

Yonah: Man against Nature

Harvey Babich, Ph.D.

Department of Biology, SCW

Yonah ben Amitta's beginnings were quite unusual. According to Pirke d'Rabbi Eliezer (chapter 10), Yonah was the son of the widow in whose house Eliahu HaNavi lived during a famine. This was the same child who died and was revived by Eliahu HaNavi (I Melachim 17:9-24). Yonah was a disciple of Eliahu and, afterwards, of Elisha and was the prophet for the dynasty of Jehu (II Melachim 9:1-10, 10:30, and 14:25). He lived for 120 years.

The Ramban (Bereshis 6:19) notes that when resorting to miracles, HaShem employs an economy of means and causes miracles to happen as close as possible to the natural order. In the entire sefer Yonah, many of the events are an intermingling of overt miracles with natural phenomena.

The sefer Yonah consists of 4 chapters and is read on Yom Kippur. In chapter 1, HaShem commands Yonah to go to Nineveh, the capital of Assyria, and to prophesize that unless the people repent, the city will be destroyed. Yonah, reasoning that repentance by the Ninevites would reflect poorly on B'nei Yisroel, attempts to escape from delivering the prophecy and boards a vessel headed towards Tarshish. However, the vessel is beset in a tempest. The crew realizes something is amiss, as only their vessel was besieged in the storm while nearby vessels were in calm waters. They identify Yonah as the source of their problem and he is cast overboard.

Chapter 2 commences with Yonah swallowed by a "great fish." Although this fish is generally assumed to be a huge aquatic creature, interestingly, it is not mentioned by the commentaries as one of the ta'ninim. On day 5 of creation, HaShem creates, among other creatures, the fish (Bereshis 1:20), including the aquatic creatures referred to as "ta'ninim" (Bereshis 1:21). Rashi interprets ta'ninim as (a) large fish within the oceans and (b) specifically, as the Leviathan. Rokeach suggests that these ta'ninim are large aquatic, fire-breathing serpents. Rav Dovid Brown [1] suggests they are sperm whales and Rav Aryeh Kaplan [2] suggests ta'ninim are whales, dragons, sea monsters, or the Leviathan and its mate.

Why was Yonah's "great fish" not included in the category of the ta'ninim? Perhaps, this question bothered Rav Bachya, who interprets the phrase "great fish" as great in years, not size, as many aquatic creatures are much larger than this "great fish." This "great fish," was designated for the sole purpose of swallowing Yonah (Midrash Tanchuma, Vayikra, 8), an assignment fulfilled over 3,100 years after its creation.

The identity of the species of fish that swallowed Yonah has received much speculation. Although the specific aquatic species cannot be identified, it is fair to question whether it was a whale, a large shark, or another type of fish. Some identify the "great fish" as the sperm whale (*Physeter macrocephalus*), as adult males reach a length of 50-60 feet. Sperm whales are carnivorous and eat giant squid, octopi, skates, and fish, including sharks. They are mammals and usually producing a single calf per gestation period (which is over 16 months!) [3]. According to Jewish tradition (e.g. Rashi on 2:1), initially, Yonah was swallowed by a male fish, in which he was comfortable and did not daven to HaShem. This male fish then transferred Yonah to a second female fish, pregnant with hundreds of thousands of eggs, which made it uncomfortable for Yonah, thereby prompting his prayers (Yalkut Shimoni). Thus, the aquatic creature that swallowed Yonah is identified as an oviparous (egg laying) fish, not an aquatic mammal.

What about a shark? Sharks tend to rip their prey, rather than swallow them whole. The Malbim notes that this specific aquatic species was commanded to swallow Yonah whole, rather than to tear him into pieces. Thus, the "great fish" could have been a species of shark that was specifically commanded not to rip and tear Yonah. However, this shark must be huge, as, according to the Radak and Pirke de Rabbi Eliezer, Yonah's entry into the "great fish" was compared to that of a person entering a great synagogue, with enough internal height permitting him to stand erect. The largest of the sharks is the whale shark, *Rhincodon typus*, which reaches a maximum length of 45 feet. The white shark feeds on microscopic plankton, larger free-

swimming prey, such as small crustaceans, schooling fish, and occasionally tuna and squid. Female white sharks are ovoviviparous (i.e., live-bearers). In the pregnant female, the eggs are housed in temporary shells from which the embryos hatch within the mother and nourished by a yolk sac and a secretion, known as "uterine milk." The female gives birth to live young. In 1995, an 11-meter female whale shark was harpooned and found to contain 300 fetal specimens [4, 5]. Interesting, Rav Moshe Alshich states that the second female fish was pregnant with thousands of small fish, not eggs - indicating the fish was ovoviviparous.

It is probably most prudent to conclude that the "great fish" remains an unidentified species, which may or may not be extinct. However, this specific fish has the distinction of being one of the three creations with whom HaShem directly communicated (Bechoros 8a).

As noted above, some commentaries (e.g., Rashi) suggest that Yonah's residence in the "great fish" involved two distinct fish, an initial male fish and then a female fish. However, others (Zohar, Beshalach 47b-48a, Rav Bachya) suggest that only one fish was involved. In this case, Yonah, feeling comfortable, did not pray during his 3-day stay in the fish's stomach. HaShem killed this fish and other fish fed on its carcass, causing discomfort to Yonah and prompting his prayers. HaShem then revived the fish. However, there is another possible explanation that involves only one fish, yet incorporates the concept of an initial male fish followed by a pregnant female fish. Some fish are hermaphroditic and exhibit behaviorally- and environmentally-induced adult sex change, which can involve males becoming females and females becoming males [6].

Once swallowed by the fish, Chazal question Yonah's ability to see in the dark interior of the fish's stomach. According to Rav Meir, a pearl suspended inside the fish provided illumination (Pirke d'Rabbi Eliezer, chapter 10). Rav Meir may have been referring to those luminescent minerals that release light energy. In the process of luminescence, an energy source kicks an electron of an atom out of its ground (lowest energy) state into an excited (higher-energy) state; the electron falls back to its ground state and gives back the energy in the form of light. There are several varieties of luminescence, each named according to the source of energy that triggers the luminescence. Yonah may have used a mineral that emits light by triboluminescence. In this mode of light emission, the minerals are luminous upon being hit, crushed, scratched, or rubbed; here mechanical energy is converted to light energy [7].

Another question focuses on Yonah's ability to survive inside the stomach of a fish. The diet of a fish

capable of swallowing a human probably consists of large squid, octopi, and/or tons of smaller schooling fish. Once devoured, the fish's acidic digestive juices, which include proteolytic enzymes, decompose the ingested food. If so, how was Yonah able to survive in this digestive soup of extremely low pH? The Yalkut Shimoni (in chapter 4 of Yonah) suggests that the extreme acidity of the fish's digestive juices burned Yonah's clothes, jacket, and body hair. Again, so how was Yonah able to survive? A second question is directed to Yonah's sustenance inside the fish. Did Yonah eat the kosher fish (probably, as sushi) ingested by his host fish? These questions bothered Rashi (2:1), who suggests that HaShem took manna (i.e., the miraculous, spiritually-derived food that sustained B'nei Yisroel in the desert) and sustained the fish with it. Apparently, this spiritual food negated both the fish's need to swallow prey fish and its need to continue secreting acidic digestive juices. The internal environment of the fish's stomach was now suitable to allow Yonah to survive. Rashi also suggests that this manna served as a food source for Yonah. We know that eventually Yonah davens to HaShem from within the fish, yet, a person is not permitted to daven in an unsuitable place (e.g., bathroom). What about Yonah's defecation? How could he daven in an area contaminated with human feces? However, we know from the encounter of B'nei Yisroel with manna, that this spiritual food was completely absorbed into the body, without the production of metabolic waste.

Pirke d'Rabbi Eliezer relates an interesting event concerning Yonah's stay within the fish. Apparently, on that specific day the fish was designated for devouring by the giant Leviathan. As Yonah was still within the fish, his fate was tied to the fate of the fish. Yonah requested the fish take him to speak with the Leviathan. Upon encountering the Leviathan, Yonah related that in the future Messianic age, he would be assigned the task of slaying the Leviathan and preparing it for a feast for the righteous. Upon hearing this, the Leviathan fled in fear. As a reward for being saved, the fish gave Yonah an undersea tour, which included the pathway through the Red (Reed) Sea taken by B'nei Yisroel when leaving Egypt, the Eben Shethiyah (Foundation Stone), and an entrance to Gehinnom. As Yonah was within the fish and as the fish was transversing through underground aquifers lacking light, how was Yonah able to view these tourist attractions? This question bothered Rashi (2:6), who states that the fish's eyes were like windows lit by torches. Apparently, Rashi was referring to the bioluminescent bacteria living in the eye sockets of deep-dwelling fish. Bioluminescence is, in a sense, the opposite of photosynthesis. In photosyn-

thesis, green plants convert light (solar) energy into chemical energy (ATP), whereas in bioluminescence, the organism converts chemical energy (ATP) into light energy, as, for example, light emissions from fireflies. Sunlight can only penetrate the uppermost layers of the ocean; all visible light disappears below 100 meters. Fish dwelling in the great depths need an alternative light source. Bioluminescence is the solution. It is estimated that 90% of the deep-sea creatures are bioluminescent, employing a symbiotic relationship with bioluminescent bacteria, the actual producers of light. For example, the so-called “flashlight” fish house bioluminescent bacteria in small pouches under their eyes; by opening and closing these pouches, the fish use the bacterial light emissions to communicate with other fish and to attract mates [8]. These flashlight fish apparently are what Rashi meant when describing Yonah’s fish as having eyes that are like windows lit by torches.

Rav Brown [1] questions how the fish was able to show Yonah the Eben Shethiyah (Foundation Stone), which is fixed in the depths beneath the Hachil of the Bais HaMikdash, as Mediterranean coast off Eretz Yisroel or, perhaps, at the northern most tip of the Gulf of Aqaba, is the closest that the fish could get to Yerushalayim. If so, how could Yonah have seen the Eben Shethiyah, beneath the Bais HaMikdash. Rav Brown, therefore, concludes that the Eben Shethiyah is not a small rock, but rather it is shaped as an underground mountain, spreading deep beneath the surface to underlie all of Eretz Yisroel and forms the continental shelf that Yonah reached (see page 322). However, as the Eben Shethiyah is the “plug” to the subterranean deep waters, another thought is that the fish approached the underside of the Eben Shethiyah by swimming in underground aquifers (Rav Reisman, personal communication).

Chapter 2 concludes with the fish spewing Yonah out to dry land. Pirke d’Rabbi Eliezar acknowledges that the fish’s stomach, with its acidified digestive juices, was a hostile environment for Yonah. When spewed from the fish’s mouth to dry land, Yonah’s clothes were torn, his hair had fallen out, and his skin

was shriveled and swollen because of his stay within the stomach of the fish.

Chapter 3 commences with HaShem coming to Yonah a second time and commanding him to go to Nineveh. Yonah, provided with a second opportunity to bring HaShem’s message to Nineveh, tells the people and king of Nineveh that unless they repent, HaShem will destroy the city in 40 days. The people and their king (who, according to one opinion, was the same pharaoh from the time of Moshe) repent.

The last chapter begins with Yonah depressed and requesting to die. To view the outcome of his prophesy or, perhaps, to see if the repentance of Nineveh was sincere, Yonah lives in a handcrafted hut just outside the city. HaShem causes a plant (i.e., the kikayon) to grow unexpectedly, covering the open roof of the hut and providing shade for Yonah. He is quite pleased. However, HaShem designates a worm to attack the plant, causing it to wither. With the source of shade obliterated, the sun beats on Yonah’s head and a hot wind arises, causing him to feel faint and, compounded by his overall depression, to request to die. The chapter ends with HaShem explaining to Yonah why He grants clemency to the Ninevites

As a reward for being saved, the fish gave Yonah an undersea tour, which included the pathway through the Red (Reed) Sea taken by B’nei Yisroel when leaving Egypt, the Eben Shethiyah (Foundation Stone), and an entrance to Gehinnom.

after their repentance.

There is discussion among the commentaries on the identification of the kikayon. Rashi describes it as a plant that grows high, has many long branches, and affords shade. The Ibn Ezra, quoting scholars from Spain, identifies it as the gourd and the Radak as the castor bean plant. The gourd (perhaps, the species, *Lagenaria siseraria*, or bottle gourd) is a climbing plant with large leaves [9] and the castor bean plant (*Ricinus communis* L.) grows 10-12 feet tall with gigantic, broad leaves. Seeds of the castor bean plant produce oil used in folk medicine remedies and are the source of ricin, a deadly poison used in bioterrorism [10]. As both plants produce very large leaves that would provide much shade, they are suitable candidates for the kikayon.

HaShem designates a worm to destroy the kikayon. The Me’am Loez and the Radak note that the worm attacks the roots of the plant, causing death and wilting of the aboveground leaves. Perhaps, this worm

was a nematode, or roundworm. More than 10,000 species of nematodes have been identified, with about 2,500 being parasitic to plants. Many plant parasitic nematodes attack the plant roots, causing aboveground pathologies, including wilting in hot weather. Most plant-parasitic nematodes range in length from 0.02 to 0.04 inches [11]; Rav Chaim Rabinowitz (in Daas Soferim) specifically mentions that this worm was very small and, therefore, could be a nematode. The kikayon has a short existence; it sprang up overnight and at the end of the following night, by daybreak, it withered (Ibn Ezra; Radak). Thus, HaShem's zoologic impact on Yonah ranged from a huge fish to a minute worm.

Yonah went to sleep a happy man, in his hut with the kikayon providing additional shade. However, when he awoke, the kikayon had withered and he was exposed to extreme heat, from the sun and from a strong, hot wind common in the Middle East (Rav Rabinowitz in Daas Soferim). "And it happened when the sun rose that HaShem designated a stifling east wind; the sun beat upon Yonah's head and he felt faint" (Yonah 4:8). A combination of forces interacts to discomfort Yonah. The commentaries note that HaShem designated an oppressively hot, eastern wind to blow, which also swept away the hut and what was left of the kikayon. Yonah was totally unprotected and could not endure the duality of the oppressive, hot wind and the sun beating on his head. He became faint, apparently experiencing heat stroke, which occurs when the normal body heat loss processes become ineffective and

hyperthermia, or elevated body temperature, ensues. Symptoms of hyperthermia include an increased metabolic rate, which in turn, increases heat production by the body. The skin becomes hot and dry and, as the body temperature spirals upward, multiple organ damage, including that of the brain, becomes a possibility. Heat stroke can be fatal [12].

Albeit the wind was hot and oppressive and the sun was strong, but why was Yonah hypersensitive to these stresses? Hair on the scalp guards the head against physical trauma, heat loss, and sunlight [12]. The pasuk (4:8) specifically states that the sun beat on Yonah's bald head. The Midrash Tanchuma (Toldos, 12) notes that Yonah's scalp hair and facial beard were dissolved following his stay in the fish's stomach. The Ibn Ezra explains that because Yonah was in the stomach of the fish for an extended period of time his skin was tender and hypersensitive to heat. Rav Yosef Kara suggests that when the sailors threw Yonah into the sea, the high salinity caused his hair to fall out. Without hair covering his skin or head, Yonah was hypersensitive to the sun, explaining his fainting when the sun beat on his head.

This incident with Nineveh concludes Yonah's role as a *navi*. Apparently, sometimes a person must be hit with the "kitchen sink" before he understands the message. HaShem utilizes many components of nature - a great fish, a minute worm, the kikayon plant, a tempest, turbulent waves, strong winds, and the sun - to bring across His message to Yonah. ■

Dr. Harvey Babich is a Professor of Biology and Head of the Biology Department at Stern College for Women

Acknowledgements:

Appreciation is expressed to Rabbi Yisroel Reisman, Agudas Yisroel of Madison and Yeshiva and Mesivta Torah Vodaas, and to Rabbi Eli Babich, Jewish Enrichment Center and HAFTR, for reviewing this manuscript.

References:

- [1] Brown, D. 1997. *Mysteries of the Creation*. Targum Press, Inc., Southfield, MI.
- [2] Kaplan, A. 1981. *The Living Torah*. Maznaim Publ., Corp, NY, NY.
- [3] Enchanted Learning. 2004. Sperm Whale, In <http://www.enchantedlearning.com/subjects/whales/species/Spermwhale.shtml>
- [4] Davis, D.F. 2004. Facts and stats about sharks, In http://www.mote.org/~rhuetter/sharks/about_sharks.phtml
- [5] Martins, C. and C. Knickle. 2004. White shark, In *Ichthyology at the Florida Museum of Natural History*. <http://www.flmnh.ufl.edu/fish/Gallery/Descript/Whaleshark/whaleshark.html>.
- [6] Shapiro, D.Y. 1990. Sex-changing fish as a manipulable system for the study of the sex determination, differentiation, and stability of sex in vertebrates, *J. Exp. Zool.* 4(Supplement):132-136.
- [7] Li, Z. 2004. Physical Properties, In *GEOL Minerals and Rocks*. http://uwp.edu/~li/geol200-01/phy_pro/index.htm
- [8] Widder, E.A. 2003. Marine Bioluminescence, In *Bioscience Explained*, Vol. 1. <http://www.bioscience-explained.org/EN1.1/PDF/BiolumEN.pdf>

- [9] University of Hawaii, 2004, Cucurbitaceae, In Flowering Plant Families.
<http://www.botany.hawaii.edu/faculty/carr/cucurbit.htm>
- [10] Duke, J.A. 1983. *Ricinus communis* L., In Handbook of Energy Crops, unpublished.
http://www.hort.purdue.edu/newcrop/duke_energy/Ricinus_communis.html
- [11] Ingham, R. and H.J. Jensen 2003. Nematodes, In An Online Guide to Plant Disease Control. http://plant-disease.ippc.orst.edu/articles.cfm?article_id=1
- [12] Marieb, E.N. 1997. Human Anatomy & Physiology, 4th edition. Benjamin/Cummings Science Publishing, Menlo Park, CA.

Translations used:

- Rosenberg, A.J. (editor), 1991, Twelve Prophets, Volume 1, Judaica Press, NY
- Zlotowitz, M., 1988, Yonah, Artscroll, Mesorah Publications, Ltd., Brooklyn, NY

Derech HaTeva

Staff

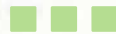
Editors-in-chief

Malkie Krupka ■ Eliza Moskowitz ■ Helen A. Nissim



Cover Design

Shani Guttenberg



Layout and Printing

Tova Press, Inc. ■ 718 438.8877
