

# One

It was the second anniversary of the day that Kirsty came into Alan Westbrook's life, and they were still living and working in the secret underground lab owned by Kirsty's Uncle Justin Williams. Ever since the death of Sir Malcolm Birch, who had caused them so much grief, they had worked feverishly on the development of a new type of robot. All the standard industrial robots were really no more than flexible machines used for specific roles in manufacturing, but since they had uncovered the secret development unit run by Professor Diane Crouch it had set Alan off on a new approach to robotics. They had kept Diane on to run the development, but Alan was working on the neurological aspects of the project, whilst Kirsty was trying to marry up the various items developed by Diane with the neurological inputs and outputs generated by Alan.

Over the last two years, they had made great strides towards a finished unit. Instead of the more traditional servo-motors and gears used in industrial robots, their concept tended to copy nature more closely; simulating muscles and tendons as found in the human body.

The early results had been encouraging, when they had managed to get an arm to work in a very similar way to an actual human arm; though it didn't look quite the same.

"Now we have shown that the thing works," said Kirsty, "we should try to get it to look right. Anyway, it would make the whole structure much stronger and more fit for purpose."

"You have a point," said Alan, "and what's more it'll make us focus more on how the thing is powered. It's OK in the lab, having cables draped all over the place, but if this thing is to be of any use, it has to be self-contained."

The ideal power source was to be their biggest problem and would, as with electric cars, be the last problem to be solved.

They had now got to the point where they could put together a full figure and start on one of the main challenges for robot designers; balance. We don't even think about what goes into keeping upright: we do it automatically.

The current attempts at producing a robot that can walk had been anything but successful. A slightly uneven surface and the robot would fall over. But with their new approach to musculature, they hoped that this would be overcome. They hadn't bothered too much about the aesthetics at this stage. They would leave that until they had a finished and working model. Alan had developed what he called a neuron cube which was made up of billions of neural circuits all linked together, but with no pre-programming, which meant that it would need to be trained to develop all its skills, much as a newborn baby would. He stood about five foot six tall, though he would be taller if he had a proper head instead of the two small video cameras mounted on the top of his shoulders. Alan called him 'Bob'. Well, he thought that 'Robert the Robot' was a bit corny. There was just one cable emerging from the middle of his back to provide him with power, and this was suspended from the ceiling to allow him to move about without tripping himself up.

"What now?" asked Kirsty.

"He has to learn," said Alan. "He will tend to copy what he sees, so I'll try a few things." He sat down in front of 'Bob' and then held up a hand, waved it and put it down again. He repeated this several times, then sat to wait for a response. There was a lot of twitching and flailing, but nothing that looked anything like the movements Alan had made, so he did it all again. This time the movements looked similar to Alan's movements. After several attempts, Alan decided to leave it for a while. "Let's go out for a drink and some lunch," he said. They both got up and left 'Bob' to think over his first lessons.

They still hadn't got used to going out with impunity since the death of Sir Malcolm. They had nothing to worry about now, but it had become such a habit; covering their every move.

The White Hart was quite busy when they arrived, but they managed to find a table near the band. The pub was featuring a number of local Trad Jazz bands this week, and there was a small group getting ready to play. They didn't look old enough to remember the old bands but must have listened to their recordings to learn the tunes. This group, 'Moors Trad' looked more like an outing of the young farmers club. There was a trumpet player, a trombone, a clarinet of course, a guitar, a double bass and a drummer. After two numbers they were hoping for an interval which mercifully came after the next number.

"That trumpet player should take lessons," said Kirsty. "I bet their parents encourage them to do these gigs, so they don't have to listen to them practising."

"I must admit they'd have been booed off in my younger days," said Alan. "We used to go and see all the big names at the local jazz club in Watford; people like Chris Barber, Ken Collier and the like."

There was a short period of peace while they were able to eat their lunch in relative quiet before the band returned, fortified by a couple of pints of local brew. The first number was loud and fevered, and Alan was inclined to remember the quotation from Morecambe and Wise when Eric said to Andre Previn, that he was playing all the right notes but possibly not in the right order. They had just finished eating and had ordered another drink when the band started up again.

"God! This is one of my favourite tunes they're murdering," said Kirsty, getting to her feet.

"What're you doing?" asked Alan, alarmed.

"I'm going to show them how it's done." She strode over to the band and grabbed the trumpet from the lad who was, at that moment, murdering it. There was a cheer of approval from the other diners, then they all went quiet as she took her stand in front of the band and started to play. Alan sat with his mouth open. He had no idea that she could play like that. He used to play the clarinet, but not to that standard. When they finished the number, there was tumultuous applause. She bowed and handed the trumpet back to its surprised owner. "When you can play like that," she said, "you can perform in front of people." She strode back to her seat and sat down. The band went into a huddle before sidling off to catcalls from the crowd.

"I didn't know you could do that," said Alan.

"There's a lot you don't know about me," she said.

"So I'm beginning to see," he replied. "Look out, the manager's heading this way." She looked round and, sure enough, the manager was weaving his way between the tables in their direction.

"Excuse me, madam," he said, "but that was very impressive."

"Just wanted to show the lad he had a long way to go."

"Trouble is," he said, "they don't feel they can continue after that and I wondered if you could help out?"

"Well, I'm not really prepared to do more than the odd item," she said. "It was just that they were murdering my favourite tune. However, for a couple of free drinks, I'll sit in with their drummer, bass player and guitarist for a few tunes. How's that?"

"Sounds good to me," he said. "I'll go and fetch them." When he returned with the required instrumentalists, there was a hush which burst into tumultuous applause when Kirsty got to her feet. She had a few words with the lads who set about playing the backing to one of their favourites, and Kirsty just improvised along with them. What had started as a couple of numbers eventually took up half the afternoon. The bar was still packed with people standing round the sides to listen. Finally, she thanked the lads, handed back the trumpet to its rather disgruntled owner, said goodbye to the landlord and left to tumultuous applause.

“That was a pleasant lunch,” said Alan, “if a little quiet. I didn’t know you played the trumpet.”

“So you said earlier,” she replied. “I’ll have to dig out my old trumpet and play a bit.”

“I used to play clarinet a bit,” said Alan, “but when I played in our school jazz band, I played piano, as a friend played the clarinet as well.”

“Justin’s got an old piano,” she said. “Perhaps we could move it through. I don’t think he can even play it.”

Back at the lab, they found that ‘Bob’ was still practising his arm movements and was getting quite proficient at it. It was going to take quite a long time before they had him completely trained.

“When we have got him doing all the basics,” said Alan, “I’ll see if I can export all the settings so that we can start the next one at a more advanced state. By the way, how is the new head coming on?” Kirsty was working on a more lifelike head with vision and hearing as well as a simulated voice box to give him a voice.

“We’re getting there,” she said. “The voice box is taking a bit of perfecting. Should have something by the end of next week though, then you’ll have to teach him to talk.”

“That could take quite a time,” said Alan.

“Well, while you’re doing that,” she said, “I’m getting on with the next one, but she’s going to be a bit better looking than your ‘Bob’.”

“She?” he said, surprised.

“Yes. I thought it would be better to try and make them as human-like as possible,” she said. “If they have to interact with people they should look as unthreatening as possible. Your ‘Bob’ looks like a superannuated cyclist dressed in lycra. Not a pretty sight.”

“Well, he wasn’t meant to be pretty,” said Alan, indignantly.

“So it seems,” she said, “and you have certainly succeeded there.”

“Don’t listen to her, Bob,” he said. “But you can’t hear yet, can you?”

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By the end of the next week, they had Bob walking quite efficiently. He certainly looked a lot firmer on his feet than most robots they had seen on TV. You couldn’t push him over as he responded just like a person, and if you put objects in his way, he would either step around or over them. He could also carry objects and put them down carefully. He did very well with a cup of coffee too.

“What is the next stage?” asked Justin who had come through to see the progress.

“Fitting the new head,” said Alan. “I think it’s about ready to go.”

“So then he’ll be able to communicate with us?”

“Sort of, yes,” said Alan, “but he isn’t a sentient being. He may seem to be, but he will have no actual consciousness.”

“How do you know that?” asked Justin.

“Well, all his actions will be programmed by the computer part of his control system,” said Alan. “We don’t actually know which part of the human brain is the part with consciousness.”

“Most people think that that part is added to the body and is a separate entity which we think of as the soul,” said Kirsty, “but we don’t actually know.”

“But I think that there is an actual neural network in there that produces consciousness,” said Alan, “and that is the bit we think of as ‘me’, and I think it is the same for everybody.”

“You mean everyone thinks that they’re you?” said Justin.

“Sort of,” said Alan, “except that their notion of me is different for each person, depending on their initial programming.”

“You think we are all pre-programmed, then?” said Justin.

“Oh yes,” said Alan. “We all have hereditary traits which can affect the way we think and build up the rest of our brains as we grow up.”

“Sounds very impersonal,” said Justin.

“I suppose it is,” said Alan. “Because we can think, we think that we are special and different from other animals.”

“But don’t we have humour?” said Kirsty. “We all get together for a laugh. Animals don’t do that.”

“Well, actually, they do,” said Alan. “If you see a group of chimps, and another group of chimps from another band approaches them, they all jump up and down screaming with laughter at the newcomers. This is a pack instinct to show solidarity and to make fun of the outsider. When you go out for an evening with the girls, and you all sit together howling with laughter, you will inevitably be laughing at someone not present. It is a pack bonding exercise.”

“It doesn’t seem like that,” said Kirsty.

“Well, next time you go out with the girls notice what they are laughing at,” he said, “and how ridiculous their laughter sounds. Then picture a pack of chimps.”

“A night out with the girls will never be the same again,” she said. “Anyway, do you want to see the new head?”

“Is it ready?” said Alan, surprised. “I thought you were still working on it.”

“Well I was,” she said, “but it’s finished now.” She went over to her desk and opened the cupboard and took out a package wrapped in brown paper. “Voilà!” she said, unwrapping it.

“It looks a bit like me,” said Alan.

“Yes, but he has more brains than you.”

“Thanks,” said Alan, “seeing as I made his brains. Anyway, I’ll fit it tomorrow. What do you think of your new head then, Bob? You’re a bit like Worzel Gummidge now with your spare head.”

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It took a bit longer than Alan had estimated to fit the new head. There was movement to take into account as well as the extra senses like hearing and voice, and he wanted to get it right. A mix up in the connections and the whole project might have to go back to the drawing board. However, on the third day he was ready for switch-on.

“Do you want to do the honours?” he shouted to Kirsty who was in the next room.

“What do I have to do?” she asked as she appeared from the next room.

“Just throw that switch,” he said.

“No speech?”

“No speech!”

She switched on and nothing happened.

“Does he have to warm up or something?” she asked. The creature let out a scream, and both Alan and Kirsty jumped. “God, what was that?” she said.

“Just trying out his new voice,” said Alan.

“Is there a volume control?”

“I’m afraid not,” said Alan.

“I hope we don’t have to get up in the night every time he screams to feed him.”

“Hadn’t thought of that,” said Alan. “Anyway, we can switch him off at night.”

“Seems the ideal baby,” said Kirsty.

“Anyway, now to teach him to talk.” The artificial brain learnt things much more quickly than the human brain so, in just a few days, Bob was able to talk in a rather basic fashion. However, once the process was started, he could be sat in front of a TV and left to learn on his own. So, from a limp and lifeless doll, Bob became an active and responsive creature, and while this was happening, Kirsty was building a second robot in female form, but teaching her would be much easier as it could be left to Bob to do much of the teaching.

They decided to change Bob’s name to ‘Jack’ as Kirsty had called her robot ‘Jill’. They were both a bit hampered by the fact that they each needed a power cable that dangled from the ceiling which restricted their area of activity, so Alan put more effort into solving the power problem. He looked at some of the power sources that had been used on space missions and came up with an isotope power source which would solve the problem. It took a while to obtain all the parts but eventually, the time came when they could install the new power sources in the two robots. Each would have a switch in the middle of its back so that it could be deactivated if necessary.

“They look almost human,” said Kirsty. “So, I think we should give them some clothes to finish the job. If we are to take them out into public view they would attract too much attention as they are.”

“Seems a good idea,” said Alan. “I’ll leave that to you.”

A week later, the two robots were fitted with their internal power sources and were fully dressed to look human, which they did. If you walked into a room, you would think they were two people. The way the muscles were formed to mimic human muscles, even on their faces, made them look extremely human. Nothing gave a hint that they were machines.

Kirsty took ‘Jill’ into their living room and taught her how to make coffee, which she learned remarkably quickly, and Alan taught ‘Jack’ how to use the vacuum cleaner. They fitted out a room where the two robots could pass the time when not required for anything. They had a television, a radio and a music player. Alan also gave them a chess set and taught them how to play chess, so they could compete with each other.

“Now we’ve built them, what do we do next?” asked Kirsty.

“Well we could set up a production line and sell them as home assistants,” said Alan, “but I think they may turn out to be rather expensive for normal domestic use. They could be used in factories to do delicate assembly work, or in agriculture. Most jobs there are more suited to manual work. Some harvesting has been mechanised, but the machinery is very expensive and can only be used for the job it was designed for.”

“There’s always the military,” said Kirsty.

“Yes, I know,” said Alan, “but they have a tendency to want to take full control of anything useful to them. I’ve been caught like that before.”

“But if we patent it and manufacture it to their requirements, they may accept that,” said Kirsty.

“But they would be scared that we would sell to other powers,” said Alan. “We wouldn’t even be able to sell them to industry. No, for the moment at least we’ll keep it to ourselves. There’s still a lot of work to do with these two, finding out what they are capable of.”

“If you say so,” she said. “We can always change our minds later.”

After two weeks they had the two machines doing all the household chores, and Alan had decided to teach Jack to play snooker. Justin had a table through in the farmhouse, so Alan took Jack through there to see what he could do. He explained the game to Jack who nodded after each instruction. Alan had already taught him all the maths involved in calculating what will happen when one ball strikes another. Alan put out the balls and then showed Jack how to hold the cue and how to strike the ball.

“Is there a purpose in this?” asked Jack as Alan played the first shot.

“It is a competition to see who can play the best,” said Alan, “and it is a form of recreation. We all need to relax from time to time.”

“Do we?” said Jack. “I hadn’t realised, and I have never felt the need to relax.”

“Well, it’s a human thing,” said Alan. “We get our energy from a different source. You have an advantage over us there.”

It was now Jack’s turn to play, so Alan handed him the cue. There was one red ball that could be potted, but it would be extremely difficult. Most of the professionals would have played a safety shot here, but Jack leaned over, lined up the cue ball and potted the red.

“Well, I didn’t think you would be able to do that,” said Alan. “It was a very difficult shot.”

“The chance of error was nought point nought two,” he said. “So, I thought it worth the try. Anyway, if I had missed the pot, the cue ball would have gone safe.”

Alan realised that Jack was a far better player than he would ever be, and he hadn’t even played before. He then went on to clear the table.

“Well, you seem quite good at that,” said Alan. “I think that will do for today.”

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