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https://www.100test.com/kao_ti2020/471/2021_2022__E4_B8_8A_E5_A4_96_E7_89_88_E5_c67_471996.htm Unit Then Text Do animals think？ How could the earth show so many signs of design and purpose and yet be random？ Our best scientists are heatedly debating both sides of these and other scientific questions. In the following essay, the author takes a look at science education and argues that as well ass telling students the facts and theories that have already been proved and accepted, science teacher should spend more time introducing their students to the many mysteries that remain unsolved and the arguments taking place between scientists. What better way, he argues, to stimulate their interest in thing scientific？ DEBATING THE UNKNOWABLE Lewis Thomas The greatest of all the accomplishment of twentieth-century science has been the discovery of human ignorance. We live, as never before, in puzzlement about nature, the universe, and ourselves most of all. It is a new experience for the species. A century ago, after the turbulence caused by Darwin and Wallace had subsided and the central idea of natural 0selection had been grasped and accepted, we thought we knew everything essential about evolution. In the eighteenth century there were no huge puzzles；human reason was all you needed in order to figure out the universe. And for most of the earlier centuries, the Church provided both the questions and the answers, neatly packaged. Now, for the first time in human history, we are catching glimpses of our incomprehension. We can

still make up stories to explain the world, as we always have, but now the stories have to be confirmed and reconfirmed by experiment. This is the scientific method, and once started on this line we cannot turn back. We are obliged to grow up in skepticism, requiring proofs for every assertion about nature, and there is no way out except to move ahead and plug away, hoping for comprehension in the future but living in a condition of intellectual instability for the long time. It is the admission of ignorance that leads to progress, not so much because the solving of a particular puzzle leads directly to a new piece of understanding but because the puzzle if it interests enough scientists leads to work. There is a similar phenomenon in entomology know as stigmergy, a term invented by Grasse, which means "to incite to work." When three or four termites are collected together in a chamber they wander about aimlessly, but when more termites are added, they begin to build. It is the presence of other termites, in sufficient numbers at close quarters, that produces the work： they pick up each others fecal pellets and stack them in neat columns, and when the columns are precisely the right height, the termites reach across and turn the perfect arches that form the foundation of the termitarium. No single termite knows how to do any of this, but as soon as there are enough termites gathered together they become flawless architects, sensing their distances from each other although blind, building an immensely complicated structure with its own air-conditioning and humidity control. They work their lives away in this ecosystem built by themselves. The nearest thing to a termitarium that I can think of

in human behavior is the making of language, which we do by keeping at each other all our lives, generation after generation, changing the structure by some sort of instinct. Very little is understood about this kind of collective behavior. It is out of fashion these days to talk of "superorganisms", but there simply arent enough reductionist details in hand to explain away the phenomenon of termites and other social insects： some very good guesses can be made about their chemical signaling systems, but the plain fact that they exhibit something like a collective intelligence is a mystery, or anyway an unsolved problem, that might contain important implications for social life in general. This mystery is the best introduction I can think of to biological science in college. It should be taught for its strangeness, and for the ambiguity of its meaning. It should be taught to premedical students, who need lessons early n their careers about the uncertainties in science.
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