Loefer, but they obtained growth for only a few days. They conclude: "It would seem, therefore, that our strain of *Chilomonas paramecium* is unable to synthesize protoplasm from ammonium compounds and other inorganic salts and is thus quite different in this respect from the strain used by Mast and Pace." Loefer[6] concludes that their strain can not even "utilize as a source of nitrogen any of the single amino-acids tested," *i.e.*, "glycine, dl-valine, l-leucine, dl-leucine, dl-iso-valine, dl-β-phenylalanine, l-tyrosine and the compound asparagin."

At our request Loefer and Hall very generously sent us a sample of their strain of *Chilomonas*. This sample contained bacteria when it arrived, having, unfortunately, been contaminated en route. Loefer and Hall had for two or three years grown their strain in a bacteria-free solution containing tryptone.

We added to this solution an equal quantity of our solution D, *i.e.*, a solution containing nitrogen in the form of ammonium chloride and carbon in the form of acetate and left it 12 hours; then several specimens were removed with .1 cc of the solution and added to .3 cc of solution D and left 12 hours, after which single individuals were removed, passed through several portions of fresh solution D and cultured on depression slides in accord with the method described by us.[7]

Four lines of isolation cultures were thus established and carried for six weeks with daily transfers. During this time the average rate of fission was 3.06 per day, *i.e.*, it was practically the same as that obtained in our earlier experiments with our strain of *Chilomonas*. None of the lines died out during the experiment and at the close the specimens in all were in excellent condition and indistinguishable from those in our strain cultured in solution D. There is therefore no reason for assuming that the two strains in question differ. We have grown in the acetate-ammonium solution chilomonads collected at Woods Hole, Mass., Baltimore, Md., Durham, N. C., and Birmingham, Ala. It is therefore not probable that there are different strains of *Chilomonas* in reference to ability to obtain nitrogen and carbon from simple compounds.

We have repeatedly observed that if chilomonads are transferred from a glucose-peptone solution directly to an acetate-ammonium solution or from this solution directly to this solution minus acetate nearly all die immediately, and that those which do not die immediately divide infrequently and usually die after a few days. We have also repeatedly observed that if the concentration of the acetate is too low there is frequent division for a few days during which the chilomonads become smaller and smaller until they die. The failure of Loefer[8] and Loefer and Hall[9] to obtain growth in our inorganic solution (solution I) or our acetate-ammonium solution (solution D), and Loefer[10] to obtain growth in solutions containing but one amino-acid was therefore probably due to insufficient care in transferring the chilomonads from their tryptone solution to the solutions containing ammonium chloride and acetate or a single amino-acid, or to unsatisfactory concentrations of acetate.

Pringsheim presents no details concerning the methods used in his attempt to grow *Chilomonas* in inorganic solutions. We are therefore unable to offer any suggestions concerning the cause of his failure.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

PARADICHLOROBENZENE AS A HERBARIUM INSECTICIDE

THE author read with interest an article recently published in this journal entitled, "Paradichlorobenzene, an Effective Herbarium Insecticide."[1] The gratifying results obtained by the author of this article are similar to the results experienced by many of us who have been using this herbarium insecticide for the past several years. The use of paradichlorobenzene in herbariums goes back several years. It was used in a part of the National Herbarium prior to 1930, and also in many other herbariums prior to that date. The use of this insecticide has become so popular that the old method of periodic fumigation with hydrogen cyanide or carbon bisulfide is almost obsolete.

Even though good results were obtained by the author of the above-mentioned article by placing the crystals of paradichlorobenzene on the *bottom* of the herbarium cases, it is considered to be better practice to place the crystals on the *top* shelves of the cases. The fumes of the insecticide are heavier than air, and thus by placing the crystals near the top better distribution of the insecticidal gas is obtained. When the crystals are placed at the bottom, distribution of the heavier-than-air gas depends upon convection currents.

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7 *Protoplasma,* 20: 326–358, 1933.
1 Frank C. Gates, SCIENCE, 81: 438, 1935.
8 *Biol. Bull.,* 66: 1–6, 1934.
9 SCIENCE, 81: 486, 1935.
10 *Arch. f. Protist.,* Bd. 85, S. 74–86, 1935.