It is a familiar story: a small group of animals living in a wooded grassland begin, against all odds, to populate Earth. At first, they occupy a specific ecological place in the landscape, kept in check by other species. Then something changes. The animals find a way to travel to new places. They learn to cope with unpredictability. They adapt to new kinds of food and shelter. They are clever. And they are *aggressive*.

In the new places, the old limits are missing. As their population grows and their reach expands, the animals lay claim to more territories, reshaping the relationships in each new landscape by eliminating some species and nurturing others. Over time, they create the largest animal societies, in terms of numbers of individuals, that the planet has ever known. And at the borders of those societies, they fight the most destructive within-species conflicts, in terms of individual fatalities, that the planet has ever known.

This might sound like our story: the story of a hominin species, living in tropical Africa a few million years ago, becoming global. Instead, it is the story of a group of ant species, living in Central and South America a few hundred years ago, who spread across the planet by weaving themselves into European networks of exploration, trade, colonisation and war – some even stowed away on the 16th-century Spanish galleons that carried silver across the Pacific from Acapulco to Manila. During the past four centuries, these animals have globalised their societies alongside our own.

It is tempting to look for parallels with human empires. Perhaps it is impossible *not* to see rhymes between the natural and human worlds, and as a science journalist I've contributed more than my share. But just because words rhyme, it doesn't mean their definitions align. Global ant societies are not simply echoes of human struggles for power. They are something new in the world, existing at a scale we

can measure but struggle to grasp: there are roughly 200,000 times more ants on our planet than the 100 billion stars in the Milky Way.

In late 2022, colonies of the most notorious South American export, the red fire ant (*Solenopsis invicta*) were unexpectedly found in Europe for the first time, alongside a river estuary close to the Sicilian city of Syracuse. People were shocked when a total of 88 colonies were eventually located, but the appearance of the red fire ant in Europe shouldn't be a surprise. It was entirely predictable: another ant species from *S invicta*'s native habitats in South America had already found its way to Europe.

What is surprising is how poorly we still understand global ant societies: there is a science-fiction epic going on under our feet, an alien geopolitics being negotiated by the 20 quadrillion ants living on Earth today. It might seem like a familiar story, but the more time I spend with it, the less familiar it seems, and the more I want to resist relying on human analogies. Its characters are strange; its scales hard to conceive. Can we tell the story of global ant societies without simply retelling our own story?

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A polygyne population of red imported fire ants at Brackenridge Field. Austin, Texas, USA. Photo by Alexander Wild

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Some animal societies hold together because their members recognise and remember one another when they interact. Relying on memory and experience in this way – in effect, trusting only friends –

limits the size of groups to their members' capacity to sustain personal relationships with one another. Ants, however, operate differently by forming what the ecologist Mark Moffett calls 'anonymous societies' in which individuals from the same species or group can be expected to accept and cooperate with each other even when they have never met before. What these societies depend on, Moffett writes, are 'shared cues recognised by all its members'.

Recognition looks very different for humans and insects. Human society relies on networks of reciprocity and reputation, underpinned by language and culture. Social insects – ants, wasps, bees and termites – rely on chemical badges of identity. In ants, this badge is a blend of waxy compounds that coat the body, keeping the exoskeleton watertight and clean. The chemicals in this waxy blend, and their relative strengths, are genetically determined and variable. This means that a newborn ant can quickly learn to distinguish between nest mates and outsiders as it becomes sensitive to its colony's unique scent. Insects carrying the right scent are fed, groomed and defended; those with the wrong one are rejected or fought.