mine-free diets devoid of water-soluble vitamine are used, is averted. The bulky character of such fruits has made it impracticable to feed more than 10 grams per day without decreasing too greatly the intake of other essential nutrients. Ten c.c. of orange juice per day suffice to promote considerable growth. The inner peel of the orange (which Hess has found to be antiscorbutic) seems also to contain some of the other water-soluble vitamine. It is already evident that the proportions of the latter in the fruits tested is not large in relation to the quantities edible.

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Some observations on the biological characteristics of bacillus botulinus.

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In a study of sixteen strains of *Bacillus botulinus*, which have been isolated in connection with outbreaks of food and forage poisoning occurring in different parts of the United States during the past five years, a number of interesting facts have been observed. While a complete report of the findings will be published elsewhere, it seems justifiable to record at this time some of the salient facts; namely:

1. Contrary to the general view that the optimum temperature for growth of *B. botulinus* is about 22° C., we have found that the body temperature 37° C., is most favorable for the growth and spore production of all of the sixteen strains of *B. botulinus* studied. Toxin is readily formed at this temperature.

2. At autopsy of guinea pigs which have been either fed or injected with cultures of *B. botulinus* it has been possible to recover this organism quite frequently from the liver and spleen and also occasionally from the heart's blood, the kidneys and the pancreas.

3. Contrary to the results obtained by previous investigators, guinea pigs, which have been fed or injected with toxin-free spores of *B. botulinus*, Nevin strain, have died with symptoms resembling those of botulinus poisoning. At autopsy of these animals *B. botulinus* was recovered from the liver and spleen.