

figuration of the surroundings, which results in the ability to come home directly after a nest is found.

Experiments made in 1966 and 1967 seem to verify the odor-trail theory. On August 16, 1966, 10 *Polyergus* workers from nest O-26 were crushed in dichloromethane to extract pheromones. Next day the colony was visited at 3:30 PM when early preraid activities were beginning, with a dozen *Polyergus* circling about the nest area and surrounding grasses. A pheromone trail, laid down with a small brush, was extended from the nest for 3 feet. Instantly ants began to follow the brush; and by the time the trail was complete, 50 ants were upon it. More came from the nest, and in 5 minutes there were about 75. Each ant ran forward and backward and from side to side, crossing and recrossing the odor trail, just as they did on their own raiding trails. At trail's end they ran forward and to each side, as they did when one of their own trails ended without leading to a nest. Then, finding nothing, they began to return home; and in 25 minutes all but 10 had abandoned the trail. There had been no outpouring of ants from the nest (the odor trail began at nest edge), and ants did not mass in a typical raiding formation. But each ant, going singly on the trail, had acted in characteristic fashion.

The same pheromone solution was then taken to another colony (M-26), which had ants out in preraiding activity at 4:23 PM. A trail 6 feet long was made; and again ants followed the brush immediately, moving back and forth and from side to side along the trail. In this case about 100 ants were attracted. Again they came along the trail singly, explored a little beyond it, and returned when no nest was found.

On August 20, 1966, a trail was attempted under conditions when no ants would normally be out. A dichloromethane solution of 10 crushed ants from M-26 was used. The *Polyergus* colony was visited when it was still in hot, bright sun. No *Polyergus* were in sight until the nest was shaded. Within 10 minutes about 25 *Polyergus* were running about, keeping in the shade. A short trail, stretching 12 inches out onto the hot soil, induced those crossing it to follow; but they came back almost immediately. Subsequent trails were extended out in different directions for 4, 7, and 11 feet. In each case ants followed these trails, although the soil was still hot enough to prevent ordinary raids.

It was found that dabs of solution worked as well as a continuous line, since ants found them readily as they zigzagged back and forth. Putting the brush into the nest entrance caused 25 to 30 ants to come