natural humility in the presence of physical disaster without really equipping them to relieve it. It is not in the patient's interest that the partly trained should feel a surgical confidence.

Training of Medical Orderlies

The training of medical orderlies calls for a different approach. They make up a small but essential section of the station, directly under the command of the M.O. They are recruited largely from completely untrained and inexperienced civilians, and, apart from an initial six-weeks course, are wholly dependent upon the M.O. for their instruction, the interpretation of their duties, and the inspiration to perform them to the utmost of their ability. He in turn is dependent upon their loyalty, efficiency, and enthusiasm for the smooth running of his department and its reliability under all conditions; for he will have no highly trained sisters or nurses to appreciate the immediate medical implications of an emergency or anticipate his needs in a time of stress. His staff will reflect the value of his teaching and his example; it behoves him always to remember that. The very obligation is stimulating: to teach as well as to treat, to explain as well as to diagnose. This involves both lectures and demonstrations. In practice it is a sound plan to include teaching rounds in the ward whenever there are suitable cases, as this not only stimulates interest and accustoms orderlies to observation at the bedside but also gives them a feeling of studentship which they enjoy and which fosters discipline and loyalty to their officer.

He must display leadership and a capacity for organization as well as professional ability, for the grouping and handling of medical resources in men and equipment are also among his responsibilities. Practical schemes for dealing with casualties from land or air attacks, from crashes, or from aircraft returned with wounded on board demand constant practice and revision. Simplicity cannot be too highly prized in such schemes. Under the impact of extreme crisis—for example, collision of two bomber aircraft on a runway while landing at night, with perhaps eight seriously injured men in urgent need of trained attention—the simple, easily remembered routine with its scope for elasticity and improvisation under the immediate orders of the M.O. will steady the orderlies, whereas a more elaborate organization delegating complex individual duties to each member of the staff may break down.

Every orderly can, however, be trained in the essentials and rationale of anti-shock treatment, including the administration of morphine by tubulin ampoules, in the control of haemorrhage, the utmost gentleness in handling fractures, the preparation of a trolley for intravenous injection or anaesthesia, and the technique of sterilizing instruments and assisting at minor surgical operations. Above all they can be imbued with enthusiasm and a feeling of confidence and pride in their performance as a team under the guidance and leadership of their M.O.s.

Conclusion

Because of all this the M.O.'s job in the R.A.F. is an extremely important and responsible one. His knowledge of general medicine and surgery is by no means doomed to decline on a station; rather will he gain a breadth and background to his judgment, increased by the necessity for independent action and decision in many cases. He will encounter the special psychological problems of modern flying, and may gain personal experience of flight in modern operational aircraft. No matter how young he is, his position in the community of his brother officers is established; to them he is "the Doc."—to be consulted at all times and in all places. He is expected to advise his commanding officer on all matters relating to the hygiene and health of the unit—advice to which a good commanding officer attaches considerable importance and upon which he acts.

To the unit as a whole, the M.O.'s capabilities and attitude to his job are equally important. Service life has meant changes and sacrifices for them far more fundamental than those he has to accept—the diversion of his career and the severance, at any rate for some time, of his hospital connexions. He is bound still to follow his vocation; the least he can do is to display the utmost energy and enthusiasm for its every aspect.

The aspects that have been stressed here are perhaps less obvious than the more material and generally recognized responsibilities for the care of the sick and injured, the super-

vision of sanitation, and the keeping of medical records. But they are no less exacting; moreover, they are vitally important, because indifferent morale can rot the fittest body of men. The influence of a medical officer on the morale of his unit—the inescapable obligation for its upkeep that he shares with his senior officers—inspires with an Aesculapian touch his first duty: to maintain the effective strength of his unit by every means in his power.

AN INVESTIGATION INTO THE STANDARD OF MILK SUPPLIED TO CHILDREN

BY

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The British Paediatric Association recently organized an inquiry into the standard of milk supplied to children throughout the country. It is felt that the findings would be of interest to the medical profession and should be made more widely known. This article is based on information so received from eight separate areas in England, Wales, and Scotland, representing a London borough, a Scottish city, a West of England city, a South Wales urban area and a South Wales rural area, two Northern industrial towns, and a Midland county. As the reports received were in the nature of confidential comments the areas are subsequently designated by the initial letters A to H.

Results of Questionnaires

A questionnaire was sent to each area and the following is a summary of the replies received:

1. Is there any Evidence of an Increase in Bovine Tuberculosis in Children Since the War?

Area	Non-pulmonary Tuberculosis			
	1938	1939	1940	1941
A*	—	—	—	—
B†	120	126	107	143
C	30	36	29	54
D	No increase			
E	" "			
F	" "			
G	" "	527	—	664
H	No increase			

* Double the number of cases of meningitis in 1938 as compared with 1941.

† From P.M. material: 1935-9, 15.7% primary abdominal; 1940-1, 58.3% primary abdominal.

Accurate evidence on this point has been difficult to obtain owing to the shifting population. Some observers report a clinical impression of an increase, especially of tuberculous glands in the neck.

2. Is there any Evidence of an Increase in Tuberculous Cattle Since the War?

Area A.—Samples of milk containing tubercle bacilli:

1938, 8%; 1940, 5.3%; 1941, 6%

Areas B, C, and D.—No evidence

Area E.—Cases dealt with by Ministry of Agriculture and Fisheries:

1939, 267; 1940, 192; 1941, 164

" F.—No evidence

" G.—Samples of milk containing tubercle bacilli:

1939, 9.4%; 1940, 6.3%; 1941, 6.0%

" H.—No evidence

Evidence on this point has been difficult to collect, as tuberculin testing has been reduced, slaughterhouse statistics are no longer reliable owing to different allocation of carcasses by the Ministry of Food, and there is a shortage of inspectors.

3. Is there any Evidence of an Increase in Milk-borne Infections, other than Tuberculosis, Since the War?

Area A.—No evidence

" B.—Increase in notification of undulant fever

Areas C, D, and E.—No evidence

Area F.—? Increase in gastro-enteritis due to milk?

Areas G and H.—No evidence

In a personal communication Prof. G. S. Wilson of the Emergency Public Health Laboratory Service states that in the area covered by that service there have been two small outbreaks of undulant fever, three outbreaks of dysentery due to the Sonne organism (one of them involving over 1,000 people), two outbreaks of diphtheria, and one of typhoid fever, all due

to the use of raw milk, and one of paratyphoid fever probably due to its use.

4. What Percentage of Milk is Pasteurized?

Area A.—70 to 75% sold as pasteurized	Area E.—60%
" B.—40%—not all sold as such	" F.—90%—only 50% sold as such
" C.—30%	" G.—80%
" D.—65%	" H.—40%

Several areas comment on two points: first, that not all pasteurized milk is sold as such; and, secondly, that any heat-treated milk is often erroneously referred to as pasteurized.

5. What Percentage of Milk is Sold Ungraded?

Area A.—12 to 15%	Area E.—?
" B.—70%	" F.—48%
" C.—50%	" G.—2 to 3%
" D.—32%	" H.—40%

6. Has the Bacterial Content of Milk Changed Since the War?

Area A.—Higher bacterial content. Pre-war, 10% pasteurized milk failed to pass test; post-war, as high as 50% at times	
" B.—Higher bacterial content. One district reports samples over 100,000 orgs./c.cm.: 1938, 11%; 1939, 19%; first half 1940, 35%	
" C.—Higher bacterial content. One district reports: "Still as bad as ever"	
" D.—Higher bacterial content	
" E.—25% samples of "accredited" milk unsatisfactory	
" F.—Higher bacterial content	
" G.—No change	
" H.—Higher bacterial content	

7. What Standard of Milk is Supplied to Nursery Schools and Day Nurseries?

Area A.—Pasteurized	Area E.—Accredited or pasteurized
" B.—Variable	" F.—Pasteurized
" C.—"	" G.—"
" D.—Pasteurized	" H.—"

8. What Standard of Milk is Supplied to Schools?

Area A.—Pasteurized	Area E.—Accredited or pasteurized
" B.—"	" F.—Pasteurized
" C.—Variable	" G.—"
" D.—Pasteurized	" H.—Variable

9. What Standard of Milk is Supplied to Children's Hospitals?

Area A.—Pasteurized or T.T.	Area E.—?
" B.—Variable	" F.—Pasteurized
" C.—Ungraded	" G.—T.T.
" D.—T.T.	" H.—Pasteurized

10. Do Welfare Centres Mainly Recommend Liquid or Dried Milk?

Area A.—Liquid	Area E.—Liquid and dried
" B.—Dried	" F.—Dried
" C.—"	" G.—"
" D.—"	" H.—"

11. What Proportion of National Dried Milk is Used?

Area A.—11%	Area E.—Hardly any
" B.—20%	" F.—55%
" C.—30%	" G.—Hardly any
" D.—High proportion	" H.—90%

12. Are You Satisfied with the Standard of Milk in Your Area?

Area A.—No	Area F.—Only one sample of pasteurized milk in 1942 failed to pass standard
" B.—No	" G.—No—so long as 6% samples contain tubercle bacilli
" C.—No	" H.—No
" D.—Yes	
" E.—No	

13. What Standard of Milk do you Recommend?

Area A.—Dried milk for infants; pasteurized for older children	
" B.—Dried milk up to 9 to 12 months old; pasteurized for older children	
" C.—Dried milk for infants; pasteurized for older children	
" D.—Good quality milk from a herd free from tuberculosis. All fresh milk to be scalded	
" E.—Dried milk or pasteurized	
" F.—Dried milk up to 12 to 18 months old; pasteurized for older children	
" G.—Dried milk for infants; pasteurized for older children	
" H.—T.T. and bacteriologically clean	

Comments

In a field survey of this kind it has not been possible to obtain accurate figures, but, representing as it does the findings of paediatricians in their respective areas, it is disquieting to note that so many are dissatisfied with their milk supply. Comments received from medical officers of health also suggest that they too are concerned about the problem, with little if any power to correct matters. It would, however, seem possible for health authorities at least to ensure a safe milk supply for children in their nursery schools, day nurseries, schools, and hospitals.

The fact that certain areas report 6% samples of raw milk containing tubercle bacilli is a reflection on our cattle super-

vision, but it must not be forgotten that, although tuberculosis is perhaps the most serious of milk-borne infections, it is by no means the only one, and measures such as tuberculin testing of herds deal with only half the problem, and not too well with that half. There is no alternative to pasteurization, which alone can prevent all milk-borne infections.

The problem of efficient pasteurization is many-sided, and therein lie its difficulties. One medical officer of health reports that of three firms selling pasteurized milk in his area only one, as judged by the phosphatase test, is satisfactory, yet little attempt is made to bring offenders to book. If milk below the specified fat content is sold fines are readily imposed, but the selling of milk improperly pasteurized is too often ignored by legal, health, and sanitary authorities alike. Perhaps the commonest faults in pasteurization are inefficient cooling of milk at the farms and delay in transport to the pasteurization plants, both accentuated by wartime conditions. This can only be corrected by proper inspection by responsible authorities. To examine the plant only is not enough; if milk is to be pasteurized it must be of a sufficiently high standard of bacterial cleanliness, otherwise rapid souring may take place. As Wilson (*The Pasteurization of Milk*, 1942, London) says, "Though it may make a dangerous milk safe, pasteurization can never make a dirty milk clean."

That so little has been done by responsible authorities, including the Government, to tackle the problem of safe milk in spite of urgent recommendations by such bodies as the B.M.A., the Royal College of Physicians, and more recently the M.R.C. Committee on Tuberculosis in Wartime, is an indictment on our preventive-medicine policy. The M.R.C. Report sums up the situation by saying: "If all milk for human consumption were pasteurized in licensed plants under adequate supervision, it is no exaggeration to say that tuberculosis of bovine origin would be eliminated." Why, then, cannot this be done, with the example of the U.S.A. and Canada before us? In a personal communication Dr. Enid Williams says that in a small number of cases of tuberculous meningitis which she has investigated 50% were found to be due to the bovine bacillus. Here we have a fatal disease untouched by clinical therapy, yet preventable in a large proportion of cases by safe milk. There is no other field in which preventive medicine can hope to achieve such dramatic results. If the British Paediatric Association's findings can help to stimulate the powers that be to legislate for a safe milk it will have served its purpose.

Summary

The following recommendations have been made by the British Paediatric Association as the result of the above investigations, and have been forwarded to appropriate authorities:

1. All milk to be efficiently pasteurized. Increased inspection of cooling facilities on farms and pasteurization technique is essential.
2. These investigations revealed that the safeguards to ensure that pasteurization is efficient are not reliable, and it is recommended that steps be taken to remedy this state of affairs.
3. Until all milk is efficiently pasteurized the public should be instructed to scald all liquid milk for children up to 5 years of age, but preferably dried milk should be used for infants.

The services of the family doctor are to be called on as part of the Ministry of Health's campaign for the immunization of all children against diphtheria. The Ministry (Circular 2753) points out that, in response to its first appeal in the early part of last year, local authorities concentrated on school children and those of pre-school age attending maternity and child welfare centres, as the centres were the obvious places for immunization of the child population. But the time has come, the circular continues, to find out just which children in an area are not yet immunized, and for the local authority to make whatever arrangements are necessary to deal with the position. If for any reason a child cannot attend a centre, immunization should be carried out at home by the family doctor. Doctors should be asked to undertake this work, the local authorities informing them at the same time of the fee they are prepared to pay for the service. The prophylactic will be supplied in suitable containers free of cost. It is pointed out that this domiciliary immunization should not be regarded as precluding doctors from being employed at centres, but as supplementary to their work there.