lesions will take place fifteen to twenty-five years later as in the case of extensive thermal burns. Finally, the psychical disturbances following mustard gassing should not be minimized.

As to its use in warfare, mustard gas is a disabling rather than a killing agent. Under the actual conditions of the field the great majority of mustard gas casualties are likely to be of a nature tending to incapacitate the injured for service for a number of days or weeks, or even for months. Added to this, the insidious character of this invisible fire, painless and often unrecognized in its action, makes mustard gas a potent factor in undermining the morale of the troops exposed to it.

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The optimum H-ion concentration for the growth of B. typhosus, and the effect of changes in H-ion concentration on the generation time.

By **P. SCHOENHOLZ** and **K. F. MEYER.**

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1. *B. typhosus* has a range of growth from P_H+ 5.0 — P_H+ 8.6, with an optimum growth at P_H+ 6.8 — P_H+ 7.0.

2. Stock cultures isolated from stools, blood, and urine have a more decided optimum than recently isolated cultures. In such cultures, the plateau is much more pronounced and extends over a wider range than in stock cultures. The latter is suggestive of microbic adaptation to changes in H-ion concentration in body fluids, particularly urine and bile.

3. The growth curve is influenced by changes in H-ion concentration.

At P_H+ 7.0, the minimum generation time at 36.0° C. – 37.0° C., is 31 minutes. Maximum growth begins on the average after five hours incubation.

At P_H+ 7.8, the minimum generation time is 33.4 minutes. The maximum rate of growth is reached by the eighth or ninth hour.

At P_H+ 5.4 the minimum generation time is 41.3 minutes. The maximum rate of growth is reached after $9\frac{3}{4}$ hours.

85 (1460)

The pathogenicity of bacterium melitensis for guinea pigs.

By **K. F. MEYER, E. C. FLEISCHNER** and **E. B. SHAW.**

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The very close relationship of *B. abortus* (Bang) to *B. melitensis* demonstrated by A. C. Evans[1] has been confirmed by our observations. Experimental studies, to be published in the near future, have furnished two additional characteristics of similarity.

1. The guinea pigs infected with *B. abortus* developed striking reactions of cutaneous hypersensitiveness with melitensis-protein, and vice versa in animals successfully infected with *B. melitensis* skin reactions are obtained with aborto-protein (see Table I.).

2. In a series of attempts to infect guinea pigs with various known strains of *B. melitensis* obtained from the Hygienic Laboratory, U. S. Public Health Service (same strains as studied by Miss Evans), we finally succeeded in producing by intratesticular injection of 1/10 agar slant (48 hours' growth on peptic digest agar) a disease with pathological changes which could not be distinguished from those seen in about one hundred guinea pigs suffering from abortion disease. The lesions of two guinea pigs, which consisted of a very large spleen, general lymphadenopathy, liver and lung lesions with infiltrations of epithelioid cells and lymphocytes were only definitely diagnosed to be the result of a *B. melitensis* infection by cross agglutination and absorption

[1] A. C. Evans, *J. Infec. Diseases*, 1918, xxii., 580.