

13. Horowitz, N. H., The search for extraterrestrial life, *Science*, Vol. 151, No. 3712, Feb. 18, 1966, p. 32.
14. Rea, D. G., Analytical methods for Landers, *Biology and the Exploration of Mars*, National Academy of Sciences, 1965, p. 378.
15. Levinthal, E., Hundley, L., and Lederberg, J., Multivator-A biochemical laboratory for Martian experiments, *Life Sciences and Space Research*, Intersciences Publishers, New York, Vol. II, 1963, pp. 112-113.
16. Horowitz, N. H., The search for extraterrestrial life, *Science*, Vol. 151, No. 3712, Feb. 18, 1966, pp. 33-34.
17. Levin, Gilbert V., and Heim, Allen H., Gulliver and Diogenes-Exobiological antitheses, *Life Sciences and Space Research*, Intersciences Publishers, New York, Vol. III, 1963, pp. 105-119.
18. Corliss, William R., Detecting life in space, *International Science and Technology*, No. 37, Jan. 1965, pp. 497-499.
19. Horowitz, N. H., The search for extraterrestrial life, *Science*, Vol. 151, No. 3712, Feb. 18, 1966, pp. 32-33.
20. Vishniac, Wolf, et al, A model of Martian ecology, *Biology and the Exploration of Mars*, National Academy of Sciences, 1965, pp. 229-241.
21. Corliss, William R., Detecting life in space, *International Science and Technology*, No. 37, Jan. 1965, p. 499.
22. *Ibid.*, pp. 499-500.
23. Glaser, D. A., McCarthy, John, and Minsky, Marvin, The automated biological laboratory, *Biology and the Exploration of Mars*, National Academy of Sciences, 1965, pp. 331-345.
24. Horowitz, N. H., The search for extraterrestrial life, *Science*, Vol. 151, No. 3712, February 18, 1966, p. 34.

ULCERS AND SWINE

Modern man can't claim a monopoly on stomach ulcers. In some instances, pigs, too, develop stomach ulcers. But the main difference is that while we have a pretty good idea of how to treat human ulcers, we do not know much about the causes of stomach ulcers in hogs.

For some time animal researchers at the University of Wisconsin have been taking a serious look at the problem of stomach ulcers in swine. W. G. Hoekstra, R. H. Grummer, and Tadeusz Kowalczyk ran a series of experiments to determine the factors associated with ulcer development in pigs.

The Wisconsin researchers found that various feed grains had a significant effect on the formation of stomach ulcers in swine. A ration containing 85% oats seemed to prevent ulcers, while one containing corn caused a high incidence of stomach abnormalities.

In another series of trials, the animal researchers studied the effect of various nutritional and management factors on the formation of gastric ulcers in swine.

The effects of different vitamins, nutrients, and antibiotics were examined. Chlortetracycline, arsanilic acid, bacitracin, streptomycin, dried skim milk, ground soybeans, soybean oil, thiamine, riboflavin, vitamins A, D, E, and K and several other additives were mixed with rations in various combinations. None seemed to produce or prevent stomach ulcers in pigs.

Varying the method and schedule of feeding also didn't show much effect on ulcer development. Likewise, crowding the pigs to varying degrees did not appear to cause ulcers, but probably made them more severe.

The researchers feel that more studies are needed to explore the problem of stomach ulcer formation in swine and to determine why oats prevents the problem while corn does not.

MOSQUITO-KILLING FUNGI

The "lowly" mold has come a long way since Fleming's discovery of penicillin. And if applied research keeps at its present pace, the fungi family might well prove to be man's wonder plant.

University of Wisconsin researchers V. K. Shah and his colleagues isolated some soil fungi that produce substances toxic to mosquito larvae. In some instances, up to 93% of the larvae were killed in two hours with as little as one percent of the liquid medium in which the fungus was grown.

So far, four species of fungi (still unidentified) showed potent mosquito-killing properties. In one test, three milliliters of the culture liquid were sufficient to kill all but four of the 54 larvae in two hours. Extracts from the fungi culture medium have been turned over to University entomologists for further study.

In the course of his experiments, Shah also got some intriguing side results. In one test, for instance, the secretion from a certain species of mold did not kill any of the larvae. Instead, the larvae grew to a large size. Whether this effect was due to some kind of growth hormone produced by the mold, Shah has not yet determined.

Another angle being looked into is whether some mold-derived substances cause sterility in male mosquitoes. If this is so, then this would suggest a practical method of controlling malaria by mass sterilization of male mosquitoes.

OSTEOPOROSIS AND FLUORIDE

The prevalence of osteoporosis, a disease in which there is a reduction in bone mass and a fragility of the bones, is lowered significantly in individuals who drink water containing generous concentrations of fluoride.