

challenge. In contrast, retardation of the growth of a rat epithelioma has been achieved by other non-specific immunostimulants, such as killed *Brucella abortus*.

If levamisole is an immunostimulant, we do not know what it might stimulate, and the possibility of exciting an undesirable kind of immunological reaction demands further investigation in animal models before opening the floodgates of necessarily less controllable clinical trials.

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PERSON-TO-PERSON TRANSMISSION OF ENTERIC BACTERIAL INFECTION

SIR,—Dr Steere and his colleagues (Feb. 8, p. 319) have demonstrated person-to-person spread of salmonellosis in cases where predisposition due to reduced gastric activity or previous treatment with antibiotics was precluded. This faces the epidemiologist once more with the question why challenges with very low concentrations of enteric pathogenic bacteria can occasionally trigger disease in healthy persons, whereas, when the same organisms are absorbed with food, doses well over 10^3 colony-forming units seem to be required.¹ Outbreaks of salmonellosis²⁻⁵ and shigellosis⁶⁻¹⁰ transmitted in drinking-water that was certainly not grossly contaminated have presented similar questions.

Such questions have prompted us to carry out some investigations of the kinetics of the emptying of the stomach, using a ^{99m}Tc-colloid dispersion in water, its fate being studied with a gamma camera on line with a computer. This revealed that, in healthy individuals, small amounts of water (up to 50 ml.) taken between meals pass the pyloric area with very little delay. When such small volumes of liquid substrate contain enteric pathogens, these bacteria are hardly exposed to the bactericidal effect of gastric juice and hence reach the duodenum in virtually the same numbers as ingested. In this way very small numbers of cells may lead to disease. However, when the same bacteria are absorbed with solid food, intragastric-retention times are considerable. This results in a dramatic reduction of viable bacterial cells, at least in normoacidic subjects. In this instance very high numbers of cells have to be absorbed to allow at least a few to penetrate the duodenal and lower areas.

The infecting dose of given enteropathogenic bacteria thus depends greatly on the carrier wherein the bacteria are contained, particularly water versus solid foods. Person-to-person spread of such pathogens might result from a saliva-borne infection secondary to transmission by the contaminated hand, similar to the triggering of enteric bacterial disease resulting from the consumption of relatively small volumes of only very sparsely polluted drinking-water.

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BLOOD-LEAD LEVELS, BEHAVIOUR, AND INTELLIGENCE

SIR,—Dr McCabe's letter (Oct. 12, p. 896) criticising the Center for Disease Control's report of psychological deficit in children appears to be an exception to an observation we and others have made. We have noted that reports and commentary on lead toxicity tend to sharply divide between those who are alarmed that "low level lead" exposure is accompanied by adverse health effects, particularly in neuropsychological performance, and those who argue that no case has been made for low-level lead exposure as a hazard.

We could find no statement, report, or study by an industry-sponsored scientist, whether in-house grantee, or academic consultant, which frankly acknowledges that low-level exposure is hazardous. Those reports of toxicity due to low-level lead exposure, on the other hand, tend to come from departments of public health, paediatrics, or environmental science. This observation appears well supported by the recent literature and by views expressed at three major meetings.¹⁻³

The association between nature of sponsorship and position on low-level lead toxicity appears challenged by Dr McCabe's letter. Dr McCabe cited his affiliation as an academic department of paediatrics in Wisconsin, but argued that low-level-lead effects have not been demonstrated. We find, however, that his text was first published almost verbatim as an International Lead Zinc Research Organisation In-House Report, dated July 16, 1974. In that report, the face sheet lists him as "Edward McCabe, Pediatric Consultant, ILZRO (International Lead Zinc Research Organisation)".

It is not our interest to question Dr McCabe's intent. That the lead industry supports research on the health effects of its products, and hires medical consultants for opinions, seems only proper. That these consultants acknowledge industry support when entering industry-sponsored comment into the scientific arena, seems to us not only proper, but obligatory.

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* * We showed this letter to Dr McCabe, whose reply follows.—ED. L.

SIR,—The letter signed by Dr Needleman and others offers no scientific rebuttal to my letter, which contained

1. International Symposium on Health Effects of Lead. Congress of European Communities, Environmental Protection Agency, Amsterdam, 1972.
2. Low Level Lead Exposure. National Institute of Environmental Health Science, Environmental Protection Agency, Raleigh, North Carolina, 1973. *Environmental Health Perspectives*, no. 7, May, 1974.
3. International Symposium, Recent Advances in the Assessment of the Health Effects of Environmental Pollution, W.H.O., C.E.C., E.P.A., Paris, 1974.