

Free will, Judaism and quantum physics

This week's Torah portion, Re'eh, begins with God telling us:

Re'eh, anochi noten lifnechem hayyom brachah uklalah.

See, I set before you today a blessing and a curse. [Deut. 11:26]

Later in the same book of Deuteronomy, we hear God saying:

Re'eh, natati lefanecha hayyom et ha-chayyim ve-et hatov, ve-et hammavet ve-et hara'.

See, I have set before you this day life and good, and death and evil. [Deut. 30:15]

And later still in Deuteronomy, we hear God saying:

Ha-chayyim ve-hammavet natati lefanecha, ha-brachah vecha-klalah.

I have set before you life and death, blessing and curse.

Uvacharta bachayyim lemaan tihyeh atta vezar'echa.

Choose life, that you and your seed may live. [Deut. 30:19]

The message is clear: We have free will. (In Hebrew, *bechirah chofshit*.) We have choices, and we can freely choose among them.

Maimonides, the 12th century Jewish Sage, writes:

Freedom of choice has been granted to every man. If he desires to turn toward a good path and be righteous, the ability to do so is in his hands; and if he desires to turn toward an evil path and be wicked, the ability to do so is in his hands... For if God were to decree that a person be righteous or wicked..., how could God command us... "do this" and "do not do this"...? What place would the entire Torah have? And by what measure of justice would God punish the wicked and reward the righteous...? [Rambam, Mishneh Torah, Laws of Repentance 5:1-3]

Every person is fit to be as righteous as Moses or as wicked as Jeroboam, wise or foolish, kind or cruel,... and may tend, of his own free will, to whichever side he pleases. [Rambam, Mishneh Torah, Laws of Repentance 5:2]

Jewish teaching is that we were created with a good inclination and an evil inclination -- the *yetzer ha-tov* and the *yetzer ha-ra'*. We are free to pursue either and enjoined to pursue the first one. In the Talmud, Ben Zoma says:

Ezehu gibor? Ha-kovesh et yitzro

Who is mighty? He who subdues his evil inclination. [Pirkei Avot 4:1]

Yet, at the same time, we are taught that God is omniscient, that is, all-knowing, that He knows the future in all its details. More than that, some Sages, such as Nachmanides, the 13th century Spanish Sage, held that the Torah itself contains not only the general outlines of world history, but the precise details as well. The Vilna Gaon, the influential 18th-century Lithuanian Sage, writes:

The rule is that all that was, is and will be, until the end of time, is included in the Torah from [the word] "Bereshit" [in the beginning] to "l'enei kol Yisrael" [at the end]. And not merely in a general sense, but including the details of every species and every person individually, and the most minute details of his life from the day of his birth until his death. [Vilna Gaon on Sifra d'Tzniusa]

In the Talmud, Rabbi Akiva sums it up by saying:

Hakol tzafui, ve-harshut netunah

Everything is foreseen, and freedom of choice is given. [Pirkei Avot 3.19].

So we ask: If God knows what we are going to do, how can it be said that we have a choice? Why the Torah and the exhortations to be righteous if God predetermined exactly whether you will be righteous or not? If everything that happens in the universe is programmed in advance and simply unfolds, with no variations allowed, what is the point of it? What is its purpose? Such a scenario is profoundly unsatisfying and disappointing, not to say depressing. Are we mere robots unwittingly following a script, with only the illusion of free will? That is what even scientists actually believed in the 19th century. It is called "determinism".

I will suggest two answers to these questions.

First, we have to deal with God's infinity attributes. We are taught that:

- God is omnipotent (He can do anything),
- God is omniscient (He knows everything),
- God is omnipresent (He is everywhere),
- God is eternal (He has always existed and will always exist),
- God is perfect,
- etc.

These infinity attributes show the influence of Greek philosophy, but they are not in the Torah. In the Torah, God does not say, "I am the

Lord your God who is omnipotent, omniscient, etc." Rather, God says,

I am the Lord your God who took you out of the Land of Egypt; who extends mercy to the thousandth generation; who is slow to anger; who forgives iniquity, sin and error; who does not remit all punishment. [Ex. 20:2; Deut. 5:10, Ex. 34:6-7]

These are among the 13 attributes we recite on the High Holy Days and other times.

In other words, God describes himself by what he **does**, not by what he **is**. When Moses asks God at the burning bush, 'What is your name?', God simply answers, '*Ehyeh asher ehyeh*' -- 'I am what I am' or 'I will be what I will be'. [Exodus 3:14] This means, "the only thing you can say about my nature is that I am, I exist". So Maimonides concluded that you can talk only about what God **is not**, but never about what God **is**. This is called "negative theology".

In addition, the infinity attributes quickly create paradoxes. Can God create a boulder so heavy that even He cannot lift it?

-If so, then God is not all-powerful, because He can't lift it.

-And if not, then God is still not all-powerful because there is something He cannot create.

So we conclude that God intentionally inserted limits on what can be done in the universe, and made these limits apply to Himself as well.

This brings us to the second answer. In the past century, physicists have been able to establish that there is an inescapable randomness in nature. It is called the uncertainty principle. It says that we can predict the probabilities of certain things happening, but only their probabilities. We cannot know with certainty which ones will actually occur. This uncertainty is not a limitation on our instruments or capabilities, but built into nature itself. This theory is called quantum mechanics. We have not been able to find any way around it. We cannot discard it, because it is the most accurate theory ever devised, even more accurate than gravity. We use it every day. Without it, we would not have transistors, lasers, electron microscopes, MRIs, microchips, the Internet, and many other wonders of modern technology.

So now we understand what Rabbi Akiva's dictum really means: "Everything is foreseen, and free will is given." It means: "Everything [*that there is to foresee*, namely the probabilities of occurrence,] is foreseen, and [therefore] free will is given, [because these probabilities are not certainties.]" So the future is really unknown, even to God, because that is the way God built the world.

This is not a limitation on God's power. To use an analogy, let's say you invent a board game that uses dice. You are the creator, you made the rules and built the game, but you chose to include rolls of dice, so that even YOU cannot predict how the game will evolve or who will win. This is not a limitation on your power to create a game. You could have created a game where chance plays no part, such as chess or checkers, but chose to insert an element of randomness instead. God did the same thing when He created the world. But He also gave us tips to improve our chances to win in spite of the randomness. This is called the Torah. The Torah is God's strategy tips to increase our chances of winning despite the dice. We are taught that "winning" means "earning a place in the World to Come".

So God does not know the future. When God is angry at us or pleased at us in the Torah, it is not just a show to impress us, as it would be if God knew what we were going to choose all along, but genuine anger or pleasure, because He did not know what we would choose. Note that you can still say that God is omniscient, but now the word means "knowing all that there is to know". The future is simply not there for anyone to know.

Note that Rabbi Akiva's dictum is always mistranslated as "Everything is foreseen, YET free will is given." The "yet" implies that the two parts are in opposition to each other. But he did not say that. The Hebrew says "Everything is foreseen, AND free will is given." The two parts are not in opposition.

An objection can quickly be raised: What about the prophecies, when God predicted that certain things would happen, and sure enough they did? For example, God predicts to Abraham the enslavement of Israel in Egypt:

Know for certain that your offspring will be strangers in a strange land, and will be enslaved and afflicted for four hundred years. But know with equal

certainty that I will judge the nation that enslaved them, and that afterwards they will leave with great substance. [Genesis 15:13-14].

How do we square these prophecies with the notion that God does not know what will happen? Simple. Prophecies are fulfilled when God chooses to intervene to make them happen. Just as you can remove the dice from your board game anytime you want and introduce temporary new rules, so God can temporarily suspend randomness to force something to happen. But most of the time God chooses not to intervene, and lets matters play themselves out, free will and all.

Interestingly, Jewish mysticism seems to accept this view, using its own terminology. The Kabbalah introduces the idea of *tzimtzum*, which literally means “constriction”. It teaches that God “constricted” his infinite essence to create an independent world. This constriction made free will possible, and allowed people to earn their entry in the World to Come. *Tzimtzum* seems to be quantum mechanics by another name.

To be sure, the exact connection between free will, consciousness, and quantum mechanics is not completely understood, and is still being debated. The problem is that when a laboratory experiment can have several possible outcomes, and the experimenter makes an observation and brings one of them into reality, he does not really choose it, at least not consciously. It just happens. Our mental powers are still largely unknown and uncontrolled.

Free will can and does lead to bad choices. In the Midrash, Israel complains about having free will for this reason, saying:

Israel said: “Lord of the Universe! If a potter leaves a pebble in the clay and the jar leaks, is the potter not responsible? You have left in us the evil inclination, which causes us to sin. Remove it, and we will do your will!”
God replied: “This I will do in the Time to Come. [Exodus Rabbah 46:4]

The implication is that in the next world we will automatically do all the right things. But nevertheless, in this world, most of us are happy to have free will, and happy to feel that the unknown future belongs entirely to us and to the choices we make. As reported by the prophet Jeremiah,

V'esh tikvah l'acharitecha, n'um HaShem

And there is hope for your future, says the Lord. [Jer. 31:16]

Shabbat shalom.