a few seconds the muscle relaxes but the lung is still fully expanded and proper comparison can be made.

I think from the above investigation that some new facts have been elucidated which may require confirmation by other observers, and that the value of a routine examination of Krönig's areas and its tidal expansion as an aid in early diagnosis and a guide to prognosis has been shown.

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BUCCAL INFECTION WITH *B. TUBERCULOSIS*.

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RECENT researches [1, 2, 3, 4] in America on the prevalence of the tubercle bacillus outside the body have demonstrated the fact that spoons, forks, glasses, cups, pillow cases, &c., used by tuberculous persons may harbour virulent tubercle bacilli. Further, researches [5, 6, 7] on the washing of such infected articles suggest that direct infection from person to person may occasionally take place by direct transmission. As the matter has some bearing on other investigations now being made in this laboratory—e.g., the infection of the tonsil and of cervical glands [8]—a short series of experiments was carried out, the results of which largely corroborate the conclusions of the American workers.

Three questions were investigated. Are virulent tubercle bacilli commonly present in the mouths of patients suffering from pulmonary tuberculosis? If so, can these organisms be transferred to table utensils? And thirdly, does the washing of these utensils destroy the bacilli?

Mouth Washes.—20 patients who had tubercle bacilli in their sputums were examined. Half of these cases had only a very small amount of sputum daily, whilst the other half had profuse expectoration (i.e., from 2 to 4 oz.). In each instance the mouth was washed out with 40 to 50 c.c. of sterile water and sufficient antiformin added to the washing to make it a half per cent. solution. This precaution was found to be necessary to destroy secondary organisms. The washing was allowed to stand at room temperature for one hour, then centrifuged and the deposit inoculated into guinea-pigs. All washings which showed, naked eye, any particles of sputum were rejected.

The results were as follows: The 10 cases with scanty amounts of sputum yielded two positives, whereas the 10 with profuse expectoration showed eight.

Ten "controls" were also made from apparently healthy persons working in the hospital wards and laboratories. These were all negative.

Table Utensils, &c.—In the same way spoons used by 20 patients with tubercle bacilli in their sputums were examined, half of the cases having scanty and half profuse expectoration. Each spoon was washed in sterile water and the washing inoculated into guinea-pigs. There were no positive results from the 10 patients with scanty sputum, but six positives from the 10 with profuse expectoration. From this latter group of patients three forks and three pillow cases were also examined, and one positive result from a pillow case recorded.

Next, a series of 15 cups from patients in a ward of phthisis patients was examined, the cups being carefully washed with a sterile swab and sterile water and the washing inoculated into guinea-pigs. The results were negative.

The Sterilising Effect of Washing.—A large bowl containing about one litre of water was used from washing cups used at the tea stall in out-patients department, where patients suffering from pulmonary tuberculosis in all stages are served. The water from this bowl, after sedimentation and centrifugation, was examined by the usual guinea-pig inoculation method. The towel used for drying these cups was also examined by washing it in sterile water and inoculating the centrifuged washing into guinea-pigs in the same way. In both instances the result was negative.

Finally, the ward crockery was examined after use. All the crockery was placed in a large open sink filled with water and allowed to stand for a few minutes. A sample of the deposit was then withdrawn for examination. Live steam was next bubbled through the water for an hour—this being the usual method of sterilisation employed in the ward kitchens—and a second sample withdrawn. This experiment was repeated a few days later, so that, in all, four samples of the sink washings were obtained, two before and two after exposure to steam. All were negative with the guinea-pig inoculation test.

Conclusions.

(1) 50 per cent. of phthisis patients with tubercle bacilli in their sputum were found to have virulent tubercle bacilli in their mouths. The group with profuse expectoration yielded a larger percentage of positive results (80 per cent.) than the group with scanty expectoration—(20 per cent.).

(2) 60 per cent. of the group with profuse expectoration were found also to infect the spoons used, whereas none of the group with scanty expectoration did so. Other table utensils were not found to be infected. Probably the spoons were more easily contaminated because a larger surface of the utensil was exposed to the buccal mucous membrane than was the case with the other utensils investigated.

(3) Plain water, if used in sufficient quantity, appeared to be a satisfactory sterilising agent. Live steam as used in the ward kitchens makes this sterilisation doubly sure.

These brief records agree fairly closely with those obtained in American institutions, and once more emphasise, on experimental grounds, the well

recognised fact that the patients with profuse expectoration are the most infective.

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TUBERCULOSIS STATISTICS.

ENGLAND AND WALES. STANDARDISED MORTALITY PER MILLION
POPULATION FROM VARIOUS FORMS OF TUBERCULOSIS.

Period	Pulmonary tuberculosis and phthisis				Meningitis		Peritonitis		Other forms (including bones and joints)	
	0—5		All ages							
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
1861—70	994	433	2612	2578	345	253	271	243	129	103
1901—10	351	137	1358	951	189	172	160	145	184	156
Percentage fall (—) or rise (+)	—64·7	—68·4	—48·0	—63·1	—45·2	—32·0	—41·0	—41·3	+42·6	+51·6

The notable points are:—

(1) Pulmonary tuberculosis has fallen more for females than for males both for early years of life and for all ages.

(2) Peritonitis has fallen evenly for the two sexes.

(3) Meningitis has fallen more among males.

(4) "Other forms of tuberculosis," the group which includes tuberculosis of bones and joints and so may be held to represent "bovine" tuberculosis, has risen markedly and especially among females.