

The Randomness and Revelation of the Hidden God in the World

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Abstract

In the eyes of the Torah, probability allows for the intervention and appearance of the will of God – immanence - without interfering with the laws of nature that He Himself created (and vice versa, in cooperation with other laws of nature), and without detracting from free will, without which there is no meaning to reward and punishment. Miracles and chance must be seen as necessities, an intentional part of creation, which integrates the behavior of Man with his consciousness.

1. Thesis:

Many occurrences in the Tanach are related to the concept of randomness, sometimes in a positive light, and sometimes in a negative one. *Hazal* (the Rabbis) also relates to random processes in the Talmudic and Halachic literature. In this article we will attempt to distinguish between the different kinds of randomness, the ways in which *Hazal* relates to them, and their importance relating to the purpose of the world. It would appear that the unique Jewish understanding of randomness in the world, integrates order and randomness. We will look at the meaning of the connection between these two ideas.

We will discuss the term 'randomness' from a Jewish perspective, as reflected in the commentary of *Hazal*. Despite the diversity within the Rabbinic exegesis on the Torah, there appears to be total agreement regarding the theological meaning of the random as reflecting hidden divine providence. It should be emphasized that the random in Judaism is always meaningful, in that it reveals to man the divine will, or the path he should be following.

Judging from the number of different words for it, it appears that the random is rich in

the variety of possible meanings: accident, chance, fate, luck, speculation, magic.

To this day there is no precise definition of randomness. A random event is thought to be something that happens with no meaning and no clear cause. In the modern world, the holiness of the random is completely absent. There is a branch of mathematics called Probability Theory, which deals with the quantitative aspects of randomness, developing axioms, and investigating concepts such as independent (unconditional) events, stochastic processes, and borderline occurrences. Despite the success of Probability Theory, not a word has been said about the deeper meaning of the accidental. Computer scientists try to develop algorithms which produce pseudo-random numbers, but the creative powers of man are incapable of creating true randomness. Apparently the creation of randomness demands a higher level of complexity than which is known to man.

The special relationship of *Hazal* to randomness isn't confined merely to the realms of philosophy and thought, but also carries with it fundamental implications for the way man lives his daily life. This can be seen in many laws regarding lotteries (for example, laws concerning the division of property and capital between partners or heirs, see *Shulchan Aruch, Hoshan Mishpat*, 175). It would appear that due to Judaism's absorption of Western culture over tens of generations, these laws are not frequently encountered today.

There are a wide range of discussions about lotteries by *Hazal*. For example, in *Yalkut Shimoni* it says: there are many names for lotteries: *helesh*, luck, fate, trial. The children of Esau suffered from all of them. Amalek was struck with weakness, as it says: "and Yehoshua weakened..." The fourth kingdom will be struck with trial in the future, as it says: "birth pangs will come upon him" (*Hosea* 13)

In the *Tanach* (Bible) the word lottery appears to have different meanings. It is used first of all to describe using physical objects to make decisions in times of doubt. It also refers to things which are determined by one's fate or personal destiny. Fate also implies one's lot in life, or fortune, as in Daniel (12:13) "and you will receive your fate in the end of days."

These two meanings have a direct connection: just as you can't know the results of flipping a coin, you also cannot know or predict a person's future. You can argue about the predictability of one's future, but when one uses the term 'fate,' the implication, consciously or sub-consciously, is that the results of one's actions include a factor which is incalculable.

Today it is common parlance to think that we, the human race, are not just subject to the whims of chance or fate, but that we **are** our own fate. That doesn't mean that we have no control or influence over our lives. Freedom is always a choice. Rather it suggests directing the existential path of freedom towards an inclination we choose. Afterwards, a person should not look back at their *curriculum vitae* as pure chance.

From a Jewish point of view, randomness has a deeper meaning, and using it serves

the following five purposes:

- 1 To allow for divine intervention in human history.
- 2 To deliver messages about human or civic behavior.
- 3 To leave free will in the hands of man.
- 4 To leave room for diversity in processes of renewal or continuity of life.
- 5 To prevent the prediction of natural forces over the long run.

The practical application of these ideas is expressed in the idea of Fate, and in the numerous laws surrounding this concept.

That God reveals himself in the world contains an inherent internal contradiction. It is not my intention to discuss the problematics of the transition from the eternal to the finite, but rather the tension between revelation on the one hand, and the free will of man on the other. In other words, how can a person maintain their free will if they see or sense the clear unquestionable presence of the Holy One Blessed be He in their midst?

In this article I would like to look at several examples from the Torah which relate to the concepts of chance and randomness, and discuss the inevitability of these concepts. By understanding these examples it will perhaps be possible to see how individuals, and all of mankind, rely on hidden revelations to encounter forces on high without expressly acknowledging them.

2. Examples:

A. The story of Avraham's servant: "It happened to me today..." (*Bereshit* 24:12) and later on "because God happened to encounter me" (*Bereshit* 27:20). This is the first time that the word with the root 'happened' (*kara*) appears in the Torah. Its meaning is happened or occurred. Avraham's servant uses a special sign to help him find the appropriate woman for Yitzhak. Was this a desirable act? *Hazal* is split. There is a slender line between 'conjured' (*nichesh*) which is forbidden by the Torah, and a 'sign' (*siman*), which expresses divine intervention deeply concealed. Regardless, what happens here is a meeting between God and Avraham's servant in an 'incidental' manner.

B. The story of Yosef's brothers: After Yosef's brothers sold him to a caravan of Ishmaelites heading towards Egypt, they decided to report to their father that Yosef was devoured "and they took Yosef's coat and they slaughtered a goat and dipped the coat in the blood and they sent the striped coat to their father with the message: we found this coat, can you identify it as your son's or not?" (*Bereishit* 37: 31-33) The Torah doesn't reveal who announced to Yakov that his son was apparently dead, but

the Midrash (*Midrash Raba*) tells that the sons held a lottery amongst themselves to determine which would perform the terrible deed. Rabbi Eliezar ben Azarya explains the word 'stripes' (*pasim*) as "did a lottery (*hepistu*) to decide which one of them will go to their father, and it fell to Yehuda."

C. Jacob's fears: "and you take this son as well... and an accident befalls him" (*Bereishit* 44:29). Yakov is afraid that something will happen to Binyamin, after two of his sons have been taken from him. From this story *Hazal* derives the law of "probabilistic presumption ": when similar events occur twice (or three times) consecutively, despite the fact that they appear unrelated, there is a prima facie reasonableness to the assumption that they will happen again. This sentence appears to contradict the "Bernoulli sequence trials" model. The solution lies in the existence of time dependence derived from the event happening (conducting the experiment is the cause of the dependence).

D. The Appearance of the Holy one Blessed Be He in Egypt: "The God of the Hebrews has happened upon us" (*Shemot* 3:18). The first time that the Higher Power makes an actual appearance before all of Am Yisrael, the word used to describe the scene is "happened" (*nikra*), as if it were a chance occurrence (and that is in fact the way that Rashi explains the words there). In other words, this is not a fixed event of stature, but rather a fleeting one. The reason for that is that Egypt is a land full of impurity, and therefore a fixed presence is impossible. The "minor revelation" occurs only to initiate the redemption. An exact reading of the verse reveals that these are instructions from the Holy-One-Blessed-be-He to Moshe and Aharon to present God in a certain way when they are standing in front of Pharaoh. But when Moshe and Aharon come before Pharaoh, they present him slightly differently: "And the God of the Hebrews called to us" (*Shemot* 5:3). The letter '*hey*' turned into an '*aleph*,' and the meaning of 'called' is totally different than the meaning of 'happened!' Why the change?

E. War with Amalek: In the book of *Shemot* (Exodus, 17:8-15) the description of the war between the Children of Israel and Amalek uses the expression "and Yehoshua weakened," which suggests, according to the midrash, that Yehoshua defeated Amalek with the help of fate. In the book of *Devarim* (Deuteronomy) Amalek is described "who happened upon you and attacked your stragglers" (*Devarim* 25:18). The expression 'happened' (*karecha*) suggests a chance happening, from Amalek's point of view.

F. Yom Kippur Lottery: "And Aharon took the two goats and placed lots on each one, one lot for God, and one for Azazel" (*Vayikra* 16:8). This is the first place in the *Tanach* that the word lot (*goral*) appears. *Hazal* (the midrash on this verse and in the Gemara *Yoma*) stress that the two goats that were chosen for the lottery were identical in appearance, size, and shape, and that it was impossible to distinguish between them or to identify one from the other. It is a specific commandment from the Torah to use a lottery to choose between them. The description of the process of drawing the lots is interesting: they would bring two absolutely identical lots and place them in the ballot box (which is also obligatory according to the Torah). The

box was placed in the eastern side of the Temple courtyard, and the two goats stood with their faces toward the west and their backsides toward the east. The *Cohen Gadol* (High Priest) would come, with his assistant on his right and the head of the *Bet Din* (high court) on his left, and the goats in front of him, one to his right, one to his left. The *Cohen* would shake the box until they came out "so that he would not plan which one to take." No planning or personal factor can interfere, and the choice of the goats must be totally left to chance, to the point that *Tanaim* and *Amoraim* debated whether a failure to conduct the lottery would impede the fulfillment of the commandment. The *halacha* is that it in fact does impede: the entire sacrifice of Yom Kippur is rejected if the goats are not chosen by lottery. The Zohar also stresses the importance of the lottery and its necessity to determine God's will. The Rabbis used the results of a lottery to make decisions of the greatest importance. For example, in Gemara *Yoma* (39b) it is told that for the forty years that Shimon HaTzadik was the *Cohen Gadol*, the lottery for the goats always came out on the right side, and this was an indication that the people were following God's will. After his death, the lottery would come out sometimes right, and sometimes left. In the last forty years of the second Temple, a period when the people of Israel were at an absolute low point, the lottery for the goat for God always came out on the left.

A simple statistical analysis justifies the Rabbi's reading so much into the results. The statistical odds of seeing the same result in 40 random events is 2^{39} . That's roughly equal to 10^{12} . To give a sense how small a number that is, if every day was Yom Kippur, and the *Cohen Gadol* were to run the lottery a thousand times every day, he would need approximately three million years to happen upon forty consecutive similar results. In statistical tests where the probability is less than 0.05 (which is to say, a significance of more than 95%), it is customary to reject the hypothesis of randomness and to infer that there is a "deliberate force" involved.

G. Curses: In the curses in *Vayikra* the phrase "occur" appears seven times, more or less one after another. For example, "and you followed me by chance (*kery*)... and I followed you by chance (*kery*) too" (*Vayikra* 26:23-24). The usual straightforward meaning of '*keri*' is revolt. There are many commentators though, who explain the expression according to the event where it appears. In our example, Rashi says "*Hazal* said random where events were inconsistent."

H. Redeeming the firstborn: The story of the redeeming appears in the third chapter of *Bamidbar* (Numbers), verses 40-51. The first-born were amongst those who participated in the sin of the golden calf, and so they lost the rights which had been granted them originally- the right to serve in the Temple. The privilege was transferred to the Levis, who did not participate in the sin of the golden calf. The first-born had an inherent holiness stemming from this right, and so the Levis had to redeem them, which is to say to replace them, so that the holiness would devolve onto the Levis. There were 22,273 first-born and only 22,000 Levis (excluding the 300 first-born Levis who were able to redeem themselves), so 273 Levis had to be redeemed on five shekels of silver each, which was then dedicated to the Temple in place of the first-born. How do you choose who will be redeemed by a Levi and who by shekels? The Talmud tell us (Gemara *Sanhedrin* 17b) that the first-born

conducted a lottery: Moshe conducted a lottery with 22,000 slips on which "Levi" was written on it, and 273 slips with "five shekels" written on it. Each first-born drew a slip, and determined whether he would be redeemed by a Levi, or would be required to redeem himself monetarily. The Jerusalem Talmud (*Sanhedrin* Chap. 1, page 19, *halacha* 2) specifically notes that the lottery was miraculous, that all of the slips with five shekels on them were drawn, despite each slip being returned to the box after each draw.

I. Complaining in the Desert: In this story, the people complain and demand that Moshe find them food. Moshe is totally distraught, and turns to God claiming that there is no way to find enough meat to feed all the people. Moshe's reaction is strange. Moshe knows that God does miracles. God's answer is strange. Moshe knows that God works miracles! God's answer to Moshe is: "The hand of God is lacking? Now you will see if what I said happens (*hayakircha*) or not" (*Bamidbar* 11:23). Moshe is surprised to hear that the meat which will suffice for the people is available. But God does not provide it through visible miracles, because the people do not deserve a miracle because of their low spiritual level and their constant complaints. Therefore God answers him: "The hand of God is lacking?" Am I unable to fulfill your request without causing desecration of my name by way of a visible miracle? "Now you will see if what I said happens or not," which is to say, your request will in fact be fulfilled, but by way of an incidental event. (See the Rambam and the Or HaHaim's interpretation of the events)

J. The Seventy Elders: In this event, which happens in the desert, and is described at length in Talmud *Sanhedrin* 12a there were 72 candidates (6 from each tribe), out of which 70 Elders had to be chosen. They used one lottery, into which 72 slips were placed (In the Jerusalem Talmud it says there were more slips, but for our discussion here it makes no difference). 70 of the slips had 'Elder' written on them and two slips were blank. Moshe said to the people: "Come draw a slip!" Everyone who drew a slip with 'Elder' on it was told: "You have already been sanctified from heavens." Whoever drew a blank slip was told: "God doesn't want you, what can I do?"

K. Bilaam's Blessing: "And God happened upon Bilaam" (*Bamidbar* 23:16). The phrase 'happened' appears three times in the interchange between God and Bilaam. Rashi explains it as being an expression of randomness, disgrace, and impurity. This happenstance was the means of communication between God and Bilaam completely concealed divine providence.

L. Nocturnal Emission: "A nocturnal happening will not be pure" (*Devarim* 23:11). We note that in the punctuation of this unique verse, the letter '*resh*' carries a '*tziri*' and not a '*segol*', changing the meaning from nocturnal emission to 'happening,' the divine providence is concealed or completely hidden.

M. Division of the Land: "The Land shall be divided by lottery" (*Bamidbar* 26:56), "God commanded that the inheritances of the Land will be given to the Children of Israel by lottery" (*Bamidbar* 26:2). Additional verses in *Bamidbar* as well as the Book of Joshua (Chapters 15-19) stress the importance of dividing the Land specifically by

lottery.

We'll explain the process by which the Land was divided according to Talmud *Baba Batra* (122). (Rashi's explanation of the verse in the Torah is a somewhat different.) "The Land of Israel is not to be divided except by lottery, as it says "only by lottery". And is not to be divided except by *Urim* and *Tumim* (the Priests breastplate), as it says "according to lottery". How? Elazar wore the *Urim* and *Tumim*, and Joshua and all the people were standing before him, and a ballot box of tribes and a ballot box of territories was placed before him. And he would deliberate on the holy spirit and say: Zevulun arise, and the area of Acco with him. He drew from the box of tribes, and came out with Zevulun. He drew from the box of territories, and came out with Acco. And again he would deliberate on the holy spirit and say: Naftali arise, and the area of Ginosar with him. He drew from the box of tribes, and came out with Naftali. He drew from the box of territories, and came out with Ginosar. And so for each tribe."

We'll note several interesting details. First of all, the system of randomization described here is the most scientific and the least susceptible to fraud. The boxes are mixed before each draw, all the slips are identical, and the process happens in front of the entire community. The Rashbam explains: "And two ballots were required, one for tribes and one for territory, because if you say, 'now I'm choosing the land for Reuven,' the division is not really a lottery, and the Torah says "only by lottery." The requirement is for the most random lottery possible. The Maharasha adds: "Since divisions in this world are not eternal, they are divided by lottery... but in the world-to-come, where divisions will be eternal, they will be by God." The intervention of God must be concealed by the lottery, which to a certain extent is a natural phenomenon. We will have no need of that in the world-to-come.

Here too we can test the presumption of absolute randomness. To do that we'll calculate the probability of each of Elazar the Priest's predictions coming true. The calculation works out to an extremely small number:

$$\frac{1}{(12)^2} \cdot \frac{1}{(11)^2} \cdots \frac{1}{(2)^2} = \frac{1}{(12!)^2} = \frac{1}{(479 \cdot 10^{10})^2} \approx \frac{1}{10^{25}}$$

That is to say, the chances of everything occurring as Elazar predicted is one out of a 26 digit number- a number well beyond any human comprehension. (That's assuming that the slips that were withdrawn were not returned to the ballot. If the ballots were returned after each draw, the chances of it happening are much smaller) [I worked from the assumption that the lottery was executed for all twelve tribes. There is an opinion that the lottery was only for the nine and one half tribes that remained in the Land of Israel. Then the number is only $(10!)^2$ instead of $(12!)^2$, but the conclusions remain the same.]

The assumption regarding the likelihood of Elazar the Priests predictions occurring randomly is rejected of course. To give a sense of the order of magnitude of the number, let us assume that a monkey is hitting keys on a typewriter with a blank

page in it. The chance that he will type, first time out, a verse like: "only by lottery shall the Land be divided" is roughly equivalent to the chance of the incident we are speaking of happening. The Torah wanted the division of the Land to be executed with divine inspiration, and therefore insisted on creating a holy connection by integrating the division and a random lottery. On the one hand, this is a holy event (*HaEmek Dvar, Bamidbar 36*: "establishing the inheritances in the Land of Israel is a holy event. It is not like the inheritance of brothers, which need not happen by lottery, but can also be done by mutual agreement, something that is not possible with the Land of Israel"). On the other hand, "It's not in the heavens," everything must happen through the natural order, so that mankind will not question it afterwards.

3. Chance:

After this brief survey, it seems to me that we are better able to come to an understanding of the concept of 'chance.'

Returning to section D, the first time there is a revelation before the entire people. We looked at the distinction between the commandment, where God 'happened', and the execution of the deed, where it says God 'called'. There are other questions that must be asked:

Why does the staff turn into a crocodile in front of Pharaoh, when it turned into a snake at the burning bush? Even if we accept Rashi's explanation, that a crocodile is a snake (or, in other words, a snake is called a crocodile when it is seen in the water), it's still difficult to explain the use of different words. Why does the text speak of 'miracles' when dealing with Pharaoh, and 'signs' when it involves the children of Israel? Why were the first plagues delivered by Aharon, while the last plagues were delivered by Moshe himself, and Aharon isn't even mentioned?

It seems to me that the foundation for understanding all these things is the clarification of the concept 'chance.' As we saw, the expression 'chance' appears in the Torah a number of times. Already from the first appearance with Avraham's servant the meaning of the expression is happened or occurred. That is true of all other instances of the use of the root 'chance' (*kara*). The common denominator of all these incidences is that the incidental-ness comes to express the connection between Man and God, but points to a distant connection, a random, happenstance occurrence, and sometimes even with the taint of impurity.

When God intervenes in the world, he can do this in several different manners: from explicit miracles, visible to all, to the most hidden of interventions. When the providence is hidden, we see the phrase 'chance' and the meaning is that there is a God above, but we do not know and we do not clearly see his intervention and action within the world.

Returning to the meeting between Moses and Pharaoh, God commanded them in the minimalist language of 'happened' (*nikra*), for Pharaoh was intended to recognize

the reality of God within the universe, though not yet to see him as a force involved in history. Moses and Aaron did not want to present God as if he incidentally appeared, but rather in his full glory. They used the stronger phrase 'called.' It is interesting to contrast this change of wording with the Rabbi's explanation of the first word of *Vayikra*: "And he called to Moses." The letter '*alef*' of '*vayikra*' is written in miniature in the Torah. The Rabbis say: "God in fact called to Moses, but because of Moses's extreme humility, wanted to write 'happened' (*vayikar*) without the '*alef*,' as if God appeared to him by chance.

And now what is the difference between a snake and a crocodile? In *Bereshit* both the snake and the crocodile are mentioned. The crocodile is a creature unto itself: "And God created the large crocodiles" (*Bereshit* 1:21). This is the only creature, except for man, who is associated with the word 'created' (*bria*), with no change, no alteration, no formation. The crocodile represents the existence of God as the sole creator of the world. On the other hand, the snake is neither created nor even formed. It is a creature that lost its limbs as a punishment for eating the fruit of the Tree of Knowledge. The snake represents the intervention of God in the world in the most substantial and visual way possible.

Since the initial purpose when encountering Pharaoh was to announce to him that God exists in the world (as is suggested by the word 'happened'), so we meet the crocodile, which suggests that God created the world. There is no need for this statement that God created the world for the People of Israel. There the goal is different, to declare that God is involved in the world, responding and punishing. For them, the snake is the proper symbol.

In a similar vein one can explain the expression 'wonder' (*mofet*) which strengthens the message to Pharaoh that he is seeing something special and different, such as the creation of the world, versus the 'sign' (*ot*) which suggests divine providence, a covenant between God and his People, and the promise that in fact God will intervene in the world, and will come to save the People of Israel from slavery. The message to Israel is different from the message to Pharaoh.

Remember also that Aharon comes to help Moshe deliver the message that God exists, but definitely not to announce that God supervises the world. It makes sense therefore that in the first plagues, where the purpose is to declare the existence of God, Aharon is the agent. But when the message is for the People of Israel, or in the later plagues when the message is directed to both Pharaoh and the People of Israel, the declaration is that God directly intervenes in history. There Aharon leaves the stage and Moshe himself is the instrument, declaring that God, who manifestly intervenes, is the master of the world.

The solution to the conflict between revelation and free will, lies in the tool of randomness.

4. A distinction:

I would like to suggest a distinction between 'chance' and 'randomness': Chance is the antithesis to causality. It is something that happens without any reason, accidentally. See *Shmuel I* (First Samuel) 6:9 for example: "For it wasn't his hand that struck us, by chance he was there." The meaning there is: accident, without any intention of the author. The word 'chance' (*mikra*) with a *segol* accent on the letter *resh* does not appear anywhere in the Torah, but it does appear several times in *Kohelet* (Ecclesiastes), and always with the same meaning. In the language of the Rabbis, '*derech mikre*' is 'by chance,' and the expression carries the connotation of causeless, and sometimes even reasonless as in the curses at the end of *Vayikra* which expresses the idea of alienation and disconnection between Israel and divine providence.

On the other hand, the chance only appears to be accidental. It conceals within it unpredictable determinism. Randomness is deliberate coincidence. It is similar to chaos in the scientific meaning of the word: there is causation, but it is so complicated that even theoretically it is impossible to unravel it. The Torah is full of verses where providence is expressed as chance. For example: "Happened before me today" (*Bereishit* 24), "The God of the Jews chanced upon us" (*Shmot* 3), "Did what I say happen to you or not?" (*Bamidbar* 11), "Maybe it will happen that God will call me" (*Bamidbar* 23), and "And you will chance upon cities" (*Bamidbar* 35).

At the level of Jewish theology, chance includes a component of the lack of intervention of God (see for example the Rambam's words on chance's control over the average person), while randomness includes a basis of concealed intervention of divine providence, a sort of concealed revelation in the world. The fact that man meets up with unpredictable processes enables, so to speak, God to intervene in this world without detracting (to the naked eye) from the laws of nature. According to *Hazal*, randomness is a positive and necessary phenomenon, as opposed to chance, which also exists, which reflects a status of cursedness or at least distance from the ideal situation. (In the language of the Gemara, "random" doesn't deny causality; see for example the Gemara *Rosh Hashana* 15b.) We'll add here that the main Hassidic proponents saw this slightly differently. In their eyes there was no such thing as chance: God is involved in everything in the world, even the smallest details, and therefore anything which doesn't have a clear reason falls within the category of randomness.

The Malbim's commentary (on the verse "And the earth was desolation and confusion") explains that the heavens haven't changed since their creation on the first day. The earth, on the other hand, though it was also formed on the first day, is dynamic and changing all the time. In fact, the earth must be like this, having the ability to change, in order for the crucial factor of free will to exist.

This dynamic is hinted at in the words "desolation and confusion": desolation is chance, and confusion is randomness. Together they are the force for dynamic change in nature. The explanation in the book *Sefer HaBahir* is: "desolation- that which astonishes people, confusion - that which has a basis to it". Desolation is the

absolute chance occurrence which strikes people as having absolutely no meaning. In contrast, confusion is the randomness of something which has meaning. *Hazal* brings a similar idea in a number of places (for example the parable in Gemara *Hagiga* 12). *Midrash Raba* (*Bereishit* 2:4) also says: "And the earth was desolation and confusion, this is the Babylonian exile, as it is said, I saw the Land and it was desolate. And confusion this is the Median exile, as it is said, and in confusion they brought Haman..." It is interesting to note that the midrash connects desolation with the exile of Babylon and confusion with the scroll of Esther. The verse quoted suggesting confusion is the verse which tells of the beginning of the chain of miracles leading to the rescue of the Jews. The entire story of Esther, which appears to be a string of unconnected events, is directed above by a guiding hand. This randomness is divine providence. In the same light we can explain the issue in the Gemara, *Shabbat* 88a: "The Master of the Universe made all of Creation conditional and said to them, if Israel accepts the Torah, you may exist, and if not, I return everything to desolation and confusion." The return to desolation and confusion should not be interpreted as uprooting the universe and the undoing of Creation, but rather a new beginning, giving a new chance to the world in order that His creation will better succeed.

Just as coincidence and randomness are tools in the hands of God, even so Man, in his attempt to fulfill himself in God's image, tries to use these tools. The mathematician E. Borel, at the beginning of the 20th century, said that human intelligence is incapable of truly imitating chance. Man is capable of creating algorithms which generate random numbers by way of using sophisticated computer-based simulations, but it will always be possible to discover the deterministic mechanism behind the simulation, and therefore predict the next number. The level of complexity that the human being is able to create will never approach the complexity that we see in nature.

Man, and to a lesser extent every living thing, is also similar to the Creator in perpetuating the species. The Gemara (*Kidushin* 30b) says: there are three partners in the creation of an embryo - the parents of course, but also the Holy One Blessed-be-He. The meeting of sperm and egg is a lottery of total chance. The number of possible combinations of the different genes of the parents is so big that it is not possible to make any prediction as to the characteristics of the outcome of the offspring, except of course for the statistical prediction, which is meaningless for the specific couple which is bringing a life into the world. The enormity of the number of combinations makes it possible for no two human beings in the world to be the same, makes possible diversity in the world, as well as free choice. The meaning of the Gemara is that the infant created by the pairing of man and wife is not the result of chance, but the result of randomness, because there is intervention from above. This can be distinguished from the animal world, where the embryo is the result of pure chance.

Note that the idea of randomness and the idea of chance are totally foreign to the scientific thought of the Greeks, and as a result, of all Western science up until the 19th century saw them as standing in conflict with rational culture. Today of course,

the philosophy of science has changed, and integrates chaos in every phenomenon. Today, the only way to understand the creation of the universe without assuming the existence of a higher power is by theories claiming total accident. The believer in God will say that the universe was created randomly.

5. Miracles:

This article would not be complete without mentioning the concept of miracles. The word '*nes*' (miracle) is based on the word '*mitnoset*', flapping in the wind like a flag. The concept of miracle expresses a special, and in general unexpected, event. Some philosophers see miracles as something above nature, or even opposed to the laws of nature. According to several commentators, and especially the Ralbag (Rabbi Levi ben Gershon, 14th century), miracles can always be explained by natural forces. He says that when an event is called a miracle, it is because its happening at that specific time and specific place was unexpected. In other words, a miracle can be an event whose probability is close to zero, and sometimes even zero itself (it is known that there are possible events whose mathematical probability is zero). The concept of a miracle is of course relative: one person can see an event as a miracle and come to the obvious conclusions from this, while another person may remain doubtful or even deny it completely. That is the way it should be: to see the hand of God in events that do not contradict the scientific structure. Sometimes God wants to send a message to an individual, and not to his neighbor. For instance, a person tells of his surviving a battle in combat miraculously, he believes it to be true, and he is right. His friend can prove to him that his being saved was to be expected - that in a battle of that type only a certain percentage are likely to be hurt, or for any other reason - and he is also right.

The relativity within a miracle, and even a revealed miracle, is deliberate. It is the necessary anti-determinism which leaves free will in the hand of each individual, and doesn't force the heretic to see divine providence. Free will is possible only if the chance is interwoven with order. Order alone leads to determinism, and chance alone leads to delusions or Eastern fatalism and the inability to plan anything.

In the eyes of the Torah, probability allows for the intervention and appearance of the will of God – immanence - without interfering with the laws of nature that He Himself created (and vice versa, in cooperation with other laws of nature), and without detracting from free will, without which there is no meaning to reward and punishment. Miracles and chance must be seen as necessities, an intentional part of creation, which integrates the behavior of Man with his consciousness.

From a Jewish standpoint, God created the world; or, in other words, the world was created as a random process. Here the fundamental difference between a believer in God and a heretic is revealed: beyond the laws of nature, do the flow of events happen by pure chance, as the heretic would have one believe, or do they conceal the randomness that the believer sees, the randomness that empowers Man to be like unto God.

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