deteriorating as a result of the unplanned location of industries and urban development.

Experience in other countries has indicated certain basic requirements for tackling the problems of pollution. These are legislation, technical expertise, funds, the co-operation of industries and the need for a master plan for the location of industries. It is time that the industrialists realize their responsibilities and take effective action in the prevention and abatement of environmental pollution arising out of industrial wastes.

Influence of D-Alanine, Glycine and Egg Albumin on Biochemical Oxygen Demand

By B. L. C. RAJAN (*Visvesvaraya College of Engineering, University of Bangalore, Bangalore-1, India*)

Experiments were carried out by adding D-alanine, glycine and egg albumin in different combinations to domestic-sewage and industrial-waste waters and following the 5-day biological oxygen demand of these mixtures. The results indicated the following. (1) There was variation in the increase in biological oxygen demand in the presence of equal amounts of the amino acids and egg albumin; the increase was greatest with D-alanine and least with glycine. Of these chemicals D-alanine apparently stimulated bacterial growth to the greatest extent and glycine to the least extent. (2) The increase in biological oxygen demand in the presence of egg albumin was not appreciable during the first 36h, presumably owing to a lag phase in the growth of bacteria. (3) About 90% of the biological oxygen demand was satisfied in 5 days in the presence of D-alanine, whereas 80 and 70% of the biological demand were satisfied during that time in the presence of egg albumin and glycine respectively. (4) With increased concentrations of amino acids and egg albumin in the waste water the increases in biological oxygen demand were not proportional. (5) The 'K' values also closely followed the values for the biological oxygen demand.

These observations suggest that addition of such organic chemicals as those used in this work is useful in the treatment of organic industrial-waste waters deficient in nitrogen.

Effect of Ultraviolet Irradiation on Chlorine Residuals in Polluted Waters

By T. M. AHMEER AHMED (*Civil Engineering Department, Visvesvaraya Engineering College, Bangalore-1, India*)

In this study over 50 samples of river water polluted with sewage and industrial wastes were used. They contained high concentrations of suspended solids and dissolved impurities. All the samples were ex-

posed to ultraviolet irradiation for 6h. There was a decrease of about 60% in the chlorine residuals in the first 2h. The decrease was less at greater depths when the samples were kept in experimental tanks. The decrease was increased with a greater intensity of illumination. Along with the decrease in the chlorine residuals there was a fall in pH value.

A simplified water system obtained by passing distilled water through a column of Amberlite MB-1 resin at pH7 was compared with the polluted waters for the decrease in chlorine residuals. There was about an 80% decrease in 6h. In the same period the polluted waters showed a decrease of about 70%. This was due to the presence of suspended and dissolved impurities.

These results show that the depth of the tank, intensity of illumination, time, pH and the dissolved and suspended impurities of the sample influence the decrease in chlorine residuals effected by ultraviolet irradiation. These observations have a bearing on chlorination practice in the treatment of waste waters.

Biochemical Evaluation of Pesticides

By LEELA IYENGAR, M. P. PANDEY, C. VENKOBACHAR and A. V. S. PRABHAKARA RAO (*Department of Civil Engineering, Indian Institute of Technology, Kanpur, Kanpur-16, India*)

In view of the increasing use of pesticides and insecticides in agriculture and of the problem of development of resistance and effects of insecticide combinations, a biochemical evaluation of pesticides was undertaken. The effects of chemicals such as DDT [1,1,1-trichloro-2,2-di-(*p*-chlorophenyl)ethane], BHC (lindane, 1,2,3,4,5,6-hexachlorocyclohexane), aldrin (1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene), endrin (1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4,5,8-endo-endo-dimethanonaphthalene), malathion (*S*-1,2-dicarbethoxyethyl *OO*-dimethyl phosphorothiolothionate), Rogor [*OO*-dimethyl *S*-(*N* - methylcarbamoylmethyl)phosphorodithioate], parathion (*OO*-diethyl *O-p*-nitrophenyl phosphorothionate), Diazinon (*OO*-diethyl *O*-2-isopropyl-6-methylpyrimidin-4-yl phosphorothionate), chlordane (1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-4,7-methanoindene) and Thiometon *OO*-dimethyl *S*-2-(ethylthioethyl)phosphorodithioate on amylase, catalase, transaminases, proteases, lipases and dehydrogenases from such different sources as seeds and mosquito larvae were studied. The results indicated that there was a delay or inhibition of germination of some seeds. The inhibitory patterns