

Ants & Mushrooms

Ants and mushrooms are deeply fascinating. They are seemingly modest entities, small and almost literally beneath our notice. But they are not simple, nor are they unimportant. Ants, for example, are easily the most populous animal on the planet and their combined mass is many times that of humans. And fungi may be the most common living structure of all - there are an estimated 6 million varieties and some of them grow in large 'fungal mats' that cover as many as 20,000 acres with up to a *mile* of mycelial strands in a *single cubic inch* of soil.

And they communicate. Ants have a rich language based on pheromones and other chemical secretions that allow them to coordinate large activities - Army Ants, for example, engage in foraging raids and mass relocations in colonies numbering up to a million. There is even some evidence that ant colonies engage in propaganda wars and chemical disinformation. And fungal mycelia have been shown not only to respond to natural disasters such as fire, but to 'broadcast' the information so that other fungal networks can pick it up.

Scientists, frankly, know very little about all this complexity and tend to speak about it with awe. It's just so astounding to realize that these tiny little ants, these squishy little strands of fungus, are collectively so complex, so mind-numbingly beyond our current comprehension. When searching for metaphors, scientists come up with models of organization like cities, the Internet, or even the most complicated and organized object known, the human brain.

We're used to the idea that complexity adds up, that small beings can organize into big systems. Small unintelligent ants, for example, add up into large and sophisticated colo-

nies, and individual humans add up into states and nations that can build telephone systems or send representatives to the moon. But systems add up as well; individuals add up to families, families add up to cities, cities add up to states, and so on and so on. Complex systems made up of smaller systems and beings seems to be a condition of life.

So what does *everything* add up to? All the human institutions, all the natural systems, all the ant colonies, all the fungal networks, all of the staggering complexity that coats the surface of this rocky planet... what is all *part* of?

The Gaia hypothesis, which holds that Earth can be viewed as a single organism, was first proposed in the 1970s. Initially it was ridiculed by those who held that it wasn't scientific, but so called 'weak' versions of the idea are now widely accepted. In retrospect, it seems sort of obvious: in a world full of biology frantically organizing into larger and larger systems, doesn't it seem possible that the world *itself* is a huge system?

Which brings us back to ants and mushrooms; they cover the surface of the planet with a net of complex structure, they exchange trillions of sophisticated chemical signals, they interact with other biological entities... if the scientists who are studying the Gaia hypothesis are looking for some mechanism by which the planet can 'think', a global 'brain', it seems to me like ants and mushrooms are a good place to start.