from 40 to 85 per cent and on dust from a hospital blanket, mainly carrying a sarcina, at humidities of 60–80 per cent. Both heat volatilization of the pure acid, or its aqueous solution, and dispersal as a fine spray in aqueous solution, produce bactericidal atmospheres when the acid is in a concentration of 10 mgm./cu. metre; at one third of this concentration it is much less effective. The majority of the tests were carried out in an 800 cu. ft. room at 60–70° F. and the bacteria sampled on to serum agar plates in a slit-sampler[2]. The kill was confirmed by collecting the bacteria directly into broth in an impinger and plating out.

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## A Thermolabile Accessory Growth-factor to Rhizobium

IN addition to the thermostable accessory growth-factor (Allison and Hoover's coenzyme *R*), we have found a thermolabile accessory growth-factor to the root-nodule bacteria.

The medium was prepared by grinding 20 gm. of air-dried vetch powder (stem and leaves of *Vicia sinkiangansis*) with 20 c.c. normal caustic potash solution; when well rubbed, the paste was put into a cylinder containing 1,000 c.c. distilled water and was kept overnight. Next morning the supernatant fluid was transferred to a clean container, to which was added enough phosphoric acid to neutralize the alkali, and also 10 gm. sucrose and 3 gm. calcium carbonate. The resultant medium was then made up to 1,000 c.c., sterilized either by autoclaving for 25–30 minutes at 15 lb. per sq. in. pressure or by filtering through a Chamberland *F* (*L5*) candle attached to a filtering press. The autoclaved medium was distributed in 9-c.c. portions to test tubes before sterilization. The filter-sterilized medium was transferred to sterile test tubes aseptically after filtration.

Nodule bacteria strains 107 (of pea group) and 520 (of cowpea group) were used as test organisms. The inoculum was made up by washing a slant culture of the organism with approximately 10 c.c. of sterile water. A loopful of bacterial suspension was inoculated to each tube. The cultures were incubated at 25–30° C. for five days or more. Table 1 shows a typical result, in which cold sterilized medium gives more than three times the growth on autoclaved medium. Repeated experiments of the same kind established the presence of a thermolabile accessory growth-factor, stimulant, though not necessary, to the growth of root-nodule bacteria.

TABLE 1. DIRECT MICROSCOPICAL COUNT OF 11 DAYS BACTERIAL GROWTH (STRAIN 520) IN MILLIONS PER C.C.

| Autoclaved medium | Cold-sterilized medium |
|---|---|
| 31·5 | 114·0 |

A second series of experiments was then carried out to investigate the response of the thermolabile factor to heating. Test tubes containing cold sterilized vetch extract medium were heated for 30 min. at 40°, 60°, 80° and 100° C. in a water bath. In addition, unheated tubes and autoclaved tubes containing the same medium and autoclaved tubes containing the standard yeast-water-sucrose medium were included for comparison. Table 2 gives results of one experiment of this kind. The result shows that bacterial growth diminishes with increasing heating of the medium prior to inoculation, while there is no definite thermo-inactive point. The cowpea bacteria strain 520 seemed to have responded more readily to the thermolabile factor than that of the pea bacteria strain 107.

TABLE 2. DIRECT MICROSCOPICAL COUNT OF 5 DAYS BACTERIAL GROWTH IN MILLIONS PER C.C.

| Strain | Yeast-water-sucrose | Autoclaved | Vetch extract medium | | | | Not heated |
|---|---|---|---|---|---|---|---|
| | | | 100° C. | 80° C. | 60° C. | 40° C. | |
| 520 | 139·1 | 0·6 | 44·8 | 43·6 | 59·2 | 71·5 | 128·0 |
| 107 | 143·6 | 78·6 | 85·2 | 119·0 | 105·3 | 120·2 | 126·1 |

Owing to the very poor laboratory equipment at our temporary war-time quarters, which are without a refrigerator to keep stock medium, and with crude chemicals, we were not able to give reproducible quantitative data between two independent sets of experiments. Nevertheless, within each individual experiment, the presence of a thermolabile factor which affected the growth-rate of root-nodule bacteria was unmistakable.

Further studies on this newly found factor are under progress so far as facilities and time permit.

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## Localization of Vitamin C in *Belascaris marginata*

THE distribution of vitamin C in many vertebrate tissues is now well known, but excepting the Protozoa, knowledge of its localization in invertebrate tissues is somewhat limited, and no work, to our knowledge, has been carried out on the Nematoda.

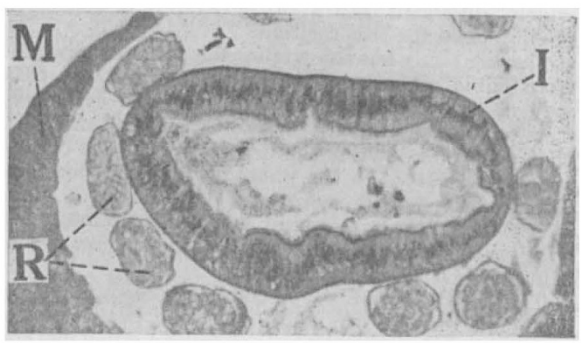


Fig. 1

Using the usual silver nitrate–acetic acid technique (for the validity of which see Barnett and Bourne[1]), we have investigated the localization of vitamin C in the tissues of *Belascaris marginata*. In specimens taken from dogs fed on a normal mixed diet, we have shown that a large aggregation of vitamin C can be demonstrated in the walls of the intestine. Fig. 1 shows part of a transverse section of Belascaris stained