greater than the whole organism rate. This latter result is very similar to that found for the temperate echinoid *Strongylocentrotus purpuratus* (Giese *et al.*, 1966).

These results suggest that antarctic echinoderms are much like temperate species, in that oxygen availability to the internal tissues limits oxygen consumption of body components in the intact animal. However, oxygen consumption measurements per unit weight are always lower for the entire organism than for an active body component such as the body wall, because often one body component (for example, the body fluid) consumes little oxygen yet constitutes a considerable fraction of the body mass. The oxygen consumption of the body fluid, which contributes little to the total oxygen consumption of the body, thus lowers the oxygen consumption of the body per unit weight. No measurements were made of the oxygen consumption of the body fluid of antarctic echinoderms, however, because such measurements have already been made with temperate forms and little was to be gained by repetition (Giese *et al.*, 1966).

The mean oxygen consumption rate of the antarctic echinoid *S. neumayeri* measured at −1.8°C. is similar to the rate measured at 13°C. for temperate-zone urchins (Webster, 1972). The rate of oxygen consumption measured for *O. validus* at −1.8°C. is, in general, somewhat lower than that measured in temperate asteroids at 13° to 15°C. (Farmanfarmaian, 1966). The lack of any significant temperate effect between −1.8° and 3°C. in these species suggests metabolic compensation over this range.

This research was conducted under National Science Foundation grant GA-4458 to A. C. Giese of Stanford University who planned the present study as part of a larger program on the physiology of the body wall of echinoderms. Special thanks are due to David Checkly and A. L. DeVries who assisted in the diving program and to the U.S. Navy for support.

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Distribution of the antarctic mite *Stereotydeus mollis* Womersley and Strandtmann in southern Victoria Land

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An earlier study (Pittard *et al.*, 1971), demonstrated measurable variations in populations of the mite *Stereotydeus mollis* among isolated localities in southern Victoria Land, Antarctica.

Our purpose this season was to recollect mites from the same areas as the previous study and see if the findings reported in 1971 could be repeated. The mites for the Pittard *et al.* study had been collected in 1966-1967 and 1967-1968.

Also, observations were made on relative densities of mites in the collection areas with the idea of perhaps reaching some conclusion as to the factors that limit their distribution. Collections were made at seven points along the coast of the Ross Sea, from Cape Roberts on the north to Minna Bluff on the south; five inland points including Hart Glacier in Wright Valley, Rhone and Canada Glaciers in Taylor Valley, Gondola Ridge on the McKay Glacier, and Kar Plateau; plus one area of Black Island and one area at Cape Royds on Ross Island. Collecting was attempted on Observation Hill and at Hut Point, but the mites were very few in number, probably because of excessive disturbance by man.

All the above areas have one thing in common. They are absolutely barren except for occasional small patches of moss. A few lichens occur in Victoria Land, but there are none where the mites were collected. The substrate consists of coarse sand and volcanic or granitic rocks of all sizes, from tiny pebbles to large boulders. Because of the nature of the substrate, all collecting was done manually, by picking up a rock, turning it over, and aspirating the mites found there.

In general, there seems to be a relationship between the size, density, coloration, and position in the soil of a rock, and the probability of finding mites under it. The "ideal" rock is a dark, relatively dense piece of basalt with some pores or small fissures in it; its size is 2 to 4 centimeters in diameter by 1 to 1½ centimeters thick, and it is resting lightly on very moist sand. There are many exceptions, but, if it is possible to generalize, this type of rock is the most typical habitat in the majority of the locales we collected.

The temperature beneath such rocks was generally 6° to 9°C. warmer than the ambient temperature and about 1°C. warmer than the surface. That is, when the ambient temperature was 0°C., the undersides of rocks were 6° to 8.5°C., when the ambient temperature was 3.5°C.; the

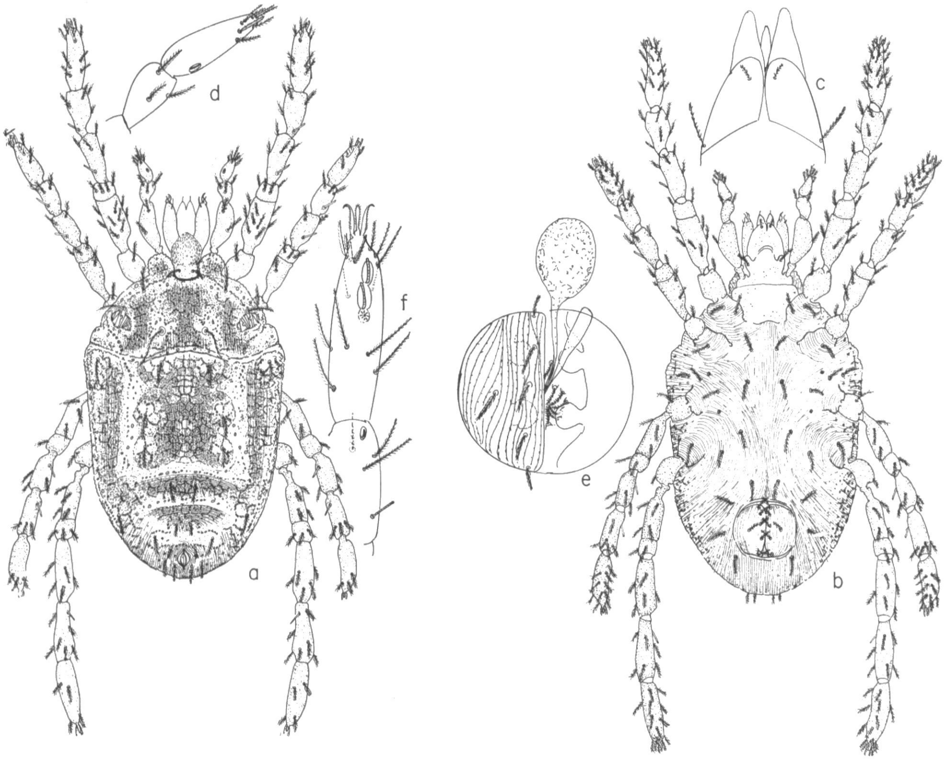

Figure 1. ***Stereotydeus punctatus*** Strandtmann. a, dorsal; b, ventral; c, ventral view of rostrum; d, pedipalp; e, male genitalia (with left cover removed); f, tarsus and tibia I.

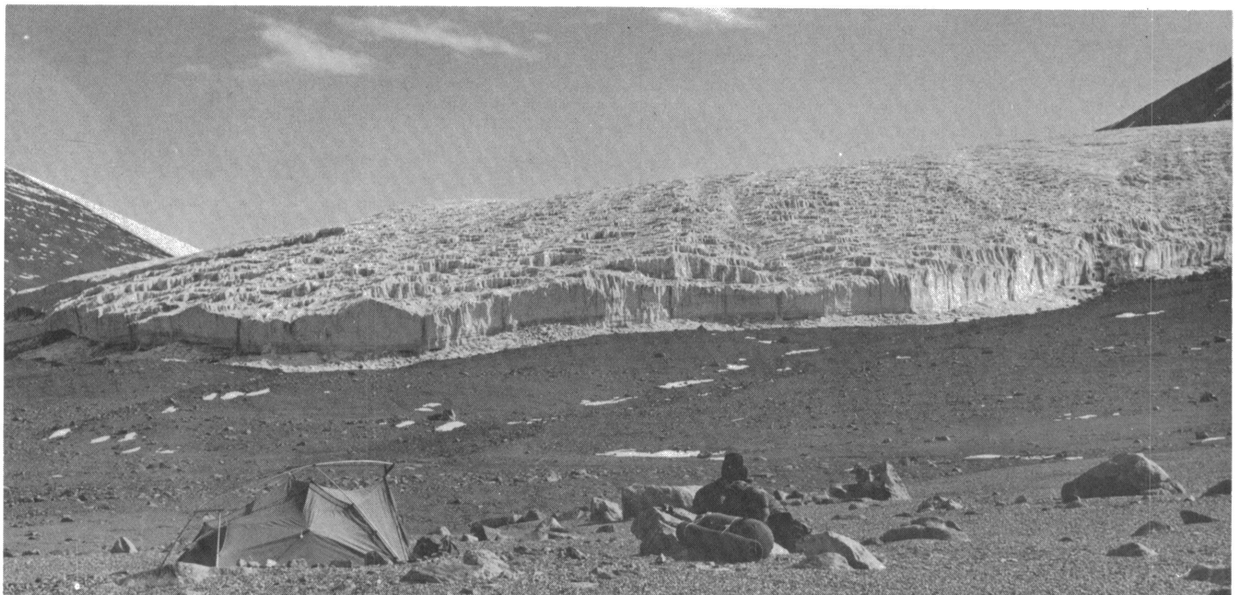

Figure 2. A portion of Garwood Valley, with Garwood Glacier in the background, where there is a medium to dense (up to 2,000 per square meter) mite population.

undersides of rocks were 10.5° to 12.2°C. In the latter instance, surface temperature was 10.0°C.; 2 centimeters down it was 11°C.; 4 centimeters down, 9.3°C. The foregoing is true on sunny days.

An estimate of density was made in a typical area below a snow bank at Cape Royds. A typical area is one that is moist from melting snow or ice and has a sandy substrate, on the surface of which are pebbles of various sizes. A barely visible flush of green or blue-green algae lines the margins of the pebbles on the under side. A count of total mites was made in three 400-square-centimeter areas, and an average of seven mites per area was found under the pebbles. The sand beneath these pebbles to a depth of 2 centimeters was then washed in water, and an additional twenty mites per area were gathered by flotation. This turns out to be about 650 mites per square meter and represents what we call a moderately dense population. By applying this fairly educated guess of density to other areas, we have come up with the following population estimate: small, 20 to 50 mites per square meter; medium, 100 to 250 per square meter; dense, 500 to 1,000 per square meter.

Compared to areas like Signy Island where Tilbrook (1967) found mites in the range of 20,000 to 50,000 per square meter, these numbers are very low. However, considering that there is apparently nothing but a barely visible wash of algae for the mites to feed on, the number seems quite high.

Applying this scale to the areas collected, the mite population of Cape Roberts was very dense (perhaps as high as 2,000 per square meter); medium to dense at Spike Cape, Marble Point, Garwood Valley, Cape Chocolate, Miers Valley, Canada Glacier, and Cape Royds; medium at Hart Glacier, Rhone Glacier, Gondola Ridge, and Kar Plateau; small at Black Island, Observation Hill, and Hut Point, zero along the Onyx River in Wright Valley, Lake Bonney and the Taylor River in Taylor Valley, and on the broad moraine near the tip of Minna Bluff.

At present, we cannot explain the total absence of mites along the Onyx and Taylor Rivers, Lake Bonney, and the Minna Bluff moraine. Moisture and soil conditions seemed ideal, but we found no evidence of algae or any other life.

This work was done between December 4 and December 26, 1972. The dominant mite was *Stereotydeus mollis* Womersley and Strandtmann. *Nanorchestes antarcticus* Strandtmann was present in small numbers at most places. The small *Tydeus setsukoae* Strandtmann probably was also present, but we have not yet done the special preparations necessary for identifying it. For estimates of density, all three species are lumped together.

Assisting in this program were two graduate students, William Graham and Allen Crooker. Graham and Crooker joined us at McMurdo in late December after spending a year at Palmer Station. A report on their activities will appear in a later *Antarctic Journal.*

This work was done under National Science Foundation grant GV-24359.

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Aerobiological monitoring of dry valley drilling sites

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Air and soil sampling during the 1972-1973 austral summer took place primarily at the drilling site at McMurdo Station and at prospective drilling sites in the dry valleys: New Harbor, Lake Fryxell, Lake Bonney, Don Juan Pond, Lake Vanda, and Lake Vida. Additional samples, with reference to environmental impact of manned facilities, were taken within and adjacent to the McMurdo dump, the Lake Bonney hut, and the Lake Vanda Station. The environmental field monitoring team consisted of the three authors.

Similar instruments and methods were used as for previous soil and aerobiological monitoring in the Antarctic (Lacy *et al.*, 1970; Cameron *et al.*, 1971; Morelli *et al.*, 1972; Cameron *et al.*, 1972). Based on previous years' experience, the three most efficient air samplers were the Reynier slit sampler, the Staplex high velocity sampler, and the Roto-rod sampler (fig. 1). The Reynier and Roto-rod samplers were operated for 1 hour and the Staplex for 30 minutes.

This paper presents the results of one phase of research carried out under National Aeronautics and Space Administration contract NAS 7-100. Logistic support and facilities for the investigations in Antarctica and additional laboratory support at the Jet Propulsion Laboratory were provided under National Science Foundation contract NSF-C585 for the study of antarctic microbial ecology.