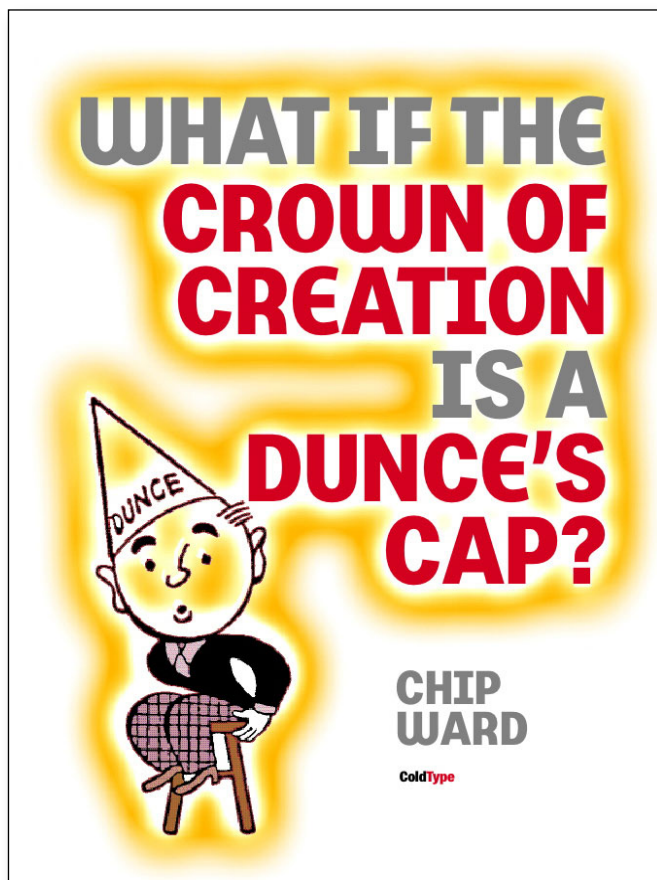


WHAT IF THE  
**CROWN OF  
CREATION**  
IS A  
**DUNCE'S  
CAP?**



**CHIP  
WARD**

**ColdType**



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evidence of human intelligence has always been mixed. On the one hand, we have traveled to the moon. On the other hand, it took us 200 years to figure out we needed wheels on our luggage.

We have created astonishing computers and the Internet that we use to look up Britney Spears' skirt. Some of us can do brain surgery but most of us can't locate Iraq on a map and think H2O is a cable channel. And if humans express the epitome of intelligence, as opposed to, say, the intelligence of migrating birds or even underground networks of mushroom spores, then how do you explain that hundreds of years after the "Enlightenment" we are still slaughtering each other in serial warfare; that we poison our own bloodstreams with toxic pollution; and that we have so altered the climate that harbors our proud civilization that it may collapse around our ears? Our intelligence encompasses both Mozart and suicide bombers. Perhaps it's time to take a second look.

The Brain Chauvinist Menu and the Limits of Doing the Math. What is intelligence? No doubt most humans will answer, it's what I've got that animals don't have: language, reasoning, problem solving skills, and the ability to make and use tools. After all, monkeys and parrots might learn a few words but they can't do crossword puzzles and when was the last time you saw a dolphin on a pimped-out street bike?

The difference between our way of thinking and that of our fellow creatures is a key to how we treat them. We are brain chauvinists. We believe, for instance that it is okay to consume without a second thought any brainless creature – oyster mistreatment is not on PETA's radar. For those with brains, the degree of intelligence that we acknowledge governs our relationship. We have no qualms about eating a

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stupid tuna but we'll pay big bucks to swim with dolphins and want our tuna "dolphin-free." You can be jailed and shunned for torturing a cat or dog, but the routine and massive abuse of chickens in factory farms is largely ignored as if they are merely vegetables with feathers. Our attitude towards animals is basically 'if you're smart, you're safe and if you're dumb, you're dead.'

Our kind of intelligence is undeniable. Humans are very sharp when it comes to all those aspects of the world that are fixed, measurable, happen in a linear progression, and are predictable. That is how, after all, we put a man on the moon. The moon is pretty predictable – it doesn't take last minute vacations or sleep in. So if we are dealing with the mechanical realm of physics, our airplanes, dams, chemical finesse, and nuclear machines are wonders to behold.

What we are not good at are all those phenomena that are nonlinear and have emergent behaviors, where, in other words, the whole tends to be greater than the sum of its parts but not predictably so – things like the climate, ecosystems, fetal development, immune systems, brain function, and crowd behavior. We are only beginning to understand the dynamics of our chaotic world - feedback loops, thresholds, and basins of attraction. We have a rather myopic view of scales, seeing well what is happening now and predicting what's right around the corner but missing the slow variables that can be more important in the long run. This is why we deplete soils, turn grasslands into deserts, and use up ancient aquifers and oil deposits in a geological instant.

### **Virgin Births and Cultural Amnesiacs**

Our intelligence is also tempered by the human condition. Although we can boast about the scientific prowess we express through our technology and medicine, we are easily distracted by emotional needs for validation, approval, and identity. Our persistent belief in religious doctrines has us accepting as true phenomena that contradict our otherwise proud powers of reasoning – how else do you explain virgin births and angels with gold plates? We compete as much as we compute, greed still drives us, and we can rationalize any destructive behavior. We are easily addicted and not easily satiated. There is reason to believe we have been traumatized by our recent history of global war, genocide, environmental dislocation, and fear.

Because we have short memories and a tendency towards denial, collectively we act like amnesiacs, as if every other past civilization or previous empire didn't also think it was smarter than all the others that had preceded it and, unlike them, was immune to failure. Consider that almost everything an intellectual in the Sixteenth Century knew for certain has since been proved wrong and almost everything we

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know for sure today will be radically revised a hundred years hence. Today's genius is tomorrow's fool.

### **Stink Think, Bee Dancing, and the Mushroom Internet.**

For a moment, then, let's concede the field to our non-human fellow creatures and redefine intelligence simply as the capacity to learn from experience and apply that learning to future challenges. Even moths can do that. Ohio State University entomologists implanted electrodes into the brains of sphinx moths. The researchers monitored the moths' nervous systems while presenting them with different odors — including sugar water, a favorite moth treat. They saw a dramatic restructuring of the neural networks that convert scent into a code that the rest of the brain can understand and concluded that, like humans, moths learn. Even the lowly slime mold can find the shortest route through a maze to get to nutritious food sources.

Learning involves pattern recognition and communication. We've all heard about the complicated messages dolphins, elephants, and prairie dogs can convey through their various vocalizations. But non-vocal communication is also common. Insects use pheromones to communicate a wide range of messages that are, like human messages, mostly about food and sex. Bees perch at the door of the hive and do a little dance that indicates to the other bees where the flowers are in relation to the Sun. Because we humans cannot understand the language non-humans are speaking, doesn't mean communication is either absent or inferior to ours. If computers can communicate with nothing more than series of ones and zeroes, creatures that can emit endless variations of notes, clicks, and tones might be up to more than we suspect.

Mushroom visionary Paul Stamets argues that mycelium fungi function as the neurological network of the soil. Layering the ground with interwoven microbial mats that share information, mycelium fungi react to changes that threaten soil health by devising diverse enzymatic and chemical responses to the complex challenges they detect. We are not sure how they do this but Stamets claims they are the sentient membrane of the earth, a bio-molecular matrix that is in constant dialogue with the environment, responding to and governing the flow of essential nutrients. "I believe," he writes in *Mycelium Running*, "mycelium operate at a level of complexity that exceeds our most advanced computers. I see mycelium as the Earth's natural Internet."

Drop for a moment our brain chauvinism and it is clear that there is such a thing as non-centralized intelligence. Immune systems learn or you wouldn't make it

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through the next flu season. Microbes learn, too, or there wouldn't be a next flu season. An entire pharmaceutical infrastructure, peopled by the best human brains Big Pharma can pay, works constantly to outwit the viruses that would consume us and lately the antibiotics side is losing.

### **Lizard Avoidance and the Wisdom of the Hive**

Then there is “swarm intelligence.” How is it that an individual ant cannot survive alone and is downright clueless about the big picture he is in, but an ant colony makes complicated decisions daily and can thrive for decades? How do the actions of individual ants, undirected by leaders, add up to the complex behaviors of the group?

Swarm intelligence depends on simple creatures following simple rules and acting on local information. Ants communicate by touch and smell. Patroller ants leave the colony and don't return until they find food. When they return they touch other ants. If the patrollers are successful, they return quickly and often. When the colony's forager ants are touched by enough patrollers in a short time, they leave the colony to harvest the food, following scent trails left by the patrollers. If, on the other hand, the patrollers encounter bad weather or a hungry lizard, they don't return and they don't touch their fellow foragers who stay put. A variety of critical decisions about life in the ant colony are made in a similar way.

Bees also show how swarm intelligence works. When a hive becomes too large, about half the population splits off and clusters on a nearby tree branch. Scout bees search for a new home. When they find a likely location, they return and communicate to the other scouts via that tiny dance. The other scouts then visit the various locations that have been identified. At some point, enough scouts coalesce in a particular location that a kind of consensus is reached and then communicated to the cluster that it's time to move. Researchers have learned that the bees' method always picks the most ideal habitat to rebuild the hive.

Bee behavior could be characterized as unconscious democracy where diverse options are examined openly and choices made on the basis of the information as it freely emerges. Give humans a similar challenge of moving and reconstituting an entire community and long after the bees have resumed constructive relationships we'd still be arguing, vying for power, dividing into factions, hiding our agendas, spreading rumors, suing each other, and speaking in tongues.

Swarm intelligence is also expressed by schools of fish, flocks of birds, and herds of caribou to confound predators. Again, coordination is based on individuals following simple rules and responding to local information and the cues of others in the group. These distributed behaviors become a whole that is greater than the sum of

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the individual parts. What we have learned about swarm intelligence is now being used by computer programmers to solve traffic problems, distribute goods, and route telephone calls. Google and Wikipedia use the principles of swarm intelligence to gather and select information. The anti-globalization protestors who challenged international capitalists in Seattle in 1999, used mobile communication to become “smart mobs” and the Pentagon is developing fleets of “swarmanoid” robots to find bombs planted by terrorists.

Perhaps the most profound example of such self-organizing intelligence is Gaia herself. The planet's various natural operating systems - its climate, oceans, biosphere, soils, minerals, and nutrients - are integrated into complex feedback loops that prompt constant adjustments to keep life viable. If Gaia is smart enough to keep life as a whole going, humans should worry since we are behaving collectively like a persistent rash on the planetary skin.

What if the Crown of Creation is a Dunce Cap? The intelligence revealed in such self-organizing behaviors might give us second thoughts about the prevalent notion that we humans, the crown of creation, should second-guess the natural processes that we have re-engineered. For instance, we suppressed forest fires until the build-up of unburned fuels within forests guarantees that future wild fires will be catastrophic. We skewed whole ecosystems by eliminating the key role that predators played within them. We drained wetlands and dammed and channeled watersheds with mixed results.

As far as we know, of course, microbes and insects do not act with conscious intent, at least outside of Gary Larsen cartoons. But if conscious intent is the criteria for “learning,” then we can't claim we understand the consciousness and intent of non-human creatures any better than they understand our consciousness. Your cat and you sit on opposite sides of a cognitive wall, you thinking ‘he loves me’ and him thinking...well, we don't know what he is thinking, though chances are it has more to do with food and amusement than filial affection. If you drop dead in your house tomorrow and remain undiscovered, chances are your supposedly loyal cat will eat your eyeballs by the end of the week. Our notion of what and how our pets think says more about how we project our own needs and notions on them and less about the nature of their consciousness or lack thereof.

### **No Stupid Survivors**

Certainly, human learning often involves a motive, like wanting to learn Chinese so you can be a buyer for Walmart, whereas brainless life forms may simply adapt to changing conditions through an algorithmic process linked to random mutations and the consequent improvements in viability that result from those

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changes. But why would the existence of an introspective motive be so important? Wouldn't it make more sense to define intelligence as the ability to solve problems related to survival? If a species ability to remain viable – to fit its environmental conditions – is used as criteria for intelligence, then turtles were here long before us and are likely to be here when we leave. What's so smart about self-destructive behavior, no matter how sophisticated the motives?

Indigenous cultures that lived close enough to nature's processes and actors to admire the unique characteristics of non-human species to thrive in the wild, acknowledge and honor the intelligence of wild creatures. In America, for example, many indigenous cultures paid tribute in story and song to ravens and coyotes. Coyote is perceived as the clever trickster who always manages to face adversity, often of his own making, but comes back. And ravens share carcasses with wolves and bears without becoming lunch themselves – a tricky, teeth-defying act that humans admired.

Yeah, but can ravens do this! (Imagine here some kind of technological back-flip, cultural sleight-of-hand, or problem-solving cartwheel...) Well no, ravens like all creatures have limits. But ravens are thriving on the detritus of our crisis – those troubling gas-guzzling cars we drive that are pushing our climate towards tipping points also leave behind lots of tasty roadkills. They are not at war for oil. They will not suffer the calamities of disruption when our fossil-fuel loaded infrastructure runs out of gas. When climate change forces us all to adapt quickly to survive, we may yet admire the ability of the raven and coyote to change habits and strategies to fit new circumstances.

### **I Shop, Therefore I am**

Again, if we're so much smarter than non-human creatures, why do we engage in such self-destructive and confusing behaviors? The purpose of mycelium communication is to heal and cleanse, not to inundate the soil with spam e-mails. Elephants are not tricking each other into adjustable-rate mortgages. In one of my favorite movies, "Forest Gump," Forest answers those who question his own innate intelligence with a quote from his mother: "Stupid is as stupid does." If human intelligence isn't a means to survive, then maybe its just the way evolution's eventual losers – humans - rationalize their self-destructive addictions to going faster and getting more stuff. But I refuse to believe that WalMart and NASCAR are what it is all about.

All I'm suggesting is a little humility. Creation's other beings have much to show us that we need to learn if we would only shut-up, drop the mirror, and listen. When we recognize the self-organizing genius of nature, we realize that the natural world



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may not only be more complex than we thought, it may be more complex than we can think. Appreciating non-human intelligence might even be humbling and awe-some enough to make us rethink our 'crown of creation' attitudes and enjoy a new sense of kinship with the rest of life on the planet. That new attitude would be healthy for them and, in the long run, be better for us too.

We need the uniquely human intellectual skills we have acquired to survive. Clearly, far-reaching innovations in technology – like alternative energy technologies and green designs - are required to meet the challenges of global climate chaos. But new infrastructures alone will not heal the wounds we have inflicted on the earthly nest that holds us, nor will it get us over the ecological abyss we now face. We need to rethink and re-feel our relationship to the rest of the living world. To do that, we must wipe off that smirk and pay attention to the evidence of intelligence all around us. When we perceive and respect the self-organizing intelligence at work in the natural world, we try to dance with nature, not drive it. Now that's smart!



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