REPORT ON TUBERCULOUS MILK IN EDINBURGH.

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THE results of the bacteriological examination of a large series of unselected cases of tuberculosis of the cervical lymph glands published in the BRITISH MEDICAL JOURNAL last January (p. 125) showed conclusively that the bovine type of tubercle bacillus plays a significant part in the causation of this disease affecting children in Edinburgh and district.

Being thus furnished with an index of the frequency of the bovine infection in children, it was natural to inquire to what extent the milk supply of the same area was infected with tubercle bacilli. The Edinburgh milk supply had not been satisfactorily investigated in this particular.

Examination of Milk in Edinburgh.

A systematic examination of the milk supply was commenced in November, 1913, the results of which I desire to state briefly.

As in all large towns, Edinburgh derives its milk supply from two sources, dairy byres within the city boundary and milk imported from country byres. The latter is the more important, because at the present time almost two-thirds of the total amount of the milk consumed in the city is derived from country byres, and is conveyed to town by road or rail. Roughly speaking, the quantity of milk reaching Edinburgh daily from the country is about 10,000 gallons, as against 6,000 gallons supplied from the city byres.

Practically all milk imported from the country byres reaches the consumers through the milk shops, which number fully 400. Whereas the great bulk of milk produced in the city byres is conveyed direct by van to the consumers, a comparatively small quantity reaches them through the milk shops. Hence milk as sold in Edinburgh milk shops is largely produced in country byres.

The milk was collected in the following way: Samples of mixed milk were obtained from the milk shops in each municipal ward. They were collected in the morning in sterilized pitchers and brought immediately to the Royal College of Physicians Laboratory. A pint of milk was bought from each milk shop. After allowing the milk to sediment during the day in a sterilized separation funnel in the ice chamber the sediment was withdrawn and centrifugalized in the evening. The cream and supernatant milk were then poured off, and the deposit (mixed with a small quantity of cream and milk, generally about 5 c.cm.) was inoculated into two guinea-pigs. As far as possible guinea-pigs of medium weight were employed. In testing each sample the inoculations were made subcutaneously into the groin and intraperitoneally. It is highly important to employ two animals for each test, as may be judged by the fact that of the 82 tuberculous samples, only 36 produced generalized tuberculosis in both of the experimental animals. The animals were allowed to live at least three weeks.

Samples of mixed milk to the number of 406, collected from the same number of milk shops, were tested in the manner described; 82 samples (20 per cent.) were found to contain tubercle bacilli. The table shows the prevalence of tuberculous milk in each municipal ward.

It may be safely assumed that the results of these investigations indicate that a considerable number of the cows in country byres contributing to the Edinburgh milk supply are giving tuberculous milk. It is unfortunate that it was not possible to trace the milk to its source, and that I am unable to record the condition of the cows or of the herds which supplied the milk. If the administrative arrangements in regard to milk sent to Edinburgh from country byres had been adequate, the majority of the infected animals might have been eliminated from the herds supplying tuberculous milk.

It is a noteworthy fact that one country byre frequently supplies several milk shops in the same street. When such a byre is sending tuberculous milk to the city it is possible that, in some instances, tuberculous samples may be

Samples of Mixed Milk collected from Edinburgh Milk Shops (November, 1913, to May, 1914).

Municipal Wards.	Number of Milk Shops in each Ward.	Number of Samples tested for Tubercle Bacilli by Inoculation.	Samples found to be capable of producing Tuberculosis by Inoculation.	
			Actual Number.	Percentage.
1. Gorgie ...	22	22	8	36.3
2. Dalry ...	33	33	8	24.2
3. Haymarket ...	19	19	4	21.0
4. Merchiston ...	36	36	8	22.8
5. Morningside ...	28	28	7	25.0
6. George Square...	33	33	4	12.1
7. St. Leonards ...	37	37	2	5.4
8. Newington ...	26	26	4	15.3
9. St. Giles ...	21	21	3	14.2
10. Canongate ...	21	21	4	19.0
11. St. Stephens ...	27	27	5	18.5
12. Calton ...	45	45	13	28.8
13. Portobello ...	17	17	3	17.6
14. St. Bernard's ...	16	16	3	18.7
15. Broughton ...	24	24	5	20.8
16. St. Andrews ...	1	1	1	—
Totals ...	406	406	82	20.0*

* Average percentage for city.

obtained from each shop supplied. No doubt this affects the percentage to a certain extent in a systematic examination of milk samples from milk shops only. However, we cannot well fall back upon this explanation when we come to consider the prevalence of tuberculosis amongst dairy cows in Scotland. It is only since the coming into operation of the Tuberculosis Order on May 1st, 1913, that reliable statistics on this point have been forthcoming. Of the 1,249 slaughtered cows in Scotland during the first year's operation of the order, fully 370 were notified in the six counties (Dumfries, Kirkcudbright, Wigtown, Lanark, Linlithgow, and Midlothian) which are large contributors to the daily milk supply of Edinburgh. It is evident that the number of cows supplying tuberculous milk in Scotland is by no means small, and that the milk supplied from the country to all Scottish towns must frequently contain tubercle bacilli. Furthermore, these figures, I consider, harmonize with the high percentage of tuberculous contamination which I have found in country milk as sold in the Edinburgh milk shops.

With such a milk supply as that of Edinburgh, which yields tubercle bacilli in 20 per cent. of the samples examined, the legislative measures required to render this supply pure are far-reaching.

The Control of Bovine Tuberculosis.

In the light of present knowledge bovine tuberculosis can no longer be considered a negligible factor in respect to the spread of tuberculosis amongst children, more especially since unsterilized cow's milk in Scotland is a vehicle by which tubercle bacilli must very frequently be introduced into the bodies of children.

The control of bovine tuberculosis is undoubtedly a large undertaking, but I am convinced that important results would follow from local authorities being compelled to provide for a regular and adequate system of veterinary inspection by full-time officers, the frequent bacteriological and experimental testing of samples of milk and milk products by skilled bacteriologists, and the destruction of all cows which show evidence of udder tuberculosis, or which are clinically tuberculous.

While a number of towns such as Manchester, Liverpool, Birmingham, Sheffield, and Leeds have realized the necessity for taking steps to deal with this problem, very little has been attempted by local authorities in Scotland to prevent tubercle-infected milk from reaching the public—

in fact, sometimes the actual regulations enforced being considerably less than those set forth on paper. For example, the Edinburgh local authority has had the power under the Municipal and Police (Amendment) Act since 1891 for the medical officer of health or a veterinary inspector to enter any byre or cowshed wherever situated if the milk produced therein is being sent for sale within the city, to examine any cow kept therein for the supply of milk, and to take samples of milk. Such important powers as regards the country supply of milk to the city have, I regret to say, scarcely been exercised at all by the said local authority. It is clear that for the proper exercise of these powers a sufficient staff of veterinary inspectors is necessary.

General Conclusions.

The high incidence of tubercle bacilli in milk imported to Edinburgh from country districts clearly points to the necessity of measures more stringent than those at present enforced being taken to prevent tubercle-infected milk reaching the public.

The danger from infected milk in Edinburgh cannot be regarded as other than serious. The fact that the supply of milk from country byres, which yield almost two-thirds of the total amount of milk consumed daily in the city, and of which there is practically no veterinary inspection, is increasing annually, strongly emphasizes the necessity for radical changes. It is a question which must be taken up and dealt with by the local authority. The only way to safeguard the public against this danger is, without further delay, to grapple with the existing inadequate supervision of the milk supplied to Edinburgh from rural districts. The existing local powers should be exercised to their full extent and a sufficient staff of veterinary inspectors established. But veterinary inspection cannot do everything. A systematic bacteriological examination combined with experimental testing (by inoculation of animals) of milk samples carried out uninterruptedly year after year is indispensable—such samples to be collected not only from milkshops and milk vans, but at railway stations. Bacteriological methods and veterinary inspection must go hand in hand, the former serving as a guide and also a check upon the latter.

It must be borne in mind, however, that no purely local effort will suffice to eradicate bovine tuberculosis. The provision of legislation for the whole country is very desirable in view of the inadequacy of the powers at present vested in Scottish local authorities to ensure a pure milk supply. Additional and more stringent regulations will have to be drawn up and applied so as to exclude the recognizably tuberculous cow from the milk supply, whether the seat of the disease is in the udder or elsewhere. Means must be provided for tracing diseased milk back to its source and stopping the source of such milk. These requirements can only be secured by the universal compulsory inspection of dairy cows by full-time veterinary inspectors, assisted by experienced bacteriologists provided with adequate laboratories. It is unfortunate that such demands are not fully met in the Milk and Dairies (Scotland) Bill now being considered by Parliament. Efforts should be made to have these incorporated in the bill.

Until the proper legislative measures are obtained it is advisable for the public to boil all milk consumed in their families.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

APPENDICULAR GRAFTING.

In 1911 Lexer¹ made use of the appendix to repair the deficiency occurring in the urethra as the result of excision of a stricture. Streissler² in the same year used the appendix to restore the urethra in a case of hypospadias, and more recently Babcock³ transplanted the right ureter into the appendix in a case of carcinoma of the bladder.

In October, 1913, I saw a boy, aged 11, who had on the previous day been walking along a railing. He had slipped and falling astride the railing, had bruised the perineum. When I saw him any bruising that may have occurred was masked by extravasation of urine. I opened freely into the tissues of both groins, and then performed

suprapubic cystotomy and passed a rubber catheter from behind forwards. Two days afterwards the temperature reached 105° F., and he was in a very critical condition. Extensive sloughing of the tissues in the perineum and groins took place, with loss of the perineal portion of the urethra. The sloughs separated slowly and cicatrization finally obliterated the perineal urethra. All urine was discharged through the suprapubic opening. In November I attempted to reconstitute the urethra over a catheter. The wound broke down, urine was discharged from the perineum for some time, but gradually the wound closed and the urethra was again obliterated, all urine being discharged suprapubically.

In March, 1914, I made another attempt to reconstitute the urethra and again failed. Further attempts of a similar nature I considered to be unwarranted, and I thought it better that all urine should be passed suprapubically until the perineal tissues were healed, and then to attempt grafting the saphenous vein into the deficiency.

On May 29th I again dissected out the proximal and distal portions of the urethra in the perineum and removed as much scar tissue as possible. I then resected a portion of the saphenous vein, but finding its calibre much too small for my purpose, I opened the abdomen and removed the appendix. It seemed quite healthy, but contained a threadworm. It was impossible to remove the serous coat, so I scarified it thoroughly with a scalpel, and then removed about half an inch of its distal end. The graft finally prepared was over an inch in length. I passed a rubber catheter through the penile portion of the urethra and then threaded the appendix on it. The point of the catheter was then passed on into the bladder. It was now quite easy to unite the mucous membranes of urethra and appendix at either end, and, that being accomplished, the wound was closed.

On June 3rd the catheter came out (it had been stitched in with catgut) and another catheter was passed under an anaesthetic and stitched in.

On June 8th the catheter was left out, the perineal wound was healed, and all urine since that date has been passed naturally. The boy is now walking about and micturates freely and normally without discomfort.

In conclusion, I would point out that Axhausen's experiments on transplantation of mucous membranes show definitely the value of autoplasmic as opposed to homoplastic or heteroplastic grafts. The biochemical properties of the individual are so diverse, and anaphylaxis is of such potency in the subsequent fate of grafted mucous membranes, that it would seem imperative to rely only upon autoplasty.

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REFERENCES.

- ¹ Lexer, *Arch. f. Klin. Chir.*, 1911, xcv, p. 827. ² Streissler, *Arch. f. Klin. Chir.*, 1911, xcv, p. 665. ³ Babcock, *Journ. Surg., Gyn., and Obst.*, 1914, xviii, p. 119.

HOURL-GLASS CONTRACTION OF UTERUS AFTER PITUITARY EXTRACT.

I RECEIVED an urgent message on June 28th to see a healthy multipara (aged 35 and at full term), as she had a profuse "show," and her "waters had come away"; I was assured that she had had no pains.

I found the patient had lost a fair amount of blood, which was slowly oozing; the os was dilated to the extent of two fingers, and the presentation was a normal vertex. The membranes had ruptured. There was no placenta praevia.

As the bleeding continued and no pains supervened, I applied a tight binder, and administered 1 c.cm. of pituitary (infundibular) extract hypodermically. Pains came on immediately, the haemorrhage ceased, and two hours afterwards the child was born. An hour and a half after the birth of the child I decided, after several futile attempts to express the placenta, to introduce my hand into the uterus, as I strongly suspected hour-glass contraction. I discovered, well above the cervix uteri, a typical constriction, which embraced the umbilical cord so tightly that I had some difficulty in slowly dilating it digitally and liberating the imprisoned placenta, which was found detached and normally situated in the upper segment of the "hour-glass." The amount of blood lost *post partum* was not abnormal.

I had only once before used pituitary extract, and that was in a case of severe *post-partum* haemorrhage when