Analyses of 50 sera from normal adults revealed *PD*50 titres ranging between 1 : 3 and 1 : 2,000. The geometric mean titre of this group was 1 : 192, as calculated by Perkins's method[10]. Limited studies have shown that persons with a chronic staphylococcal infection, furunculosis, had serum *PD*50 titres in the low range : 1 : 10 to 1 : 60. It has also been noted that, out of 54 pairs of maternal and newly born (cord) sera, 41 exhibited comparable mouse protective antibody, but 13 cord sera were substantially lower in mouse protective antibody content than were the respective mothers. This observation suggests, as noted by Rountree and Barbour[2], that in some instances there may be a placental barrier to the transmission of staphylococcal antibody to the fœtus. Studies are in progress to determine the incidence of staphylococcal infection among the newly born and their mothers with respect to their mouse protective antibody titres.

The widespread occurrence of staphylococcal mouse protective antibody in adult human sera indicates that this is a normal antibody, a characterization that was previously applied by me for staphylococcal and other bacterial mouse protective antibody in pooled human gamma globulin[11]. This conclusion has been recently substantiated by Jensen[12], who employed a qualitative agar gel precipitin method for demonstrating staphylococcal antibody in human sera.

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## Immunizing Properties of Insoluble Cell Material derived from *Brucella*

An insoluble fraction was obtained by high-speed centrifugation from *Brucella suis*, after disintegration in a sonic vibrator[1]. This fraction could absorb the agglutinating and mouse protecting antibodies from *B. suis* antisera. Since similar absorptions could be carried out, although less effectively, with whole bacteria, the insoluble material was assumed to be situated on the cellular surface and tentatively regarded as part of the cell wall.

The present work was concerned with the immunizing properties of two insoluble fractions derived from *B. abortus* and *B. suis*. The starting material consisted of bacteria killed and dried with acetone, disintegrated in a 9-kc./s. Raytheon magneto-striction oscillator. The sonic extract was centrifuged in a Sorval centrifuge at 10,000 r.p.m. and the sediment freed from intact cells by differential centrifugation. Fraction 1 (*F*1) was thus obtained. Fraction 2 (*F*2) consisted of smaller particles sedimented from the supernatant fluid left from the first centrifugation, after spinning for 30 min. in a Spinco model *L* ultracentrifuge at 40,000 r.p.m. The immunizing activity of these fractions was compared in mice with that of whole cells killed and dried with acetone, following a method previously used in passive protection experiments[2]. 0·01–1 mgm. quantities were injected intra-abdominally into groups of 5–10 mice. At various times after immunization (2–14 weeks) the immune animals were challenged, together with controls, with 30,000 virulent *B. abortus* (strain 2308) cells administered intra-abdominally. 7 days later the mice were killed with ether, the spleens removed, ground with glass sand and plated on trypticase soy agar. Protection indices were calculated as the ratio of the number of *Brucellae* in the spleens of normal mice to that in the spleens of the immune mice. Higher indices were consistently obtained with the insoluble fractions and the small particle fraction (*F*2) appeared to be more effective than *F*1 (Table 1).

Table 1. Immunizing Activity of Whole, Dried *Brucella* Cells and of Insoluble Fractions derived from Them

| Immunizing antigen | Protection indices when challenge given at weeks after immunization | | | | |
|---|---|---|---|---|---|
| | 2 | 3 | 6 | 12 | 14 |
| *B. abortus* whole cells | 270 | — | 30 | — | 8* |
| *B. abortus* Fraction 1 | 541 | — | 750 | — | 53* |
| *B. suis* whole cells | 25 | — | — | — | — |
| *B. suis* Fraction 1 | 222 | 236 | — | 50 | — |
| *B. suis* Fraction 2 | — | 3,535 | — | 600 | — |

One immunizing injection was administered. Groups marked with an asterisk received 1 mgm. antigen, the others received 0·1 mgm. —, Not done.

The higher efficiency of the insoluble fractions, as compared with whole bacteria, was evident in many other experiments not reported here.

It appears very likely, in view of their serological properties, that the insoluble fractions are cell-wall fragments of various sizes, as already stated in a previous publication[1]. Chemical and spectrophotometric determinations are in progress to confirm this assumption. Although little studied so far[3], cell-wall material has already been found a good immunizing antigen[4,5], and the present work shows it to be of promise in immunization against *Brucella*. Recent work[6,7] suggests, however, that some of the activity shown by the cell wall may be non-specific. Experiments are under way to determine to what extent the effects described above might be reproduced with non-related cell-wall material.

This is a preliminary report on an investigation carried out by one of us (J. M.) in partial fulfilment of the requirements for the Ph.D. degree of the Hebrew University—Hadassah Medical School.

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