streets and courts in all our large towns. These receptacles are often placed in close proximity to the back windows of the dwelling-house, or opposite the front entrance of inferior cottages, and often there is only one such place to serve for a full row of houses. It must, however, be remarked, that in many newly-constructed cottages and streets for the working classes both in this town and other places, there has been much improvement in these particulars; and we may suppose, from the diminished prevalence of fevers and other epidemics of a miasmatic nature in our large towns, that increased health and longevity will be still more promoted.

Little attention has, as yet, been paid in this country to the medical police of repositories for the dead. Burials in churchyards, in the midst of a crowded population, and even within churches, is still suffered to disgrace many of our cities and towns. The French have set a good example in their *Pere la Chaise*, and the Turks have long been noted for the decent propriety and judicious position of their cemeteries, which are always beyond their towns. The same is the practice among the Chinese and also of many nations whom we call barbarous. It appears strange, that among Christians, the most civilized part of the human race, this revolting and unwholesome practice should almost exclusively have prevailed. Whether this is owing to their greater and more confirmed belief of the resurrection of the body, or that it was formerly promoted by the craft of the priesthood for saying masses over the dead under their feet, I know not.

A better system, however, is commencing among us, and we need only advert to the new cemeteries at Glasgow, Liverpool, and in this place, as showing the growing feelings and convictions of the public on this subject. The late enquiry and report of a Committee of Parliament on interments in large towns have also awakened the public mind to a better economy, and a more enlightened hygiene on this matter. It is difficult in every case to determine the exact amount, if any, of the injurious effects on health that result from living near or in the immediate vicinity of burial grounds, so much exaggeration is often made use of; but where there are any exhalations ascertained to arise from such places, we may infer upon sound theory, that they must have a positively noxious effect. There are two many well-attested facts in history to prove the rapidly fatal nature of exhalations arising from decaying corpses, without

mentioning the number of victims which fell a sacrifice to opening the *Tombs des Innocents* at Paris, in 1789. To prevent much of the dangers that may probably arise from burying grounds, they should be placed outside of towns, and at a distance from springs and rivers that are subject to overflow. They should have an extent of ground, at least, in this country, ten times the space that would serve for one year's interments, since it will take this period of ten years for a body to be consumed at about five feet depth. The graves should have a depth of about four to five feet. This is the Bishop of London's opinion. Dr. Copland says six to seven feet; in France they are from five feet to six and a half, all according to age. If they are deeper, the decomposition is retarded from the total exclusion of the air and heat; and if at a less depth, they would allow the exhalations from the corpses to permeate the earth easily, and thus infect the atmosphere. Cemeteries should also be placed in elevated situations, gently inclined and to the north of towns; they should be removed from the contiguity of all dwelling houses; trees and shrubs should be planted in clumps, rather than in rows, over their areas, and sufficiently dispersed that they may not prevent a due circulation of air, and receive at the same time the open sunshine for the elaboration of oxygen. The walls round a cemetery should not be above six feet high, in order that the air may have a free sweep over its surface, and so prevent any accumulation of foetid gases.

While we are upon putrid exhalations from animal decomposition, as subjects of medical police, we may also notice shortly the emanations which vitiate the air from butchers' shambles and from dissection-rooms. It appears that the exhalations from fresh blood and recently-killed meat, contribute greatly to give butchers that florid complexion and high colour to all their tissues which they generally possess. These exhalations have nothing insalubrious, as long as they arise not from decomposition of the tissues. It is otherwise when putrefaction has commenced; for butchers, when they have neglected to wash out their killing shambles, and allowed the blood and other animal debris to become putrid from a high atmospheric temperature, have been seized with inflammations of the viscera, accompanied with carbuncle, anthrax, and malignant pustule. Students of anatomy are exposed to analogous accidents; and very fatal miasmata have at times escaped on the dissection of bodies far advanced in putrefaction. These noxious emanations have for their base carburetted hydrogen, with which there are generally united, sulphuretted and phosphuretted hydrogen, combined with aqueous vapour, ammonia, carbonic acid, and some animal matters. Their deleterious effects may be greatly, if not wholly prevented, by washing the dissecting rooms out every day with plenty of water, by removing every useless cadaverous debris each evening, and by keeping the macerating vessels

in an open place. The disinfectants, as the chlorides of lime and soda, may also be repeatedly employed, besides having the bodies at first injected with some of our improved antiseptics, as the pyroligneous acid, solutions of creosote, or of arsenic itself.

It has also been proposed to have a wide inverted funnel made of wax cloth, distended by hoops, and suspended at a certain height over the dead subject. The upper end, being attached to a pipe in connection with a chimney-draught, in which is a fire, will carry off by suction all the cadaverous exhalations from the corpse and surrounding table. The only objection to this mode, is the draught that would be kept up, which would be very unpleasant if not baneful to the dissector. It is highly necessary to pay every attention to this subject, not only to encourage the practice of practical anatomy and the spread of science, but to divest the public of that natural horror they feel about such highly useful occupations.

The erection of hospitals is intimately connected with the subject of medical police. Each sort of hospital ought to be placed according to the nature and species of diseases or ailments that are intended to be treated. While those devoted to surgical cases and to sporadic, non-contagious diseases may be placed in the most airy situations in the centre of large towns, that they may be as convenient as possible, for all accidents and sudden seizures that may arise in the midst of a dense population, those intended to admit contagious diseases and idiopathic fevers should be situated in the open and rather elevated outskirts of the town. It is also of essential importance that hospitals for lunatics be placed in the country, and at some distance from the public roads, where the inmates may be exposed to as little adventitious excitement as possible. Every means should be taken not to allow any crowding in an hospital. A ward 78 feet long, 24 wide, and 14 in height, should not contain more than 18, or at most 20 patients. The wards should be provided with proper modes and apparatus for ventilation, so that they may be kept at any requisite temperature; and this is easily managed by Silvester's method, or by Dr. Reid's mode of a hot-air generator, and a suction shaft communicating with each ward. A very good and economical plan, is by causing the cool fresh air from without to pass through an iron pipe behind the fire-place before entering the ward, the heated air escaping by ventilators at the tops of the windows or at the ceilings.

The windows should be carried up near the ceilings, and be long and lofty rather than wide, so that the light may be thrown on the floors, and the heated air be allowed fully to escape from the lowering of the upper sashes. If the wards are lighted on one side, there should be galleries on the other, for exercise and exposure to the open air to convalescents. If they are lighted on both sides, or are

double wards, a gallery should be on the side opposite to the south or south-west. In tropical countries these galleries are erected to the north-east or east. There should be a water-closet and a bath provided for each set of wards on the same floor, and they should be kept sedulously clean, and the chlorides frequently thrown into the vessel of the former, when fever, contagious exanthemata, or dysentery prevail. The bedsteads should always be of iron, as less fit to harbour vermin, and clean dried straw or chaff is better than flock to fill the bed-ticks. Convalescent wards are very necessary pieces of arrangement, and principally tend to remove the renovating mind as well as body from the melancholy association of disease and death, and the keeping up the *morale* at this hopeful period is of great service for complete recovery. This piece of economy obviates many errors and tricks about diet and drink, that often take place between those who have no appetite and those who have often too much. In cleansing the floors, which in this country should be of wood, dry-rubbing with sand-stones in damp or winter weather is expedient, except where hot water can be used effectually and quickly dried up, which is the cleaner practice.

The state of our prisons is much improved since the days of Howard. The principal improvements are in our county prisons, in many of which much attention is paid to preserving the health of prisoners by clean rooms, commodious airing-grounds, and a humane regard to their diet, and the cleanliness of their persons. As a model of all these economical and other matters, the prison at Pentonville is set forth as nearly a *ne-plus-ultra*. As far as lodging and diet are concerned, there is no room for much improvement in most of our English jails, and this humane attention is rewarded by the disappearance of jail fever. Scurvy and affections of the mucous coat of the bowels do, however, make their epidemic appearance in some of our prisons, such as in the Penitentiary, at Millbank, in 1823, and at unfrequent times in some other of our prisons since that period. These diseases and morbid affections appear not to result so much from a low diet as from a monotonous one, affording not that variety, even in the simplest article of green vegetables and roots, which the poorest at large contrive to pick up. Another great concomitant cause of these bodily ailments, is the want of occupation and exercise in the open air, so essential to the health of all but those of old age to make the best of diet nutritious. Where the diet is unstimulating and uniform, it fails to excite the functions of digestion, when there is no exercise or exposure to the open air, but accompanied with these non-naturals, very spare diet will not only support life, but keep up muscular vigour, as in the Irish and Highlanders.

Much has been advanced lately by the followers of Liebig, respecting the comparative amount of

nutritive matter in different kinds of animal and vegetable food, and which has led to the belief that the article which contains the most of that supposed prototype of nutrition, called *protéine*,* would be solely of itself the most nourishing. Among the vegetable class, it is found that peas, lentils, and beans, contain a very great proportion of this *protéine*, and therefore might appear equal, if not superior, in nutritive qualities, to many articles even of an animal nature. But the practical dietetic question is not what contains the greatest amount of nutrition, chemically considered, but what is found by experience most fitted and salubrious for men in the several circumstances in which they are placed. From not considering all the non-naturals, scurvy has appeared in some prisons where the dietary has been fair, as in the Lincoln City-gaol and House of Correction, where boiled beef four times a week, twice fresh and twice salt, with bread and farinaceous vegetables were given, and on the other days, broth thickened with oatmeal was distributed. In other prisons, again, no scurvy has appeared under a diet of twenty-four ounces of bread daily, together with a pound of potatoes and four ounces of oatmeal, as in the Monmouth county gaol, by last public report.

To obviate any danger of diseases of debility arising from a low diet, and to deprive the magistracy of all discretion in this respect, Government has lately, with a kind and liberal hand, laid down a general table of diet for all prisoners, which is sufficient for the benevolent objects they have in view, however little it may operate in the wished-for object of repressing crime.

A chief and primary object in the erection of prisons and workhouses, is their site; no attention and judgment should be neglected to have them erected in the most salubrious situations possible, as a due and strict regard to this step will afterwards compensate for many errors or deficiencies in diet and discipline that may temporarily or unwittingly take place. The great object, and it is one of great difficulty to the authorities, is so to regulate the diet of workhouses and prisons, that it shall not be so ample and generous, as to be a sort of bounty on crime or idleness, or above what an honest labourer is able to procure out of doors from his daily wages, nor yet be so low and meagre, and innutritious, as to run the obvious risk of bringing on debility and asthenic diseases, for the law only condemns to confinement, not to starvation. We, as medical men, may occasionally be called upon to give our opinion on these matters, especially when any ailments are alleged to arise from a want of sufficient food. It behoves us, then, to take a very circumspect view of the whole circumstances, and not yield too hastily to our benevolence. The

site, atmosphere and water should be examined as well as the diet, and even the prevailing *morale* of the place. We ought to compare the affections or diseases complained of with the amount and nature of the diet, to see if there be any physiological connection, and in deciding on an amelioration of diet we ought also to consider how much more, or what change will have the nearest and most economical effect in accomplishing the object that is in view.

We shall, in next lecture, enter upon the subject of employments, as they severally affect the health of individuals and the duration of life.

ON THE TREATMENT OF DROPSY WITH CROTON OIL.

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[FOR THE PROVINCIAL MEDICAL AND SURGICAL JOURNAL.]

The great diversity of the forms in which dropsical effusions are met with, and the variety of causes on which they may depend, must abundantly demonstrate the irrationality of extolling any particular plan of treatment, as possessing universal efficiency or as being of similar applicability. My sole object in now addressing my professional brethren is to communicate to them results, which have in the cases hereinafter to be mentioned, most agreeably surprised myself and those who have had the opportunity of witnessing them. Should a further trial in the hands of others prove equally satisfactory, it will to me be a high source of satisfaction, more especially, as with a very few exceptions, I have never known the operation of paracentesis ultimately successful; but on the contrary, have looked upon the operation, however efficacious in relieving suffering it may sometimes prove, as neither more nor less than the death-warrant of the patient.

Few as the cases are in number on which the following remarks rest, their character being all dependant on, or complicated with organic disease of important organs, seems to add to the value of the remedy, as from such complication the cases were necessarily of the least favourable nature for the trial of any medicine. To this circumstance must be ascribed my anxiety to have the remedy fairly tested by those whose opportunities may be more extensive than my own. I will now, as concisely as possible give an outline of the cases in which this medicine has been employed by me, and the results by which its exhibition has been followed; and this shall be done in the plainest possible manner, from the conviction that the most certain of all means of improving our knowledge is the simple and unvarnished record of facts by men possessing the opportunity of observation.

The first case in which I used the croton oil was that of a young woman, twenty-five years of age, who had suffered from ascites of between five and six years standing, and for the relief of which, in consequence of the enormous distension, the operation of paracentesis

* *Proteine* is composed of carbon 48, hydrogen 36, nitrogen 6, oxygen 14, and contains neither sulphur nor phosphorus, which caseine, albumen and fibrine are always found to do, besides the basic element of *proteine*.