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There are practices and some beliefs in Judaism that most people today would define as superstitions. My aim here is to investigate some of these in order to see to what extent these practices or beliefs are coeval with what was considered science at the time of our Sages.

A source that suggests that the Sages were interested in what may be described as the science of their time appears in b*Pesahim* 94b. The source also indicates that there was interest in the science of the non-Jewish world, though the Sages were not always in agreement with its findings:

Our Rabbis taught: The sages of Israel say, “The orbit (of the constellations) is fixed, but the constellations shift.” But the sages of the nations say, “The orbit (of the constellations) moves, but the constellations are fixed.” Rabbi said, “There is a response to their words: We have never seen Ursa Major in the South and Scorpio in the North….” The sages of Israel say, “During the day the sun travels beneath the firmament (and therefore is visible), and at night it travels above the firmament (and therefore cannot be seen).” But the sages of the nations say, “During the day the sun travels below the firmament, and at night it travels beneath the earth. Rabbi said, “Their words appear more logical than ours. For during the day springs (deep in the earth) are cold, and at night they are hot (relative to the external temperature).”

As it turns out, modern science would invalidate all of these theories since our perception of the movement of the sun through the zodiacal constellations is just that: perception, but not reality. What is moving is the earth. But the ancients, just like us, did not feel the earth turning and therefore assumed it was stationary. What they could see was what appeared to be the movement of the sun, sometimes through the constellations, sometimes during its daily “risings” and “settings.”

More important than the accuracy of what we might call ancient science, this talmudic source points to interest in the nature of the universe in the ancient world as a matter of human curiosity. Jews and non-Jews engaged in what they considered scientific observation, and there was a Jewish willingness to accept a logical explanation of a phenomenon from whatever source it came.

This willingness to accept what was believed to be scientific truth in antiquity led, as so many scientific findings do, to actions based on these beliefs. Just as the record of astronomy preserved in

Pesahim is now known to be incorrect, so, too, are other "scientific" ideas in the Talmud that are derived from Greco-Roman and Persian sources. Nevertheless, these ideas affected Jewish law, behaviors, and belief in their time and sometimes beyond. Some of these practices and beliefs still are observed in the observant Jewish community, while others have fallen by the wayside, often with the aid of significant halakhic authorities and Jewish thinkers. We will inspect some instances of what the Sages in antiquity would have considered scientific truth but today would be dismissed as superstition.

A Fatal Application of Numerology

A host of societies believed in the power of specific numbers. In those societies, numerology was considered a science. In our case, the Greeks, like so many other peoples including our own, assumed seven to be a particularly powerful number. In a Hippocratic work called *Peri Sarkon,* in English "*Of Flesh,*" the writer states:

The seventh month child is born according to logic and lives. It has reason and invariable counting in regard to numbers divisible by seven; but the eighth month's child never lives. The child of nine months and ten days also lives; it has invariable counting in regard to numbers divisible by seven" (Hippocrates, *Peri Eptamenou* (*On the Seventh Month Embryo*) and *Peri Oktamenou* (*On the Eight-Month Embryo*)

It seems this notion entered into rabbinic thinking as well and is expressed in a halakha that the overwhelming majority of present-day Jews and others would consider not only the result of ignorant superstition, but a cruel and heartless ruling.

The halakha begins with a Mishnaic rule: "One does not violate Shabbat for a child whose birth date is in doubt nor for an androgyne… (m*Shabbat* 19:3).

This rule is stated in the context of activities one may do on Shabbat related to healing a circumcision wound. In some cases, these activities are permitted because the circumcision itself would be permitted on Shabbat, and these activities prevent dangerous side effects generated by that act.

According to the Mishnah, circumcision on Shabbat is prohibited in two cases: When a child's birth date is in doubt, and when a child is an androgyne, that is, a child exhibits both male and female characteristics.

There are several possible ways of understanding what the Mishnah meant when it spoke of the case of the child whose birth date is in doubt. One way, perhaps the simplest one, is to say we are not sure whether the child was born on Shabbat. If so, the next Shabbat would be his circumcision day. If, however, the child was born on Sunday, his circumcision would not override Shabbat. In such a case, rather than potentially violating Shabbat by circumcising the child earlier than the eighth day of his birth, we defer the circumcision by one day.

This, however, is not the Talmud's understanding of the Mishnah. Rather, it states:

"Nor does (the circumcision) a child of a doubtful birth date allow for the overriding of Shabbat"—What does this include? It includes that which our Rabbis taught, "A child born in the seventh month of gestation, we violate Shabbat on his behalf. A child born in the eight month of gestation, we do not violate Shabbat on his behalf. We do not violate Shabbat for a child about whom we are in doubt as to whether he was born in the seventh month of gestation or in the eighth month. (This is because) a child born in the eighth month of gestation is like a stone. It is prohibited to move it on Sabbath. Its mother, however, may bend over and suckle it because of the danger (to her)" (b *Shabbat* 135a).

It is interesting that the Talmud chooses to understand the notion of "a child whose birth date is in doubt" as related to months of gestation rather than to a doubt about the day on which the child was born. It seems the Talmud takes this tack because a doubt about a day of birth is clearly easier to determine than the month of gestation, and the word "doubt" could cover both cases.

More to the point in this presentation is the idea that a child born in the seventh month of gestation is considered viable and all activities that would require overriding Shabbat may be done for him. A child born in the eighth month of gestation, however, is regarded as dead ("it is like a stone"), and like any corpse, may not be moved on Shabbat due to the rules of *muktzeh.* These rules prohibit the movement of items that have no use on Shabbat or holy days. The child's mother may not move him. The most she can do is suckle the baby so that she does not become endangered due to an excess of breast milk.

It is obvious that this halakha at least shares the Greeks' ideas about numerology and most likely drew its conclusions on the basis of Hippocratic medicine. In the classical world and late antiquity, Hippocratic medicine and numerology would have been viewed as science, and there would be no reason for the rabbis to ignore these "facts" in deciding the law. Indeed, the medical profession was still accepting the idea that seventh-month babies live and eighth-month ones die from the classical period through late antiquity, the middle ages, and into early modernity (Dr. Rosemary E. Reiss, MD and Avner D. Ash, PhD, "The Eight-Month Fetus: Sources for a Modern Superstition," *Obstetrics and Gynecology*, 71:2, 1988, Ohio University, pp. 270–273).

Our experience with gestation based on observation rather than reliance on numerology has made us aware that babies who gestate for eight months have as much a chance of survival, if not a better one, than babies with less gestation time. It is no wonder that today we consider the science of the rabbis in this halakhic case, and the numerological science of their predecessors, the Greeks, superstition. But as my title suggests, one person's science is another's superstition. This transition takes place as more and more sophisticated scientific methodologies supplant older ones.

This analysis is less a defense of the sages than it is a study of cultural interplay and the use of what were deemed reliable facts when one culture learns from another. As our opening source about the scientific discourse between the rabbis and the sages of the nations indicated, the rabbis were interested in how the world works and Rabbi Judah Hanasi, the preeminent rabbinic figure of the late second century, defended Jewish scientific perceptions when he felt those observations were correct. He was, however, willing to concede that sometimes the perceptions of non-Jewish wise men, most likely Greco-Roman philosopher-scientists, appeared to be more reasonable than the Jewish ones. To the extent that that was generally true in the world of formative rabbinic Judaism, it is not surprising that what was considered scientific fact in the world at large impacted the thinking of the rabbis in the world of the Bet Midrash. Nevertheless, as scientific knowledge of gestation has progressed, it is clear that maintenance of the life of an eighth month fetus is a given (Rebecca Garber, "The Eighth Month Conundrum," YU Torah, www.yutorah.org › lectures › lecture.cfm › the-eighth-month-conundrum, pp. 1–2.)

The Efficacy of Incantations

Virtually every society in antiquity and well beyond believed in the efficacy of incantations. Egypt, Sumer, Akkad, Greece, and Rome all used and believed in the power of incantations. This belief was considered to be based on "facts" like the incontrovertible existence of gods, the connection between humans and the natural world they inhabited and over which they had some control, and similar factors. In that respect, incantation was "scientific" and the formulation of incantations was certainly a science, often delegated to expert practitioners.

One of the bases for the belief in the power of incantations finds its roots in the belief in the power of words. According to the Torah, God's words caused every created thing to emerge. Hence, Judaism and its interpreters would very naturally consider the power of the word effective in

incantations. Beyond the overall belief in incantations held by many rabbis, the different societies that surrounded the rabbis contributed measurably to the formulae they thought worked.

First, we will consider some of the earliest rabbinic sources dealing with incantations in general. We will then turn our attention to specific incantations and their origins.

Some rabbis represented in rabbinic literature considered incantations for the purpose of healing effective. One early source, the Mishnah in m*Sanhedrin* 10:1, discusses those who do not enter the World to Come and mentions "one who incants over a wound." The larger context of this Mishnah is a rabbinic discourse on what qualifies as a prohibited belief or a failure of appropriate belief.

Is the one who incants involved in one of these problematic beliefs? It seems not, since he uses a verse of the Torah as the powerful element in his incantation. The denial of a portion in the World to Come to one who uses an incantation over a wound lies elsewhere.

It is Rabbi Akiba who opines that "one who incants over a wound" is excluded from the World to Come. It is not clear, however, that Rabbi Akiba did not believe in the power of incantations and therefore opposed them as superstitious beliefs. Rather, opposition to incantation, at least as the Mishnah records it, appears restricted to the use of the Torah verse, "All the diseases I brought upon Egypt I will not bring upon you, for I am the Eternal, your healer" (Exodus 15:26). Both Talmuds (b *Sanhedrin* 101a, b*Shevu`ot* 15b and p*Sanhedrin* 10:1, 28a–b) understand Rabbi Akiba's prohibition as resulting from a lack of honor to the Torah, either because incantation includes spitting along with the use of a verse including God's name, or because the Torah's sanctity is devalued by secular use.

It seems that with the Mishnah's notable exception, rabbinic sources viewed incantations in general as effective. Indeed, a Baraita which the Talmud cites permits "an incantation against snakes and scorpions on Shabbat" (b*Sanhedrin* 101a). The commentators understand this incantation as an effective prophylactic against the damage these poisonous animals can cause.

The special permission to use this incantation on Shabbat is related to the Shabbat prohibition of hunting or trapping animals. Since the authors of this permissive halakha viewed the incantation against snakes and scorpions as effective, snakes and scorpions would be dsequestered somewhere away from the one using the incantation. One might think this was a form of trapping these animals, which is forbidden on Shabbat. The Baraita negates that idea. Though the incantation may be effective, it does not constitute the physical act of sequestering the snakes and scorpions which would indeed entail violating Shabbat.

A Zoroastrian Influenced Incantation and Cure for Rabies in the Talmud?

As an example of incantations, this extended talmudic passage on attempted cures for contact with rabid dogs or for their bite is instructive. Incantations and attempted cures for rabies are well attested for Sumer and Akkad, two Ancient Near Eastern societies (Wu Yuhong, "Rabies and Rabid Dogs in Sumerian and Akkadian Literature," *Journal of the American Orientalist Society*, 121:1, January–March, 2001, pp. 32–43). Obviously, given the likelihood of recovery from this disease, invocation of the gods or other supernatural powers or adjuring them was a last-ditch effort to save the patient. Incantation, often along with medication of some sort, was, as we have seen, believed to be a potent force for healing by the world community in general and by the Jews in particular.

In m*Yoma* 8:6 there is a discussion about someone whom a rabid dog bit. The Mishnah addresses the question of whether one may feed this individual a lobe of the dog's liver, which was considered a possible cure. The anonymous Mishnah forbids feeding this to someone on Yom Kippur on the grounds that it is an uncertain cure. Rabbi Mattiyah ben Heresh allowed it because he considered it a true cure (b*Yoma* 84a). A talmudic passage discusses the rabid dog and how to deal with its touch or bite:

One who touches a rabid dog endangers himself, and one who is bitten dies. If one touches a rabid dog and is endangered, what is his cure? He should throw of his clothes and run. A rabid dog touched Rabbi Huna the son of Rabbi Joshua in the marketplace. He threw off his clothes and ran. He said, "I fulfilled in regard to myself, 'Wisdom preserves its master' (Ecclesiastes 7:12)."

The one who is bitten dies: What is his cure? Abbaye said, "He should bring the skin of a male hyena and he should write on it, "I, so-and-so the son of my mother, so-and-so, have written on a male hyena's skin 'To you, Kanti, Kanti, Qaliros,' and there are those who say: 'Qandi, Qandi, Kalurus,' Yah, Yah, the Lord of Hosts is His name.'" He should then remove his clothes and bury them in a cemetery for a year. He should then retrieve them, burn them in an oven, and spread the ashes on a crossroad.

What should he do for the year's time? When he drinks water, he should drink only through a brass straw lest he see a demon and endanger himself….(b*Yoma* 84a)

One wonders how many people survived rabies by using the cures and incantations the Talmud suggests, but one can begin to understand why at least some of the talmudic suggestions were at least reasonable to a degree. For example, the sages acknowledged danger caused by touching a rabid dog. This may have been due to the sages' belief that the disease infecting the animal could infect humans by contact, which in the case of many diseases is true. The sages' remedy consisting of casting away the garments which came in contact with the dog would almost suggest a rudimentary germ theory: What the diseased animal touches becomes a source of infection from which one needs to be distance oneself. This might also explain why the one who touches or is touched by a rabid dog must run from his garment. If the garment is a source of infection, the best idea would be to distance oneself from it, just as we would distance ourselves from someone whose disease could be spread aerially.

We know today that simple contact with a rabid dog will not cause rabies. Only the entry of its saliva or matter from its brain or nervous system into the human body by bite, through a scratch, or through a mucus membrane can cause the disease. So, the "science" of the ancients would be considered superstitious today.

Turning to the case of a bite by a rabid dog, which even the Talmud initially declares fatal, if there is a remedy at all for the bite, it is by incantation and a variety of rites supposed to provide healing. Here, too, we see what will be a cross-cultural sharing of healing or protective techniques.

Most immediately noticeable is the incantation formula "Kanti, Kanti, Qaliros" or "Qandi, Qandi, Kalurus" alongside the abbreviated form of the Tetragrammaton and the phrase "the Lord of Hosts is His name" which the bitten individual writes on hyena skin. According to Alexander Kohut in his *`Arukh Completum*, these foreign words are actually in Middle Persian and refer to Kunda, or in some talmudic manuscripts as Kundis. In the case of Kunda/Kundi, this is a reference to the Zoroastrian demon of madness and destruction, Kundag. If the reference is to Kundis, this is Kundizha, the feminine form of Kundag. The last word of the incantation, Qaliros or Kalurus, may be a combination of the last letter of Kundag's full name plus *liros* or *lurus,* which according to Kohut has the double meaning of madness and female dog in Middle Persian. Thus, this incantation is very much a mixture of a Zoroastrian belief in demons of destruction and madness and the power of the God of Israel to overcome them.

In regard to the hyena skin, the hyena was considered in antiquity and until this day an animal with magical powers. This was true around the world: in Europe and Western and Southern Asia (J. W. Frembgen, "The Magicality of the Hyena: Beliefs and Practices in West and South Asia," Asian Folklore, 57: 2, 1998, pp. 331–344). Its skin was believed to possess the power to heal, but mostly people used its body parts as love and fertility charms. Therefore, its use as part of the cure for rabies is not at all surprising. Rather, it is another instance of Jews sharing the cultural norms and "scientific"

beliefs of the society in which they lived.

No doubt the other rites and recommendations that this talmudic passage contains are part of the general society's best practices for attempting to cure rabies. The Talmud's remedy is more hopeful in terms of results than the reality is likely to have been. Most people died if a rabid dog bit them, and a year's survival and full cure as described in the Talmud would have been miraculous.

Spontaneous Generation

Spontaneous generation is best defined as the production of a living organism from non-living matter. Starting with the Greek philosophers who studied living things, especially Aristotle who summarized the theory, and into the nineteenth century, spontaneous generation was considered a scientific fact that explained such things as the generation of maggots. In that case, it was believed they sprung from rotting meat. The Talmud also accepted the theory of spontaneous generation and even based a Shabbat halakha on it.

A Mishnaic passage leads into the talmudic discussion that includes the reference to spontaneous generation:

The eight creeping things that are mentioned in the Torah: one who hunts them or wounds them [on Shabbat] is liable; But [as for] other abominations and creeping things, one who wounds them is exempt. One who hunts them for use is liable; Not for use, is exempt…. (m*Shabbat* 14:1)

The Torah lists eight "creeping things" in Leviticus 11:29–30, and it is to these things the Mishnah refers. According to the Mishnah if one hunts them or wounds them one is in violation of one or the other of two Shabbat prohibitions. Somewhat surprisingly though, someone who wounds other "abominations and creeping things" is exempt, and depending on the reason for which one hunts them is either liable for a Shabbat violation or exempt.

The Talmud discussion takes its cue from the Mishnaic exemption from Shabbat violation for wounding "abominations and creeping things" other than the eight listed in the Torah:

"…Other abominations and creeping things, one who wounds them is exempt": However, if one kills them, one violates Shabbat.

Who is the one who teaches this? Rabbi Jeremiah said, "It is Rabbi Eliezer's teaching," as it is taught in a Baraita*:* "One who kills a louse on Shabbat is as one who killed a camel."

Rav Yosef raised an objection: "Up until this point the Sages did not argue with Rabbi Eliezer (about the violation of Shabbat for killing a creeping thing) except for a louse, which does not reproduce sexually. But the Sages did not dispute his ruling regarding other creeping things that do procreate sexually…."

Abbaye responded (to Rav Yosef), "Is it so that lice do not reproduce sexually? Has it not been said, 'The holy Blessed One sits and sustains everything from the horns of the wild ox to the eggs of lice' (b`*Avodah Zarah* 3b)"

(Anonymous response to Abbaye): "There is a specific species called 'lice eggs' (but lice themselves do not procreate sexually)…."

In antiquity, the general view about the generation of lice was that they were produced by sweat or dust. For Jews, the Torah's description of the plague of lice brought on Egypt would substantiate this view since "all the dust became lice" (Exodus 8:13).

By the nineteenth century, Pasteur had proved conclusively that spontaneous generation has no scientific basis. Yet, in an age when no microscopes were available and mere observation was all one could rely on, the appearance of creatures apparently emerging from rotting meat or sweaty parts of the body became the scientific explanation for the source of their existence.

Anyone believing in spontaneous generation today would be viewed as mistaken at best or foolish at worst. But in antiquity, such a person would have been considered reasonable. Again, one man's science becomes a later man's superstition.

***Ruach Ra`ah*, Evil Spirits, Possession, and Mental Illness**

The Tanakh records one case of *ruach ra`ah*, which I will translate as "evil spirit," that affected the emotional state of an individual. That individual was Saul. After Samuel secretly anoints David as king, God's spirit departs from Saul, "…and an evil spirit (*ruach ra`ah*) from the LORD began to terrify him" (I Samuel 16:14). The last days of Saul were filled with anxiety, paranoia, and often unreasonable anger directed at David and even his own son. In sum, God caused Saul's possession by an "evil spirit."

The idea of a form of possession by a deity as the cause of mental illness was held by the Mesopotamians. They called various mental illnesses the "Hand of Ishtar" or the "Hand of Shamash" in which the hand of the god seized the victim of the disease (Wikepedia, The History of Mental Disordershttps://en.wikipedia.org/wiki/History_of_mental_disorders).

Other ancient societies, however, did not view mental illness as possession by a god or demon. Egypt sought the source of disease in the heart or brain. The Greek physicians were divided as to whether mental illness was an imbalance in the so-called "humors," black bile, yellow bile, phlegm, and blood. Asclepiades rejected the humoral theory as a source for mental illness, while Galen, whose medical opinion eventually won, held that an imbalance of the humors in the brain caused mental illness.

We are quite aware today that possession by a god or demon is not the cause of such ailments as depression, bipolar disorder, or schizophrenia. Rather, these diseases are due to a multiple possible causes: imbalances in the chemicals of the brain, problems in intra-brain communication, malformations of the brain, and a range of external conditions such as genetics, drug use during pregnancy, abuse, and the like.

Yet, in late antiquity, rabbinic Jewish sources assigned the cause for these conditions to what we may call "Saul's original *ruach ra`ah*." Here are a few examples of Mishnaic uses of "*ruach ra`ah*" and halakha based on it:

In a Mishnaic section we read on Erev Shabbat we find:

One who extinguishes a Shabbat lamp because he fears non-Jews, highwaymen, a "*ruach ra`ah*," or for a sick person is exempt (from full Shabbat violation)…. (m*Shabbat* 2:5)

Similarly, in m`*Eruvin* 4:1 we find:

Someone who was forcibly taken outside the Shabbat limit (of 2,000 cubits from the city limits) by non-Jews or by a "*ruach ra`ah*" has only four cubits (in which he may move about on Shabbat). If they returned him (into the Shabbat limit), it is as if they had never taken him outside (the limit)….

In both sources the term "*ruach ra`ah*" appears, but what does it mean? Since the sources themselves do not say, we turn to the commentators for clarification.

In relation to the first Mishnah, *Shabbat* 2:5, Maimonides and Bertenuro both define "*ruach ra`ah*" as mental illness. Maimonides seems to equate it with depression in which the depressive finds light uncomfortable and seeks a dark, preferably, lonely place to get rest. Maimonides' diagnosis seems to fit the symptoms of what he describes in Arabic as "melancholia." Therefore, to mitigate the torment of a depressive, one could extinguish a Shabbat lamp without violating the Shabbat.

The second Mishnah, *`Eruvin* 4:1, indicates a similar meaning for "*ruach ra`ah*." If the first mishnaic case seems to indicate some sort of mental illness, here, too, it seems that a one-time, short psychotic episode is implied. Indeed, there exists a phenomenon called somewhat inaccurately "single episode schizophrenia" (Kate Rosen, M. Phil., Phillipa Garrety, PhD, *Schizophrenia Bulletin*, 31:3, 2005, pp. 735–750) since it appears to turn into full-blown schizophrenia within a few years. But any sort of temporary mental disorientation could easily push someone out of the Shabbat limit, and the same disorientation could bring one back into it. Whether that was due to a single episode of schizophrenia or something else, the law allows full use of the Shabbat limit as long as one was forced out of and back into the Shabbat limit against his will. Obviously, "*ruach ra`ah*" was seen as a psychological force majeure that could not be resisted any more than non-Jewish attackers.

While mental illness has been part of the human experience from the earliest times, the notion that the various psychiatric ailments are the product of demons and evil spirits has seen its day. Yet, for the ancients, how could they explain the frequently sudden changes in behavior mental illness caused? Everything from humoral imbalance, not that far from the theory of chemical imbalance as the cause for mental illness, to possession explained the phenomenon. So, once again, one person's science is another's superstition.

Conclusion

This article has pointed to a number of phenomena that the ancient world held to be scientific, though today we know they have no scientific basis at all and are, at least in our opinion, superstitions. Many of these phenomenon are not at all worthless since they show that rabbinic Jews took part along with all of humanity in the attempt to explain their world. Indeed, if they had not, where halakha required knowledge of nature, they would have been not been prepared for the work that was quintessentially theirs.

Further, the examples assembled here show the sages intersecting with their surroundings. Whether it was the Greco-Roman or Sassanid Babylonian world, Jews, rabbinic or otherwise, participated in the scientific "best practices" of their time. Cross-cultural knowledge was not foreign to them nor eschewed by them.

Last, but not least, we should be aware that what we consider normal Jewish practice is, in fact, often superstition. On the parchment of your mezuzah you will find what is more or less an incantation—*kuzu b'mukhsaz kuzu* based on a letter transference of "the Eternal our God is the Eternal" (*Hashem Elo-henu Hashem*). Even *Sha-dai* on the mezuzah may be a protective name to ward off a *shed,* a demon, who shares two letters of God's Holy name. And when did an observant caterer ever serve fish with meat or not provide different silverware for each? Why? Because the mixture of the two could cause halitosis, or worse, *davar aher,* usually understood as leprosy (b*Pesahim* 76b).

Of course, science has a stronger hold on the human consciousness today than ever before. Nevertheless, as much as human beings seek to be rational beings, there is a side of us that assumes or hopes that there are forces, especially the power of God, that we can call on when all else fails. When what is palpably superstition harms us, rather than having out hopes dashed by trust in that which won't help, perhaps we should put our trust in the best science can do and the God who guides the hand of the practitioner. Yet, human nature being what it is, a red string tied around one's wrist may give enough spiritual solace to give some people longer life than expected.

For all that rationality is significant, the irrational also has shown to be powerful. What many of us would deem one person's superstition may indeed turn out to be not totally lacking in what we will discover to be based in psychological science.