results would have been expected to show at least some significant correlation with the clinical condition of the patients.

It is true that this study does not provide enough evidence to enable one to judge the reliability of the skin-test response as an indication of allergic sensitivity in asthma; and the literature, vast as it is, does not give us a clear and unequivocal answer. It would, however, seem fair at least to say that the absence of any significant relationship of change in skin sensitivity to clinical progress in this series of asthmatic patients may not necessarily indicate that allergic sensitivity was an unimportant factor in the series as a whole, and that the skin response is perhaps not a completely reliable indication of allergic sensitivity. On the other hand, it must be said that in a number of cases skin-testing may give valuable and helpful information—always provided that its significance is judged in relation to all other available information.

Summary

The skin-test responses to the common inhalant allergens were followed in 209 asthmatic patients (of whom 31 were under the age of 15) over an average period of seven years, with extremes of 17 and 2 years, and were compared with the clinical progress of the patients.

The series was, as a whole, somewhat biased against the "improved" cases by the reluctance of asthmatic persons who were well to submit themselves to "repeat" skin-testing. This was not found, however, to affect the purposes of the survey and analysis.

Of the 209 cases, 138 were improved (no asthma for at least one year, or only occasional or moderate attacks at infrequent intervals), 55 were unchanged (or slightly improved), and 16 were worse.

The skin-test responses were found to have altered widely or significantly in 90 of the 209 cases.

These changes in skin sensitivity were found, however, to bear little or no relation to the clinical progress of the patients.

Skin-testing may not be a completely reliable indication of allergic sensitivity in general, but in the individual case it may give valuable information if used with discretion.

I am grateful to Dr. Christopher Strang and Dr. Michael Evans, who carried out the follow-up skin tests; to the Librarian of the Royal Society of Medicine and his staff, who kindly conducted a detailed research of the literature; and to Mr. Campbell, of the Department of Industrial Health in the University of Durham, who kindly checked the statistical analysis.

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The new neurosurgical theatres and extensions to the department of neurosurgery, which Sir Geoffrey Jefferson, F.R.S., opened at Frenchay Hospital, Bristol, last October, are now in commission. The theatres embody many modern improvements. Full air-conditioning on a plenum system has been installed, which provides 16 changes of air per hour, the intake being high above the roof and the air filtered. Glass-screened galleries help reduce aerial contamination by spectators, and allow a 70° angle of view on to the operation field. Communication with the galleries is by throat-microphone. The twin operating theatres share a common instrument store and sterilizing rooms; in the latter there are special arrangements to prevent excessive humidity. The department, which is the base for the neurosurgical service of the South-western Hospital Region, will ultimately have accommodation for 72 patients, including children.

INVESTIGATION OF AN OUTBREAK OF BOVINE TUBERCULOSIS IN A RURAL AREA IN LEICESTERSHIRE

BY

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The *British Medical Journal* (1953) again drew attention to the importance of tuberculosis of bovine origin when it summarized in a leading article a survey undertaken by the Medical Research Council on this problem (Wilson *et al.*, 1952). The survey showed that tuberculosis of bovine origin still remains a serious problem. It was estimated that in 1944 there occurred 550 deaths in Great Britain from tuberculous meningitis and 1,050 deaths from other varieties of non-pulmonary tuberculosis due to infection by the bovine type of bacillus. It is realized that a survey at the present moment would not show such a high mortality, on account of the effects of streptomycin and P.A.S., but it is logical to assume that the amount of illness and disability from infection by the bovine bacillus still remains a very great problem. The survey showed that such infection occurred more often in children between the ages of 5 and 9 years. It was suggested that this could be explained by the fact that, whereas infants had previously been fed on cows' milk when breast-feeding failed, now, largely through the efforts of welfare clinics, they are fed on dried or other safe forms of milk, and it is when the child goes to school and moves around in other households that the possibility of infection from raw milk may arise. That leading article has stimulated us to report a recent survey which was undertaken in a rural Leicestershire area where there seemed to have been an abnormal incidence of tuberculosis associated with a known source of infection from a single cow in an otherwise healthy herd.

In January, 1952, notifications were received of two cases of non-pulmonary tuberculosis in children aged 9 and 5 living in the same village (Cases 1 and 2). Abdominal glands were evident in one and cervical glands in the other. The occurrence of these two cases in the same village at the same time led us to inquire from the chief county sanitary officer about the milk supply for these two households. It was found that both children were obtaining milk from the same source, and it was reported that on December 20, 1951, a routine biological sample of milk from this source contained tubercle bacilli. On December 22 a clinical examination of the herd was carried out by the divisional veterinary officer, and this revealed that a cow in the herd was suffering from tuberculosis of the udder. This cow was slaughtered under the Tuberculosis Order of 1938.

Since most of the children in this area were obtaining their milk from this known infected source, inquiries were made to find other children who might be suffering from tuberculous glands of the neck and other tuberculous conditions, and at the same time it was thought

advisable for a tuberculin survey to be undertaken of all children in the area. In addition to the two original cases of tuberculosis a further three children were found to have tuberculous glands of the neck which required treatment.

Case Reports

Case 1.—A case of tuberculous glands of the abdomen in a boy aged 9 was notified on January 18, 1952. Six weeks before examination he had erythema nodosum and later abdominal pain. He was seen by Dr. J. V. C. Braithwaite, who diagnosed tuberculous abdominal glands.

Case 2.—A girl aged 5 developed a gland on the right side of her neck in October, 1951, and was later admitted to the Leicester General Hospital, where the gland was excised and found to be tuberculous. The child was subsequently treated with streptomycin and P.A.S., making an uneventful recovery. This case was notified on January 21, 1952.

Case 3.—As a result of our inquiries a boy aged 14 with an enlarged gland in the neck was referred to the Leicester County Chest Clinic by his general practitioner on February 6, 1952. His history was that in September, 1951, he developed a gland at the right side of his neck which at first settled down. When he was first seen at the clinic the Mantoux test was strongly positive, but the gland itself did not seem to require any active treatment, although his tonsils were somewhat enlarged. These were removed and found to be tuberculous. In January, 1953, the gland increased in size, and after a preliminary course of streptomycin and P.A.S. it was excised.

Case 4.—A girl aged 4 was referred to the Chest Clinic on April 2, 1952, with a history of repeated sore throat for the past five months. She had a gland at the left side of her neck and an enlarged tonsil on that side. The tonsils were removed and culture revealed tubercle bacilli of the bovine type. The gland has since settled down without any further treatment.

Case 5.—A child aged 2 who was tuberculin-positive when we undertook the survey developed a gland in the right side of the neck two months later. This increased in size and was treated with streptomycin and P.A.S., and finally by excision. This case is interesting because it is the only one of the five which presented no clinical signs at the time of the survey but subsequently developed clinical evidence of tuberculous adenitis.

Commentary

At the time of writing we have these five clinical cases of tuberculosis arising in children, all of whom had been obtaining milk from the same source and whose infection can, in our opinion, be directly attributable to a tuberculous cow.

We decided that the problem should be investigated as soon as the first two cases were notified from the same village. The population of the area is 9,660 people, scattered in 31 villages over an area of 45,000 acres. Two of these villages have a population of about 1,600; two have between 600 and 900; 12 have 100 to 500; and 15 have fewer than 100. In the area there were 154 milk producers, of whom 38 retailed their products. For two years prior to this outbreak all raw milk sold in this district had been sampled quarterly and subjected to examination for living tubercle bacilli by guinea-pig inoculation. By this means four infected milks had been discovered and the appropriate action taken. In the particular herd with which we are concerned one of us (R. W. K.) found that the customary veterinary inspection due in July, 1951, had not been carried out and that the infected cow had been under treatment for at least four weeks before its detection in December, 1951. It therefore seemed likely that the milk from this herd, which was bulked together, had contained tubercle bacilli for several weeks before bacteriological confirmation was available, and that the consumers in this area had been exposed to the risk of infection for a period of several months. The producer

made available to us his register of customers, which showed that he supplied 106 families in five villages, including 63 children under school-leaving age.

The five villages catered for by this particular supplier, together with seven other villages, send their children between the ages of 5 and 11 years to one central primary school, and from there, at the age of 11 plus, they pass to an adjacent secondary modern school, where they are joined by children of a similar age from a further 32 outlying villages. It was administratively easy to investigate the entire child population of these 12 villages, but the whole of the older children's school was included in the survey, in order to distract attention from the local nature of the real investigation. Since the majority of the older children attending the secondary modern school lived in villages too far away from the area at risk for their tuberculin results to be of any statistical significance in this survey, they are not included in any of the tables in this paper.

The county medical officer circularized all parents in the area, pointing out the desirability of such a survey, and at the same time he advised the general practitioners that such a survey was to be undertaken and asked for their co-operation. The co-operation of the parents and general practitioners was readily given and was universal in the villages at risk. The refusals received were from parents of older children coming from outside the infected area. It is interesting to see how much co-operation can be obtained in a survey of this nature; the response is shown in Table I.

TABLE I.—Parent Co-operation

Age Group	Total No.	Refusals	Absentees from Testing	No. Tested
Under 5 years ..	123	—	5	118
5-7 " ..	61	—	—	61
8-11 " ..	63	—	—	63
12-15+ " ..	37	—	—	37
Total ..	284	—	5	279

The high response in the age group under 5 was largely due to the fact that the health visitor personally visited many of the houses to carry out the tuberculin test. The method of tuberculin testing was that in children under the age of 10 Allen and Hanburys' tuberculin jelly was used in the routine manner—that is, the skin was cleaned with acetone and rubbed gently with flourpaper. In children over the age of 10 we contented ourselves with a single dose of 1/1,000 of old tuberculin. The results of the survey are shown in Table II. All children who were tuberculin-positive were x-rayed by the mass radiography unit; no abnormalities were found. The outstanding points in Table II are the variations between groups A and C, which

TABLE II.—A Summary of Test Results

Village Group	Under 5 Years			5-7 Years			8-11 Years			12-15+ Years		
	Pos.	Neg.	% Pos.	Pos.	Neg.	% Pos.	Pos.	Neg.	% Pos.	Pos.	Neg.	% Pos.
A (infected)	18	10	64.2	10	7	62.5	11	9	100	8	0	100
A (other) ..	3	11	21.4	1	6	12.5	9	11	45.0	9	6	60.0
A Total ..	21	21	50.0	11	13	45.8	20	11	64.5	17	6	73.9
B ..	14	23	37.8	7	12	36.8	3	9	25.0	5	3	62.5
C ..	3	36	7.6	4	14	22.2	1	19	5.0	3	3	50.0

Group A = Five villages at risk—subdivided into group A (infected), those children known to have been supplied from the infected source; and group A (other), the remaining children in these villages not receiving milk from the infected source.

Group B = Five adjacent villages; no known source of infection.

Group C = Two adjacent villages; milk supply known to be safe.

clearly demonstrate the beneficial effects of a milk supply which is known to be safe (group C). Group A indicates what may occur when there is a known infected supply. We do not intend to introduce any discussion on the alleged

value of drinking raw milk as a means of immunization, but merely mention it in order that we may dismiss it as a tragic form of immunization.

The Medical Research Council (1952) published the results of a national tuberculin survey which was undertaken in 1949-50, and, while no figures are given for those under 5, the figures for a rural area in the age groups indicated showed a tuberculin sensitivity rate as follows: 5-7 years, 26.5%; 8-11 years, 35.6%; 12-15 years, 50%. Compare these with our figures, which were also taken from a rural area but which are not unnaturally boosted up by this known source of infection. Hall (1950) did a similar survey on children in a village where there was a proved source of infection associated with a tuberculous gland; his results are shown in Table III. In this particular outbreak the

TABLE III.—Results in Hall's Survey

	Children Tested	Positive	Negative
Age 0-1	60	41 (68.3%)	19
1-4	7	1	6
5-15	15	12 (80%)	3
5-15	38	28 (74%)	10
% 1-15	53	40 (75%)	13

milk supplier had served the school as well as the village. In the Leicestershire survey the milk supply to the school was from an outside approved source.

As most of us in the tuberculosis service feel we are approaching the possible end of tuberculosis as a major problem in the community, it does seem more evident than ever that there is absolutely no justification for bovine tuberculosis playing such an important part in the incidence of tuberculosis. Not only may the bovine type cause a mortality of well over 1,000 a year in Great Britain, but it produces many crippling forms of tuberculosis. John Francis (1947) states that, according to the most reliable estimate, 20% of cattle in England are tuberculous, 7.5% in Wales, and 14% in Scotland. The incidence in dairy cows is probably 30 to 35%, but there is a great deal of variation in incidence in various parts of the country. It is lower in Wales, the North and South-west of England, and the North of Scotland. The Midlands of England are the most heavily infected. Furthermore, he states that complete healing of lung lesions is much less common in cattle than in man. He estimates that probably 0.5% of all cows in Great Britain have tuberculosis of the udder, and it is this type of tuberculosis which is the most important from the point of view of milk-borne infection. The result of infection in a small community by a single cow such as we have described emphasizes the need either for ensuring that the milk supply throughout the country must eventually come from accredited tuberculin-tested herds or for the general pasteurization of milk.

Conclusion

This survey demonstrates the following facts as well as the statistical data outlined.

(a) The importance of close liaison between the chest services and the local authorities in the prevention of tuberculosis. The chest physician can deal with a problem such as this only by obtaining the fullest assistance from the county medical officer and the staff of the county health department and the district medical officer of health.

(b) The desirability of a tuberculin test in all cases of glands of the neck. In our opinion this should become a routine: it is a very simple procedure, and any chest clinic would willingly undertake the necessary investigation. It must be borne in mind that only about 50% of cases of tuberculous adenitis are, in fact, bovine in origin. The tonsil is the recipient of the human bacillus

by inhalation and the tonsillar glands are subsequently involved. This fact was proved by the classical work of A. S. Griffith (1937, 1938).

(c) The high response of such a survey can be obtained only if the parents, general practitioners, and school authorities are all acquainted with the problem, and it is hoped that this article will show the willingness of both the local authority and the chest service to investigate any such similar outbreak and will again prove that the notification of a case of tuberculosis may have much wider ramifications than at first supposed.

We wish to acknowledge the help given to us by Dr. G. H. Gibson, County Medical Officer of Health for Leicestershire, Mr. S. A. Gregory, Chief County Sanitary Inspector, and all the other members of the County Health and Education Department who assisted us in making this survey as complete as possible. We also thank Dr. J. V. C. Braithwaite, Mr. T. M. J. d'Offay, and Mr. N. E. Kendall.

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DIAGNOSTIC DIFFICULTIES IN CONSERVATIVE TREATMENT OF PERFORATED ULCERS

BY

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It was only 60 years ago that Hastings Gilford treated a case of perforated peptic ulcer by operative closure—the first case so treated in this country. Since then this has become the accepted method and, until recently, the only method; but for some time a conservative regime has been advocated by a few authorities (notably Hermon Taylor, 1946, 1951).

The prerequisite of any form of treatment is accurate diagnosis, a problem which, in this matter, troubles us to-day almost as much as it did Mikulicz at the end of the last century. He indeed, before performing laparotomy, confirmed his diagnosis by puncturing the distended abdomen with a trocar.

Gastro-duodenal perforation causes the clinical syndrome of acute peritoneal irritation, hence the problem of accurate diagnosis consists first in eliminating the various extra- and intra-abdominal conditions which may simulate peritoneal irritation—for example, tabetic crisis, diaphragmatic pleurisy, coronary infarction, acute cholecystitis—and, second, in eliminating the other conditions which also cause peritoneal irritation.

If the treatment be conservative a misdiagnosis of one of the first group of conditions is not likely to be a tragic error, but a misdiagnosis of one of the second group may well be. On the other hand, if the treatment is to be operative a misdiagnosis of one of the first group will lead to an unnecessary and possibly dangerous procedure, whereas a misdiagnosis of one of the second group will automatically be corrected at operation.