of inhibition, less dichromate would be needed for an inhibition in cases where the enzyme concentration is decreased from that used in these particular experiments.

The effect of dichromate on growth of two strains of *Staphylococcus aureus* was followed turbidimetrically (at 450 mμ. on the Coleman spectrophotometer) and checked by duplicate pour-plate dilution counts. In synthetic medium[2] as little as 1 μg./ml. was very toxic to growth, whereas in nutrient broth approximately 10 times as much dichromate was needed to obtain equivalent inhibition. This was undoubtedly due to binding of the heavy metal ion by constituents of the nutrient broth.

Because of the extreme difficulty in ridding glassware of dichromate after cleaning in "cleaning solution" and its great toxicity for living cells and enzymes, it is believed highly advisable in laboratories dealing with such material to clean all glassware by another method, such as 10 per cent nitric acid, a detergent, or 1–5 per cent trisodium phosphate.

[2] The medium used was that of Landy and Dicken (2) with the omission of sodium acetate, asparagine, guanine, xanthine, uracil, and folic acid.

References

1. Furman, N. H. *Scott's standard methods of chemical analysis.* (5th ed.) New York: D. Van Nostrand, 1939.
2. Landy, M., and Dicken, D. M. *J. lab. clin. Med.*, 1942, **27**, 1086.
3. Laug, E. P. *J. ind. eng. Chem.* (Anal. ed.), 1934, **6**, 111.
4. Richards, O. W. *Physiol. Zool.*, 1936, **9**, 246.

Letters to the Editor

The Effect of Urethane on Lymphatic Leukemia in Rats

In 1925 Hawkins and Murphy reported from this Laboratory that urethane anesthesia (ethyl carbamate) caused a rapid increase in the CO_2 content and pH of the whole blood of rabbits to a point where there was a marked uncompensated alkalosis. This reached its maximum in 24 hours and persisted for 48 hours. Accompanying this change was a marked fall in the circulating lymphocytes, similar in extent to that following a relatively large exposure to X-ray (*J. exp. Med.*, 1925, **42**, 609). Recently an investigation has been undertaken to test the effect of urethane on the development of transplanted lymphatic leukemia and lymphosarcoma in rats. Since starting this study, our attention has been called to two articles which have appeared in British journals. Haddow and Sexton, in testing urethanes on experimental animal tumors, noted that the most striking effect was upon leukemic cells (*Nature, Lond.*, 1946, **157**, 500). In the second paper, Paterson, Haddow, Thomas, and Watkinson compared the effect of urethane with deep X-ray on human leukemia (*Lancet*, 1946, 11 May, 677). They noted that the chemical agent produced a remarkably similar effect on the blood count and the enlarged lymph nodes to that resulting from the application of the standard method of deep X-ray therapy.

The material for our test was a transplanted disease of rats, which manifests itself as generalized lymphatic leukemia if the malignant cells are injected intraperitoneally or as a localized lymphosarcoma when the cells are inoculated into the subcutaneous tissue of the groin. The leukemic type of the disease develops rapidly, with marked increase in the circulating lymphocytes and extensive involvement of the thymus and lymph nodes. Death results in 8 to 12 days. The groin inoculations result in rapidly growing tumors which attain very large size and cause death of the rats in 16 to 21 days.

Among 50 inoculated rats, given from 50 to 100 mg. of urethane/100 grams of body weight, repeated 4 times a week, only 3 developed leukemia (6 per cent). Among 41 controls of the same strain, inoculated with the same material but receiving no treatment, 33 developed fatal leukemia (80.4 per cent). Among 30 rats inoculated in the groin with leukemia cells, and given the urethane treatment, only 9 (30 per cent) developed progressive tumors, while 26 of the 30 controls (86.6 per cent) died of lymphosarcoma.

We have previously demonstrated that adrenalectomy renders rats much more susceptible to our strain of leukemia (*Science*, 1943, **98**, 568). Furthermore, adrenal cortical and pituitary adenotropic hormones retard or prevent the development of the disease (*Science*, 1944, **99**, 303). In the light of these observations it may prove significant that the adrenals of rats given urethane in the dosage employed above show about 33 per cent increase in weight over those from normal, untreated animals. A similar increase in weight of the adrenals has been noted in rats which develop resistance to inoculated leukemic cells without treatment. We are attempting to evaluate the part played by the adrenals by treating inoculated, adrenalectomized rats with urethane.

James B. Murphy and Ernest Sturm
The Rockefeller Institute for Medical Research
New York City

Wild Pineapples in Venezuela

Although pineapples, *Ananas ananas* (L.) Cockerell (*A. sativus* Schult. f.) were known to have originated in the American tropics and have been reported growing in the wild state in Brazil, Surinam, and Paraguay (*Pflanzenfam.* (2nd ed.), 1930, p. 154), not until recent observations by the author and V. Badillo in the Parguasa region of the Estado Bolívar, and simultaneously by others in neighboring regions, have they been definitely known to be in the wild state in Venezuela. They grow