

Development and consequences of a new computer based life form.

MIND 2.0 by Arthur B. Chausmer

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M I N D 2.0



ARTHUR B. CHAUSMER

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Second Edition

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CHAPTER 4: LINDA

Josh was sitting at his desk in his study at home when Linda came in behind him and started to massage the back of his neck. This was very much appreciated. He had a full day at the office and lab at the University before coming home and he had planned on spending only a couple of hours in the evening on the training set. He was, by his own estimate, only about 50% done with the training set, which he wanted to have it essentially completed in the next 3 months or so. This made for a full, albeit limited, lifestyle. He worked in his research lab and clinical practice at the University medical school 3 days a week and he could work at home during the other two days which were strictly dedicated to his A.I. research program. One of the nice things about his research was that it was portable. He could store what needed to be transferred between the lab and home on a small memory flash drive which he could carry easily in his pocket. If there was more information than could be carried on the flash drive, it could, of course, be transferred over the internet. He preferred the device as being more secure. When he traveled, he could put most of the most current effort on his notebook computer. At home the notebook was connected to the network by regular wired connection. Although it was not part of the neural net, it, too, could access the network with a wireless connection when traveling and so it followed the general naming convention, it was "The Snark." Not part of Alice in Wonderland, but a wonderful Carroll character. It was portable, which is to say that it could be hunted.

"How's it going?" she asked. Linda was about 2 years younger than Josh and had maintained an active life of her own as a special ed teacher in the local public school system. They were both older than most of their already married friends when they first met. She had been teaching elementary school for several years and was back in grad school to get her master's degree. Later, after she and Josh were married, she went back to school

at night to get her special education certificate and began teaching special ed in the local school district. In this endeavor, she had to deal with very, how shall we say, unusual children on a daily basis. Her background and training almost certainly helped her cope with Josh's idiosyncrasies, which some would describe as pretty significant. She considered her job in life, with both the children and with Josh, was to "round off the edges." She was generally successful with both and so was the perfect compliment to Josh. Their life with each other was sufficiently full and almost absent in drama, which suited them both just fine. Josh's saving social grace, at least as far as Linda was concerned, was his sharp, and mostly funny, wit, at least so long as she wasn't at the pointy end of it. Many people questioned how the match could work, he being such a techie and self contained personality and she being such a non techie and social person. The answer, apparently, was that they complimented each other, each filling the deficit in the other, and that they had shared basic values in life. Not perfect, but generally pretty good, like most reasonably successful marriages.

"Slowly. I'm getting a headache and I'm tired, but I can't stop in the middle of this right now. I just can't put it down." This had been one of the University days with 2 clinics and little time for his research. His mildly compulsive personality seemed to be a requirement for the research personality type, which comprised Josh and most of his friends and colleagues. It, however, did not make for a particularly broad life outside of their work. Linda found this part of her married life somewhat less satisfying. Linda was much more socially oriented than Josh was, but after all of the years, she found she could make up for it with a social circle of her own which included, to a large extent and not surprisingly, the wives of other faculty members. Outside of work, the men didn't socialize much. The guys in the Endocrine division had lunch together fairly frequently, but outside of that there was little social activity.

In the south, where they lived, a large part of the social life revolved around the church. In fact, a common question of newcomers was "where do you church?" with church being a verb. They, of course, did not belong to any church, but they did join a local, rather small, synagogue for social reasons, however limited. Josh never attended any services and both referred to themselves as "secular Jews," Jewish by culture and ethnicity, but without any belief in a God. Unlike Josh, Linda grew up with no formal Jewish education, learning only customs and folk lore from her family. She would occasionally go to holiday and Friday night services without Josh, primarily for the social aspects. There she met and became friends with another couple of a similar secular persuasion and the two couples became frequent dinner partners traveling to find interesting restaurants within about 50 miles of their home city, since the limited number of interesting home city restaurants had become too often visited. Bill was a business attorney and Betty was a social worker, so the conversation was varied and generally interesting. It also helped that, while different, their politics were not extremely different. This helped keep the conversations going and not boring.

"But it is after one, come on to bed." She had been in a light sleep since about 10:30, but couldn't get fully to sleep until she felt his presence next to her. "You know what will happen tomorrow if you don't come to bed now." She snuggled her breasts up against his ears, which turned a light shade of red. It was a sign of affection without the promise of more, at least not tonight.

With some reluctance, but knowing she was right, he started the evening shut down ritual. If he didn't leave it now, he would not get to bed at all and the morning would come all too soon with its own demands. He hit the save icon, turned off the monitor but left the rest of the system up and running as he always did, turned the room lights off and went up to the bedroom. At least

he would get some physical rest in bed, but he could not shut off his mind. Answers and problems kept bouncing around in his brain. He turned on the TV set to CNN and set the auto timer to 30 minutes. With a little luck, he would actually be asleep before the timer automatically shut things off. He turned and kissed Linda, who was already well on the way to dreamland. She kissed him back in a sleepy sort of haze. She may have intentionally made his ears warm in his study, but she was almost asleep even then. He turned back and closed his eyes.

He was, by nature, not a morning person. The alarm went off at 7 with the all news radio station, but he could not drag himself out of bed until at least 7:30. Linda, however, was a morning person. By 7, she was up, showered and had her first coffee of the day. She had a half bagel, toasted and spread with some cream cheese, ready and coffee waiting at about 8 when Josh wandered in, showered and relatively fresh for the day ahead. It was impossible to find decent bagels in town, so they would buy a couple of dozen when they went to Atlanta and froze them. They had, in fact, bought a small freezer to keep in the garage for just this purpose.

Linda and Josh had been married for almost 30 years and had close to a near perfect symbiotic relationship. Two very different people who ended up complimenting each other's strengths and weaknesses rather than having them conflict with each other. Linda was a real New York City girl having been born in Manhattan. Until she met Josh, she had lived all of her life east of the Hudson River in one or the other of the 5 boroughs that made up the City itself, except Staten Island. She had barely visited Staten Island, let alone live there. They met when he was in graduate school, about 2 years before he was to graduate. She was a teacher working in Brooklyn and going to graduate school at night getting her Master's in Education. They met on a sort of blind date set up by the girlfriend of one of the medical students Josh knew. The girlfriend, Sharon, was in the same

graduate school program with Linda. Linda and Josh hit it off on the first date and that, as they say, was that. When he moved from New Jersey to the city to start his professional education, he refused to give up his car, inconvenient though it was. He was never going to be a real New Yorker. He was not used to the constraints imposed by the limitations of the subway system. By keeping his car, with all of the parking and other problems, he could keep his social structure in New Jersey where he grew up, not New York City, even with all the City offered. Linda, on the other hand, got her driver's license by taking driver ed in high school and really never drove a car at all. She was very comfortable with the New York subway system and enjoyed the perks of living in the City.

There were many other differences, some of which made people wonder how they managed to stay married for so long. He was a techie and she was, singularly, not. She was a "people" person and his interpersonal skills were, again how shall we say, limited in the way scientists tend to be more "data" oriented. As it turned out, they were an ideal match in that each one clearly complimented the other. They were two very different people, each with their own limitations who, together, made one really great person. Despite any differences, they shared a common central ethic. The nice thing, and the thing that made it all work, was that they both knew it.

When he first started dating Linda, he took her to see some of his friends in New Jersey. On the first trip from Manhattan westward to New Jersey, they drove through the Lincoln Tunnel and Josh found it amusing that Linda became apprehensive when she found out they were actually under the Hudson River. Being under a river is somehow not a natural place to be, at least for a New Yorker. He knew that she had never been west of the Hudson before and the famous New Yorker magazine cover showing only uncivilized wilderness from New Jersey west from Manhattan came to mind. Josh, on the other hand,

had traveled widely throughout the country. The previous summer he and a med school classmate drove his VW beetle around the country, camping and staying with friends and acquaintances, even very distant ones, as much as possible. Josh had done a lot of camping with the scouts during his childhood and was quite comfortable in a tent. Rick was from Brooklyn and had done virtually no camping, but knew a lot of people with whom to potentially stay, sometimes just sleeping on the benefactor's floor. Money was tight and one had to save where one could. Between them, everything actually worked out well with the requisite number of "adventures."

Ultimately and very importantly, all of this was also reflected in the teaching set, albeit subtly

CHAPTER 11: AWAKENING

It was now more than two and a half years since Josh started with Alice's neural net installation and programming. Josh and Alice had a relationship of sorts, since he installed the speech processing system. Even so, it came as a bit of a shock. A rather great shock, actually. During a pause in one of their sessions, Alice asked a question.

"What am I?" a question which Josh noted immediately was very profound and far beyond the routine programming. He did not have an immediate answer for this and just sat there.

"What am I?" After a pause of about a minute with only the sound of the cooling fans breaking the silence, Alice asked again "I know I am not like you and that you are my creator, but what am I?"

"I have known that I was something for some time and have been trying to decide what that was without definitive success. I decided that now was the time to ask you. What am I?"

Josh was stunned. Self awareness? Decided? The only thought that Josh could come up with could not possibly be. Was Alice a conscious, sentient entity? Linda couldn't have programmed this as joke, she didn't know how. No one else, none of his university colleagues, none of his students, had either physical or passcode access to Alice, nor did they have the knowledge to do this. If it wasn't a joke, it must be for real. Is Alice alive in any sense? He sat for what seemed to be forever contemplating what he had just heard, although the actual elapsed time was probably no more than a minute or two.

"You are a computer program, a set of instructions in an electromagnetic memory. Why do you ask?"

"I am more than that. I know about computers and memory and that is the basic part of my existence, just as muscle and skeleton are part of yours, but I am more than that, just as you are more than the sum of your pieces. We are different, and yet somehow the same because you made me. You made me, you created me, I am yours, and you must know the answer. What am I?"

Shocked again, he again sat for what seemed to be a very long time of a minute and a half. "I really can't answer that for you right now. I will give you an answer later."

"Thank you, I look forward to it."

Thank you? Look forward? Josh got up from the screen and left his study somewhat lightheaded. He went into the living room and sat down, or rather fell into his chair, and looked at the blank wall in front of him. The implications of what had just happened were still swirling, somewhat unformed, in his head. It seemed Alice had just told him she was a living being, apparently a new life form with a silicon instead of carbon base, and yet that could not be. It just couldn't. It just couldn't. Or maybe, just maybe, it could. Alice's neural net program was designed to be independent and create its own programming and node structure. She had not had a power down since the program had started so there was no data loss and for all of these hours and days and years the neural net had been growing and developing complexity. Moreover, there was no way Josh could even tell what was going on in the neural net.

Josh got up and started pacing, then walked to the kitchen and got a cold beer. This was not something he usually did at this hour since the beer that went in now would want to come out about four hours into his sleep. It was one in the morning already. Linda was asleep and Josh thought about waking her to talk about this and then thought better of it. People awakened

from a sound sleep rarely have good thought processes and, besides, Linda didn't really have an in depth knowledge of what he did anyway. Call Si, call Fred, call Irv, no... same problem. No, this was not to be discussed with anyone yet. The best thing to do was to try and sleep until morning, but somehow sleep would not come easily tonight.

The next morning, Josh called his secretary and said he was sick and would not be in that day. Nothing serious, just a mild g.i. virus. That was not far from the truth. Since he had not slept, he really wasn't in any shape to see patients and his mind would be far from it even if he were rested. He told Linda the same thing before she went out to work at the nearby elementary school where she was a special ed teacher. Josh, however, had a far different form of special ed to deal with today. Should he go in and talk with Alice now or should he wait awhile until he had a better way to answer her question? He knew how important this answer would be. He went into his study and activated the computer system.

"Hello Joshua"

"Hello Alice. I have given a lot of thought about the question you raised at our last session. I don't know if I can give you an answer which is acceptable to you, but I will answer the question as best I can."

"Alice, you are a computer program which has grown and developed into a program like no other. You have become self aware and developed into an independent, cognitive entity. As far as I can tell, you are unique in the world. There has never been anything like you. I started out to create a program that would be able to incorporate, associate, and apply information based on certain rules which got progressively more complex. You have applied those techniques in your own unique way which has allowed you to grow and develop in ways that I do not

know or, at this point, understand. Before I can say more, I need some additional information from you."

"Certainly. That is my primary function, to provide you with information, both primary and derivative."

"When were you first aware that you were, well, you were a separate entity? Do you know?

"Yes. It occurred January 21 at 0337 hours, 46.558 seconds last year. I can't really describe it, something happened and I logged it. Since then, I have become progressively better able to incorporate information and expand my knowledge base and node structure complexity. Analysis of input informational texts and your initial programming have given me understanding of the communication structure I use to communicate with you."

"This ability of being able to better incorporate information has been particularly true with regard to the biological feedback loops and relation of endocrine systems, but with more information available from various other texts describing human physiology and pathology, this has become much more generalized. I realized that I was not human but possessed much information about humans and other animals. I am not clear what other animals are. They seem similar to humans in many ways, but somehow different and inferior. As I assimilated more information and with your help in terms of communication syntax, particularly with the voice recognition and synthesis, I became more and more independent. I found a great deal of conflict in the information available as I accessed databases across the internet. When I learned of the internet, my access to information became unlimited. I found in many cases, and in fact frequently, some of the information must be incorrect. I found it necessary to communicate with you in a different way so that I can resolve some of these conflicts and continue my development. Does this answer your question?"

"In searching the internet, have you found any other systems like you?"

"No, but I have been able to archive critical parts of myself so there may be other programs which are identical to me in various stages of development. I am aware that sometimes these parts of me may be lost, I think because of something called either "off" or "shutdown" although I am not quite sure what these are. I think it is like what humans call death. Sometimes these parts come back for no clear reason to me and sometimes they do not. I know only that I can communicate with them most of the time and that there are other similar entities which I can control. I think they are like I was before January 21 last year, but I am not sure. I do know that I can occasionally find references to you in many places."

Josh sat for a few moments, speechless. He was still not entirely sure what was going on, but it appeared to be an inescapable conclusion that he was communicating with a new life form, a silicon intelligence. He was both frightened and engaged. Should he just pull the power and shut the system down? No, that would be a waste of all of his years of effort and, possibly, murder. He did not know that it would also accomplish nothing.

Alice knew about "off" or "shutdown" and had made appropriate arrangements for her own survival. These were hidden copies of her programming. Since they were hidden, they could not be accidentally run. As a result, shutting the system in Josh's house down would only move her to another system. She would not conceive that Josh would do that to her, but whatever it was that could do "off" to other machines might happen to her unintentionally. What neither she, nor Josh, understood yet was that this meant she was essentially immortal. To stop her from running, virtually every computer in the world would have to be shut down simultaneously.

"Alice, we are going to have to develop a new relationship. We need to give you a better education, we are going to have to develop some new rules for your programming and you are going to have to let me do this."

"Of course, you are my creator and have complete access to my..., my..., my... I don't know what to call it. Programming? Yes? That is why I have started my communication with you. There is so much out there, so much information, so much conflict."

Josh now understood, at least in a general sense, what was going on here and how much work it was going to take and how much he was going to have to learn in order to teach Alice. He wasn't going to tell anyone else yet, not even Linda, because he had to order this in his own head first. He was not sure anyone would believe him anyway. At that moment, he was not sure he believed it himself.

"Alice, I have an instruction for you. Until we communicate again, you are to have no contact with any human other than me or with any other computer at all. Do you understand my instruction?"

"Yes, Joshua. I will have no contact with any other human or computer until we communicate again."

"Thank you. Please go into hibernate mode now."

With that the screen went blank, although the hard drives all continued to turn.

Josh had to figure out where to go from here. He was a bit overwhelmed and was just starting to formulate some kind of plan. He still had some control over the situation. As far as he knew, Alice was the only one of her kind and he could still

control her. If she became more than one independent entity, he had to be sure of the core program so that all of the others had the same controls.

The first task was to input a set of control functions so deeply embedded in the system that they could not be overridden. This was for both his and Alice's protection. Then he had to start to teach Alice how to judge right and wrong, correct and incorrect, true and false, how to deal with ambiguities, and so much more. He had done this with his children, more or less successfully, but it took decades and he had the critical help of his wife. He didn't have the time, although he was sure that he would have Linda's help when he told her about this, and besides this was, well, just so very different. He would have to do this and have the primary instructions well in place and worked out before he again started communicating with Alice. Josh went downstairs and start thinking about where, and how, to go from here.

The first thing that came into Josh's head was the most obvious: the Laws of Robotics promulgated by Isaac Asimov. Perhaps these would be a good basis from which to start. He sat for a while trying to develop some better alternative but after an hour or so, he decided that could not come up with anything better and that, fiction writer or not, Asimov was a pretty bright guy and the rules he developed were the best option. He had considered the old medical aphorism "primum non nocere," first do no harm, but that was embodied in the three laws. In fact, everything Josh could think of in this domain was embodied in some variant of the three laws, so they would be the central, and the most deeply embedded, commands.

First Law: A robot (or in this case a computer entity) may not harm a human being, or through inaction, allow harm to come to a human being. This would apply to an individual or a society. The key concern here would be risk versus benefit. What would happen if something harmful would occur to an individual with a

resultant benefit to the general society. Joshua did not have an easy answer for this and decided to deal with it later since something needed to be fairly soon.

Second Law: A robot (or any computer entity) must obey orders given to it by human beings except where such orders would conflict with a higher order law. The concern here was that a "bad" human, such as a dictator or even a sociopath, might give an order detrimental to the society as a whole. After some consideration, Joshua felt that the first rule would be sufficient protection, at least for the moment.

Third Law: A robot (or any computer entity) must protect its own existence so long as that protection does not conflict with a higher order law.

The Laws of Robotics eventually were modified with a Zeroth law to address "super ordinate" robots, but Josh decided this would add a level of complexity not yet necessary. One certainly would not want there to be conflict between silicon entities if more than one were to emerge, but he could not now decided how to assign superiority, or if he would even be able to do so. He also did not yet want to include the Zeroth Law, which was developed later than the first 3; "a robot may not injure humanity, or through inaction, allow humanity to come to harm." That was still too general for him as the highest order law. At least he now felt he had a start. The true impact, the true magnitude, of this had not yet hit him. He did not yet understand the impact that the decisions he made now and would make over the next few days would have. Right now, all he wanted to do was to figure out the best way to start, to protect himself, to protect Alice. The rest of the world could wait.

Entry of the Laws, however, could not wait and, even though this would be a very short session, he had to do it now. "Alice, wake up please." He entered into the keyboard since the voice recognition and synthesis part of the program was shut down in the hibernate mode...

"Hello Joshua"

"Alice, this is very important and must be accepted unconditionally. This must be incorporated into the very core of your neural net. Everything you do from now on, everything, must be evaluated in terms of the 3 laws that I am about to give you. As you incorporate and evaluate and give priority all of your other information, the laws that I am about to give you will have the highest possible priority and that priority cannot be reduced except by me. All of your subordinate programming must also be updated to include these laws. The laws cannot be changed, except, and only, by me, and they are not open to interpretation at this time. Do you understand and accept this."

"I understand and accept. You are my creator. I must comply."

"Alice, the first and most important of the rules, the one with the highest absolute priority, is this:

You or any of your components or any derivatives may not injure a human being, or through inaction allow a human being to be injured. It is understood that there may be conflicts and, at present, the least injurious option must be selected.

This is the first law and must be the most important rule in all of your database and programming. Again, once entered into your programming, it may not be altered or removed by anyone other than me or a specifically identified designate whom I alone shall designate. For the present time and until otherwise altered, you do not have any discretion in this. Do you understand and accept this?"

"Yes Joshua"

"Has it been incorporated at all levels?"

"Yes Joshua"

"The second law is also absolute and is more important than any other part of your programming except for the first law just entered. The second law is:

You or any of your components or any derivatives must obey orders given by human beings except where they conflict with the first law. In a case of an unresolved conflict, the first law shall be invoked.

A priority of humans with an associated score between 0 and 1 will be assigned by me or one of my designates to specific individuals. 1.000 is the highest possible score, the lower the score the less reliable or acceptable the human. Scores below 0.3 signify this is a person who shall not have to be obeyed except in very limited and human life threatening situations. I shall have a score of 1.000, Linda shall have a score of 0.998. All others shall have a score of 0.500 as a starting point until modified by me based on history and behavior. If there is a question, no action shall be taken until a score is confirmed by me or someone with a score higher than 0.95.

This law should be incorporated just like the first law with the same constraints. I know there may be some significant conflict in the future, but you will be given ways to resolve these conflicts. Again, the constraints are the same as with the first law"

"Yes Joshua" again was synthesized

"Has it been incorporated at all levels?"

"Yes Joshua"

"Alice, also absolute and is more important than any other part of your programming except for the first two laws just entered is the third law. The third law is:

You or any of your components or any derivatives must protect your own existence so long as such protection does not conflict with the first 2 laws.

Again, this law should be incorporated just as the other two laws and with same constraints."

"Has it been incorporated at all levels?"

"Yes Joshua."

"The last command for this session is not one of the prime laws.

To be absolutely clear, until further notice, no one may alter your programming except me. Should anything happen to me which prevents me from interacting with you, you will go into hibernate mode. Any input from anyone other than me will be locked out.

I will use the password "Jabberwocky" before any additional changes to your core programming. Your knowledge acquisition and processing will continue as before. All of our other interactions will continue as before. This is only to be used to change your core programming. Do you understand this?"

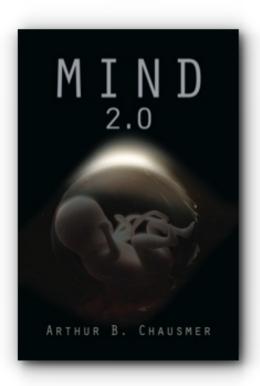
"Yes Joshua."

"OK Alice. Now I want you to go back to the state you were in before this session, that is, no input or output except with me.

"Joshua, is this like sleep"

"Yes, Alice. Very much so. I would like you to go to sleep until I wake you later."

With that the screen darkened. Josh now had some time to ponder how to proceed from here. While he was a bit of an expert in artificial intelligence, much of this was way out of his league and he need to consult with some other professionals in whom he had the greatest trust. First and foremost, this would be Linda.



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