

# The Tomorrow People

## Introduction

*The Tomorrow People* was a children's television drama serial that ran from 1973 to 1979 on UK channel ITV. Written almost entirely by its creator, Roger Price, it focused on the adventures of a group of teenagers who represented 'the next stage of human evolution'. This evolved status manifested as a variety of psychic gifts, including telepathy, telekinesis, teleportation and clairvoyance, which were used to combat a variety of terrestrial and alien evils. The programme was recreated, again for a juvenile audience, by CITV and Nickleodeon in 1992-5, and has recently been re-launched for a more mature young adult/teen audience by American channel 'The CW'. This review will focus primarily on the 1970s version.

The majority of the scenarios rely on psychic abilities which are beyond the scope of a scientific analysis. However, like many science fiction shows, it draws on interest and extrapolations from established science for veracity. The 1979 children's annual even had a double page of science facts to entertain its audience. Physics topics that can be explored include:

- TIM and biotronic computing
- Teleportation as a Quantum Phenomenon

## A New Kind of Computer

*'How do you work, Tim?'*

*'Now you're asking. Basically I'm a biological computer. I don't have tapes or disks. Instead, in these tubes are biological fluids.'*

*'You mean you're alive?'*

*'Not exactly, no. But I am capable of original thought about things I have not been programmed for.'*

*- Stephen and Tim, 'Slaves of Jedikiah'*

Tim, the artificial intelligence (AI) who acts as mentor, housekeeper, companion and advisor to the Tomorrow People, is not a conventional computer. Described as 'biotronic' and utilizing organic fluids, he was constructed by one of the Tomorrow People - perhaps under extraterrestrial guidance. We are never given any real insight into how he works, but the technology may well be closer to reality than you first assume.

Conventional computers store information in digital form - breaking down every letter or number into a series of ones and zeros. Calculations on these stored data make use of logical combinations of these digits to produce a sequence of outputs. The storage medium usually involves either pits in the surface of an optical disk or magnetic regions on a hard disk or tape. A biological computer instead stores digits in the state of organic compounds. Those states can be processed either through chemical reactions, or the more complex interaction of DNA and proteins. For example, a positive 'bit' may catalyse a reaction or impede it.

One advantage of such a system may be its ability for parallelization - instead of processing commands in sequence, as an electronic computer does, a biochemical computer may be able to respond

to many simultaneous inputs, producing more complicated computation algorithms. Given that complexity is considered to be a prerequisite for emergent properties like consciousness, this may indeed be a logical step on the way to developing an AI system.

Simple biocomputers have already been developed in the laboratory, and their ability to perform calculations and logic operations demonstrated. As recently as January 2013, DNA molecules have been used to store images, audio and text data, which can be read and manipulated through application of specific enzymes or through the construction of RNA strands. This is an active area of research, which is likely to lead to important innovations in the future.

## The Art of Teleportation

*'It's alright for some though, isn't it? What have you been doing today?'*

*'I went for a swim and a sun-bathe in the Caribbean. Galleon Island.'*

*'Yes, some people do have jam on it.'*

*'Well, you could still go. One of the advantages of jaunting: distance no object.'*

*'You sound like a travel brochure!' - Stephen and John, 'The Blue and the Green'*

One defining feature of the Tomorrow People is their ability to teleport between locations. Teleportation as a concept has a widespread and long lasting presence in popular culture. However Einstein's theories of relativity are, unfortunately, quite emphatic on the subject. Nothing made of matter can travel faster than the speed of light, so instantaneous relocation from one place to another is pretty much against the rules of the Universe as we understand them. However quantum theory - which describes the behaviour of the Universe on scales much smaller than a human being - takes a different perspective.

In quantum theory, all particles exist as a combination of states, each with an associated probability. The most famous consequence of this is the Schrödinger's cat paradox. Schrödinger's cat was put into a hypothetical box with a bottle of poison and a radioactive atom. If the atom decayed the poison bottle would break and the cat would die, otherwise it would live. Since radioactivity is a purely random process until you get enough atoms to do statistics on, this arrangement means that until you open the box there's no way of telling if the cat is alive or dead.

Schrödinger explain that unless you look, the cat is both dead *and* alive simultaneously. It's the observer that "collapses the quantum waveform" or, in other words, forces the cat to be in one state or the other. This 'observer effect' is one of the six postulates of quantum mechanics.

Similarly, each massive particle has a probability distribution that determines its location at the point of measurement... and that probability distribution extends to infinity. There's a finite - infinitesimally small, but still finite - chance that at any moment any of the electrons that make up your body is in orbit of Jupiter instead of under your skin. The point is that until you actually look, it's both in orbit of Jupiter AND under your skin.

So, an attempt to reconcile teleportation with physics might hypothesize that teleportation is the ability of an individual to select which of the possible, extremely unlikely quantum states they exist in. Given that there is a finite chance that each elementary particle of your body is in orbit of Jupiter, there must also be a finite chance that *every* particle of your body is there at the same time. So a person who can jaunt is effectively their own observer in a quantum sense. They can select the infinitesimally small fraction of their quantum state in which every atom of their body is in the place where they want to be and select that as the state their waveform is going to collapse into. Then they'll actually be there.

While this is an appealing hypothesis, it has to be stated that there are problems with this theory. Quantum effects are dominant below the Planck scale, or  $1.6 \times 10^{-35}$  m. To the best of our understanding, they are minutely small on human scales. Quantum waveforms can't be calculated for complex molecules, let alone anything as complicated as a human! Even if they could be calculated, an observer can measure them, but manipulating them to achieve a desired result is a different problem entirely. If it is at all plausible, which is doubtful, teleportation is well beyond anything science can explain!

It's worth noting that this would be a phenomenon distinct from the well-publicised 'Quantum teleportation'. In that, a pre-existing connection between two particles known as entanglement allows one to be instantaneously 'aware' of the state of the other. If the state of one of the pair can be manipulated, the result, in both theory, is to allow for the instantaneous communication of information between two locations. In September 2013, a team at the University of Tokyo successfully demonstrated this method, opening the possibility of superluminal communication (although not movement!) for the first time.

## **Concluding Thoughts**

*The Tomorrow People* is based on a premise that presupposes psychic phenomena for which our current paradigm of physics has no explanation. However, in at least one respect - the use of biological computing - it anticipates the development of computing in the future. While such logical extrapolation and anticipation is characteristic of good science fiction, it is interesting to note that the show's scientific advisor, Dr Christopher Evans, was an early computer scientist, and it is perhaps a tribute to his legacy that this aspect of the show remains as current now as it was in the 1970s.

## **References and Further Reading**

Jaunt: an unofficial guide to the Tomorrow People, 2014, Miwk publishing.

The Tomorrow People Annual 1979, Stafford Pemberton Publishing.

<http://research.microsoft.com/en-us/groups/biology/> - Microsoft's biological computation group

<http://www.newscientist.com/article/dn18989-dna-logic-gates-herald-injectable-computers.html>