THE MILK SUPPLY OF THE METROPOLIS.

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It is unnecessary to emphasize the importance of milk as an article of diet, and I will only say that as it is the chief food of infants, young children, and sick persons, no effort to secure a supply which is clean and unadulterated can be deemed too great to be made. The conditions of life have greatly changed since the pastoral age, when every family produced and consumed its own supply. Then milk was used as taken from the cow, and consumed so quickly that no noxious products arising from contamination were developed. The promised "three acres and a cow" are not likely to materialize. We have, therefore, to deal with a system of supply for large towns which may be expected to persist without material alteration, and it is our duty to see that that system is developed to the highest possible standard.

The London milk trade dates from 1860 or thereabouts, and was greatly promoted by the outbreak of cattle plague in 1865. The trade would, of course, be impossible without the numerous avenues for quick importation afforded by the railways converging on the metropolis. The consumption within the Metropolitan area was estimated some three years ago at about 60,000,000 gallons per annum. It is now probably nearer 63,000,000. In 1889 there were 10,000 cows in the Metropolis, a number which in 1900 had fallen to little more than half (5,144). At the licensing meetings of the London County Council of last year 276 licenses were granted for cow-sheds, affording accommodation for 6,047 cows, but the number actually kept there is between 3,500 and 4,000. The average amount of milk yielded by a cow is stated to be 500 gallons per annum, so that the "local production" may be estimated at from 1,750,000 to 2,000,000 gallons per annum. The deficiency is made up from all parts of the United Kingdom, the area of supply extending occasionally as far as Scotland in the north and Cornwall in the south. Within recent years a beginning has been made of a milk trade from the continent, as much as 10,000 gallons arriving during one week of the winter of 1900-01.

Prof. Delépine, in a paper read last year before the Epidemiological Society, adduced convincing proofs not only of the well-known fact that milk is liable to undergo harmful changes when contaminated with "dirt," as distinguished from more specific contamination, but also of the importance of time and temperature as the efficient factors in the development of those noxious products. As much of the milk

reaches the town consumer twelve or more hours after leaving the cow, it is evident that he is the person who has the greatest right to demand that milk shall be produced under conditions which will keep it free from dirt, and that its transport and delivery shall be adequately supervised, so that the milk shall reach him in a sound and unadulterated state. A great responsibility rests on the local authorities of rural England in this matter, a responsibility which unfortunately is too often not recognized, or deliberately ignored. This has been recently demonstrated by the replies collated in the *British Medical Journal* of December 5th, 1903.

The proportion of the London supply which is produced within the Metropolitan area is so small, that I may dismiss it from present consideration with the remark that as it is under the joint supervision of the officers of the County and Boroughs, it should be an easy matter to secure its production in a clean and wholesome state. The rural cowsheds and farms have the most vital interest for us, but I do not propose to deal with them, as they are under the jurisdiction of provincial officers. I prefer to make the act of milking my point of departure, and to note certain mishandlings of the milk which have come under my personal observation. After that I propose to say a few words on the powers possessed by the Borough officials with regard to the supervision of the sale of milk, and to suggest certain methods which appear to me to afford a hope of a better supply.

On the occasion of official visits to dairy farms one has little chance of seeing the normal conditions of milk production. What is seen is often bad enough, but to get really behind the scenes it is necessary to live on the premises. A few summers ago I spent my holidays at a small farm in Gloucestershire, where the principal business was the supply of milk to the neighbouring town. The cows were kept in the fields, but were brought to the farmyard for milking. The principal milking shed was a narrow one, just large enough to take one cow at a time. The floor and the walls were covered with dung, the former to the depth of several inches. The milk was simply strained before being taken on the round, which included the principal refreshment contractor in the neighbouring town. The milk vessels were washed in well-water which was not thought good enough for drinking. In this case the milk was consumed so soon after being drawn, that there was not time for any toxic property to develop. If the milk had been sent to a distant town, I think the results would have been different. While admitting that very many farms are managed on much better principles, I fear that what I saw was but a sample of common experience.

I have mentioned the distances from which the Metropolitan supply

is derived. The usual milk-van is well known, and where the milk traffic is sufficiently large and regular in its dispatch, the railway companies always provide such vans. Under other circumstances the milk takes its chance, and I have seen it loaded into vans stinking of fish, and into others in which dogs have travelled. The smaller quantities get but scant care at the stations, being left while waiting for the expected train, exposed to dust and sun. Usually the churns are not locked, and so afford opportunities for pilfering, with the consequent addition of water of unknown source and quality.

Arrived in London, the milk either goes direct to the retailer, or to one of the large wholesale depôts. Many London firms, both large and small, take the utmost care of the milk consigned to them; but there is still reason to believe that "blending" is not unknown. A judicious mixing of high- and low-grade milks, without the addition of water or separated milk, can be safely effected without getting within the grasp of the law. The milk standard has not for this reason been an unmixed blessing. Structurally I think the London milk stores are satisfactory, but the same cannot be said of the manner of conveying the milk through the streets. The cans and churns are too much exposed to dust and sun, while in hot weather the means adopted to prevent heating of the milk are (to put it mildly) rudimentary. As regards the shop sale, it is only necessary to allude to the fact that it frequently takes place on premises where paraffin, wood, and other commodities of a more or less savoury character are dealt in. The counter-pan is more commonly uncovered than otherwise, in spite of the efforts of the officials, and the shop door being usually kept open (in hot weather at any rate), the milk pan is the "Happy Valley" of flies, and the catchment basin of much dust and *debris* from the street.

At the consumer's house the milk has to take its chance between the hot kitchen, the cooler scullery with the neighbouring sink and its trap, or the still cooler larder, if there be one, in all probability adjacent to the dust-bin. Here again it receives its quota of flies and dirt. What wonder that the milk fails to "suit the baby," who after all is the most sensitive re-agent we can use to test the purity of the milk?

The treatment so far described, except as regards "blending," is due to ignorance or more or less culpable negligence. In addition to that process, skimming, watering, and the addition of preservatives are only too common. I do not propose to dwell upon these fraudulent practices here, although I shall have something to say about them when dealing with the legal provisions relating to milk. To the latter subject I now proceed.

The Metropolis cannot be congratulated on the possession of such clear and intelligible powers of supervision over the sale of milk, as the importance of the commodity and vital interests involved entitle this, the first city of the world, to possess. Prior to the passing of the London Government Act, 1899, the County Council had the whole matter under its control, in pursuance of section 28 of the Public Health (London) Act, 1891, under which section the Local Government Board is authorized to issue such Orders as may be necessary for the Metropolis, and the County Council to make bye-laws pursuant to the same Orders. The Board has issued no Order, and consequently the County Council has made no bye-laws. By the London Government Act certain powers were transferred from the County Council to the Borough Councils, viz., the registration of dairymen and the administration of the "bye-laws and regulations for the time being in force with respect to dairies and milk." At a first glance it would appear that the supervision of the London milk trade was allocated between the two authorities in such manner as to leave the administration of the Dairies, Cowsheds and Milkshops Orders of 1885, 1886, and 1899 in the hands of the County Council, and that of the Bye-laws (non-existent) and Regulations (dated 1885) in the hands of the Borough Councils; but the definitions of "dairy" and "dairyman" contained in section 141 of the Public Health (London) Act, 1891, include in the former all places where milk is produced, manufactured, or sold, and among the latter farmers, cowkeepers, dairymen, and milk vendors. I do not know whether it is due to bad draftsmanship or intention, but it does appear to me that practically the whole of the supervision of the milk trade is now transferred to the Borough Council, except the licensing of cowsheds, expressly reserved to the County Council, and the making of bye-laws. I must admit that there is some doubt on the point, and probably the only way of clearing up such ambiguity will be by the enactment of bye-laws. I think it will be generally admitted that neither the Orders nor the Regulations are really suited to the London trade, or up to date. The Council of this Branch might with advantage take up this question, and press the Local Government Board and the County Council to exercise the powers which have been in abeyance since 1892.

As regards transport, it appears to be desirable in every way (including the interests of the milk importers) that all churns should be either locked or sealed. The railway companies are usually said to be opposed to such practice; but that allegation has been so conclusively and so frequently refuted that it need not be dealt with now. Whether the present form of churn is the best pattern is open to question. I have often thought that one of a cylindrical shape

and smaller dimensions would be better, both as regards cleanliness and convenience of handling. I should like to have the milk-vans provided by the railway companies built with double roofs and louvred sides, and all milk conveyed in such vans. The latter suggestion, however, is a matter more for the farmers than the railway companies. If the farmers would combine and arrange for a sufficient number of churns to be at a smaller number of stations, instead of a small number of churns at many stations, the railway authorities would arrange to have proper milk vans always attached to the trains. The vans used for road traffic should have solid canopies and curtains of washable material. Provision should also be made for keeping the curtains wet in hot weather. The present system of covering the churns with a dingy-looking blanket cannot be described as satisfactory, and, judging by results, is not efficient.

The foregoing suggestions, however, only deal with the milk after it has left the farmer's hands, and there is still room for other improvements. The farmer nowadays is too impecunious to inaugurate any extensive improvements, and what is required to bring milk production up to date is combination among the farmers. They should be not only the producers, but the retailers of milk. If, as seems possible, farmers will not or cannot combine, I think the wholesale firms would do well to remove their depôts to the provincial milk areas. By this means I feel sure better supervision would be exercised over the keeping of cows and their milking; less adulteration, either skimming, watering, or the addition of preservatives, would take place; and it would be possible to get the milk into the Metropolis in a much cleaner and sweeter condition. Such country depôts, if provided with motor vans, would be able to draw supplies from comparatively large areas. Seeing the number of mechanical milkers now on the market, it should be possible to put an end to hand milking. There is really no inherent difficulty in arranging for milk to reach the dépôt without coming into contact with the air. At the dépôt the milk would be filtered, cooled, and run into closed cans of the pattern already suggested, and despatched to London in suitable vans by fast train. At the London dépôt it could be again cooled and distributed in bottles, as is done in certain towns on the continent. Proposals which are condemned in one generation as fads, so frequently become the necessities of a later generation, that I venture to hope some system such as I have sketched will ultimately come to be regarded as the proper method of conducting the trade.

No remarks on the milk trade can be considered as complete which do not touch on the question of adulteration. This subject was before the Society in January last, but I will venture to say a few words on it in special relation to milk.

The three matters which come under special cognisance are watering, skimming, and the addition of preservatives. The two former are dealt with under the sixth section of the Sale of Food and Drugs Act, 1875, and the third under the third section of the same Act.

It is commonly said that adulteration is less prevalent than it used to be, and the statistics given in annual reports are quoted in support of this statement. I question, however, whether the published statistics are a safe guide in this matter. It is a very significant fact that samples submitted by private purchasers always show a very much higher percentage of adulterated samples, than do those obtained by officials. Thus in the last Annual Report of the Local Government Board it appears, that while the proportion of adulterated samples obtained officially was only 8·8 of the whole, in the case of the seventy-two samples submitted by private purchasers 28·7 per cent were condemned. It is common experience that official purchasers require to exercise much slowness to catch old offenders. It is also common knowledge that an unexpected raid on a Sunday generally yields a good harvest of bad samples. As regards milk samples, in the whole country 11·6 per cent were adulterated in 1902, (compared with 11·2 in 1901), and in the Metropolis 15·6. It has also been found that station samples are less frequently adulterated than those obtained from retailers, except when taken under Section 3 of the Act of 1879. The Analyst for the County of Kent has probably very accurately stated the present position in saying: "The older and grosser form of milk adulteration by the addition of water to milk, is largely giving place to more refined methods of mixing 'separated' with 'whole' milk so as just to escape the Board of Agriculture limit for fat."

It appears to me that the only way to successfully combat this deliberate lowering of the nutritive value of milk, is to raise the standard. Surely it is more reasonable to fix a standard which involves an improvement in the quality of the article affected, rather than one which allows a good supply to be tampered with with impunity.

Of late years the difficulties in dealing with adulteration have been increased by two important decisions in the Court of Appeal. Section 25 of the Act of 1875 provided that a written warranty should be a good defence if the vendor of the sample satisfied the Court that he sold the substance in the same condition as he received it, and had no reason to believe that the commodity was otherwise than as warranted. Proceedings were also provided (section 27) for the giving of false warranty, but in their original form they involved the expensive procedure of summons in the place where the contract was executed. By section 20 of the Act of 1899 the latter difficulty was

in part remedied, and proceedings can be taken with respect to a false warranty in the place where the sample was purchased. It was thought that this provision applied to all givers of false warranties, but the decision given in 1902 in the case of "*Manners v. Tyler*" laid it down that those provisions applied only to (what may be styled) warranties of the first degree. Where the article has passed through several hands, and each purchaser has covered himself by a warranty, the second or more remote warrantor can only be reached by process in the district where the warranty takes effect, that is, where the consignor's liability ends. Thus in the case of a sample purchased from a retailer *A* and found to be adulterated, if a warranty be proved, proceedings against *B* who gave *A* his warranty can be taken in the district where the sample was purchased; but if *B* had a warranty from *C*, and *C* from *D*, and it is desired to take a summons against *C* or *D*, it is necessary to first find out where the warranties between *B* and *C* and *C* and *D* are current, and then journey to the courts having respective jurisdictions. The witnesses requisite in such cases are usually numerous, and the expense considerable. Moreover, there is a strong probability that, as some time is likely to have elapsed between the purchase of the sample and the hearing of the summons, the success of any proceedings will be more than uncertain. If the defence of a warranty is to remain in the Acts, which I think it should not do, then section 20 of the Act of 1899 should be amended to get over the difficulty created by the decision given in "*Manners v. Tyler*."

My reasons for thinking that the warranty defence should be done away with are: First, that it is a very simple matter to make such rough tests of milk as will suffice to arouse a suspicion of adulteration (when the aid of the Inspector can be sought under section 3 of the Act of 1879) and that every milk dealer ought to be assumed to be able to make such tests; and, secondly, that it is exceedingly rare for milk to be sold without mixing two or more supplies. The latter point has not yet been taken in any Court, but I should think that it might be successfully maintained that the mixing of two separate supplies abrogated the warranties, as, in the words of section 25 of the Act of 1875, the milk was not sold "in the same state as when purchased."

A further difficulty has been created by the case of "*Whitaker v. Pomfret Bros.*," where it was held that proceedings for a false warranty could not be taken after the expiration of six months from the date of the warranty. The sample which gave rise to that case was one of pepper, and the facts of the case do not fall in line with those of a milk case. The pepper was sold in one delivery, and the invoice was the warranty. In the milk trade it is customary to affix to each

churn a label (which is practically an invoice) stating that the contents are warranted to be pure and unadulterated, or words to a like effect. It appeared to me in a recent case that I was concerned with, that the label ought to be held to be the warranty, and the offence to be taken as committed on the day the milk was despatched.* However, in the milk cases which have been before the lower Courts since the pepper case, the contract for the supply of the milk has in each case been regarded as the warranty. Such contracts are almost invariably made for a year, so that, following the ruling in "*Whitaker v. Pomfret Bros.*," after the contract has run for six months adulteration can go on with impunity, and no one can be made responsible if the contract is to be held to be the warranty.

I would, as I have already said, do away entirely with the "warranty" defence in prosecutions under the Acts, leaving the defendant to take civil remedy if he can prove that he did not know that the commodity was adulterated, although sold to him as genuine. The conditions of food analysis are so different now from what they were at the passing of the Act of 1875, that the provision is really out of date. I venture to hazard a guess, that comparatively few actions would be taken, as I believe that a very large proportion of the adulteration of milk is done by the small retailers, from whom the bulk of such samples are obtained.

In the matter of preservatives, the difficulties of local authorities are of a different character. Although the Departmental Committee of the Local Government Board reported in 1901 on this subject in no uncertain terms, yet the burden of proof of the injurious character of such preservatives still rests upon the authority taking any case into Court. Such proof being a question of opinion and not one of fact, it is usually possible to adduce evidence of the non-injurious character of the ordinary preservatives, although I believe that the profession as a whole are of the opposite opinion. It seems incredible that the Government, after having received so strong a report, should not have given effect to the recommendations of the Committee—recommendations which follow the practice of other countries, and have been adopted by others in recent years. Further, it is unfair both to the trades concerned and to the consumer, that the matter should be left in doubt. In one district tradesmen are liable to be constantly proceeded against, for doing what those in the adjoining district do with impunity. Of the possible injury to the consumer which remains unchecked by such dilatoriness, I need say nothing here. I would commend the matter to the Council of the Branch,

* This view was not accepted by the Council's Solicitor, but was subsequently endorsed by the Board of Agriculture.

with a view to pressure being brought upon the Government to introduce the necessary legislation.

In conclusion, I desire to refer to one special part of the question of milk supply which has recently taken a prominent position—I mean the special supply for infants who are not breast-fed. This has been in several forms in the past. The large milk companies, such as the Aylesbury, Welfords, and others, have for many years provided “humanized milk,” “sterilized milk,” etc., while even the smallest retailer exhibits the stock sign of “nursery milk.” Then there are the more specialized preparations, such as the “Walker-Gordon” and the like, most, I believe, hailing from the States. All these varieties are more expensive than the ordinary supply, and are consequently out of the reach of the poorer classes.

In this connection three facts have to be recognized and dealt with : First, the birth-rate has been for years, and still is, shrinking ; second, the infantile mortality is practically what it was in pre-sanitation days ; and, third, breast-feeding is out of fashion. The first and second facts make it imperative that something should be done to foster a higher rate of increase of the population than is at present prevailing. No influence external to the individual can raise the birth-rate to its former height, but we ought to be able to do something to stop the leakage due to the high infantile mortality. Neglecting that proportion of deaths of infants which is due to causes absolutely beyond our control, we may say that the greater part of the preventible mortality is due to improper food given in substitution for breast milk, and that such errors in diet (and rearing) arise from want of training in maternal duties.

It is evident that the foregoing facts demand some systematic effort, and as the question is a national one, it may seem at first sight that the establishment of milk depôts by local sanitary authorities affords the best and most suitable remedy attainable. I am unable, however, to endorse that view. Municipal depôts are not only wrong on abstract principles of political economy, but they attack the question in a wrong direction, and their influence is at the best more or less limited in scope. Parents who are without the necessary moral calibre will not stint themselves so as to have money to spend on such a supply, and even were the milk free, many would not take the trouble to fetch it. Looked at in the most favourable light, these depôts can only be regarded as makeshifts. Their establishment to my mind may be compared to the action of a gardener who cuts off the top of a weed, instead of grubbing up its roots. I maintain here what I have advocated elsewhere, that the proper procedure is to educate girls in the duties of wifehood and motherhood. I want

domestic economy and hygiene, including such subjects as the nutritive values of foods, their proper use, the care and feeding of infants, etc., to form part of the curriculum of every girls' school in the country. There are many subjects of which only a useless smattering is acquired, which can be abandoned in favour of the more useful, not to say vital, subjects I have enumerated. The "physical degeneration" and the "temperance" questions would be dealt with finally and successfully by the adoption of such a course. The children would be so fed that they would grow up healthy and vigorous in mind and body. The craving for alcohol which, in those who are not degenerates, is due to starvation (I mean by that want of nutrition, not of food) would be eliminated. Inexpensive and nourishing foods are cheaper now than they ever were; what is wanted is the due appreciation of their values and knowledge of their use. I can only approve the establishment of municipal depôts as a temporary measure, pending the time when the desired amendment of our educational system becomes operative, a time which I fear is still far distant. In this matter also London is in an unfavourable position compared with the provinces.

In provincial towns, where the milk supply is much more favourably circumstanced, such depôts can be maintained by the local authorities, but in London the Local Government Board has decreed that any expenditure of the rates on depôts is illegal. It is difficult to understand the position. Relying on my (perhaps now somewhat rusty) experience of provincial legislation, I can call to mind no special provision in any of the Health Acts authorising this expenditure. It almost appears as if the difficulty has been created by the Government Audit, but surely "what is sauce for the goose is sauce for the gander." If London cannot spend the rates in this way, the provincial towns ought not to be allowed to do so. On the other hand, if the provincial authorities, in whose districts wholesome, cheap milk supplies should be, and generally are, available, can legally incur this expenditure, then London authorities, where the milk supply is most handicapped, ought to be able to follow what is generally regarded as a good example.

On the subject of the competition between municipal depôts and the trade, I will only say this. Were the depôts regarded as part of the machinery of the Poor Law administration, instead of being managed so as to be self-supporting, and the depôts not open to customers of all classes, the question of competition would not arise. Having regard, however, to the present system of management, I feel that there is a taint of "municipal socialism" associated with them, a taint which threatens to do much harm not only to municipal institutions, but to the nation as a whole.