

PERSPECTIVE

ADAM AND EVE AND THE COLLAPSE OF THE MORAL WAVE FUNCTION

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An analogy is drawn between the collapse of the quantum wavefunction caused by observation, as exemplified by the famous Gedankenexperiment of Schrödinger's cat, and the collapse of the metaphysical moral wavefunction into one or other of the states 'good' or 'bad'. Again observation is necessarily involved, and perhaps making that observation requires certain innate or conferred abilities.

A study of quantum mechanics is included in few, if any, courses on religion or moral philosophy. That is a pity, because it can provide insights into some very basic questions, as I hope to demonstrate. But first, let me remind you of a fragment of the subject appropriate to the present discussion — the wave function and the strange case of Schrödinger's cat.

In quantum mechanics the state of a simple system such as an electron is completely specified by its wave function, a mathematically complex function that extends throughout all space, though it is usually nearly zero except in a small locality. According to the orthodox 'Copenhagen' interpretation, the square of the wavefunction amplitude, or more generally of its projection upon some sub-space of its definition, allows us to calculate the probability of the particle being found in that particular place or state. This is particularly interesting in the case of a radioactive atom, which gradually evolves from its intact to its decayed state, the wavefunction after one half-life being an equal superposition of these two possible states. The only way in which the state of the atom can be determined is to perform an observation or experiment on it, in which case the wave function 'collapses' to one or other of its possible states and we see either an intact or a decayed atom.

Actually much larger objects also have wave functions that are made up from the wave functions of all the particles they comprise. We could even say that a cat has a wave function, though it would be hopelessly complex to specify. But this leads us on to the famous 'thought experiment' proposed long ago by Erwin Schrödinger. Suppose we have a cat in a closed box, and that also inside the box is a radioactive atom. Inside the box is also a piece of equipment that will detect the decay of the atom and, when this occurs, smash a phial of cyanide that will kill the cat. Now we know that quantum mechanics is a reliable theory, and what it tells us is that, after a time equal to the half-life of the radioactive atom, the wave function of that atom will be an equal superposition of the wave functions of an intact atom and a decayed atom. No real problem about that. But quantum mechanics also tells us that the wave

function of the cat will similarly be an equal superposition of two wave functions, one representing a live cat and one a dead cat. According to the theory, the cat actually is in a superposition of these two states! But if we perform an experiment, for example by opening the box and looking inside, then the wave function of the cat will 'collapse' to just one of these states, so that nothing strange seems to have happened. The only puzzle is the peculiar existence of the cat in its mixed state of being both alive and dead before someone performs the necessary observation or experiment. Resolution of this puzzle from a physics perspective has been the subject of much discussion in the scientific literature, and several easily understandable modern expositions are available.¹⁻³

So what does this all have to do with Adam and Eve in Judaeo-Christian-Islamic religions? You will remember that, according to the King James version of the book of Genesis, when Adam and Eve dwelt alone in the Garden of Eden, "They were both naked, the man and his wife, and they were not ashamed." They lived happily in this state until the advent of the serpent which was "more subtle than any beast of the field which the Lord God had made." And the serpent tempted Eve to eat the fruit of the forbidden tree, saying "God doth know that in the day ye eat thereof, then your eyes shall be opened, and ye shall be as gods, knowing good and evil." Eve ate and gave the fruit also to Adam "and the eyes of them both were opened, and they knew that they were naked." God was greatly displeased at this development: "Behold, the man is become as one of us, to know good and evil: and now lest he put forth his hand, and take also of the tree of life, and eat, and live forever: therefore the Lord God sent him forth from the garden of Eden."

The serpent is widely thought to have been the angel Lucifer, the 'bearer of light' or perhaps the 'bringer of enlightenment', who was subsequently, or perhaps before this, exiled from heaven and sent to dwell in hell for ever.

Before this 'fall from grace', Adam and Eve were described by a wave function in which actions were neither good nor evil, because these terms had no meaning for them, or indeed for anyone but God. Life was perfect and there were no internal conflicts or feelings of guilt. But then the serpent initiated the equivalent of an observation of the system by providing to Adam and Eve the fruit of the tree that enabled them to distinguish between good and evil — the wicked 'tree of knowledge'. They could then observe all their actions and

cause the wave function describing them to collapse to a state either good or evil. And indeed Adam and Eve appeared compelled to perform this observation to collapse the wavefunction at all possible times. Every action was now seen to be either good or evil. The collapse of the wave function in the moral coordinate served as the basis for Judaeo-Christian religion.

It is not clear why God disapproved so strongly of this action. Indeed the subsequent priestly foundations of Christianity depend for their very existence on the dichotomy between good and evil, on atonement for evil acts and promised rewards for those that are good. Perhaps the danger was not so much in the knowledge gained from this tree, but rather that, having eaten this fruit, Adam and Eve might well go on to eat from the 'tree of life' and so live forever, thus becoming serious rivals to the previously all-powerful God. This was not to be contemplated, and banishment was the only sure solution.

Setting aside the religious myths enshrined in this biblical account, it is clear that the distinction between good and evil is an important part of human civilised behaviour. It is taught in the home, encoded in laws, and prayed about in religious institutions. Different religions and legal codes may have slightly different definitions of the moral distinction, particularly in religious matters, but the general desire is to

enforce a code of behaviour that is for the common good, or at least for the good of the tribal group involved, and to maintain the authority of the priests.

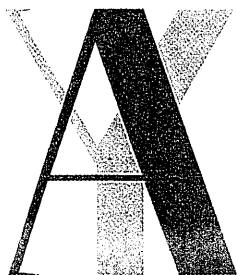
It is an interesting question whether other intelligent animals have anything comparable to this dichotomy in their mental makeup. It seems quite clear that many species of higher animals, such as primates, dogs and cats, have a significant level of self-awareness, and mental states quite similar to those of humans. But for dogs, at any rate, their God is nearly always present and quick to make moral judgments — "Good dog!" or "Bad dog!". They have had no need to eat of the forbidden tree or make their own moral judgments, and their God did not exile them from his garden.

References

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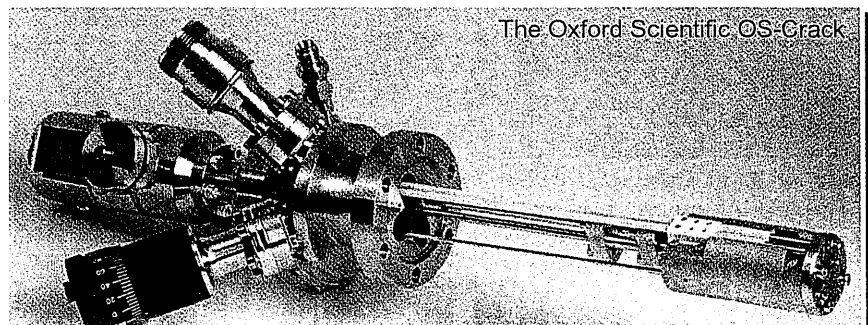


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