

*The Medusa and the Snail*

heard of such a cycle before. They are bizarre, that's it, unique. And at the same time, like a vaguely remembered dream, they remind me of the whole earth at once. I cannot get my mind to stay still and think it through.

*The Tucson Zoo*

SCIENCE GETS MOST of its information by the process of reductionism, exploring the details, then the details of the details, until all the smallest bits of the structure, or the smallest parts of the mechanism, are laid out for counting and scrutiny. Only when this is done can the investigation be extended to encompass the whole organism or the entire system. So we say.

Sometimes it seems that we take a loss, working this way. Much of today's public anxiety about science is the apprehension that we may forever be overlooking the whole by an endless, obsessive preoccupation with the parts. I had a brief, personal experience of this misgiving one afternoon in Tucson, where I had time on my hands and visited the

zoo, just outside the city. The designers there have cut a deep pathway between two small artificial ponds, walled by clear glass, so when you stand in the center of the path you can look into the depths of each pool, and at the same time you can regard the surface. In one pool, on the right side of the path, is a family of otters; on the other side, a family of beavers. Within just a few feet from your face, on either side, beavers and otters are at play, underwater and on the surface, swimming toward your face and then away, more filled with life than any creatures I have ever seen before, in all my days. Except for the glass, you could reach across and touch them.

I was transfixed. As I now recall it, there was only one sensation in my head: pure elation mixed with amazement at such perfection. Swept off my feet, I floated from one side to the other, swiveling my brain, staring astounded at the beavers, then at the otters. I could hear shouts across my corpus callosum, from one hemisphere to the other. I remember thinking, with what was left in charge of my consciousness, that I wanted no part of the science of beavers and otters; I wanted never to know how they performed their marvels; I wished for no news about the physiology of their breathing, the coordination of their muscles, their vision, their endocrine systems, their digestive tracts. I hoped never to have to think of them as collections of cells. All I asked for was the full hairy complexity, then in front of my eyes, of whole, intact beavers and otters in motion.

It lasted, I regret to say, for only a few minutes, and then I was back in the late twentieth century, reductionist as ever, wondering about the details by force of habit, but not,

this time, the details of otters and beavers. Instead, me. Something worth remembering had happened in my mind, I was certain of that; I would have put it somewhere in the brain stem; maybe this was my limbic system at work. I became a behavioral scientist, an experimental psychologist, an ethologist, and in the instant I lost all the wonder and the sense of being overwhelmed. I was flattened.

But I came away from the zoo with something, a piece of news about myself: I am coded, somehow, for otters and beavers. I exhibit instinctive behavior in their presence, when they are displayed close at hand behind glass, simultaneously below water and at the surface. I have receptors for this display. Beavers and otters possess a "releaser" for me, in the terminology of ethology, and the releasing was my experience. What was released? Behavior. What behavior? Standing, swiveling flabbergasted, feeling exultation and a rush of friendship. I could not, as the result of the transaction, tell you anything more about beavers and otters than you already know. I learned nothing new about them. Only about me, and I suspect also about you, maybe about human beings at large: we are endowed with genes which code out our reaction to beavers and otters, maybe our reaction to each other as well. We are stamped with stereotyped, unalterable patterns of response, ready to be released. And the behavior released in us, by such confrontations, is, essentially, a surprised affection. It is compulsory behavior and we can avoid it only by straining with the full power of our conscious minds, making up conscious excuses all the way. Left to ourselves, mechanistic and autonomic, we hanker for friends.

Everyone says, stay away from ants. They have no lessons for us; they are crazy little instruments, inhuman, incapable of controlling themselves, lacking manners, lacking souls. When they are massed together, all touching, exchanging bits of information held in their jaws like memoranda, they become a single animal. Look out for that. It is a debasement, a loss of individuality, a violation of human nature, an unnatural act.

Sometimes people argue this point of view seriously and with deep thought. Be individuals, solitary and selfish, is the message. Altruism, a jargon word for what used to be called love, is worse than weakness, it is sin, a violation of nature. Be separate. Do not be a social animal. But this is a hard argument to make convincingly when you have to depend on language to make it. You have to print up leaflets or publish books and get them bought and sent around, you have to turn up on television and catch the attention of millions of other human beings all at once, and then you have to say to all of them, all at once, all collected and paying attention: be solitary; do not depend on each other. You can't do this and keep a straight face.

Maybe altruism is our most primitive attribute, out of reach, beyond our control. Or perhaps it is immediately at hand, waiting to be released, disguised now, in our kind of civilization, as affection or friendship or attachment. I don't see why it should be unreasonable for all human beings to have strands of DNA coiled up in chromosomes, coding out instincts for usefulness and helpfulness. Usefulness may turn out to be the hardest test of fitness for survival, more important than aggression, more effective, in the long run,

than grabbiness. If this is the sort of information biological science holds for the future, applying to us as well as to ants, then I am all for science.

One thing I'd like to know most of all: when those ants have made the Hill, and are all there, touching and exchanging, and the whole mass begins to behave like a single huge creature, and *thinks*, what on earth is that thought? And while you're at it, I'd like to know a second thing: when it happens, does any single ant know about it? Does his hair stand on end?