fall of the acid-soluble organic phosphates suggests that energy-rich phosphates and other easily available organic phosphates are disappearing. A high degree of protein breakdown is also clearly demonstrated from the nitrogen analyses. Infection causes the degradation of protein and thus increases the amino nitrogen values which in turn leads by degradation to increased urea formation.

The results are preliminary in nature. The details of the altered biochemical pathways in infected animals are still in the realm of conjecture. The biochemical data reported here could be directly or indirectly related to staphylococcal infection or may even be effects of any death process. The multiple effects of the bacterial toxins make the approach all the more complicated. *In vitro* attempts with mouse liver and staphylococci to attempt to clarify the events have been discouraging. Isolation and identification of the lethal factor will help us approach the problem more systematically. Recently we have been able to extract the lethal factor from the staphylococcus after subjecting the bacteria to high pressure (40,000 psi).[10] Further purification is necessary before it is identified. Until then, more biochemical data need to be gathered from *in vivo* studies. In our experimental model the presence of live bacteria or live cytoplasm is necessary for the fatal effect on the mice. Culture filtrates, penicillin or heat-killed bacteria do not carry the lethal factor. Injection of infected homogenized liver killed normal mice in about the same time (254 minutes) only when the lethal concentration of $1 \times 10^9$ bacterial cells/ml. was present in the homogenate. Treatments with hexoses, pentoses, cortisone, phosphate buffer and 1/6 M sodium lactate or 10% oxygen at 6/10 atmospheres are found to be effective in increasing the survival time.[11-14] Cortisone or oxygen treatment can lead to 40–95% prolongation in the length of life of infected mice. Work is still under progress to establish the pathway of staphylococcal effect on carbohydrate, phosphate and nitrogen metabolism.

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1. Smith, I. M., *Modern Treatment*, 1964, **1**, 937.
2. — and Dubos, R. J., *J. Exptl. Med.*, 1956, **103**, 87.
3. —, Wilson, A. P., Hazard, E Ch., Hummer, W K. and Dewey, M. E., *J. Infect. Dis.*, 1960, **107**, 369.
4. Counts, G. W., Smith, I. M., Routh, J. I., Hazard, E. Ch., and McTavish, J. F., *Nature*, 1961, **191**, 785.
5. Hawk, P. B., Oser, B. L. and Summerson, W. H., *Practical Physiological Chemistry*, McGraw-Hill. Book Co., New York, 1954.
6. Nothstein, D. L. and Ellerbrook, L. D, *Amer. J. Clin. Path.*, 1962, **37**, 104.
7. Mukherjee, K. L. and Shaw, M., *Canad. J. Bot.*, 1962, **40**, 975.
8. Frame, E. G., Russell, J. A. and Wilhelmi, A. E., *J. Biol. Chem.*, 1943, **149**, 255.
9. Russell, J. A., *Ibid.*, 1944, **156**, 467.
10. Smith, I. M., Lindell, S. S. and Routh, J. I., *Nature*, 1965, Submitted.
11. —, — and Rabinovich, S, *J. Infect. Dis.*, 1965, Submitted.
12. Lindell, S. S., Sopher, S. I. and Smith, I. M., *Ibid.*, 1965, Submitted.
13. Smith, I. M., Lindell, S.S. and Hazard, E. Ch., *Ibid.*, 1965, Submitted.
14. Barnwell, P., Sopher, S., Flickinger, R. R and Smith, I. M., *Amer. Rev. Resp. Dis.*, 1965, Submitted.

## GEOLOGY OF MARION ISLAND

MARION Island lies in latitude 46° 49′–46° 59′ S., longitude 37° 35°–37° 55′ E. It measures 12 miles east-west, by 7 miles north-south, and rises to a maximum height of 3890 ft. The island is wholly volcanic. A younger and an older lava series are present, with intercalated agglomerate and numerous large scoria mounds. Most of the island is built up of the older lavas, chiefly dark-coloured olivine basalts varying in their degree of compaction and often carrying phenocrysts of olivine. There are several light-coloured flows with a distinctive platy habit. The platy lavas have a relatively even grain and contain less basic plagioclase. They are trachytes.

The most distinctive feature of Marion Island from off-shore is the very numerous reddish scoria mounds dotted all over the Island. They rise up to 700 ft. above their surroundings. Their conical shape is frequently perfectly preserved, and some retain crater-shaped depressions at their summits.

The age of the older lavas is uncertain. Behind the shifted coast-line the lower slopes of the Island locally exhibit a mature land surface. By analogy with other oceanic islands, they may date back as far as the Tertiary. The later lavas and scoria mounds are clearly of very recent age.—(*Nature*, 1965, 205, 64.)