SOCIETY FOR THE PREVENTION OF CRUELTY TO MACHINES

DEAN DENTON
Baltimore, Maryland

"May I have a few moments of your time? What I have to tell you could be most important."

"Oh, Jesus, no," thought Dave Rekas. "It was crazy Joe Aston. Joe couldn't tell you the time in less than half an hour, and here he was edging his way into the office. When Joe asks for a few minutes, expect the day to be shot.

"Joe, it's really not too convenient right now; could you . . ."

But Joe was already in, had set himself down and raised his hand in a friendly gesture to stop Dave's protest. He was encamped. Dave countered with a brisk shuffling of papers and rising out of his seat.

"I've got to see Dr. Rohleder about some, . . . some things we were discussing yesterday and . . ."

"Dr. R can wait," answered Joe calmly but firmly. "He's been out all week." Dave felt himself being pulled back into his chair by a gentle tug on his shirt-sleeve. This cheekiness irritated Dave, and he sat staring at Joe crossly.

"It's very important," Joe repeated in a clear, sincere voice, returning his stare with a piercing look that made Dave avert his eyes.

"Well, Joe, how can I help you?" Joe had an unpleasant reputation as a crusading eccentric who made waves. He was an animal rights activist, which can be anathema to a Life Sciences Department. This old meddler had been a gadfly to the research staff for the past ten years. His complaints about the cruel treatment of monkeys had caused Dr. Germuth to be investigated and cited for non-compliance with state regulations. His open criticism over the needless and repetitious experiments in the department actually held up federal funding for a brief while. Dr. Aston always used models or films in his biology classes instead of animals to teach anatomy. Joe preached that the casual use of animals in routine experiments repeated year after year by ham-handed freshmen was a great source of unnecessary pain that also imparted a callous attitude toward living beings instead of teaching a reverence for life. "They practice on animals what they eventually do to people," Joe always said. He insisted that the gross amount of unneeded surgery that goes on in America has its start in the needless disections in the biology labs of pre-med students.

"The demon who invented the lobotomy probably got the idea from pithing a frog in freshman bio. Cruelty is a cancer that inevitably turns on the society that tolerates the evil in its midst." Joe could be righteous at times, and he made enemies with his outspoken manner. The department chairman, Steve Arciero, was particularly acrimonious toward him, but he was tenured and untouchable. Besides, he was considered a good teacher, and undergraduates loved him. So Steve built his empire around Joe, trying to make the department a high-tech mecca for whiz kids on the glamour frontier of the life sciences: gene-splicing, cloning, in-vitro fertilizations, and so forth. Steve had a talent for garnering grants for his people

FICTION

and was incensed when Joe wrote an article for the student paper opining that the majority of research done today was useless at best and perhaps dangerous. He claimed that an unconscionable number of animals were consumed in a research machine whose major purpose was to perpetuate itself, with irrelevant knowledge a mere by-product. Joe shot from the hip a lot, and this alienated him, no matter how astute his ideas may have been. They were too provoking. It's ironic that a man who made his life and reputation in academic research could come across as so anti-research, even anti-intellectual, at times. He was somewhat isolated, a sixty year old full professor in a department where the average age of the researcher was thirty-two. Naturally, detractors called him a has-been whose hey-day had long since passed, just as his area of research, neurochemistry, had now fallen out of fashion. It had been a very intense field of investigation in the early sixties and Aston was a highly respected name in this esoteric branch of science. His most famous experiment was keeping a disembodied monkey brain and spine alive for four days by means of a crude heart-lung machine while he traced the neural pathways using electrical stimulation. This grotesque experiment reached the popular literature and excited the common man as thoroughly as Russia's two-headed dog. A friend of Joe's said that Aston's guilt feelings over this experiment and others like it were responsible for his deep concern with the ethics of science and animal suffering. Most people felt that Joe couldn't cut the mustard as a researcher, so he maliciously detracted from the good work of others and tried to pump up his own sense of self-importance by grabbing onto the tired, soft notion of ethics in scientific research. These hard-edged hot shots cynically suggested that morality in science was the refuge of incompetents who couldn't keep apace.

He hadn't published anything in nearly ten years, and his last report was a philosophical piece published in a general science journal that tried to appeal to the sophisticated layman. It was an odd piece that didn't contain any hard facts but rather mused over the notion of the origin of pain, pleasure, and the sense of conscious being in the animal kingdom. It went to great lengths to differentiate between what constituted a reflex action as opposed to the beginnings of true sensation as humans experience it and argued that the mechanism for pain and pleasure was an ancient one that manifests itself in very primitive animals. The ability to feel and experience instead of merely respond was, in Aston's mind, the greatest evolutionary leap forward ever, second only to the actual conception of life. On the whole, the article was received with a big yawn, and Joe's sun had been setting ever since. Some wags suggested that his next publication would be in Popular Science. He had also stopped taking on graduate students and occupied his time doing neural training studies on planaria, after they had been properly anesthetized, of course. People were shocked when the last department budget was published and he had only been allocated $75,000 out of the total operating fund of $19 million. Arciero had stopped trying to convince him to take on some students and had written him off, trying to minimize his losses. It was an open secret that Steve considered him dead wood and that he would love to make his offices and labs available to some eager young mental wizard to lay the groundwork for a Nobel prize at the university. This didn't please Aston, and he seemed to keep busy with his teaching assignments and on some magnum opus outlining the evolution of the nervous system. Skeptics said it was dead in the water and that his time was spent writing save-the-whale letters under the corny nom-de-plume of Hugh Mane. Joe's outside activities did include animal rights issues, and he had helped found a university chapter of the Fund for Animals. You could often see him outside the Student Union collecting signatures on a petition protesting carnage and cruelty of every form, including that in research labs.

And this was the Jonah now staring at Dave face-to-face in his own office. Saying hello to Joe was politically risky, and here this albatross was settled in for a regular pow-wow. Dave was a twenty-eight-year-old post doc earning a grandiose $10,000 a year on a research grant to develop a computer model for the nervous system. It was being sponsored by a government agency as part of a project to help quadriplegics. He wanted very much to move into the new professorship position being opened. While he heard that there were over seven hundred applicants for the job, he thought he might have the inside track since he was on good terms with Dr.

Arciero, who was pleased to have a computer specialist working within the department. It had that high-tech appeal that seemed to have untold promise for applications in the new biology. He could move into that position easily, as long as he didn't do anything foolish, such as keeping company with the department outcast.

Dave took a good look at Joe before the talking had a chance to begin. He had never really spoken with him at any length. They had once been quickly introduced at some social function, and contact after that was limited to a perfunctory greeting when passing in the hallways. This lack of communication was odd, because they worked in similar areas, and Dave had referred to some of Dr. Aston's previous publications while setting up his computer model. They were really good papers on the mechanism of neural networking, and Dave had found them useful even though they were fifteen years old, some of the last technical papers that Joe had ever released. Dave had attempted to talk to him about his work on several occasions, but Joe was somehow evasive about it. His general response to any question was to refer back to the original paper, as if it were a complete entity unto itself that would reveal all to those who studied it carefully enough. Dave felt he was getting the brush-off and stopped trying to get Joe to explain his work more thoroughly. A friend who'd known Joe for many years said that about ten years ago he'd gone through a personal crisis that seemed to make him lose interest in his work. Up until that time he'd been a star performer, leading the department in number of publications and number of grad students sponsored. Then he seemed slowly to stop working until today most of his efforts were taken up in teaching lower level courses and saving the seals. Dave felt that Dr. Aston had knowledge he wouldn't share, and he resented this lack of forthcoming help. Nor could he respect a man who had let his work slide the way Joe had, falling from the status of top researcher to department odd man, tolerated because of his former position and the tenure system. He had heard that ten years ago Joe had hired a computer hacker and for six months had attempted his own crude model of a nervous system. Nothing had ever come of it, and Joe's long decline began soon afterwards. Joe was in good health and still possessed a very sharp intellect, so nobody suggested that he was suffering from a premature senility due to some hardening of the arteries. His fundamental change of direction seemed to have an emotional basis, perhaps as simple as burnout.

Today he was a little weary and red-eyed, with a small undercurrent of agitation detectable. He definitely had something on his mind.

"What can I do for you, Joe?"

"I came to congratulate you on the talk you gave at last Friday's seminar. It was a fine piece of work. You've developed the computer model of the nervous system to an amazing degree very quickly."

"Why, thank you, Joe." Dave doubted whether he even understood the talk and felt that this was only a polite prelude to the real topic of conversation, which he expected to be about some controversial university policy that Joe was soliciting support to change. But, to his surprise, Joe kept along the same lines.

"That's a remarkable piece of circuitry you've created," Joe said, nodding toward the large flow chart he had tacked on his wall adjacent to the computer console. "Have you thought of patenting it?"

Dave was pleased and quickly forgot all his hesitance. A compliment can even turn an egghead. He had worked hard on this project and was very much alone. There was nobody he could discuss the work with because of its complicated nature. Few people would have understood what he was talking about, and so hardly anyone could be appreciative of the accomplishments he could only take a secret pride in. The seminar Joe mentioned was poorly attended, and Steve was called out in the middle of it. The biologists in attendance could not follow the high-level computerese, and after fidgeting for a while, they made an open joke of the incomprehensibility of it. "Dave, the Computer Science Building is two blocks south," they good-naturedly gibed. At the end of the talk there were no questions, and a slightly embarrassed Dave thanked his listeners for coming as they shuffled out with baffled smiles on their faces. This did not bode well for a man who was trying to become a permanent member of

the department. Surely word might filter back to Steve that his work couldn't really find a comfortable home in this department. He did feel a little self-conscious that while all of his colleagues were clinking test tubes and pinching protoplasm in honest-to-goodness labs, he did all his work at his desk, relying on the literature for hard data.

"Well, I thought of patenting it, but there is some question as to whether the university or I would have the right to it. I may just publish it without bothering with a patent, although I was toying with the idea of selling the program on a disc to research institutes in the same line of work. It should be a really valuable tool. Maybe they wouldn't have to do as many live experiments with this model around. That ought to please you, eh, Joe?"

"Oh, it's a very valuable tool, Dave. I don't think too many people could really appreciate what you've done. Certainly nobody in this department yet. It's a real breakthrough, maybe a bigger breakthrough than you even realize!"

That last statement made Dave a little edgy.

"I've waited for this day a long time; saw it coming ten years ago and kept my eye out for it ever since. Kept abreast of all the journals. Quite a coincidence that it happened right here in the department."

"What are you talking about?"

"This is the heart of the program, isn't it, Dave?" Joe leaned forward and slowly traced a circle around a segment of the flowchart with a shaky finger. "That's what makes this program unique from the other neural modeling systems in the literature."

"The synapser? Yes, you're absolutely right, Joe. I couldn't really get the model to behave like a real nervous system until I included that functionality. Once that was in the program, I could get the model to simulate all levels of nervous responses. Good memory, Joe, I didn't think that came out too well in the talk I gave. You're right though, I think it has great potential. Linking that up to a learning program really boosts the efficiency of the data acquisition tremendously. I'm not really sure why. Maybe because this system models pain so closely it somehow provides a more powerful motivation for the program to control its environment as soon as possible. It could really be useful in the robotics industry. That's one reason I was thinking of patenting it."

Joe leaned forward with wide eyes and said in a hushed tone, "Dave, the machine isn't modeling pain, it really is feeling pain. This circuitry you have created is the most basic form of the electrical impulse network that gives rise to sensation in animals. You have created a sentient being within the electronic framework of the computer!"

Dave sat quiet for about ten seconds and let this soak in. He knew something like this was going to happen. Joe broke the silence.

"Ten years ago I was working along very similar lines but studying directly from animals, trying to establish at what point of evolution animals acquired the necessary neural structure to begin to feel, particularly the ability to feel pain. Any machine, be it made of flesh or metal, can sense, but to honestly feel seemed to be that most basic distinction between the animate and inanimate, as important a dividing line as the ability to produce itself. Pain would have to be the most basic feeling, the most primitive and most important of all living experience. Pain was the first lesson nature taught to the living; the cry that awoke the eon-long slumber of an unconscious universe. Pleasure may be fleeting and ephemeral, but pain is the most real thing there is, more real than the bedpost you stub your toe against. For that reason, I chose to study it and discern its most basic level."

"And did you find it?"

"Yes, in a very primitive jellyfish. It's the simplest creature we could find that displayed aversion in the classical sense of the behaviorist term. It's also probably the first creature that ever had specialized cells in the form of neurons put together in a way that enabled it to do something more than merely respond to stimuli. We found this same neuron pattern repeated in the most

sophisticated species all the way up to man."

"And from that you concluded that this jellyfish was able to feel pain--as we know it?"

"Well, one can never be absolutely certain. It's not possible to crawl inside the skin of another creature and experience what they actually feel, but this is the most intelligent guess I've ever seen on the matter. It's a question that's intrigued me for the longest time and a central overlooked by most scientists. Just as Democritus pondered what the smallest bit of matter could be, I've wondered what is the most fundamental unit that could feel? It's become almost a religious obsession with me, as if this were the building block of the soul, the very depository of the essence of being, and it is within our power to unveil this mystery. You may be able to put a thousand on the head of a pin, or in a microchip."

"Joe, this is great, but what does it have to do with my program. This is a computer, it's not a living entity like the jellyfish you're talking about. How can wires and plastic and silicon all of a sudden start feeling?"

"Oh, c'mon Dave. That old elan vital notion went out the window a hundred years ago. You may as well ask why carbon and nitrogen atoms, put together in a certain way, should be able to feel. There's nothing sacrosanct about protoplasm as a building material, and nerve cells function only to generate, transmit, and control electrical impulses. It's this pattern of signals that engenders the sense of feeling, and it doesn't matter if they're inducted by ganglions or galium arsenide. As a matter of fact, inorganic substances can probably do a better job. Your program contains the same electrical network as the nervous system of that jellyfish. In fact, it's even slightly more sophisticated and so should be even more capable of feeling."

Dave was becoming more and more irked by the drift of this conversation.

"Joe, Joe, suppose we accept this highly dubious claim you make about a computer loaded with my program being able to feel. So what? What's the point?"

Joe stiffened in disbelief that such a question could be asked when the implications should be obvious. He feared that if he had to explain it to Dave, he would never accept and understand the seriousness of the situation. Rather than take it as a lost cause, Joe chose to try and convince.

"Do you realize the possibilities for abuse? The untold agony that could be brought into this world by placing in the hands of man the god-like power to create raw, unguarded sentience without the hope of deliverance by death? It would be a localized hell on earth, with the sufferer having no recourse in flight or even relief by a scream. There would be no way for the victim to convey its discomfort, so that terrible suffering may go on with the programmer oblivious to any harm being done. As a neurobiologist, I can tell you that flesh wears out and nerves become numbed, but the machine can be made so that relief never comes from destruction of the sensation mechanism. The suffering you yourself may have already created with this simple set-up is unconscionable. But now it will be multiplied and spread as the program is reduced to a microchip that every new toy or car will have in it to improve performance. This one invention, more than the gun, the leg-hold trap, or the cold-steel harpoon, will increase the Weltschmerz a thousand fold. it is the one line of science I wish we would never cross, even more so than nuclear power or the genetic manipulation of life. Will you help me?"

Dave was stunned by this outpouring and the emotional plea. He was also angered by Joe's suggestion of irresponsible action with regard to his work, as if he had unwittingly unleashed some terrible genie.

"Joe, are you okay? I mean, some of the people around here say you're off the wall, but, I swear, I really don't know what to think when you come here saying this. I mean, for Christ's sake, we're talking about a computer program, not some living creature."

Joe was undaunted by Dave's less than enthusiastic response to his ideas and appeal. It was this unperturbed attitude that further disturbed Dave, who was hoping that Joe would snap back to reality or at least relent, and get out of his hair. But Joe was

a seasoned campaigner, used to carefully explaining his unpopular viewpoints to people who couldn't care less, and so he continued full steam. For better or worse, he was very sincere.

"Understand, Dave, that this capacity to feel is the essence of life, and it doesn't necessarily have to be accompanied by the ability to eat and reproduce. That definition of life is Zoo 101 bull. That's the definition of a chemical machine that's only a cancerous blob not even Albert Schweitzer could care about. We need a new, more far-reaching ethics to include the rights of any feeling entity. Heretofore that could only have been a life form as we know it, but you've changed all that now, Dave, and you must share in the burden of your discovery."

Dave was still squirming. This man had made him sound like some Dr. Fu Manchu or the evil Dr. Frankenstein, when he was only a talented computer programmer whose main goal in life was landing a comfortable staff position at the university.

"Damn it, Joe. You're out of bounds on this one. This is solid work; it's harmless; and it can potentially do a lot of good. And for your information, some of it is based on your own published discoveries."

"Yes, Dave, don't feel too guilty about it. It was really inevitable, and with the state of computer technology being what it is, if you hadn't done the deed, some other hack would have stumbled upon it. I doubt if you're the first and only, as a matter of fact. I'm sure the feat's been duplicated unwittingly in half a dozen other labs without anybody bothering to write about it. The fact that the technique is about to be made public is what disturbs me, because after this becomes common knowledge, it will spread with disastrous results. A whole new class of beings will be permanently enslaved, suffering the worst abuses, without any rights or manner of redress. And for what? So that our machines run more efficiently? You've opened a whole new dimension of suffering. Congratulations!"

"Joe, this project was funded by the NIH for use in research to help quadriplegics. Maybe you ought to think about that before you go off half-cocked talking about how evil his work is."

"The greatest injury is done by well-intentioned but mistaken individuals."

"Such as yourself?"

"I've given this subject a lot of thought, Dave. You're right, I helped lay the groundwork for your simulation model with my neurological studies ten years ago. I knew we had the ability perfectly to mimic the nervous systems of simpler organic creatures even back then, but we decided not to pursue it."

"Oh, really? Why? Because there are some things science must not tamper with?"

Joe ignored Dave's sarcasm and answered directly. "To buy time. By refusing to slavishly pursue knowledge at any cost, ten years of peace have been bought. But now the day of reckoning has come. The tide of technology cannot be abated. I thought I might have to face the world alone in my struggle, but perhaps I can find an ally in you, the man who will formally introduce the first, primitive artificial circuit of sentience to the world."

"What am I supposed to do?"

"Only one thing: believe what I have told you, and everything else will follow."

After a few seconds of thought, Dave said calmly, "Joe, No. I'm going to publish this thing, and I'm not going to let your viewpoint stop me. You don't have one iota of proof to back you up, and this thing is too important to me."

***

Dave missed a good opportunity. It is in the finest tradition of science for a researcher to spend the rest of his days trying to undo the harm of his own discovery, moaning how his work has been perverted to evil ends, by banal politicians, crass industrialists, and small-minded military men. In this way, not only can he reap the rewards of his investigations, but he can gain the glory of universal acclaim for noble-mindedness. Instead, Dave chose to publish his work in some obscure computer journal, and all the publicity went to Joe when he began to issue a series of warnings to the scientific com-

munity about the dangers of establishing a "pain circuitry" within a computer program. He argued against the use of such programming on ethical grounds and proposed a series of safeguards to limit the amount of suffering that could be imposed on the helpless machines. He primarily wanted a widespread recognition of the problem with a committee established to investigate the implications of the discovery and recommend guidelines to researchers working in the area. The secret nightmare that preyed on Joe's mind was some unthinking genius designing a highly sophisticated system that would be able to endure excruciating pain for indefinite periods, mainly because the operator failed to shut the program down for the night. Joe developed a unit measure for pain, trying to quantify the subjective feeling in terms of number of electrical impulses per span of time. Joe named the unit the "Rek" (rhymes with shriek) after Dave Rekas, but Dave disclaimed this dubious honor. Joe wanted to call it the "Ast" but figured that some may have interpreted this move as showboating, thus undermining the credibility of his cause, and it was already strained to the limit. Joe said that the Rekas program could experience pain at the magnitude of 17 Reks, which is comparable to holding your fingertip in a flame.

Joe's cause was not overlooked by the scientific community, but it didn't become the cause celebre that he wanted it to be either. Five scientific journals published papers by him, carrying his message to the world that the artificial nerves made by men felt pain as real as any living creature. The papers were technically strong, which surprised many people who had come to regard Joe as a hanger-on, coasting toward a mandatory retirement. It also made the issue more controversial, because opponents of his views could not dismiss his findings as the result of Alzheimer's Disease. The papers were not philosophical in nature but contained hard data comparing the computer model with the protoplasmic analog. A surprising number of people rallied to his side, several claiming that they had reached the same conclusions fifteen years ago.

The controversy spread to the popular press, mainly because Joe called a press conference where he and his ad hoc committee of supporters fielded questions from reporters looking for the unusual. It was carried in Time and Newsweek and was mentioned as an afterthought on the national evening news. Unfortunately for Joe, it was all handled as an aspect of evolving technology, while he wanted to emphasize the moral issue of creating and perhaps torturing a sentient being. Some magazines waxed romantic as they wrote of breathing a soul into a machine. Two tabloids sensationalized it, although they came pretty close to what Joe was actually claiming. It was difficult to exaggerate the idea.

Steve took this opportunity to ask Joe to step down, claiming that the reputation of the university couldn't afford employing a spokesperson for a cause so hare-brained. Joe declined, and there was not a thing Steve could do.

Joe wasn't worried about any personal trouble his ideas might get him into. He considered this message the most important he would ever deliver to the world. He felt he should be somehow martyred for it, and yet he was still comfortable. He was bothered most by the lack of response from the general world. He should not have been surprised. There was no club to stay, no knife to stop, no trembling animal to hold and rescue. The notion was too cerebral, too detached, too unreal to rouse emotions. To many, it was an academic curiosity that was dubious anyhow. Joe had sought support from his favorite organization, the Humane Society, in his crusade against pain on this new front. While sympathetic, they replied that "the issue is highly speculative, and we feel we cannot afford to expend our integrity while so many other vital problems need resolution."

But all prophets are, by definition, ahead of their time, and preparing the way is often frustrating. Joe's favorite version of the Golden Rule was that "the highest form of enlightened self-interest is to respect the rights of all creatures." He didn't always know how, only that whenever another being was violated, all the world became a lesser, more dangerous place because of it. This principle was to him as inviolable as the conservation of mass, and so while Joe could not yet fathom what dark form the retribution would take, he knew that inevitably mankind would have to answer for its disregard toward its own creation. The equation must balance, and man must answer to the machine.

Jim Harter, Animals: 1419 Copyright-Free Illustrations. New York: Dover, 1979