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THE MILK-FEEDING OF INFANTS AT NURSE

GENTLEMEN,—In accepting, at your invitation, the honourable position of President of the Ulster Medical Society, my first duty is to thank you most warmly for the high compliment you have conferred upon me, and to express the hope that, with the aid of the Council and the indulgence of the Members of the Society, I shall be enabled to preside at its discussions to the general satisfaction.

I have great hopes that a new era has dawned on our time-honoured Society. Last session afforded evidence of renewed energy and life, and discussions on important topics and valuable monographs contributed to maintain an interest in its proceedings. I have learned, too, that in the coming session there is every prospect of progressive improvement.

I trust that the younger members will not hesitate to bring forward original papers and disquisitions on medical subjects through fear of friendly criticism, and that the seniors will endeavour to overcome the *vis inertiae* by which they are too liable to be influenced, and that they will cull from the repertory of their note-books some of their important cases and theoretical speculations. Labouring thus in unison, we may have good reason to hope that when the session terminates the retrospect shall be satisfactory to us all.

My able and accomplished predecessor in this chair treated in an exhaustive manner, in his opening address, the subject of the great advancement of medical science – its conquests and its triumphs in modern times. The task which I have imposed on myself will, I fear, be less flattering and agreeable; for it is my purpose to advance opinions adverse to those generally recognised, and to question the propriety of the teaching and practice on a very important subject – "the Milk-feeding of Infants at Nurse." The proposition which I hope to establish is, that in the unreasonable and excessive dilution of cow's milk practised by mothers and nurses in the feeding of infants, sanctioned and taught by many members of our profession, serious injury is done to the nursing child, its natural development retarded, its growth stunted, and too often the seeds of disease and death implanted in its constitution.

Were every English mother actuated by a sense of her maternal obligations, did she nourish her baby during the early months of its existence with the food specially provided for it by the Author of its existence, defective alimentation could not, with justice, be classed as a potential cause of infant mortality, nor should it be in my power to animadvert on prevalent errors in artificial or hand feeding of children, the main resource of the fashionable dames of modem days. How strange, and how much to be deplored, that the Christian mothers of the 19th century should be as oblivious to duty in this respect as the matrons of Pagan Rome in the age of Tacitus, who, as a proof of the degeneracy of Rome in his days, laments that while in former times "grave matrons attended to their children as their first duty, they now," he complains, "entrust them to the care of some Grecian slave, or other inferior domestic."

But in addition to the class of unwilling mothers, there is another and a numerous one to

whom Nature has not been so liberal, and who have not been provided with the maternal nourishment, and who are, therefore, precluded from performing that duty; and a third class who, although secreting freely, are debarred from nursing by the defective quality of their milk through a tuberculous or other taint in their system.

It is in vain that, according to the apostle, "the babe desires the rational milk without guile," for "every nurse and mother," in the words of Sir James Simpson, "thinks that she can improve upon God's food – pure and unadulterated milk." Some nurses from the very first week are in the habit of adding farinaceous food – such as corn-flour and arrowroot – to the posset of milk, in happy ignorance that it is not until the lapse of five or six months that the infant acquires the property of digesting starchy food, and that, in the absence of ptyalin, it passes into the stomach and bowels in an insoluble state, incapable of being assimilated – intestinal trouble being the necessary result of such feeding.

But the greater number – and it is with those that we have now to do – prefer to rear their children on that food alone which most nearly resembles the mother's milk, and therefore the milk of some inferior animal, when a wet nurse is not provided, is depended upon for their nutrition. The milk of the ass, though suitable for some cases, frequently disagrees, and the milk of the goat is not always available, so that practically cow's milk is the chief reliance of the hand-fed child. Milk as it comes from the cow is a beautiful emulsion – a compound fluid in which sugar, curd, and oil, are mingled with a certain proportion of water – and admirably adapted to the digestive powers of the infant. While the water and sugar are absorbed, the curd is separated by coagulation, and finally dissolved by the agency of the gastric juice, which is much more powerful in the young than in the adult, and thus greatly contributes to digestion. If then this bland fluid, moderately heated, were given without any of the improvements alluded to, especially the benevolent addition of water in scientific profusion, we should have fewer puny, sickly infants to prescribe for; fewer complaints of colic, of spasms; fewer entreaties for carminatives, for sedatives to still the voice of hunger in the poor starvlings whose only requirement is to be found in a cup of genuine unadulterated milk. But the doctor is consulted – he finds that the infant is not thriving, that it is peevish, languid, restless by night and day, that its evacuations are unhealthy, that it is constantly wetting its napkin, that its countenance is pale and anaemic, its forehead and scalp traversed by large blue veins, that diarrhoea is a frequent visitor, and that if a change do not soon occur, the gravedigger shall soon have his due – every fourth or fifth grave that is dug being for an infant under twelve months; but then –

"Tis not a life –
'Tis but a piece of childhood thrown away!"

The doctor soon discovers that there is a great defect in the nutrition of the child, and inquires upon what it is fed. He is gravely answered – "Upon milk and water." He asks, why give water? Because, the nurse replies, cow's milk is too strong for the child, and we add equal parts of water – or, two parts of water to one of milk!! or frequently three parts to one of milk!!! And upon this watery diet you expect the infant to thrive, and you wonder that the water you are incessantly pouring in by the mouth is as constantly passing by urination, that its flesh is not firm, and that its bowels are so relaxed.

On inquiring of trained nurses for an explanation of this practice, I have been answered, "Oh, Drs. A. and B. always do so;" by one that she was taught the science of dilution, 2 parts water 1 milk, in the Rotunda Hospital. My reply was, "Perhaps so." I have no doubt its present masters give different advice. By another, that an eminent gynecologist in Edinburgh told her always to give equal parts. "If so," I answered, "while I have every respect for that gentleman's scientific acquirements, it is evident he has yet some knowledge to gain."

But passing from the statements of monthly nurses and mothers, what do our text-books, what do our teachers say on the subject ? I shall quote from but a few, as I am sure the generality of the practice of dilution will not be questioned. Underwood, a great authority in his day, directs a portion of water to be added, leaving the quantity to the discretion of the nurse. Dr. Combe, "On the Management of Children" (p. 234, Chap. XI., on Artificial Nursing), says – "At first two-thirds of pure fresh water should be added to one-third of milk, but goats' or asses' milk does not require more than an equal part of water; after a week or two the quantity of water may be reduced to one-half, and afterwards to one-third, at which proportion it should remain for four or five months." Some textbooks tell us to give the milk diluted with a proper amount – some two-thirds water to one-third of milk, some with equal parts. *The Edinburgh Medical Journal*, quoted in *Brit. Medical Journal*, July 15, 1873, publishes the following, among other rules, for the management of infants, prepared by the medical officers of the New Dispensary, and circulated among the visitors to the charity – further assuring us that

they are very similar to those which have been issued for some years at the Middlesex Hospital and the Hospital for Sick Children, London. After some very useful paragraphs – Paragraph 3, how to bring up by hand: – "If the child must be brought up by hand, it should be fed with milk and water out of a bottle. At first there should be nearly as much water as milk, but when the child is a month old two parts of milk should be mixed with one of water; after this the proportion of milk should gradually be still further increased, till at five or six months it is given plain." The editor of *The Edinburgh Medical Journal* adds this sensible remark: – "To mix water with milk is needless – too much of that is added before the poor mother gets it, and, even were it not so, the child has need of all the nourishment it can get."

This expression of opinion by the editor formulates in a few terse words my long-cherished idea, the result of my personal observation and experience during the greater part of my professional life, and to enforce its adoption and to induce my professional brethren to reconsider their teaching and practice on this important subject is the aim and object of this paper. I shall trouble you with but one other quotation from a very learned and the latest writer on the Science and Practice of Midwifery, Dr. Playfair. He says, at p. 276, Vol. II.: – "A common mistake is over-dilution, and it is far from rare for nurses to administer one-third cow's milk to two-thirds of water – the necessary dilution will be best obtained by adding to pure, fresh, cow's milk one-third hot water, so as to warm the mixture to about 96°. After the first two or three months the amount of water may be lessened, and pure milk, warmed and sweetened, given instead."

You perceive, gentlemen, dilution is the prevalent idea, with one bright exception, in the hand-rearing of children – it is by this potent means that we shall succeed in putting a bone into children when they are young. But you will not fully realise the grandeur of this idea, the complete development of this gospel of nutrition, unless you take the trouble of following the process step by step.

In the first place, according to Letheby, the normal amount of water in good honest milk ranges from 84 to 95 per cent. – a fine foundation for the exercise of the noble act of dilution; to this the dairyman is permitted, by custom, sanctioned by the Society of Public Analysts, to superadd 5 per cent, from the cow with the iron tail; the dealer next appears upon the scene, and he is permitted by the authorities of Somerset House to add 15 per cent, on his own account, as they have declared that milk with 20 per cent. of added water should be passed as genuine. The purchasers are thus entirely at the mercy of the dealers, who, too often, by dilution and skimming of the milk, rob it of 25 per cent. of its cream and other nutritive qualities. According to Dr. Cameron, however, while 25 was a usual rate of dilution in Dublin, it frequently rose to 60 per cent. of added water. Let us now follow this sophisticated fluid, this ill-used aliment, to the nursery, and here we shall find that it receives the worst of all bad treatment, for before the passive infant is permitted to take the pellucid fluid it is again doctored by the addition of, not 5 or 10, but of 100, 200, or very frequently, 800 per cent. of water, by the advice or tacit sanction of the physician, and on the plea that the pearly liquid is too strong for the digestive organs of a healthy child! Surely the homoeopathic nostrum of the third dilution could not compare in absurdity to this. To what purpose, may I ask, the interference of the Legislature rendering it a penal offence in a dealer to dilute or adulterate the milk beyond a certain proportion – to what advantage the action of the magistracy who daily, in our courts of law, impose heavy penalties on conviction of the adulteration of milk, assigning as a reason that it deprives the citizens of good and proper nourishment, if heads of families, through ignorance or unsound advice, so often nullify the intentions of Parliament, and mix and destroy the most salubrious of infantile foods ? But where, I ask, in this deluge of water is the poor infant to find the necessary amount of nitrogenous and carbonaceous material? where the saline principles indispensable to the growth and development of the solid textures of the animal frame? But as those matters, so essential to vitality, are not presented to the infant, as a natural consequence defective alimentation leads to individual degeneracy, and ultimately to progressive degeneracy of the race, to wasting disease, and to death.

"How sad to mark how soon the flower of human life
Hastes to its fading from its very birth!
Another newly-born ! How near ere they –
The one that's dead, the one that's born to-day !"

As a general principle, it cannot be questioned that disease and premature decay are intimately associated with the nature of the food-supply. According to Ancell, milk, poor or defective in its staminal principles, will, no doubt, produce in the nursling all the effects of deficiency of food, and that debility which operates as a predisposing cause of tuberculous and other diseases (*vide* Ancell, "On Consumption," p. 458); and Donné informs us that he

ascertained, "by direct experiment, that an inappropriate nourishment of young animals has a great effect in altering the shape and nature of the corpuscles of the blood" (*vide Microscopical Journal*, 1842, p. 245). It is a long time since Mr. Phillips declared that dilution cannot make cows' milk resemble that of women. Physiology and pathology alike protest against the false principle which I have been arraigning to-day; but my chief reliance shall be upon chemical research to upset the assumption upon which this hypothesis rests – viz., that the milk of the cow is so much stronger than human milk that it requires an amount of water, varying from 25 to 800 per cent., according to the whim of the blender, to assimilate the fluids, and adapt cows' milk to the digestive capacity of a healthy child.

In accordance with ordinary modes of reasoning, if 300, 200, or even 25 per cent. of water were required to reduce a certain liquid to the strength of another, it should only be so because that liquid was composed of elements three times, twice, or one-fourth stronger than the other. Now, is such the case with the two liquids we are comparing? Plainly, is the milk of the cow three times, twice, or even one-fourth stronger in nutritive elements than human milk? Let chemical analysis determine. In the first place, the specific gravity is almost identical, varying in both, according to conditions of health, from 1013 to 1832 (Vernois and Becquerel). According to analysis of Regnault, given in "Neligan," in 100 parts of human and cows' milk there are found –

	Cows' Milk	Human Milk
Water	87.4	88.6
Oil and butter	4.0	2.6
Lactin and soluble salts	5.0	4.9
Casein, albumen, and fixed salts	3.6	3.9

Total solids,	cows'	12.6	
„	human		11.4
	Difference 1.2 (about one-tenth)		

Thus, on the computation that the milk is obtained direct from the cow, about one-tenth is the exact amount of solid nutriment contained in that secretion as contrasted with the milk of the mother; and upon this slender superstructure the edifice of dilution is established!

But to act in every case upon the principle of dilution is simply to become the slave of routine; and, in my somewhat extended experience, I have very seldom found it necessary to add any water to the milk provided for healthy infants, for the mere purpose of dilution. I have occasionally advised the addition of an ounce or two of lime-water to a pint of milk, not as a diluent, but as a corrective of lactic acid, which is frequently found in milk when not absolutely fresh – the normal reaction of good milk being alkaline; and often that corrective is not necessary, for if the milk occasionally disagrees on account of the varying condition of the digestive organs of the child, or from other causes, it is only necessary to boil the milk and carefully skim it before use.

Children nourished with the fresh milk of the cow present a rosy, robust, happy, and contented appearance, in marked contrast with the poor starvlings fed upon homoeopathic doses of milk administered in floods of water, or mingled with starchy or farinaceous diet. No one can adequately tell the amount of infantile mortality due to inefficient feeding; thousands whose deaths are annually registered as caused by teething, diarrhoea, water in the head, tabes mesenteries, convulsions, thrush, &c., and who perish in the first year of their existence, in reality owe their deaths either directly or remotely to improper feeding. Should not our sympathies, then, be directed

"Towards the young souls new clothed in helpless clay,
Fragile beginners of a mighty end?"

And if we could better instruct their mothers in this all-important duty, many lives would be saved to the State, infants would not die as if to make way for others to be born, and some reparation would be made by the present race of medical men for the false teachings of other days, the traditions of which still linger and are painfully evident in many customs of modern life. When a fond mother exposes her child to a cold chilling wind, with the avowed object of hardening its constitution, she is but obeying the dictum of Dr. Underwood, who taught the mothers of the preceding generation to do so, and who testified to "the absolute necessity of inuring very young infants to endure the cold as essential to their health and that of Dr. Armstrong, another great authority, who taught at the same time that infants should be daily plunged into cold water, even the day after their birth, for the purpose of bracing up their nerves, &c. We are also confronted daily with the senseless dogma, believed in by most mothers, that because a child is teething it would be dangerous to stop a diarrhoea, and many an infantile life I have known to be sacrificed to such a vulgar error.

My great object in bringing this subject before the profession is not, I trust, a too ambitious one, if I express the hope that the medical men of the present

day – the legitimate advisers of mothers and nurses – will set their faces against this monstrous and wide-prevailing abuse; and that, while it may be necessary in some cases for a time or in certain conditions of an infant's health to permit or advise the addition of some diluent to its ordinary pabulum, they will not permit the use of their high authority as sanctioning a process of promiscuous dilution.