Letters to the Editor

Carbon Dioxide as an Essential Factor in the Bacterial Decomposition of Cellulose

The decomposition of cellulose by a mixed culture of *Vibrio perimastrix* (A. Alarie. Ph.D. Thesis, McGill Univ., 1945), and another unidentified bacterium has been found to take place only in the presence of carbon dioxide.

Into each of four 125-ml. flasks was measured 50 ml. of a salt solution of pH 6.7 containing: 0.5 gram Na_2HPO_4; 0.5 gram KH_2PO_4; 0.2 gram $MgSO_4 \cdot 7H_2O$; 0.1 gram $CaCl_2 \cdot 2H_2O$; 0.1 gram NaCl; 0.02 gram $FeCl_3$; and 1.0 gram $NaNO_3$ per liter of distilled water. To each flask was added 0.5 gram of Whatman No. 41 filter paper in the form of small clippings, and finally the media were sterilized and inoculated. The flasks were fitted with an inlet tube at the bottom. Two were aerated with air from which the carbon dioxide had been removed by passing first through 50 per cent potassium hydroxide and then soda lime, and two received untreated air. The temperature was maintained at 80° F., and the duration of the fermentation was eight days.

The following results are typical of several experiments:

Flask No.	Treatment	Percentage decomposition of cellulose	pH*
1	Untreated air	5.2	7.0
2	" "	6.0	7.0
3	CO_2–free air	0	6.6
4	" "	0	6.6

* Initially pH 6.7.

The only products found were traces of unidentified acids. Viable bacteria were present only in the flasks receiving untreated air. We believe this is the first demonstration that carbon dioxide is essential for the aerobic decomposition of cellulose by bacteria.

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Use of the Shay Rat for Assay of Antiulcer Substance

Shay and his co-workers (*Gastroenterology*, 1945, 5, 43) have described a simple method for the production of gastric ulceration in the rat. These investigators suggested that their procedure might be adapted for use as a rapid assay method for any hormonal antiulcer agent. We have used their method for this purpose.

After many modifications of the procedure described by Shay, *et al.* had been tried, it was found that male rats about 60 days old and weighing 120–150 grams were most suitable. Having been raised on Purina Laboratory Chow, the rats are fasted in individual cages for 48 hours. The pylorus is then ligated under ether anesthesia and the fasting continued. Marked ulceration develops uniformly in the rumen in from seven to nine hours. This ulceration may be reduced in extent or prevented with a sufficient dose of an antiulcer substance isolated from human urine by a procedure to be described elsewhere. The antiulcer material was administered intravenously at the time of the operation, although intraperitoneal injection or administration by mouth sometime prior to the pylorus ligation may prove effective.

This rat preparation may also be useful for the evaluation of antisecretory as well as antiulcer agents, for Shay, *et al.* give evidence that the occurrence of gastric ulceration in their rats may be dependent on acid and pepsin secretion. For this assay of antiulcer substances it is obvious that the Shay Rat offers many advantages over dog preparations.

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Reprints to Denmark

Scientists in Denmark have expressed to me their regret that they do not yet receive American scientific journals regularly and that only a few of their colleagues in the United States are sending them reprints. Apparently many American scientists are not yet aware of the fact that printed matter can be sent to Scandinavian countries by ordinary mail. It would be greatly appreciated by Scandinavian scientists if their American colleagues would send them reprints of work within their special field from 1940 up to date without waiting for requests. Requests for reprints may be very much delayed, or in many cases impossible to make, because of the lack of journals since the beginning of the war.

The writer would be very much obliged if the same favor might be extended to him when, after 1 June, he takes over the Biochemistry Department of the Polytechnic Institute (Danmarks Tekniske Højskole) in Copenhagen.

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Differentiation of Antibiotics by Resistant Strains

W. J. Robbins, at a meeting of the New York City branch of the Society of American Bacteriologists on 27 December 1945, showed that a strain of *Staphylococcus aureus* made resistant to penicillin was affected by antibiotics produced by Basidiomycetes, demonstrating that this method could be used for the differentiation of unknown antibiotics.

We had obtained from an unclassified Actinomyces an antibiotic which by bacterial spectrum showed a marked similarity to highly purified streptomycin, differing only quantitatively. Robbins' method was employed by us in an attempt to further characterize the antibiotic. For this purpose we had previously developed in our laboratory two strains of *Staph. aureus* (A.T.C.C. 6538 and F.D.A. 209) highly resistant to streptomycin. Both resistant strains were found to be as sensitive to the un-