

At each sample point the height above sea level and three soil factors were measured: moisture (by drying and weighing), organic matter (by combustion) and integrated temperature. In addition the main plants (seven species) and the uncovered soil (in fact surfaced with lichens and mosses) were recorded on a proportionate area basis. Temperature was integrated physico-chemically by placing a unit in the top 5 cm of soil. Each unit consisted of pure glacial acetic acid (about 0.5 ml) in a polythene tube (volume 1 ml) with a pore (diameter 1 mm) through which the acid vapour passed into a sealed outer polythene chamber (about 18 ml volume) containing surplus soda-lime. The structure and proportions of all units were as nearly similar as practicable. They were calibrated at constant temperature ( $x$ ) and the amount of acid transfused ( $y$ ) gave the relation  $y = a - bx$  (with error variation of course). Over a period ( $t$ ) the equation became  $y = (a + bx)t$  for medium times, though the relation was not applicable for short or long periods. Typical values of  $b$  were 4 mg per °C in 4 weeks with coefficient of variation 20%. Of course other fatty acids and other absorbents could be used for other temperature ranges. These units were set in June whilst the soil is still warming up and its temperature very variable and again in August when its temperature is maximal but since the later sampling yielded no meaningful variation comparable with that of June—the area being much more uniformly warm—it has not been included in the analysis.

## THE ANTS

The species known to occur in the 8 ha area are:

Formicinae	<i>Formica cunicularia</i> Latreille
	<i>F. fusca</i> Linnaeus
	<i>F. transcaucasica</i> Nasonov
	<i>Lasius niger</i> Linnaeus
	<i>L. alienus</i> Forster
	<i>L. flavus</i> Fabricius
Myrmicinae	<i>Tetramorium caespitum</i> Latreille
	<i>Anergates atratulus</i> Schenck
	<i>Strongylognathus testaceus</i> Schenck
	<i>Myrmica sabuleti</i> Meinert
	<i>M. ruginodis</i> Nylander
Dolichoderinae	<i>M. scabrinodis</i> Nylander
	<i>Tapinoma erraticum</i> Latreille

Altogether, owing to some irregularities in the shape of the area, there were only 157 sample points. After 1, 2, 3, . . . , 8 weeks the numbers occupied by ants were 99, 128, 132, 136, 137, 137, 139, 139. This shows a rapid rate of discovery at first, slowing more and more to a limit which left eighteen (11%) unoccupied. All the species behaved similarly in this respect and there was only one change of occupancy (from *Tetramorium caespitum* to *Formica fusca*). The rate of discovery is in fact well described by a modified exponential equation:

$$y = 137.67 - 130.94e^{-1.2260t} \text{ fitted by least squares}$$

where  $y$  = number occupied, and  $t$  = time in weeks.

This could be taken to mean that search is random and since it is well known that ants are organized into colonies the random element would relate to worker foraging within