

**Observations on London milk : showing its unhealthy character, and poisonous adulterations : with remarks on the food of the cows, their pestilential places of confinement, with suggestions for remedying the evil / by H. Hodson Rugg.**

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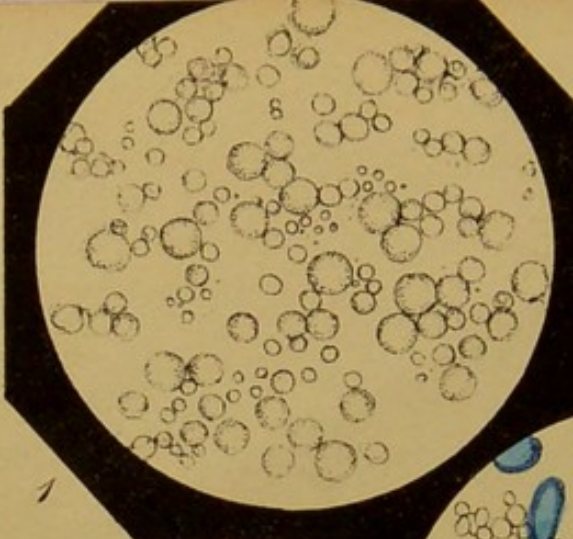
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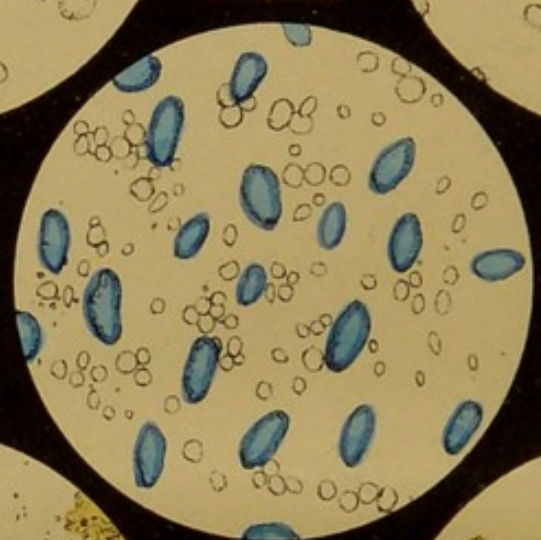
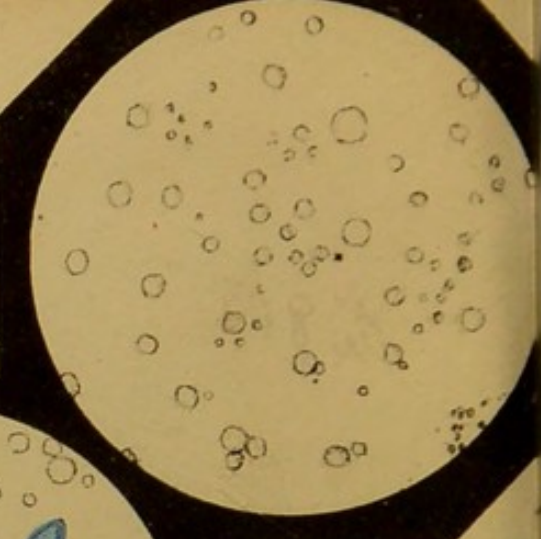


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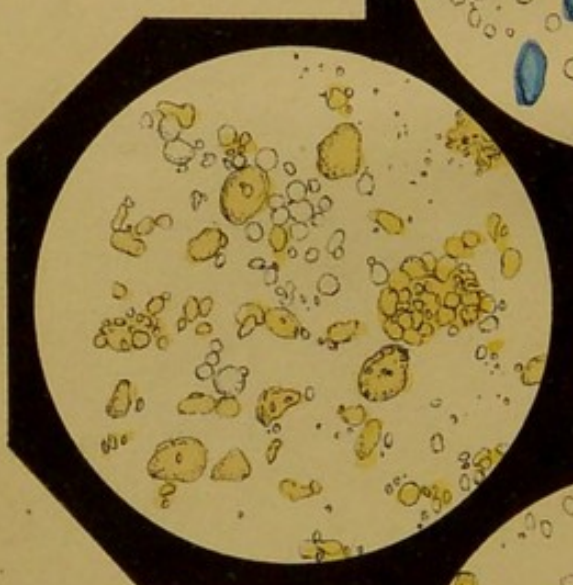




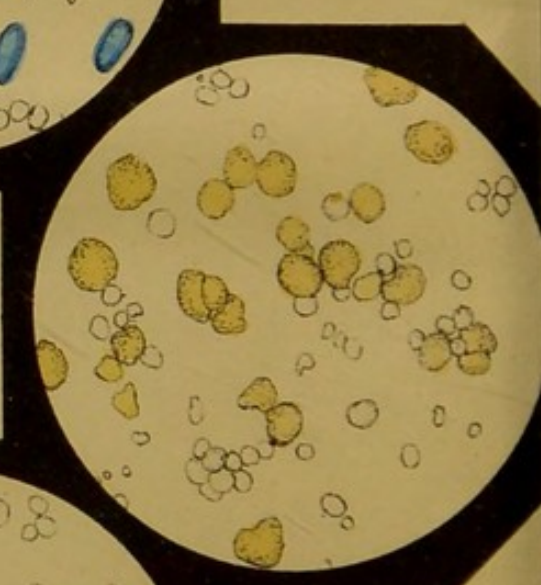
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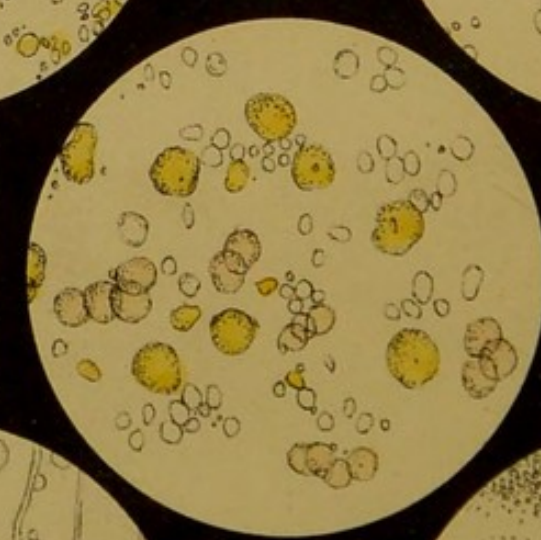
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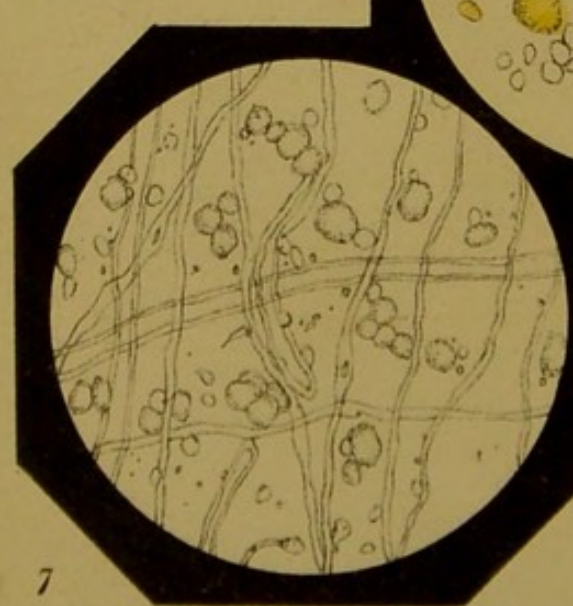
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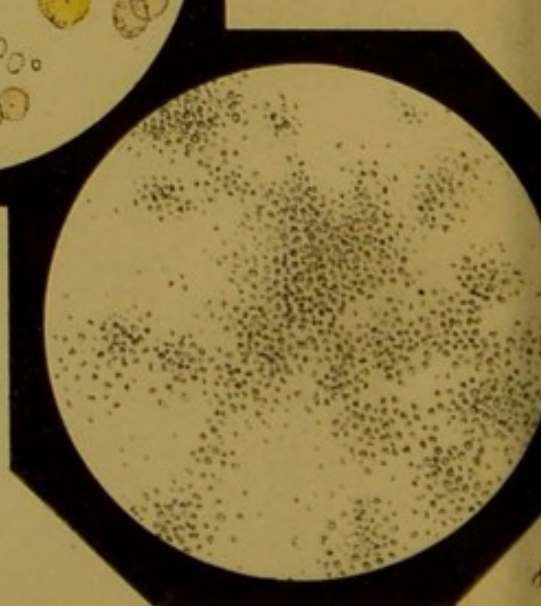
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OBSERVATIONS

ON

# LONDON MILK,

SHOWING ITS

UNHEALTHY CHARACTER,

AND

POISONOUS ADULTERATIONS;

WITH REMARKS ON THE FOOD OF THE COWS,

THEIR

PESTILENTIAL PLACES OF CONFINEMENT;

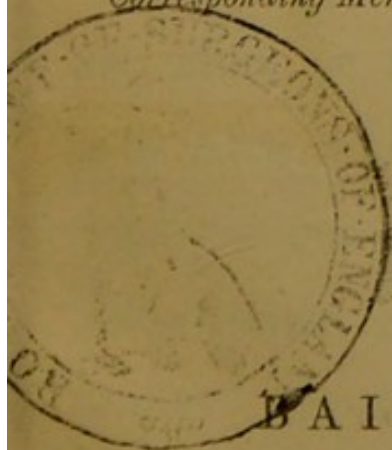
WITH

SUGGESTIONS FOR REMEDYING THE EVIL.

BY

H. HODSON RUGG, M.R.C.S.,

*Corresponding Member of the National Vaccine Establishment, &c.*



LONDON:

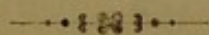
PRESENTED  
by the  
AUTHOR.

BAILEY AND MOON,

12, REGENT STREET.



## P R E F A C E.



SOME apology may perhaps appear necessary in bringing before the public, in the shape of a Pamphlet, the condition of the London Milk, it being so generally known that it is adulterated; but that adulteration is thought to consist merely of a large addition of water. Were such the case, it would indeed be presumption to write one word on a subject of which all are more or less cognizant. Unfortunately, it is little known of what nature nor to what extent this adulteration is carried. The author desires no more than an attentive perusal of these pages, for the abominable system now carried on needs but

## PREFACE.

to be known to be abolished ; and let those who doubt his statements—and he will indeed be surprised if they are not doubted—but which are founded on patient investigation at the expense of much time and trouble, inquire for themselves ; but he imagines that the overwhelming proofs which will be found herein in corroboration of his assertions on such high and undoubted authority will be sufficient to convince the most sceptical, that it is high time that some means be devised to put a stop to the nefarious practices now allowed to be carried on without either check or limit.

# OBSERVATIONS

## ON

### LONDON MILK, ETC.

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OF all animal productions, milk appears to be that which was intended by nature should constitute to man in general, and children in particular, an agreeable and nutritious food ; as it contains all the elements of animal and vegetable life most beautifully balanced and arranged. It is thus a most perfect diet. Nothing is wanting to it—it contains curd or casein, which is necessary for the development and formation of muscle—butter for the production of an adequate supply of fat—sugar to feed the respiration, and thereby add warmth to the body—the phosphates of lime and magnesia, the peroxide of iron, the chlorides of potassium, and soda with the free soda required to give solidity and strength to the bones—together with the saline particles so essentially necessary for other parts of the body. It also contains lactic acid, or the acid of milk, which chemists inform us is the true acid of the gastric juice, so requisite for the proper dissolving and assimilating our food in the stomach. It is

therefore obvious that milk should be chemically correct in all its constituents, and that its beneficial effects on the constitution should not be neutralised by adulteration; it is, as Dr. Prout properly states, "the true type of all food." How necessary, therefore, is it that it should be pure; otherwise this wonderful and wise provision of Providence will be a curse rather than a blessing.

Is it possible for the London milk to be such as it ought, being drawn from cows confined in ill-constructed, ill-ventilated, and improperly drained places—their milk at the same time being formed by such unnatural and improper food as distillers' wash, and distillers and brewers' grains.

The first and chief object of food is to produce blood, and it is most necessary that this should be of a healthy nature, otherwise it is morally impossible for the cows to be healthy or their milk good and wholesome; therefore, their food should contain all the proper ingredients for the formation of good blood, the milk being distilled (if I may be allowed the term) from the blood. Dr. Thompson states that "the nature of milk and blood are parallel, and that to make good milk is obviously producing a similar effect to that of producing good blood, and consequently, contributing to build up the body of animals in a healthy and substantial manner. Again, as the

blood of cows is identical in composition with that of the human species, it is obvious that the diet of one class of animals must possess a similar composition to that of the other.”\*

Milk as an article of agricultural husbandry should be considered a proper one for manufacturing in a wholesome state on scientific principles, by a properly defined and systematic way of feeding, consistent with the health of the animals, and the quantity, quality, and richness of the milk produced. In some few instances this has been done, but it would appear, more by amateurs than by farmers, or those whose occupations should have led them to do so, and to have furnished the result of their experiments to the world, and the basis on which they would recommend all those who kept cows to act. For it is impossible for cows to be healthy or their milk good unless their blood is produced in a state of integrity and health, it being so identically allied in composition to that of milk which as before-mentioned contains all the principles required for human food, and is the only article by which nature has supplied us with such a happy combination of materials for our sustenance, so intimately blended together. How especially requisite milk is

\* Thompson's Experimental Researches on the Food of Animals, p. 40.

for children, and for the invalid, and how necessary that it should be pure, for if milk be partaken which has been drawn from diseased cows or that has been adulterated, it is in turn taken up in the system of those who drink it, and many diseases might be traced as having been sown in the first instance from this cause. When one reflects on the many benefits these useful animals were created to confer on mankind, the more one becomes disgusted with the way they are housed and fed, particularly in London.

There cannot be, one would imagine, a more national object of its kind than to place a free and unadulterated supply of milk, with all its inestimable blessings, within the reach and power of the inhabitants to procure.\* What a luxurious comfort it would be to invalids?—what happiness a mother would feel in being satisfied that she was giving her children a pure, natural, and wholesome food? what a satisfaction it would be to the medical man to know that he could recommend with safety to his patients this most useful diet in a state of natural purity.

I will now endeavour to convey to my readers a *slight* insight into the London cow-sheds, with an account of the diseases of the cows. I say slight,

\* Vide Quarterly Review for March, 1849.

because I feel that anything that I may say must fall far short of what actual inspection would give an idea: they require to be entered and examined; and I will venture to say that not one individual who should do so, but what would be satisfied that they are not proper places in which animals should be kept that are destined to supply one of the most essentially requisite necessities of life to the great human family. They are pest-houses of the most abominable nature; the stench arising from the filth, muck, and mire, contained therein, is almost insufferable.

Any place, any hovel, cowkeepers seem to imagine will do for a cow; narrow lanes, confined corners, &c.: and yet they wonder how it is that they lose so many from disease. Can any one with a grain of common sense at all wonder that they should be afflicted with disease, when they are huddled together in a space that does not allow them sufficient breathing-room, with their heads placed close up to the wall, and from there not being a sufficient current of air or ventilation, the carbonic acid gas expired from their lungs is, before it can rise, a greater part inhaled again, unmixed with a sufficiency of pure air so necessary for the oxydation of the blood and consequent vitality of the body. The late Mr. Harley, of Glasgow, who kept 300 cows, states

that "in close, ill-ventilated cow-houses, the cattle will often be found in a profuse perspiration, which is brought on solely by their inhaling a vitiated atmosphere, deficient in vital air (oxygen gas). This necessarily exhausts their vigour and makes them liable to be injured from cold, and when they are milked in these dirty hovels the milk is always impregnated with foul air; thus the necessity of proper ventilation, and no stagnant water should be allowed to remain on the premises."\* Really, this is a question which the Society for the Prevention of Cruelty to Animals ought to take up, as well as the various sanitary associations. Talk of the Smithfield Market nuisance and its effects upon health,—why it is an evil of very small dimensions indeed, compared to this all-important and so self-evident a nuisance: which is not confined once or twice a week like that of the Market to a particular spot, but is universal,—is daily diffused throughout the whole of the metropolis, sending forth all its multifarious poisons to the great injury of the health of those who reside in their immediate locality. One illustration as reported in the "Health of Towns Magazine," by Dr. Hector Gavin, will serve as a specimen of an evil of every-day occurrence:—

\* Harleian Dairy System, p. 14.

“ J. K., aged 29, who had previously resided in the Hackney Road, close by the Victoria Park, where he had enjoyed good health, removed to No. 1, Palestine Place, at the corner and top of Bethnal Green Road, when he immediately became ill, and in a few weeks after a violent attack of fever killed him in a few days. As it was impossible he could have imbibed the contagion elsewhere than at home, an inspection of the surrounding premises took place in order to discover the cause of the malignancy of his disease. This was at first difficult, inasmuch as the entrance to the neighbouring yard, called *Paradise Dairy*, was generally kept closed against inspection.

“ The gate, however, being left open I found an extensive cow-yard immediately at the back of the premises where my friend was dying. Twenty cows and sixteen swine were usually kept there; the place was very filthy, and the odour given off most offensive. Close to the wall which separated the premises was a hollow with raised sides, filled, or rather heaped up, with filth and refuse from the surface of the yard and the excrements of the animals; these were allowed to accumulate till a sufficient quantity had been amassed to be carted away.

“ There was no difficulty in accounting for the

cause of the fatal illness of this young man, who had no knowledge of the existence of such a foul nuisance near his dwelling.”

If it has the effect thus represented by Dr. Gavin, of which there cannot be a shadow of doubt, how much more poisonous must it be to the poor animals confined within the narrow limits of their unhealthy sheds, where two large cows are only allowed six feet in width and scarcely a corresponding space either in depth or height. What is the result but disease of the lungs, consumption, tuberculous deposits which run rapidly into suppuration; abscesses full of matter are formed, a portion of this matter is taken up by the blood and conveyed to the milk: and there is scarcely a drop of London milk when placed under the field of a powerful microscope, but what traces of this matter is revealed floating therein, mixed with a bloody-like corruption. Considerable attention has been paid to this subject in Paris where the milk has been found to contain a large quantity of pus or matter; this matter, as before stated, comes from the diseased cows that still give milk, though small in quantity; yet this milk is mixed with that which is somewhat more healthy, and the poisonous liquid is consumed by an unthinking and unreflecting public.

If it were in the power of man to trace the

causes of scrofula and consumption making its direful appearance in any particular case, where previously there existed no hereditary taint, it is not at all improbable that it might turn out to be from having sometime or another partaken of milk drawn from cows that were diseased, and thus to have become inoculated, as it were, with these terrible diseases. One can easily imagine, at least, that a stimulus would be given for the development of these complaints where there existed a predisposition to the disease, either by hereditary descent or other causes.

I do not by any means wish to convey to my readers the idea that every disease which afflicts a cow in the London cow-houses is consumption; but I believe the majority of them to be labouring under that fatal complaint; and my opinion is based on actual dissection in a vast number of cases, and from what I have seen of the cows in the numerous sheds that I have visited; and is materially strengthened by the result of the investigations of the Parisian Board of Health, who were ordered by the French Government to investigate the cause of so much disease amongst the cows of the French capital and the complaint they were suffering from. The Parisian Board of Health came to the conclusion that the disease was *consumption*.

With respect to the London cows, whether consumption or not, the diseases which they labour

under are mostly of a pulmonary nature, particularly inflammation of the lungs, &c., which speedily terminates in suppuration. They also suffer from induration and enlargement of the liver. Still the little milk they do give, under the circumstances, is added to the common stock, and the public consume it; and I have no hesitation in asserting this to be the forerunner and foundation of many serious diseases being implanted in the human frame. Gaubius and Portal state that many diseases which children acquire are derived through the milk of their mother or nurse.

Dr. A. Coombe, in his work on the Physiology of Digestion,\* states, "that healthy, nourishing, and digestible milk can proceed only from a healthy and well-constituted parent, and it is against nature to expect that if a mother impair her health and digestion by improper diet, impure air, or unruly passions, her offspring can be free from their effects. It is no new or uncertain doctrine that the quality of the mother's milk is affected by her own health, and that in its turn it affects the health of her nursling." Medicines are well known to medical men to affect the milk of those who are nursing, and whilst under the influence, the effect of the medicine will be shown on the child.

As a proof that milk is dangerously and even

\* Coombe's Physiology, p. 260.

suddenly affected by the parent supplying it, independent of any disease that might be present in the system, we have several instances on record where death has taken place in the infant almost immediately after the mother has given it suck during the time that she has been in an excited state from passion, fear, or from protracted grief and sorrow. As an instance, the following quotation from Dr. Von Ammon, physician to the King of Saxony, will be conclusive:—"A carpenter fell into a quarrel with a soldier billeted in his house, and was set upon by the latter with a drawn sword. The wife of the carpenter at first trembled from fear and terror, and then suddenly threw herself furiously between the combatants, wrested the sword from the soldier's hand, broke it in pieces, and threw it away. Whilst in a state of strong excitement, the mother took up her child from the cradle where it was playing in perfect health, never having had a moment's illness; she gave it the breast, and in so doing sealed its fate. In a few minutes the infant left off sucking, became restless, fainted and sank dead in its mother's arms."

Beandelocque insists that "impure air is the true and only cause of scrofula." Though this opinion is somewhat in advance of what any reasonable medical man would listen to, still it is one well-known cause.

It is known that close and confined rooms will produce consumption, scrofula, and a whole host of other diseases. Sir James Clarke states that, "with respect to those persons who inhabit close and confined rooms, where cleanliness and ventilation are neglected, a few months will suffice to produce the seeds of consumption." There is not much doubt but that scrofula is frequently produced by breathing air vitiated by repeated respiration. Dr. Duncan states "that the being confined in small pent-up places, where the atmosphere is vitiated, not by repeated respiration only (which we have seen is the chief cause of scrofula), but by the poisonous emanations which arise from their bodies, is a sufficient cause of fever." Indeed these facts are established by the concurrent testimony of every writer on the question. With such authorities I think I am not at all unwarranted in stating that the cows of London, or any other place, when confined in ill-ventilated and unclean places, are not only subjected to the chance of contracting similar diseases, but are in reality actually afflicted with them to an alarming and enormous extent. I am informed that one slaughterer in London takes annually £200 from one man for slaying diseased cows, their flesh being sold to the poor.

One might just as well think of eating the flesh of sheep that had been killed during the

time they were afflicted with the small-pox, or the more common disease of the rot, as to drink milk drawn from unhealthy cows.

A sufficient indication of the vast and paramount importance of a free ventilation to cow-houses, and the danger of over-crowding of animals that are expected to retain a healthy condition, is given by Dr. Thompson in his calculations on the amount of carbon consumed by a cow in her food; he states that if his views be correct upwards of 6lbs. of carbon are expended by a cow, daily, in the production of animal heat; and as one pound of carbon when combined with the necessary amount of oxygen to form carbonic acid gives out as much heat as would melt 104.2lbs. of ice, it is evident that the quantity of ice capable of being melted by the heat generated by one cow in a day would amount to upwards of 625lbs., or it would heat one of water 87,528°. It would consume at the same time the enormous quantity of 330,429 cubic inches of oxygen gas or  $191\frac{1}{4}$  cubic feet; and as this amounts to one-fifth of the atmospheric air, we find that one cow consuming 6lbs. of carbon for respiratory purposes, would require  $956\frac{1}{4}$  cubic feet of atmospheric air.”\*

The carbon consumed by a cow is given off

\* Thompson's Experimental Researches on the Food of Animals, p. 114.

from her food and is required for the purposes of respiration, and is retained some time in the circulation, undergoing the proper changes for the production of animal heat throughout the body, a function assuredly carried on not alone but throughout the entire capillary system of the skin. Dr. Reid states that "any ordinary air containing one per cent of carbonic-acid gas must be regarded as of a very inferior quality, very injurious, and not fit to sustain health."\*

Some years since a great number of the horses of our cavalry regiments were subject to a disease from which many died, the cause of which for a long time could not be accounted for, until that eminent veterinary surgeon, the late Professor Coleman, who had made respiratory diseases a particular study throughout a long and valuable life, was called in, and at once saw that the chief and primary cause was the want of a sufficient ventilation in the stables; he suggested the proper alterations, and the first year the decrease in the deaths of the horses paid the expense of the alterations.

The question of ventilation has, through the great agitation that has been made respecting sanitary reform, become so familiar to every one, that it would appear at first sight to be almost

\* Reid on Ventilation, p. 133.

superfluous to dwell on it for a moment ; but though many are perfectly sensible of the great benefit that accrues from a free ventilation as applied to their dwelling-houses, yet they are too apt to overlook the necessity there exists for a proper supply of pure air to insure a healthy condition of those animals that are subservient to man, and in none more so than in that docile creature, the milch cow. I have endeavoured to show how these poor animals become diseased by breathing a contaminated and vitiated atmosphere, and what those diseases more or less are, and that many diseases to which the human being is subjected are imbibed by taking milk elaborated from the blood of these diseased cows.

The morbid principle is introduced into the cow through the lungs and skin, where it comes in contact with the blood ; and to show what a vast quantity of vitiated air may be pumped into the lungs during the twenty-four hours, it is only necessary to state that the lungs may be compared to a sponge full of a vast quantity of minute holes or cells ; the number is so great that they have been calculated in man to amount to 174,000,000. These cells are furnished with a network of blood-vessels, and are of course much more numerous in cows from the larger surface of their lungs. It is therefore a matter of paramount importance that

the atmosphere, whether inhaled by man or animals, should be pure, and free from any admixture of a deleterious nature.

The air of the cow-houses is not alone vitiated by the exhalations of the lungs of the cows, but from the improper drainage of their sheds, and from the collections of all kinds of offal and filth and vegetable substances in a state of decomposition, together with pigs running about the place, or inclosed in one corner of the shed. The poisonous vapours arising from these accumulations of garbage, offal, excrementitious matter, &c., is most sickening, and engenders, as I have before stated, scrofulous disorders, fevers, consumption, &c. The seeds of these diseases are carried into the circulation of the human system by means of a diet that is viciously corrupt.

It is really astonishing that the cow-keepers do not see that the cause of their losing so many cows by disease is from those close, filthy, unventilated, damp, badly-drained, and ill-constructed sheds. They have it in some measure in their power, one would imagine, to remedy this deadly evil; but it appears they have very little regard either for the cleanliness of their sheds or their cows, though cleanliness should be the life and soul of a dairy in all its departments.

Cleanliness is most essentially necessary in the

management of a dairy, for milk, it is well known, may be more easily tainted and rendered unwholesome than any other liquid, either by contact with foreign substances, by mixture, or by impure air. Hence the propriety of cow-houses being built in airy situations.

“Milk,” says Mr. Aiton, “which is one of our most nutritive species of food, is too apt to become neglected, and many have rejected it from a belief that it was seldom obtained free from impurities. The atmosphere of a cow-house not duly ventilated, and especially in the stenching lanes of a large town, the nastiness of the cows, want of cleanliness in those who feed and milk them, and the nature of the milk itself so apt to become impregnated with foul air and every impurity, have often driven people who have a due sense of cleanliness, as well as those of delicate constitutions, who most needed that excellent restorative, from the use of it with disgust.”\*

Cowkeepers never have the skins of their beasts regularly and properly groomed, which is equally necessary with respect to their health and consequent good quality of their milk, as being well housed in properly constructed sheds. The cows would be more healthy, would yield more milk, and that of a very much better quality.

\* Aiton's Dairy Husbandry, p. 70.

It is impossible for cows to be healthy unless the insensible perspiration, as given off through the pores of the skin, goes on regularly and uninterruptedly, and this cannot be the case when they are kept in dirty cow-houses, and no care taken to remove the dirt by which these pores are obstructed. The Hon. Robert Boyle, who wrote some years since, when asses' milk was more taken than at the present time, observes, "that many of those who were in the habit of taking asses' milk could tell if their asses had been well curried or not, by the taste of the milk."\* This is very easily accounted for: the skin being one of the natural drainages of the body to carry off the poisonous matters generated therein; which is calculated in man in a state of repose to amount daily to two pints of a fluid perspiration, holding in solution most noxious and poisonous principles. Of course it is much more in a large animal like the cow. If these poisonous vapours are obstructed in their exit through the skin, they must find vent through other channels. In a milch cow one of those channels is through the milk, and being thus impregnated, the taste, as in the case of the asses' milk, becomes offensive and unwholesome.

According to the calculation of Mr. Erasmus

\* Philosophical Transactions, No. 12, p. 206.

Wilson,\* the number of perspiratory pores in the human being “is, in the palm of the hand, 3,528 to the square inch. Each of these little pores is the aperture of a little tube a quarter of an inch long; it follows that in a square inch of skin on the palm of the hand there exists a length of tube equal to 882 inches, or  $73\frac{1}{2}$  feet. To obtain an estimate of the length of the perspiratory system of the whole surface of the body, I think that 2,800 might be taken as a fair average of pores in the square inch throughout the body. Now, the number of square inches in a man of ordinary height and bulk is 2,500—the number of pores, therefore, 7,000,000, and the number of inches of perspiratory tubing 1,750,000, that is, 145,833 feet, or 48,600 yards, or nearly 28 miles.”

In giving this calculation my object has been to show what a wonderful piece of machinery is the skin, and how necessary that it should be kept in a state of health in the milch cow as well as in the human subject. Imagine 7,000,000 pores are necessary in the skin of man to carry off the poisonous vapours so obnoxious to animal life. Why should man stultify this wonderful provision of an Omniscient Power by not attending more to the health of the animals subjected to his dominion? It amounts to a crime thus to injure the health of

\* Practical Treatise on Healthy Skin, p. 42.

these animals, and through them to be the means of producing such a train of disease and suffering.

The flesh-brush or horse-hair glove, as used by those members of society who have a desire for a healthy skin, is a species of curry-combing; it is the *tria juncta in uno* of the curry-comb, dandy-brush, and wisp of straw, as used for cleaning that noble animal, the horse. If it be necessary for the horse, it must of necessity be equally so for the cow. Those who are in the habit of using the flesh-brush can duly appreciate its worth, and must be perfectly sensible of the healthy action and vigorous glow it imparts to their skin, the bracing effects it gives to mind and body, the impulse it gives to the whole capillary and perspiratory vessels of the skin, which become distended and aroused. The whole excretory apparatus is thus put into motion, the glandular organs of the body sympathise with the skin, a new stimulus is given to their functions, and the whole system experiences a kind of renovation.

Can there be a doubt, if man experiences a benefit from the grooming of his skin, that a cow would feel the same? How often one sees the cattle in the fields literally grooming themselves against a fence or tree. Is not this a lesson that should teach man to do for them that which they have not an opportunity of performing for themselves when kept in a state of confinement.

Cows, from not having that attention paid to the health of their skin, are frequently subject to diseases thereof, such as the mange, itch, &c. There is scarcely a cow-shed that one enters but that some of the beasts will be found afflicted with the mange. I entered one shed under the Adelphi Arches, where forty cows were kept, and every one of them had that disease; also another shed in the same locality, where the poor beasts never saw the light of heaven from year's end to year's end, the place being entirely lighted by gas, and the only ventilation that existed was by means of a small hole, not half a foot square, knocked out of the wall that forms part of the lane leading to the half-penny steam-boats.

Considering the great importance of the skin in preserving health, how necessary that this organ in the cow should not be neglected. It is a physical evil that requires to be denounced in no measured terms, it being one of the great outlets for carrying off from the body any corruption that may have been formed and accumulated therein. It is also, by its absorbent vessels, one source of taking up oxygen into the system, which, if they are blocked up with dust and the accumulated perspiration, &c, cannot be effected. The compounds of sulphuretted and carburetted hydrogen, ammonia and its carbonates, and the hydro-sulphates, and the nitrogenised and car-

bonic acid gases, are met with in their unclean sheds from the atmosphere of these miserable animals. All of these gases are most detrimental to their health, which, if they cannot find exit through the natural channels, produce the consequences already stated; the milk becomes affected, and the cow becomes diseased with consumption, scrofula in all its varied forms, &c.

If cow-keepers had a due sense of cleanliness, not to speak of the health of their customers, they would make it a rule before each milking to have their cows' udders and teats washed, so as to remove any dirt that may have got thereon from lying in their excrementitious matter, with which I have frequently seen them completely plastered. As for their hind-quarters, it is generally so hard baked thereon that it would be almost next to an impossibility to wash it off, or remove it in any way, without injuring the skin of the animal and producing a sore.

I will now proceed to make a few remarks on their *food*, and in what manner it affects their health.

The system of feeding as adopted in London, is another material source by which the cows are injured in their health, and their milk consequently rendered unwholesome. Even though their provender should be such as is most congenial to their nature, it is, from its not being kept

in places sufficiently distinct from the sheds wherein they are confined, improper; as the breath from the cows and the pestiferous vapours, already noticed as being given off from their uncleanly sheds, is absorbed by their food, which in consequence becomes more or less fetid and putrid: therefore it should never be kept in the cow-houses or in lofts over the cows, unless indeed they are made sufficiently proof against any of these poisonous gases finding the way thereto, which cannot be, unless made perfectly air-tight; and in that case not without great expense would there be sufficient ventilation.

The most grievous evil with respect to their food is the quantities of brewers and distillers' grains and distillers' wash on which they are fed: indeed it is their staple food. Cow-keepers fancy that it produces quantity, but in this I think they are mistaken, and even though it should, it is at the expense of the health of the cow, and the quality of her milk—for it is of a very watery character, and of a most corrupt nature, as the blood from which it is secreted has been stimulated to an inflammatory and feverish condition. Mr. Harley states:—"Brewers and distillers' grains and distillers' wash makes the cattle grain-sick, as it is termed, and proves injurious to the stomach of the animal. It has been ascertained that if

cows are fed upon these grains, &c., their constitutions become quickly destroyed.”\* Again, it has long been known that at distilleries and breweries where cattle, &c., have been fed upon distillers’ wash, grains, &c., that their livers are much enlarged and hardened, and from that organ not being able duly to perform its functions they are frequently subject to the “yellows” or jaundice. And when a milch cow is so afflicted the milk is lessened, and what is yielded is of a yellowish and stringy quality, their udders becoming hardened and suppurated; the milk is changed into a fluid resembling matter, and smells most offensively. This disease of their livers is analogous to those diseases of the liver of our own species, who partake too freely of Sir John Barleycorn and the juniper-berry.

The “Veterinary Record” for April, of the present year, gives an extract from a New York paper, that so immediately bears upon the subject of distillers’ wash, &c., that it will not, I consider, be out of order to give it a place in these pages: it is headed “Milk for the People,” and states:—  
 “There exists on Long Island, near Brooklyn, several manufactories of milk, the process of which should be known; one of these dairies covers a space of 600 feet front, by 300 feet deep, carefully fenced in so as to be as private as

\* Harleian Dairy System, pp. 73, 74.

possible, the business of the people being to drink the milk, not to know how it is made, in which inclosure 400 cows are kept the whole year round. These cows are fed on the refuse slop of whisky-distillers, and it is given to them warm. Such is the fondness of cows for this vile compound, that after having fed upon it for a week or more, their appetites become so depraved that they will take no other food." *How like unto man!* "The result is, their milk-producing organs are stimulated to a wonderful degree; they yield enormously, but soon become diseased; their gums ulcerate, their teeth drop out, and their breath becomes fetid. Though thus diseased, they do not fall away in flesh; but on the contrary, puff up and bloat to an appearance of great fatness; their joints become stiff, so that they cannot with ease lie down, and rarely or never come out alive. Bad as this is, their milk is afterwards mixed with molasses, water, and whiting, and then sold to the public of New York for pure milk! It is of course very injurious to children who use it in much greater quantities than adults." The editors of the "Veterinary Record" state that the above extract reminds them of an accident that happened opposite the Veterinary College. "A boy carrying a milk-pail fell in front of the college, and on

rising seeing that the milk was running down the gutter he looked most lugubrious, and yet with a certain degree of archness as much as to say, After all a little water will replace it. Eyeing the pump in the yard askant, we said to the boy, 'Never mind, my lad, we have some chalk also.' 'Ah,' answered he, 'that's all very well, but you hav'nt got the treacle.' Till then we did not know the composition of that cerulean fluid which we had been partaking of morning and evening."

The cows are in many instances fed from the offal or sweepings of the vegetable markets or green-grocers' shops, such as decomposed cabbage leaves, turnips, carrot tops, diseased potatoes, and such vegetables as are unsaleable to the public, from the putrid fermented state that they are in. And when they are fed on turnips, mangel-wurzel, potatoes, &c., that are good, they never wash them; consequently the dirt that generally adheres to them is swallowed by the poor beasts, from the accumulation of which they frequently die. Professor Dick states, "that he has seen 100 lb. weight of earth taken out of a horse that had been destroyed by it."

The great necessity that exists that milch cows should be properly fed upon sweet food and such as is best suited to their nature, will be appa-

rent to every mother of a family, and there is not one but what is perfectly sensible of the ill effects of taking improper food during the period of suckling, lest the child should suffer therefrom.

Milk diet is indicated in such a variety of diseases, and in those diseases which are of the most frequent occurrence, that it is no less the duty of the medical man to know that the milk which he orders for his patient is drawn from properly fed and healthy animals, and that it is not otherwise adulterated, than it is of the friends of the invalid to have it tested by means of the microscope and chemical re-agents. The neglect of these precautions by the invalid's friends does infinite discredit to the medical man, as it is an injustice to the patient by not giving a fair chance to an invaluable diet when procured in a state of purity, and which has frequently more to do towards the cure or alleviation of our sufferings than the physic. A milk diet more or less exclusively adhered to, constitutes a very important part of the treatment in nearly all scrofulous affections; in early, advanced and confirmed cases of consumption; in spinal and glandular diseases; in many affections of the joints, and in chronic articular rheumatism; in mental debility, &c., &c., milk diet I believe has

in a great measure fallen into disuse, and been very much neglected of late years, especially in London and other large towns; doubtless from its being known to be in a very impure state by adulteration, though probably diet and the diseased condition of the cows and consequent morbid condition of their milk, has not had that attention paid to it by medical men which its importance should have demanded at their hands.

Dr. Clark, in treating of the prevention of scrofula and consumption, lays great stress on the proper regulation of diet, and shows that even in families free from hereditary taint, a morbid condition of the system is extremely favourable to the production of both diseases, and is speedily brought about by continued mismanagement of diet.

In giving an account of the adulterations that the cowkeepers and retail dealers have recourse to in London, I am fearful that I shall be considered by many to have overstepped the bounds of truth, and exaggerated beyond what in reality exists. I wish much indeed that what I in truth feel it my duty to make known to the public, never was practised by those who purvey the milk to our doors—it would be most gratifying to my feelings; but, unfortunately, it is carried to an extent that I admit, would, if I were not capable

of bringing substantial proof in corroboration of my assertions, confirmed by respectable authorities—independent of what I have seen myself—appear utterly incredible; for there are but few cow-sheds at the west end of London that I have not visited, and in the east part of London, I am informed, it is practised even to a greater extent than at the west end. The sights which I have seen in the various cow-sheds have been most repulsive to my feelings: the disgusting substances which they mix with the milk, of which I have been informed by many of the men, whom I have induced after a great deal of deal of trouble, &c., to give me an idea of, and the manner of mixing it, no less astounded me than I am sure it will my readers. The truth of what I have been made acquainted with I can, therefore, to a very great extent vouch for, as I have seen much myself when visiting their sheds, and taking them by surprise, when they least expected a stranger to enter, and which more than corroborated all that I had previously been made acquainted with on the subject. With these few general remarks, I will introduce to the notice of my readers the remarks of one or two who have studied the matter; and I cannot do better than to give in this place the experiments of Dr. Hassall,\* who states that there are but few articles of consumption more adulterated than

\* Hassall's Microscopic Anatomy, p. 176.

milk. The more usual substances employed for this purpose are water, flour, starch, chalk, and the brains of sheep. Mr. Gulliver, surgeon of the Royal Horse Guards Blue, informs me that he also has found brains in the London milk through the agency of the microscope ; indeed so peculiar is the London milk, that he can tell it by the smell. With respect to these brains, they are not always sheep's brains that they procure for this purpose, for, generally speaking, they are rather scarce in the market (the poor buying them with the " head and pluck" of that useful animal) ; consequently they are seldom got, I am informed, until they are rendered unsaleable for any other purpose, by being considerably advanced in a state of putrefaction. When they cannot procure sheep's brains, they get those of the ox or cow, and even those from those hot-beds of disease, &c. the knackers' yards. The way they use them for this detestable purpose is by rubbing them up with their hands (which are not the cleanest one would wish to see) with some warm water, and a white milky-looking emulsion is the result. This is stirred up with the quantity of water\* which they intend to add to the milk. These brains not only

\* It is quoted even by foreign writers, as a fair joke against the dairy establishments of our large towns, that, among the advantages possessed by one which was advertised for sale, much stress was laid upon a never-failing pump. See *Il Latte e i suoi Prodotti*, p. 67.

enter into the composition of the London milk, to which they give a colourable tint and rich appearance, but also to London cream, and that much more largely in proportion to the quantity than in the milk. This mixing of the brains of animals in the milk and cream is well known to be carried on to a great extent in Paris, from whence it would appear it was first imported into this country, as it was found out to have been practised there long before it was known to exist here. This surely is a dreadful state of things ;—but how is it to be remedied? There is only one consolation, that there are some very respectable dealers who would scorn to be guilty of such atrocious conduct ; but the great difficulty is to know who they are, for, although their consciences would not allow them to mix brains with their milk, still they are not over nice about giving a good supply of water, and working it up to a goodly appearance and taste, by mixing treacle, salt, whiting, sugar of lead, annatto,\* size, &c., &c.

\* This is the orange-red waxen pulp which covers the seeds of the *Bixa orellana*, a native of America. It gives a yellowish tint and rich-looking appearance of cream on the top of the milk. It is the colouring-matter of cheese. In itself it is of no particular harm to the milk, only probably increasing its astringency ; but it is very much adulterated with things not very agreeable before it is exported to this country, in Spain, from whence we import it. It is commonly called Spanish annatto.

Every milkman has his own peculiar way of manufacturing his milk with regard to the various ingredients and the quantities that he in his wisdom or roguery considers necessary to cheat his customers' palates ; but it is perfectly well known that the articles enumerated above are the principal ingredients they use. The sugar of lead is most obnoxious, though those who use it put in but a small proportion, a little giving a great bulk of water a milky appearance, being formed into a carbonate of lead, which is held in suspension. The carbonate of lead is formed by a portion of the carbonic acid of the carbonate of lime which is held in solution in the water, being given off to the lead, for which it has an affinity. Now this carbonate of lead is excessively poisonous when absorbed into the system, producing constipation and that most painful of diseases, the painters' colic. As such sugar of lead should never, under any circumstances, enter into the composition or adulteration of milk, though it may never have destroyed life, it is not improbable that it may often be the cause of producing those most disagreeable spasmodic twitches in the bowels, especially in children. Salt, probably, is of no particular harm, otherwise than by imparting a taste, and being a covering to hide the flavour of those that are not quite so pleasant. The same may

probably be said with respect to treacle, but not so with size, which is used to give a body and substance to the attenuated liquid, and to serve the purpose of keeping the whiting in a state of suspension. If this size were properly clarified (which it is not) it would not make an unpleasant jelly, with a few agreeable additions, and would be relished by many if they did not know from what it was made. It is manufactured from the scrapings and clippings of raw hides at the tan-yards, which are not of the cleanest description; being scraped and clipped, with all the filth attached to them which they get at the various slaughter-houses from whence they come, and the dirt, &c. of the tan-yards. The flour and starch are used for a similar purpose as size, to give a body and substance to the milk, and to keep the whiting in suspension; for which purpose they are made into gruel of the required thickness. Last, though not the least obnoxious of these articles, is water. "Water," I fancy I hear my reader say, "that cannot hurt." Nor would it, if it were pure, clean, and uncontaminated by any poisonous gases. The only disadvantage attached to it otherwise is, we are made to pay 4*d.* per quart for this water, which if it were necessary to add to the milk, we could do ourselves, with a better article, and at a very much cheaper rate;

for of this water they add about one-third, and oftentimes more, sometimes less, to the milk, which is quite poor enough, as the London cows are kept, without any aqueous addition. The water which they add is tainted by the tanks in which it is kept, being either in the cow-houses, without any cover on them to keep the dust and dirt of these cow-houses from falling in, or to prevent it absorbing the foul and poisonous gases that are constantly arising from the cows themselves, and from those abominations of muck, mire, &c., &c. If these tanks are not in the cow-houses, they are immediately contiguous; and, strange to say, if outside the cow-house, this tank or water-butt is invariably placed close to the dunghill, as if for the purpose of absorbing the perfumes arising therefrom. But whether this water is added to the milk or not, it is the common drink of the cows, and injures their health and milk, by the system absorbing the deleterious gasses contained in the water.\* Mr. Bishop states that, "impure or filthy water should be avoided as productive of most serious consequences to the cows, injuring the quality of the milk, butter, &c., and giving the cows a predisposition to disease."

Cowkeepers have also a most objectionable way

\* Cattle Keeper and Dairyman's Guide, p. 28.

of giving the beistings (colostrum), or first milk of the cows after calving to their customers, instead of allowing the calves to have it (which are removed from the mother when not more than a day old), to whom it is so necessary, from its purgative nature, to cleanse them. This colostrum is much thicker and yellower than ordinary milk, and is entirely different in its chemical composition, and consequently most improper to be added to the bulk of the milk. This state of the milk lasts generally from a week to ten days.

The milk of the cow is also very sensibly affected and becomes much less rich, and therefore much less nutritious when the cows become pregnant, which most cowkeepers are in the habit of allowing them to be within two or three months after calving, and in some instances in less time. Their object is (though at the expense of the quality, and as pregnancy advances quantity), that their cows should not remain unproductive as far as milk is concerned, long after they dry off, which is usually about the tenth month. The cows thus have a calf every year, instead, as should be the case, every eighteen or twenty months. It must be obvious to any ordinary mind that nature never intended that the two should go on simultaneously, and that when they do, the

public consume milk of a very much inferior quality. The forthcoming calf is also much less fully developed than it would be if nature had nothing else to do than to supply the new being with nourishment, instead of the strength of the cow being drained from her in having double duty to perform, which is not only robbing the public and the calf directly, but ultimately, by the calf not making so good and large a cow or ox as it otherwise would do if a different state of things were observed.

It may possibly be said that these objections to the milk of the London cowkeepers cannot be applied to the milk that arrives per railway from the provincial districts. Certainly not, not to the same extent; as the farmers, as far as my knowledge extends, add only a small portion of water, though their cows are never groomed, and very little attention is paid to their cleanliness, &c.; but it is adulterated on its arrival by the retail dealers putting in an additional supply of water, and mixing with it those obnoxious ingredients already mentioned; consequently the consumers are scarcely better off, if the least, by taking the railway milk.

The question is, how is this to be remedied? In my opinion, very easily—by Government standing, as it is their duty to do, in respect to public

health, *in loco parentis*, and adopting some system by which the adulteration of the article should be prevented. In the first place, every cow-house, whether in town or country, should be registered. The fee should be not less than 5s. annually, and when a cow became ill, the proprietor should be compelled, under a penalty of £5, recoverable before a magistrate, to make it immediately known to the inspector of the district where the cow-house is situated. In Holland great quantities of milk are brought a considerable distance along the canals. A number of farmers have generally a boat amongst them, and the farthest from town sets off very early. As the boats come along the canal, each farmer has his milk ready to put on board; they then proceed to the town, where officers are appointed by Government to examine the quality of the milk; and if it be under the fixed standard, it is confiscated. The smallest quantity of water can be detected by the Government tests, and most of the farmers have a similar instrument, by which they examine their milk before it is exposed for sale. It is also tried by the Government officers when the retailers are distributing it to their customers. If some such plans as the above were adopted by the Government of this country, it would have a most salutary effect on the health of the inhabitants; for

if there were no water added to the milk there would be no inducement for the dealers to mix anything else with it.

I would propose that the duty of testing the milk as it was being distributed to the customers should be thrown on the police: they could easily be taught the manner of testing it, and it would be an agreeable relief to their otherwise monotonous life of perambulating the streets with, fortunately for the public, the most of the day nothing to engage their attention. They should also inspect the various cow-sheds with the view of seeing that they were properly cleansed and ventilated, and that there were no diseased cows therein; if so, they should order that they be removed to some convenient place away from town, to be called the cow-infirmmary, to which should be attached a properly qualified veterinary surgeon, whose duty should be, if he considered they were curable, to endeavour to recover them; if not, to order that they be immediately slaughtered and their carcasses (excepting the hides, horns, &c.,) be turned into animal manure to prevent the possibility of their ever becoming human food, by being salted and made into sausage meat, soups, &c. The proprietor of the cow to be paid the market price for the hides, horns, &c., and the Government price according to weight, for

the carcase, first deducting the expenses thereon. Over the police should be placed a sufficient staff of inspectors and sub-inspectors to see that they performed their duty honestly and properly.

Every party who kept cows for the supply of the metropolis with milk or cream, should, whether the cow-houses be situated in town or country, register them as proposed above, and in addition to the payment of 5*s.* for such registration, they should register every fresh cow that they had in their shed; the yearly average should be taken, and an annual rate of 2*s.* 6*d.* or 5*s.* paid for each cow. The retail dealer should also be registered and pay a fee of 2*s.* 6*d.* The money thus obtained should go towards defraying the interest on the capital that it took to build the infirmary, and paying the salaries of the inspectors and sub-inspectors, whose duty should also be to test the milk at the various railway stations on its arrival.

Taking London to contain 2,000,000 of inhabitants, and supposing each individual to consume on an average half a pint of milk per day, it would require 50,000 cows producing ten quarts per day each to maintain the supply of 500,000 quarts per day, or 182,500,000 quarts per year; the rate therefore on the 50,000 cows, at 2*s.* 6*d.* per head, would amount, independent

of the registrations of the sheds and retail dealers, to £6,250 per annum.

In still further corroboration of what I have stated, it gives me great pleasure to have it in my power to extract from a pamphlet which has lately come into my hands, written by the Hon. Frederick Byng, on the sanitary condition of the parish of St. James, Westminster, and I feel that I should be doing not only an injustice to the subject, but to the philanthropy of the honourable author, and also to the medical gentleman who drew up the report, were I to omit giving it in full:—

“COWSHEDS.—The following particulars gleaned from the report of Mr. Aulsebrook, a competent medical gentleman, will convince every one that these cow-sheds are highly injurious to the health of those who dwell in their vicinity. The condition of the animals, as there shown, and the effect of it on the quality of the milk drawn from them, are also matters which merit the gravest consideration.

“Two of these sheds (of which there are fourteen in the parish), are situated at the angle of Hopkins and New Streets, Golden Square, and range one above the other, within a yard of the back of the houses in New Street. Forty cows are kept in them, two in each seven feet of

space. There is no ventilation, save by the unceiled tile roof, through which the ammoniacal vapours escape into the houses, to the destruction of the health of the inmates. Besides the animals, there is at one end a large tank for grains, a store place for turnips and hay, and between them a receptacle into which the liquid manure drains, and the solid is heaped. At the other end is a capacious vault, with a brick partition, one division of which contains mangel-wurzel, turnips, and potatoes, and the other, a dirty, yellow, sour-smelling liquid, called brewers' wash; a portion of which is pumped up, and mixed with the food of the cows. The neighbours are subject also to the annoyance of manure carts which frequently stand some time in front of their houses; and when the mouth of the vault is opened, to admit the ingress of the brewers' wash, a 'burning sour smell' is described by them as pervading their dwellings. After the buildings have remained closed for the night, the atmosphere within becomes heated, foul, and unwholesome. In summer time, the smell is most offensive. Decomposition of the vegetable matters in the vault is also stated to be frequent, and the stench thence arising, insufferable.

"At the opposite side of the houses in the same street is another shed, with even less pos-

sibility of ventilation than in those just described. Thirty-two cows stand side by side, two in each space of seven feet, as above. In Marshall Street there is a third establishment, containing 28 cows. In a wall on one side, overlooking a yard in which is a slaughter-house, are several grated openings, but they are carefully covered with pieces of sacking, as if to prevent all possible admission of air. In this shed are receptacles for vegetables and grains, as before; the manure tank holds 12 tons; and that for brewers' wash, 600 gallons.

“It is to be remarked, that even the manure, from the nature of the food supplied to the cows, acquires a peculiarly unhealthy and offensive odour, altogether dissimilar to that from farm-fed animals. In this atmosphere, reeking with all these pestiferous effluvia, the poor creatures are kept close shut up, night and day, till their milk failing, they are consigned to the butcher.

“The effects of this system of feeding, impure air, and deprivation of all exercise, are thus described from actual inspection of four cows, which the keeper said were suffering from the old disease. There was inflammation of the mucous membrane of the mouth, fauces and gullet; a catarrhal discharge from the nostrils, and such prostration of the muscular system, as

to render the animals unable to remain in a standing position for any length of time. The mucous membrane of the mouth is sometimes so blistered as to prevent the animals from taking food.

“Swellings of the udder appeared, attended by a change in the quality and deficiency in the secretion of the milk. The feet also became much diseased and swollen; general emaciation followed, in which the animals continued for an indefinite period, or till death. Four months prior to this visit, the owner of one of the sheds lost 13 cows by disease.

“A Dutch cow was pointed out to me which was evidently in a state of Marasmus, her head hanging nearly to the ground, the horns cold, the ribs staring through the hide on each side of her emaciated body, on which the hair bristled and stood erect: notwithstanding this prostration of the vital powers this cow was regularly milked with the others, furnishing a daily supply of two quarts.

“On inquiry, it did not appear that Veterinary aid was ever sought; the only means used was to keep the poor animals as warm as possible.

“From the above-mentioned facts it is obvious, that much of the milk sold at the west end of the

metropolis, is elaborated in the udders of animals unnaturally treated, and kept in an atmosphere impregnated with gases detrimental to the common health.

“That as the upper portion of the alimentary canal of the animals is demonstrably diseased, while the udder becomes the seat of morbid changes, the seeds of disease are carried into the human system by the use of an aliment remarkable for its affinity and ready amalgamation with the human blood, constituting a pregnant source of physical deterioration, and contributing to the propagation of scrofulous disorders, and that languid condition of the vital fluid found, on inquiry, so generally prevalent.”\*

The consideration that this subject requires should be paid to it is of the gravest and most

\* “The Journal of Public Health, No. I, vol. ii. p. 22, states in noticing the above extract from the Hon. Mr. Byng’s pamphlet, that the influence which cow-sheds, as at present constructed and managed, exert on the health of the cattle, and consequently on the purity of the secretions of milk, though so important, is most singularly neglected among a people proverbially fond of good eating and drinking and most astoundedly disregarded by all those who regard the welfare of their offspring. In the human subject, the influence of milk of an unhealthy quality has long been known. How can so obvious a fact be disregarded in connection with that nourishment which forms so essential a part of the diet of the great majority of the young of the human species.”

paramount importance, not only is it a matter of public utility as regards the health of the cows and through them the health of the community at large, but it is a sanitary question no less to be distinguished than others that have rivetted the attention of the philanthropist and the public generally, for the proper treatment and state of the milch cow is, as I trust I have satisfactorily shown, of the greatest consequence with respect to her health, &c., and it is to be hoped that these pages may be the means of drawing public attention to the many evils that at present exists, not alone in the dairies of London and its environs, but in all large towns.\* If there were a few more of the same public spirit and untiring perseverance as the Hon. Mr. Byng, a reformation would soon take place in this, as I hope ere long it will be an all-engrossing

\* "Few greater nuisances exist in the metropolis than the cow-yards. Enormous quantities of animal refuse are deposited in them. They serve as *foci* of disease, and under a proper system of government would be placed under efficient inspection, and altogether prohibited in dense localities. Their influence in the production of phthisis, or consumption, among cattle, the diseased product called milk, which is largely sold in London, and its influence on the human economy, and the sale of the diseased cattle themselves *by scores* every market-day in Smithfield, are among the prominent questions to which public attention must be directed."—*The Journal of Public Health*, No. XX. p. 224.

subject, and that the upper circles of society will show themselves in the front rank, and set an example worthy of their class; but this I can scarcely hope will be the case as the honourable gentleman above mentioned, in a conversation which I had the pleasure of having with him a short time since, informed me (and wished me particularly to mention it in this pamphlet as coming from him), that they are so apathetic and careless of subjects such as these, which one would imagine to be the first to engross their attention, that they would rather endanger the health of themselves and their children, preferring poison to purity, than trouble themselves in matters which, from want of reflection, is considered of little moment. Though this is much to be lamented, still I have hopes that when they reflect more on this question, that they will bestir themselves, and by their position and weight be the means of propounding or assisting by a hearty co-operation any well-devised plan that may hereafter be proposed, by which the inhabitants of this vast metropolis may reap a lasting and imperishable benefit in so useful and necessary an article of diet. One can scarcely imagine it to be possible that the public (when they once pay attention and inquire into this evil), will long rest satisfied until they are supplied

with a milk on which they can depend for its healthy, wholesome, and unadulterated condition.

Having now for some years paid considerable attention to this subject I am satisfied that the public can be properly supplied with the article in question in a pure and wholesome state, from thoroughly healthy cows, from the country districts (without the necessity of one animal being kept in London), at a price that would most fully and adequately pay the dairyman, without the slightest admixture of water or other articles : indeed, from the calculations which I have made, the public can be supplied with genuine milk at a cheaper rate than at present. Though nominally paying 4*d.* per quart, they are literally paying 6*d.* and 8*d.*, according to the quantity of water or skim-milk, &c., which they add to that which they call new milk ; that is 4*d.* for the pint of milk, and the water, &c. is very kindly thrown in as a gratuity. Why should those hydra-headed scourges, consumption and scrofula, be implanted in the human frame through the means of the present London milk, when it could by a properly constituted and well-digested plan be remedied ? And it behoves the medical profession generally to pay every attention to the quality of the milk, and the means by which it is manufactured. Therefore it will not be considered as

travelling out of my province in calling public attention to the subject.

If what has been stated in these pages should happily be the means of some plan being adopted for the proper supply of this most necessary article, great indeed will be the gratification of the author, and he will consider his labours as amply repaid.

## A P P E N D I X.

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“Lacte et carne vivunt.”

CÆSAR'S COMMENTARIES.

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SINCE the first edition of this Pamphlet, I have been incessantly engaged in prosecuting my enquiries on the subject to which these pages relate, and without giving any additional account of the horrible sights that have come immediately under my notice, with respect to the manner of housing and feeding the poor animals, their uncleanly appearance, and their enormously *diseased condition*. I may say, that my first account at pages 8, 16, and 40 of this volume, are entirely confirmed. Regarding the infamous adulterations of the milk and cream—I again reiterate my statements and pledge myself as to their truth. I know my assertions have been considered somewhat over-coloured, as I anticipated they would be—but I must beg distinctly to remind those who should think so, that in giving an ac-

count of those sophistications, I did not rest them entirely on my own authority, but gave those of gentlemen who are well known to the profession of which I am but an humble member, as men of science, as men of probity, as men of great and undoubted microscopic knowledge, one of whom indeed has written the most elaborate work on microscopical anatomy, &c., &c., that has ever appeared in this or any other country, and whose microscopical researches on the water of the metropolis will shed a lasting lustre on his name.\* In addition to their testimony I may state that so convinced were the Members of the Council of the Royal College of Surgeons of England, that the statement regarding the brains, &c., was correct, that they immediately, on the first appearance of the pamphlet, counter-ordered their usual supply of those articles which they considered were no longer either milk or cream, they had been in the habit of taking in their tea and coffee on the usual night of attendance at the College ; indeed, long before my observations on the subject appeared, Dr. Hodgkin informed me that brains had been detected in London milk and cream, as did Mr. Stanley, the late President of the College of Surgeons, who, when speaking to me on the sub-

\* Dr. Hassall.

ject, said that he had no doubt that the milk and cream which they had been in the habit of having at the College, contained a vast quantity of cerebral matter, and had frequently mentioned it to the Council. In further corroboration of this unpleasant and disgusting topic, I may mention that a slaughterman, when not so engaged, is occasionally employed at the College; in answer to a question (the drift of which he knew not) put to him by Mr. Stone, the librarian, if the milkmen ever applied at the place where he slaughtered for brains, replied in the affirmative; and upon his enquiring what they did with them, his answer was, that he supposed they eat them for their supper. The next question was, What brains they generally had? Sometimes one, sometimes another, but Mr. ——— (mentioning his name and who is a large cowkeeper) generally had bullock's. How many does he mostly have at a time? "Six or seven." "Six or seven," quoth I, who was present, together with two or three more, at this interlocutory conversation—"a pretty good supper considering that each brain will weigh very nearly two pounds; a dozen pounds weight for supper, for a man and his family, is a pretty good dose." Now to my mind it is perfectly clear, and I think it must be to that of every one who reads this little catechetical conversation, that these brains

were used for the purpose of mixing with the milk or cream, and if for the latter the profit must be enormous, as the price given for each is 6d., and six brains mixed with a sufficient quantity of skim-milk, a little cream, and other ingredients, to bring it to the required colour and consistency, would make about 30 pints of double or 40 pints of single cream, which sold at 2s. per pint for single, or 3s. for double, would realise a profit on the original outlay of 3s., of about £4., a pretty good per centage for money invested; allowing that they do give us half cream and half this compound, the profit will remain still the same; certainly it is a great inducement for that roguery. When a statement is made, whereon some doubt may rest, the greater number of corroborative proofs that can be brought forward in evidence of such assertion, the more likely is it to have its due weight with the public mind; therefore as another and concluding proof that milk is thus adulterated, I will give an extract from an article headed, Adulterated Milk, in Chambers's Edinburgh Journal, which has been brought to my notice since the publication of the first edition. It is there stated, No. 49, p. 363, December, 1844. That "The inhabitants of large cities are constantly complaining, and with very good reason, that the article sold as milk is systematically adulterated, the udder of the cow sup-

plies merely the basis of the compound, water and certain foreign substances to give it the necessary whiteness, forming the other ingredients. *The colouring matter is made from things of which the public at large have but very little notion.* The prevailing belief regarding the London milk manufacturer is, that chalk is their favourite pigment." (I wish much that it was only this and magnesia, which is also used largely, as it being very light is the more easily suspended.) "Their brethren of Paris, however, employ a more extensive range of adulterating substances, such as flour, plaster of Paris, calves' lights, and a still more extraordinary substance, *dog's brains*." \* (To which might be added according to M. M. Chevallier and O. Henry, on the falsifications of milk and cream, the emulsions of sweet almonds, marsh-mallow root, hemp seed, the yolks of eggs, and about one-third or one-half water, *cum multis*

\* Dr. Donnè, the chief Clinical Physician to the Faculty, of Paris, and head Professor of the Microscope, mentions in his Cours de Microscopie, p. 392, "That they are said to be *horses' brains*, that he rubbed some up in a mortar with water, and it is certain the liquid had all the appearance of milk, and when mixed with milk that the tubes of this rubbish can easily be detected by the microscope."

I have frequently made this emulsion myself and shown it to milkmen, who without knowing what it was have stated it to be very good milk.

*aliis.*) “ This system of adulteration is the more abominable when we consider that of all species of food proper for the support of human life, milk is the most useful; it is unlike every other aliment in this respect, that it has the power of sustaining life without the assistance of any other sort of food. Though man cannot live by bread alone, yet nature can be fully sustained by milk, were he reduced to have nothing else to maintain him.”

After all what are these adulterations, though disgustingly filthy in the extreme, and most obnoxiously disagreeable to our senses, and such as our stomachs ought never to become acquainted with, in the shape of a compound fluid which we unwittingly choose to call milk and cream. What are they? I ask again what are they? compared to the diseased condition of the London cows, whose unhealthy milk, containing quantities of purulent matter, which is taken up into the system, from the lungs of those that are in the aggregate, labouring under consumption. Donné states in his *Cours de Microscopie*, that he had seen some beautiful examples of pus in milk, and he particularises one instance especially, as being that of the milk of a cow whose udder was very bad and much congested (a very common disease), and that it absolutely, even to the naked eye, resembled pus from abscesses, when it had been enclosed for

some time, and that when examined with a microscope, the liquid appeared composed of pus-globules, and the small number of milk-globules mixed with this purulent matter, preserved its habitual character (this confirms my own observations); in other cases when the cows were consumptive, \* the milk preserved its good consistence, when examined with the naked eye, but when placed under a microscope, the milk-globules were found to be agglomerated and intermingled with pus-globules; he asks what will be thought when one hears *that the milk of these cows, though otherwise much adulterated, is itself mixed with good milk, and actually, with it every day, sold to the public.* IT IS THE SAME IN LONDON.

I have stated in the foregoing pages that the effect of this *diseased milk* may be to produce such disease in the human constitution; indeed, not

\* Des vaches attaquée de la maladie si commune à Paris, et que les nourrisseurs désignent sous le nom de maladie Pulmonaire (Phthisie) fournissait un lait ne différant du lait ordinaire, à l'extérieur, que par quelques grumeaux suspendus dans sa masse; au microscopie on découvrait un bon nombre de globules purulents mêlés aux globules laiteux; ceux-ci étaient presque tous agglomérés en masses confuses; la quantité des globules purulents était surtout appréciable, après avoir dissous les globules laiteux par l'éther, les premiers restaient seuls sur la lame du microscope.—Donné, *Cours de Microscopie*, p. 426.

one of my professional brethren, to whom I have advanced these views, and I have done so to some of the most distinguished in the profession, have ever attempted to controvert the supposition, for supposition it is, inasmuch that it cannot be directly proved, but the theory of it is borne out by analogical physiology, for how often do we see children at the breast partake of the disease under which their mothers are or have been labouring, of which many examples might be adduced. There cannot be a doubt that those medical men are in error who allow a mother to suckle her child, if she has the least hereditary taint, or when the seeds of consumption are already lurking within her breast; when we know such to be the case, we should endeavour, if possible, to prevent it, as by this means we should obstruct the child from being in after life similarly afflicted, and thus be placing one barrier against the perpetuation of the disease to future generations. Though medical men have not, perhaps, taken this precaution as a general rule, probably from a well founded belief that the counter-irritation of sucking (this can be kept up by other means) prevents the too rapid development and fatal termination of the complaint in the mother, as we find them in most instances very particular in selecting wet-nurses, who have no hereditary disease hidden about them. For

such children whose mothers, either from fashion, idleness, or affectation, and not liking their pleasures to be intercepted, or from fear that they would the sooner loose the beauty and freshness of youth, if they were to perform the first duties of nature towards their offspring—

————— “ I have given suck ; and know  
How tender 'tis to love the babe that milks me.”

A celebrated physician, who flourished about two centuries since, states :—“ That there are many reasons why mothers should be afraid to commit their children to strange women. First, because no milk can be so natural as their own.” (That is if the mother is in health.) “ Secondly because it is to be feared, lest the children may draw ill qualities from their nurses.” \* Galen mentions in his third book, on the nature of foods, “ That a friend’s child of his, having lost his good nurse by an untimely death, was put out to another, who in a time of dearth being forced to feed chiefly upon fruit, and roots, and acorn-bread, infected her child as she herself was infected, with grievous and filthy sores, by reason of the bad milk it sucked.”

I am fearful that I may be considered as having somewhat digressed from my subject by these re-

\* Muffitt’s Health’s Improvement, (Bennett’s edition,) p. 125.

marks, but they are so intimately connected by analogy to the question, that I should have ill illustrated the position had I forbore detailing them. As it is pretty well known that the cows in London are very much diseased,\* I have been informed by one of the Commissioners of Assessed Taxes, that the cow-keepers frequently apply to have their taxes remitted, on account of the severe losses they have met with from the disease amongst their cows.† (Indeed, the Farmers' and Graziers' Cattle Insurance Association will not insure cows kept in London and large towns, on account of the extraordinary risk.) What effect such diseases may have upon the human constitution, from partaking of the milk of such cows, has not lately, I believe, until I propounded the question, engaged either the attention of the public or the profession.

That milk in a state of healthy purity is the most useful and nutritious of all diets there cannot be a question. Varro states that of all

\* "We should make the London milk manufacturer remove his cows, in so far as cows are necessary to his ingenious trade from those dungeous, darksome and foul, where they now stand degenerating *till their very feet rot off*."—*Vide Sanitary leading article in "The Times," Oct. 2, 1849.*

† The majority of the cowkeepers in London could not bear up against these losses *if it were not for the "Cow with Iron Tail."*

aliments we make use of, milk is the most nourishing. Ovid tells us that it was the most common food of the ancients;\* we have also the authority of Pliny, Tacitus, Justin, Cæsar, and Sallust, who mentioned some that lived upon no other food. Galen, in his fifth book *De Sanis Tuendâ*, Chap. 7, mentions a man that lived above 100 years and fed upon nothing but milk. Pliny informs us that Poppea, wife of Domitius Nero, carried 500 asses continually about with her, to bathe her body in their milk once a week—to make her skin clear and smooth without wrinkles, and that the Arcadians bathed in cows' milk in the spring-time for a month or six weeks together once in the morning to cleanse and purify their bodies of bad humours. In a work called *The Castile of Health*, by Sir Thomas Elyot, M.D., written in 1541, at page 33, he states—"To children, old men, and to them which be oppressed with melancholy, or have their flesh consumed, milk is convenient; when men and women be used from their childhood for the most part to milk, and do eat none or little other meat, they appear to be of good complexion and fashion of body, and are not much vexed with sickness." Muffit states, "For as much as childrens' stomachs and old

\* *Lacte mero veteris usu memorantur et herbis,  
Sponte suâ si quas terra ferrebat.*—*Fast. lib. iv.*

mens' bodies and consumed mens' natures be so weak that not only flesh and fish, but also the fruits of the earth are burdensome to their tender and weak bowels, God tendering the growing of the one, the preservation of the other, and restoring of the third, hath therefore appointed milk, which the youngest child, the weariest old man, and such as sickness hath consumed may easily digest; it nourisheth plentifully, increaseth the brain, fatteneth the body, restoreth flesh, and giveth the face a lively and good colour." On mentioning cows' milk he says "Beware (as commonly fools do not) that you feed not your cows *with new, much less sour grains*, for it maketh their milk *strong, windy, and unwholesome*, and likewise rub and stroke down your cow every morning, and her milk will be both more nourishing and sweeter."\* Louis Lemery who wrote a work on food in 1704, states that milk is very nourishing, and that to be good it should not taste of anything that is harsh, bitter, sharp, or brackish, and that it should be such as is milked from an animal that is neither *too young* or *too old*, but such as are *healthy*, in *good condition*, and *fed with good food*.† I might go on, ad infinitum, in giving authorities from older writers on the value of milk,

\* Muffit's Health's Improvement (Bennett's Edition), p. 129.

† Lemery's Treatise on Foods, p. 177.

but am fearful I shall be found guilty of prolixity. My reason for having given thus much, is to show its real value, which has in a great measure been lost sight of by more modern authors, and to show the estimation in which it was held by our forefathers, and to bring parents to a knowledge of the necessity of giving their children *pure, wholesome, uncontaminated milk*, for if they give them *poor, bad, adulterated milk, or milk drawn from diseased cows, or cows not properly fed, or who never have their skins cleaned or groomed, or are confined in sheds without sufficient ventilation, and improperly drained*, they may depend upon it, that the consequences resulting therefrom are *fearfully alarming*; such milk is deprived of its globular elements,\* is watery, (independent of any addition from the pump,) is less nutritious, and children that are fed upon such milk (*without the assistance of other food*) will soon become emaciated, their growth will be stopped and they will dwindle away until death terminates their sufferings, and if the milk is moderately good, but the cows diseased from whom it is drawn, they may have the seeds of a serious disease sown in

\* These globular elements contain a solid fat called margarine, which is the same substance as forms the solid fat of our own species, it would therefore appear particularly adapted for the constitution of the human race.

their constitution, which if it does not immediately may ultimately manifest itself.

Dr. Robertson says, "milk is, of all kinds of food, the one which is best adapted for children, which at all ages ought to be the breakfast,"\* very true, but how are they to get it good and from healthy cows? not from the London cow-keepers, that is morally impossible; not from the retail dealers, that is equally as impossible; even though they have it from the country districts, or otherwise, for they adulterate it abominably and filthily adulterate it; and as to the trash which is sold in the poorer districts of this great metropolis it is horrible to contemplate. The way the inhabitants of those districts are cheated by the beastly stinking compound stuff called milk! it is bad enough God knows in the higher neighbourhoods, but in the poorer it is a thousand times worse than bad. A correspondent in the *Times*, who signed himself as J. R., and stated that he was a *milkman* of 15 years' standing, denied that the milk was ever adulterated, especially with brains; but at the same time, admitted that brains might be mixed with the milk in such places as Cow-cross and Petticoat-lane, but this is a solitary instance of a denial from an interested party, who seemed to forget that the milk

\* Robertson's Diet and Regimen, p. 116.

manufactured in such places finds its way to more respectable neighbourhoods and the west-end. Really this mixing of brains with milk is very ingenious though a most detestable device, for the milky looking emulsion they make when rubbed up through a sieve or fine piece of muslin with warm water (which any one can try), is probably the best article they could put in to impart a richness to the milk, as it throws down little or no sediment, and cannot be easily detected by any other means than the microscope.

Another correspondent of the *Times* writes the following, which many of my friends accuse me of being the author of, but this I most emphatically deny, or was it to my knowledge any one with whom I am acquainted.

TO THE EDITOR OF THE TIMES.

Sir,—I trust that your investigation into the quality and quantity of the water supplied to the metropolis will not be deemed complete until you have furnished the public with the statistics of a trade intimately connected with the water companies. I need scarcely add that I allude to the milk trade of London.

Every inhabitant of this great city consumes a certain portion of milk daily. It is of vital importance to our children that the supply should be pure and sufficient. The railways afford the greatest facilities for bringing up an adequate quantity from the grazing counties. The London price for skimmed milk

is rather more than double the country price for unskimmed milk, and yet it is invariably abominable. I have lived in London twenty years, Sir, I have changed my milkman twenty times, and I have never in any one instance bettered myself.

Nor do the milkmen themselves profess to sell the article unadulterated; it is not "the custom of the trade." They all admit that "the cow with the iron tail"—a pleasant periphrasis for the pump—contributes one-fifth at least to the milk pails.

As for the muco-cretaceous compound which is foisted upon us under the denomination of London cream—it makes me shudder even to think of it. Instead of seeing a rich yellow stream gliding slowly and generously from his cream-jug into his bohea, the sickened cockney is doomed to behold, with doubt and dismay, a lump like an opaque oyster, floating in putty-coloured sauce, flop heavily into his tea-cup, from the bottom of which part rises again in thin threads of white and coagulates into a sort of chalky crust on the surface, whilst the remainder resolves itself into a mucous deposit of most discouraging and unwholesome aspect.

In Paris, Sir, I can get good milk and cream without any difficulty. Will you, or the gentleman who writes so ably on water, tell us how it comes to pass that we Londoners are deprived of similar advantages as to our *laitage*?

I confess I don't object much to London butter; it is not, I am well aware, butter in the Epping sense of the word; but I nevertheless find it eat very agreeably on the bread, muffins, or toast. — I am, &c.

PATERFAMILIAS.

Paterfamilias states that he can procure very good milk in Paris, how long he may have done so does not appear, as it is well known that the adulteration there was very extensive, vide p. 53. I have been kindly informed by Thomas Pickford, Esq., the English consul at Paris, that some months ago complaints having been made about the quality of the milk sold in that capital, the Prefect of Police appointed a commission to analyse it, and the report was that in almost every instance it was found adulterated, and now if any complaints are made and proved the seller is fined. E. T. Curry, Esq., Her Majesty's consul at Ostend, has been so obliging as to inform me that there is a police law regarding the sale of milk in that city; that the police every now and then, as the milk is being conveyed through the town, cause it to undergo a proof of its not being adulterated, which is ascertained by means of a lactometer and thermometer, that these two will, according to a table, give the purity or degree of impurity of the milk on the instant. The same law exists, I believe, throughout the whole of Belgium; certainly there is a similar one at Brussels, and has been for some time, for by a paragraph in one of the Belgian papers it is stated, that a party of the municipal police armed with Dr. Donnès instruments, posted themselves on the 27th of June

1844, at the gates of the city of Brussels, and condemned and seized no less than 80 large cans of milk.

In Holland I find there is no general law, as stated (vide p. 37), regarding the sale of milk, but there are local regulations established by the municipal authorities of various towns,\* the great necessity for an universal law on the subject is very much felt, especially at Amsterdam, as will be seen by the following letter, for which I am indebted to the kindness of James Annesly, Esq., the British consul of that capital.

*“ British Consulate, Amsterdam,*

*“ March 5th, 1850.*

“ SIR,—I beg to acknowledge the receipt of your letter, and inform you that there exists no law whatever or police regulation subjecting milk brought into this city to any test or proof of its purity.

“ I can only from my own knowledge speak of this part, the Hague and Amsterdam. The want of some such law or regulation is severely felt here, for having been pretty nearly over all Europe, I have no hesitation in pronouncing the milk of Amsterdam as retailed by venders, the worst I have ever met with, not even excepting the so-called milk (chalk-and-water) of London.

\* Harley, who visited Holland for the purpose of seeing the Dutch dairy system, states that these regulations had a very salutary check.

"Allow me to add that you may at all times command my services. I am, Sir, your most obedient and humble servant,

"JAMES ANNESLY.

"*Hodson Rugg, Esq.*"

If the milk of Amsterdam is worse than that of London, which is scarcely possible to conceive, the sooner there is a police regulation to put a stop to so great an affliction on the inhabitants the better.

In Rotterdam, however, they manage matters better, there they have a law relative to the sale of milk, and a pretty stringent one, to which by the politeness of Sir James Turing, Bart., Her Majesty's consul in that city, I am enabled to give some idea, he having kindly forwarded me the printed regulations respecting it.

The milk consumed in Rotterdam finds its way to that city by the river, canals, and roads (it would appear that cows are not allowed to be kept within its precincts), it is not allowed to go beyond certain barriers, (which are arranged by a person designated a testmaster,) before it is tested by him, assisted by an agent of police and six committeemen appointed by the mayor and aldermen ; if any milk, whether it be new, skimmed or buttermilk, is found spoilt, mixed, or adulterated, the party vending the same is subjected to

a fine for the first offence of 3 guilders (5s.) on each can, pail, or barrel, and the forfeit of the milk, and six guilders (10s.) for the second and every succeeding offence; if any one should be found guilty of carrying their milk beyond these barriers before it is tested, the party infringing is fined double the above amounts besides the forfeiture of the milk.

The milk is also subject to be retested by the testmaster at the milk shops and stands and as it is being retailed from door to door, (it is the duty of the testmaster daily to perambulate the streets for that purpose,) and if found adulterated, the same fines as mentioned above are imposed. If the testmaster is obstructed in his duties, the offender is fined 25 guilders, (£2. 1s. 8d.) and the forfeit of the milk. Husbands are answerable for their wives, parents and guardians for their children, and masters and mistresses for their servants, both male and female.

Those who are fined and unable to pay it, are imprisoned. The seller whose milk has been condemned, can have it re-tested by the testmaster, before a Commissary of Police, assisted by two of the Committeemen; when if found good it is again given up to the owner, but if found to be bad, the fines are doubled, and he has to pay all costs.

The testmaster is authorised to levy a tax of 5 cents per week (4s. 4d. per year) upon each milk seller, and is to pay the proceeds thereof, and all penalties into the city treasury, once every three months.

No milk salesman is allowed to sell, carry, or retail milk, unless their names or those who carry it for them, shall have been truly given up and registered by the testmaster, together with the names of their servants, both male and female.

Is not this example set us by the good citizens of Rotterdam, worthy of being imitated? Is it not shameful that our government should neglect so imperative, so important a duty? Why should the two millions of inhabitants of the first metropolis in the world, be left to the mercy of such filthy people as the great majority of the London milkmen are?

This is a sanatory subject, and a moral subject, and one that ought to excite the philanthropy of every one, not only towards their own species, but towards the poor animals, the cows. It scarcely requires any verification that the poisonous gases given off from these pest-houses of filth, &c., are the pestilential elements of the atmosphere which they breathe, and which must of necessity be highly injurious to their health, not only is it an injury to the health of the cows, but to that of the public; for these pestilential gases as they ascend

from the sheds are wafted by the currents of the air to more remote places, as the fashionable parts of the metropolis, &c., and there to engender disease to the inhabitants thereof, in the same way as Lord Ashley stated, a short time since, at a meeting of the Metropolitan Sanatory Association, that the deleterious gases arising from the Smithfield market nuisance did.

The public should peremptorily and imperatively call for a reformation of the abuses existing in the London milk trade, which is incessantly endangering the health of the community, not only by the effluvium which is constantly steaming forth from those repositories of corruption, the cow-sheds, but from the adulterations of the milk, the diseased condition of the milk, from the diseased condition of the cows that give it, whose flesh is only fit for cats' meat, or for converting into animal manure, but which the poor unfortunately consume for food in various ways—these are considerations that should bring their own moral; we see that other countries know the value of good and wholesome milk, consequently have regulations respecting it. How much longer shall we be poisoned for the want of some such regulations? Shall it continue to be said that no sanatory laws exist in London, concerning the adulteration of the milk, the state of health of the cows from whom it is

produced, or of the uncleanly, badly drained, and ill ventilated sheds in which they are confined?

I have proposed a plan at page 38, for placing it under police regulations, (to which I refer my readers), which could very easily be reduced to practice; in addition, I would advise that not a cow should be allowed to be kept in the metropolis, for which there is is not the least necessity.

It is indispensable that there should be a thoroughly searching investigation at all times and seasons of all milk, of all sheds, and of all cows that are milked for the purpose of supplying the inhabitants of towns, with so necessary an article of food.

I have had parties say to me, my milkman keeps his cows in the country, is his milk not good? My answers in reply have been, Are you quite sure that he keeps them in the country? as many pretend they do, when they do not. Are you quite sure, even if he does, that he does not adulterate it? Are you certain that the milk he serves you with, is not drawn from cows that are in calf? For I must again warn my readers, that the milk of such cows is very materially altered in quality, &c., (see page 35.) Are you sure that he pays every attention to the cleanliness of his cows—that he cleans their skins—that some of them have not

got the mange—and that they are properly housed or fed? Even the Dairy-farms in Buckinghamshire, Gloucestershire, Devonshire, &c., do not pay that attention to their cleanliness, and proper housing, or even feeding them, that they should. See *Times'* Commissioner's Report of the Agricultural Districts.—Are you sure that he does not give you the milk of any cow that he may have, that has just had a calf? Which is most improper. Are you sure that if he has a sick cow, one for instance labouring under consumption, or some other disease, that he does not give you her milk, mixed up with that of the rest? These are questions for the consideration of the public, that it behoves every one to reflect on, and to ask themselves. There is no use compromising this question—for it is a subject that demands our most scrupulous and serious attention, and is a sanitary department that stands second to none; it is as necessary for our well-being as any to which greater attention has been paid, and it is to be hoped sooner or later will find its remedy.

But how are we to get it pure until government shall adopt some regulation respecting it? That is the question, how are we to get it pure? Only by parties purveying it, who would be satisfied with a reasonable profit, and whose characters would be above suspicion.

(For it must be wrested from the low, ignorant set, who for the most part monopolise the milk trade of the metropolis; what can we expect from them.) We must have men of philanthropy and honour, who would be above the common tricks of the trade, and who would feel an honest pride in giving the people a pure, genuine milk, drawn from cows that were healthy, that were properly cleaned, and kept free from the mange.

In conclusion, I think no one can possibly deny, that a genuine, pure, unadulterated milk, is a consummation devoutly to be wished.

[At the moment of going to press my attention has been drawn to a police report which appeared in the *Morning Post*, August 31st, 1849, headed "Mysteries of the Milk Trade." It appears that Robert Burrows, a milkman, was charged before Mr. Hardwick with using abusive and threatening language towards William Tall, another milkman, and making a disturbance in the streets. Amongst a number of adulterating substances they accused each other of mixing with their milk, was a "decoction of sheeps' brains and whiting." Thus we see, when milkmen quarrel, the *truth* will out.]

*Description of the Microscopical Illustrations  
contained in the Plate.*

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- No. 1. Good Milk.
2. Poor or Watery Milk.
3. Milk containing starch or gruel, when treated with a solution of iodine.
4. Milk as it appears within a week or ten days after calving, containing the yellowish looking confused masses, called colostrum, or beistings.
5. Diseased Milk, containing straw coloured looking globules, namely pus or matter.
6. Diseased Milk, containing the same pus globules intermixed with those of blood, found in milk from cows that have diseased udders and teats.
7. Milk adulterated with an emulsion of brains, showing the nerve-tubes thereof, their natural size being only about 1.5000th of an inch in diameter.
8. Skim Milk, showing the curd, casein or cheese.

## OPINIONS OF THE PRESS.

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“Will you take a little more milk or cream, Mr. Jones?”

“If you will have the kindness, Mrs. Smith.”

And the unfortunate individual holds out his cup for a stream of “water, flour, starch, chalk, treacle, salt, whiting, sugar of lead, annatto, and size, fattened with the *brains*” of sheep, oxen, or horses, to make the mixture slab and good! Such, according to Mr. H. Hodson Rugg, M.R.C.S., Corresponding Member of the National Vaccine Establishment, &c., are the ingredients which for the most part constitute the whitish fluid we pour into our matutinal breakfast bowl and evening tea-cup, under the pleasant delusion that it is milk. The nauseous compound is, he describes, worse than the witches’ hell-broth; and it was with a feeling of ineffable disgust and horror,—with a loathing from the very *penetralia* of feeling—that we saw the deliberate way in which Mr. Rugg sets about to prove his assertions, and the nauseatingly demonstrative evidence he adduces to support them.

Chalk we were prepared for—whiting was to to be expected—water was notorious—treacle was endurable, and even size might pass—but “sugar of lead! and rotten sheep’s brains rubbed up in themen’s hands (‘not the cleanest one would wish to see,’ interposes Surgeon Rugg, by way of a climax) with warm water, so as to form a white, milky-looking emulsion!” Pah! So filthy a compound never entered into our imagination, and from this time forth we’ll take good care it shall never enter our mouths. The very enumeration is sickening. Smollett, in “Humphery Clinker,” takes a fling at the London milk, but, as far as our memory serves us, he only charged it as a composition of chalk and water, with a little beaten snails for froth. What a vile progress we have made since then! Would we could go back to the good old times for that innocent mixture, and escape the abominations of the miscreants whose cans and pails are “whited sepulchres,” bright and clean outside, with an affectation of purity which is infamously hypocritical when we know the nature of the horrid fluid within. Never shall we pass one of these snug-looking “Hampshire Dairy” deceptions, with its bleached churns, shining vessels of brass and tin, and scrupulous eggs of snow laid in a rustic vase

of evergreens and moss, and haply the idolm of some healthy looking cow visible through the well polished window, without turning in our mind's eye to the piles of brains, *annatto*—(what is *annatto*?)—size and sugar of lead stored in some secret recess for the “new milk of the cow” of the caitiff proprietor. If Hodson Rugg does not state facts, we would deliver him up to the mercies of a jury of his own fellow-countrymen, called from the various milk-walks of the West-end. If his horrible story *is* true, we would put every milkman on trial for his life. It is really no laughing matter. We own our partiality to tea and coffee; we used to like milk in the cup that cheers but not inebriates, but *that* day is gone for ever. Hodson Rugg has, at one fell swoop, removed the emulsions—be they cream or milk—from the catalogue of clean things fit for the food of man. There is no evading him, no loophole for escape. He is clear, and positive, and precise as holy writ; and step by step, as though, with lancet in hand, he were “demonstrating” some terrible ulcer, and removing layer after layer of corruption, he proceeds, till we arrive at the conclusion that for years back we have been swallowing a stercoraceous combination of nasty substances, which we would not let a sow eat could we help it.

In the first place, with diabolical *sang froid* Hodson Rugg devotes himself to show the vast value of pure milk “to man in general, and children in particular, as an agreeable and nutritious food;” as it contains all the elements of animal and vegetable life most beautifully balanced and arranged.

Having satisfied us most fully as to the importance of pure milk, he addresses himself with the most calm and deliberate *malice prepense* to prove that “*pure milk*” cannot be got in London under any conceivable circumstances, premising that bad milk is necessarily injurious to the human body. Pure milk cannot come from unhealthy cows;—cows cannot be healthy in London;—the third term of the odious syllogism is too obvious.

But if the cows could get over the effects of bad air, they never could escape the consequences of bad diet.

The details of the articles used in “making up” milk are revolting. There seems to be no doubt about the brains—we have names and facts for it.

“But,” gasps the horror-stricken milk-drinking reader, “surely all the milkmen don’t do so? I have dealt with mine for years, and I have every reliance on him—he’d never use brains!” Probably not—if he has such a nice conscience he is not over nice—“about giving a good supply of water, and

working it up to a goodly appearance and taste, by mixing treacle, salt, whiting, sugar of lead, annatto, size, &c., &c.

Every milkman has his own peculiar way of manufacturing his milk with regard to the various ingredients and the quantities that he in his wisdom or roguery considers necessary to cheat his customers' palates.

We can fancy the horrid manufacturer. "Hand us the size, Bill!—they was a grumblin about the milk to day in Heatun-square, as how it war thinner nor hewsewal! Give us hover some more of that ere hannatto for the cream." "Ah, you d—d fool, you haven't put enough sugar of lead in yet! I'll never make a milkman of you!" But Hodson Rugg has not done with us yet. After having declared that even the *water*—the base of our creamy nectar—is *not pure or good*, generally, he lops off our last chance. "How glad I am," says one of our readers, "these remarks don't apply to me; I get all *my* milk per rail from the country!" Do you indeed?—that turn shall not serve you—read Hodson Rugg, and despair!—

The question is, indeed how is this to be remedied. These statements demand every attention; they are absolutely appalling. We would like to see the daring practitioner who, after reading them, would order a patient on a milk diet. They really should be sifted, and at once satisfactorily decided one way or other. For their own sakes the milkmen should be most anxious for the inquiry.

We shall not stop to inquire whether Mr. Rugg's proposition is the best: indeed it will not be time to do so till Government does interfere. As to the propriety of its doing so, if these things be true, there can be no second opinion. The milkman should be as amenable to police regulations as the butcher or the baker. Surely in these days, when sanitary questions engross so much space, the subject should have many advocates. There are 2,000,000 people in London: supposing each consumes half a pint of milk a day, it would take 50,000 cows to supply them.

We have said quite enough to call public attention at all events, to this startling little volume.—*Weekly Chronicle*.

The milk of human kindness must, according to Mr. Rugg, be of an entirely opposite quality to the milk of the London Dairyman since Accum published his "Death in the Pot," and Aunt Margery her Revelations," there has not been an exposure coming more home to our taste and stomachs than there is in the *via lactea* or milky-way pursued throughout the metropolis by the author; when we read "Death in the Pot"

little did we dream that the enemy was as fatal in the *milk pot*, it must be a curious *contre-temps* when a London doctor prescribes a milk diet, and the poor invalid is put upon a solutive (*fiat mistura*) of treacle, size, sugar of lead, whiting, spanish (adulterated), annatto, and other ingredients, slick and slab. No wonder people die, and doctors are decried, no skill could resist such substitutions.

Milk *au naturel* would be such a treat cockneys can have no idea of it, their children instead of dropping off as they now do *in such multitudes* between the ages of two, three, five and six, would get to be fat, plump, chubby cherubims, and look as fresh and ruddy as the red cow on a country inn's sign.

There is a sanitary commission sitting, let them look to this matter, and save the population 2,000,000 from the London dairy milk (?) of inhuman unkindness—God help the people!—*Literary Gazette*.

This pamphlet contains most extraordinary statements, which ought to be read and known throughout the metropolis.—*Lancet*.

A very useful pamphlet by a remarkable intelligent writer.—*Dispatch*.

An excellent pamphlet on the food of cows, their places of confinement, the best mode of improving them, and the adulteration of London milk.—*Maidstone Gazette*.

A very useful and remarkable pamphlet by a most intelligent writer.—*The Plough*.

Bad as we always considered the stuff that is sold in London for milk, we could scarcely have brought our minds to believe it possible that its unhealthy character and adulteration is of the poisonous kind which this pamphlet of Mr. Rugg's declares to be. The author, it is to be hoped, will by this book be able to effect a benefit which will be useful and advantageous for the preservation of the health of society.—*Bell's Weekly Messenger*.

It would, at first glance, appear that this is an odd subject for a pamphlet, and many persons would be led to exclaim, "why every body knows that milk is adulterated." It may be so, but as Mr. Rugg remarks, that adulteration is thought to consist merely of a large addition of water, it would be a great

comfort if the adulterations rested there, but we learn from pages of this well written little work, that great abominations are committed in the milk trade of London, and perhaps in other places, let us hope at least we are exempt from such practices in towns belonging to the rural districts, although we have probably a large share of water to the milk by the time it comes to the table of the consumer. An anecdote is told of Foote, who was much annoyed at the blue complexion of his milk and the absence of cream, one morning the milkman was astonished at the gentleman himself appearing at the door to take in the penny worth of milk with two large basins, he was still more astonished when Foote said he would prefer having the milk in one basin and the water in the other, leaving it optional with himself whether he would mix them or not.

Would that the adulteration remained of such a primitive character now, no great harm would come of it: but we find that filth of the vilest kind is mixed with the London milk, and in fact that the elements of disease are conveyed in it.

A dainty dish indeed to set before any one is this London milk, but still worse is it when given to little children under the expectation that a nutritious diet is administered. The first step towards the removal of an evil is a good exposure of it: and in this case the exposure is ample enough. Mr. Rugg deserves the thanks of the public for the manner in which he has laid bare the atrocity. We have no doubt he has earned for himself from the cow-keepers and milk-dealers curses loud and deep, for this interference with their nefarious trade.—*Bedford Times*.

This pamphlet ought to find its way into the hands of every person connected with the rearing and feeding of cows, for it contains much practical reason and sound observation, the subject is of greater importance than may appear at first sight, and we hope to see attention paid towards it.—*Lloyds*.

#### MILK—HEAVEN SAVE THE MARK!

The adulteration of London milk is proverbially extensive, but few we imagine who have not read Mr. Rugg's pamphlet, are aware of the deleterious nature of the adulterating materials, &c., &c., let none read the book who are not ready to co-operate to obtain a remedy, for really as ignorance is bliss to the unsuspecting it is folly to be wise, we feel an oppressive sense of duty to recommend the book, it will be found pro-

fitable of perusal, and let those who read drink deeply, not of milk, but from the fountain of knowledge and become wretched to their hearts content, we especially recommend the author's remedies to the consideration of what after all, is not a very "discerning public."—*Weekly News*.

This is a very startling pamphlet, that should command extensive perusal, it advances convincing proofs, borne out by analogy to the human constitution, and physiological principles of the unwholesomeness of the London milk irrespective of its wholesale and infamous adulterations.—*Home Circle*.

Milk, that purest and most inimitable of liquors, is seldom procured genuine in populous towns, Mr. Rugg has brought to light some of the most usual practices of the trade, we almost doubt the propriety of making them known, but if such evils be for ever winked at, when will they come to an end!—*Family Herald*.

This is a well-timed and very useful brochure. It reminds us, at a moment when we require to be remarkably particular in avoiding all kinds of food which are sources of irritation to the alimentary canal, that we have constantly presented to us as an article of diet—chalk, the brains of sheep, oxen, and cows, flour, starch, treacle, whiting, sugar of lead, annatto, size, &c., in the form of that most bland and natural aliment MILK.

It has been our province on several occasions heretofore to protest against the system of cow-yards in towns. We have protested against them—firstly, because they are direct sources of injury to public health, through the quantity of decomposing animal refuse which almost invariably attends them, and which is inseparable from them, in localities where all kinds of refuse are most irregularly and inefficiently removed. We have pointed out how, through these refuse heaps, death has knocked at the door of the young and strong; has cut short the ardent hopes of an enterprising spirit; has saddened the heart of the bereaved widow and orphan; and has indeed proved an unmixed evil. We have shown how they abound chiefly in low and densely crowded localities, where their malign influence is most potent. We have protested against them, secondly, because while sources to injury to the health of the surrounding inhabitants, they are at the same time, from their confined nature and bad arrangement, sources of disease to the cattle themselves which supply the secretion which is to be made use of as food. We have likewise referred to the

fact that milk forms the basis of the nourishment upon which the fabric of the young of the human species is reared, and that there is reasonable ground for supposing that milk containing purulent and tubercular matters, derived from the diseased lungs and udders of the cows, cannot prove other than injurious to the health of those thus fed. When to this product, termed milk, with its impurities, we inform our readers, that the adulterations to which we have referred are added, it will need no pleading on our part to convince them that some steps are demanded to suppress so vile a custom as having cow-yards in towns, and so gross a fraud as adulterating that food upon which the young are to be reared.

The title of Mr. Rugg's pamphlet informs us of its object, which it will be seen from our remarks we cordially approve of. We take it to be unnecessary at present to enter into the extensive evils which result from the entire absence of police arrangements, with reference to the sale of food notoriously unfit for healthily supporting the human frame; and among the kinds of food subject to adulterations—*milk*. The first great object of sanitary reformers with reference to this evil is to remove all cow-sheds to the suburbs of towns. The second object is to take care, through police arrangements, that the milk sold be really milk.—*Journal of Public Health*.

Perhaps next to the abundant supply of pure air and water, the supply of pure milk is of most importance to a city population. Milk is the type of all human food; and from a very early period of his civilized history, man seems to have been aware of the importance to the health of children of a plentiful supply of this nutriment from the animal kingdom. To supply London alone with this article of food, 60,000 cows, yielding upwards of one hundred thousand gallons per day, are required. A substance consumed in such prodigious quantities, and more especially by that portion of the population most liable to fall under the influence of the causes of disease, should be free from all suspicion of impurity. But what is really the case? Why, a large portion of the milk supplied to London is yielded by cows kept in the most unhealthy places possible, and under circumstances which render it an absurdity to suppose that they can afford this secretion in a condition fitted for human food. The cow-sheds of London are one of its most patent and disgusting nuisances: and we need not say how injurious to the health of the animal they must be. But the evil does not terminate here. The milk, bad as it is when produced in London, is subjected, alike with that which comes from the

country, to various adulterations. Water is the most common of these. Would that it were the worst—although London water is bad enough: but we have in Mr. Rugg's book a list of abominations added to this pure food, whose names we would not mention but in the belief that the disgust which they must produce is a less evil than that of administering them to helpless infants and children who have not yet shed their milk teeth. The brains of animals obtained from the foulest sources,—sugar of lead,—chalk,—starch,—treacle,—and annatto, are a few of the compounds which when mixed with water are used to make the scanty supply of milk from the London cow go further. It is time something should be done to stop this system. Cow-sheds should be abolished in London. People should learn to analyze their milk and water. Mr. Rugg gives no directions on this head,—but we are convinced a few simple rules would detect many of these adulterations. Above all, every effort should be made to obtain a supply of pure milk from the country without allowing it to go through the hands of fraudulent London dealers. Would not the laws which apply to selling bad meat or fish be equally applicable to adulterated milk?—Mr. Rugg deserves the thanks of the public for calling attention to this subject.—*Athenæum*.