

From the Eggs of Dodos to the Horns of Aurochsen:

The Extinction of Species in Jewish Thought¹

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Introduction

The passenger pigeon was one of the most numerous birds ever to have existed on this planet; flocks of up to two billion birds used to fly across America. But because it was so numerous, nobody imagined that the supply would ever run out. People shot them and raided their nests without pause, and deforestation ruined the security of their natural habitat. The last passenger pigeon died in a zoo in 1914.

It is possible to believe in the value of looking after the natural world, even without the notion of extinction, in terms of the importance of showing respect for God's creation.² But a belief in the pressing need for active conservation efforts will only be viable with the understanding that there is a possibility of extinction. Yet, as recently as two centuries ago, there was a widespread belief that extinction was not only impossible with prolific species such as passenger pigeons but even with any species at all. While a few naturalists such as Buffon had proposed that extinction has taken place, Georges Cuvier is generally credited with establishing the fact of extinction at the end of the eighteenth century.³ The realization that extinction occurs did not stem from any extinctions taking place at that time, but rather from the discovery of fossil species, which people gradually came to accept no longer existed anywhere in the world.

In Orthodox Jewish circles, one can still find people who believe that species do not become extinct. In 1992, when I was at *yeshivah* in England, the *mashgiach* of the *yeshivah* claimed in a lecture that conservation is a waste of time and energy, since God does not allow any species to become extinct. He based himself on various sources from the *Rishonim* that I shall later discuss. At the time, I asked him about the dodo and other such animals, and he insisted that they must all be hiding somewhere deep in the jungle.

Historically, there were several reasons why extinction was thought to be impossible. In this paper, I shall discuss all these reasons and explore which of them are found amongst Jewish thinkers, as well as in the non-Jewish world.

1 Was submitted to Dr. Shlomo Glicksberg as part of a degree at the Lander institute.

2 See, Rabbi Menachem Slae, *Chayto Aretz*, Jerusalem, Shem Publishing 1988, pp. 37-43.

3 Martin J. S. Rudwick, *Georges Cuvier; Fossil Bones, and Geological Catastrophes*, The University of Chicago Press, 1997, pp. 22-24.

It may seem that classic Judaism was fully accepting of the concept of extinction, since there were animals described in the Talmud and Midrash that no longer existed. The *tachash* and *shamir* are both described as creatures that were utilized for the *Mishkan/Mikdash* and are no longer extant. However, careful study reveals that they were not considered to be regular species that have become extinct. Rather, they were considered to have been animals that were specifically created for a purpose and removed once they had fulfilled their function: they were not considered part of the natural order.⁴ Furthermore, it is not even clear that they are considered to have become extinct; rather, they are described as being “hidden away.”

A Complete and Perfect World

In the eighteenth century, when the fossils of many unknown species were being discovered, the American president Thomas Jefferson (1743-1826) argued that these species must still exist in unexplored parts of the world. His reason was that the wondrous nature of the natural order and its apparent zeal for maintaining itself surely indicates that it has been set up in such a way as to rule out extinction:

The movements of nature are in a never-ending circle. The animal species, which has once been put into a train of motion, is still probably moving in that train. For if one link in nature's chain might be lost, another and another might be lost, till this whole system of things should vanish by piece-meal; a conclusion not warranted by the local disappearance of one or two species of animals, and opposed by the thousands and thousands of instances of the renovating power constantly exercised by nature for the reproduction of all her subjects, animal, vegetable, and mineral.⁵

In one of his works, he listed the (extant) mammals of America and included the mammoth in this list. Aware that others would challenge this inclusion, he explained why he was confident that it must still exist:

It may be asked why I insert the Mammoth [into a list of American mammals] as if it still existed? I ask in return, why I should omit it, as if it did not exist? Such is the economy of nature that no instance can be produced, of her having permitted any one race of her animals to become extinct; of her having formed any link in her great work so weak as to be broken. To add to this, the traditional testimony of the Indians, that this

4 Regarding the *tachash*, it is said that “The Holy One created a sort of kosher wild animal for Moses in the wilderness, and once the work of the Tabernacle had been done with it, it was hidden” (Talmud Yerushalmi, *Shabbos* 2:3). The *shamir* is described as having been created on the eve of the first Shabbat of creation (Mishnah, *Avos* 5:6), which indicates that it was for the specific purpose of being used in the Mikdash.

5 Jefferson T. “A Memoir on the Discovery of certain Bones of a Quadruped of the Clawed Kind in the Western parts of Virginia,” *Transactions of the American Philosophical Society* 4 (1799) pp. 255-6

animal still exists in the northern and western parts of America, would be adding the light of a taper to that of the meridian sun.⁶

Jefferson was so determined to prove that allegedly extinct species still survived that one of the reasons he sent Lewis and Clark on their famous expedition was to find living mammoths and mastodons.⁷

Many centuries earlier, Maimonides also claimed that species do not become extinct. Based on his understanding of a verse in *Kohelet* and other sources, including Aristotelian concepts of the stability of nature, Maimonides claimed that the world must always exist in the same state:

וכבר זכר גם כן שלמה, שאלו מעשי האלוה - רצוני לומר, העולם ומה שבו - עומדים על טבעם לנצח, ואף על פי שהם עשויים - אמר, "כי כל אשר יעשה האלוקים הוא יהיה לעולם, עליו אין להוסיף וממנו אין לגרוע" - הנה כבר הגיד בזה הפסוק, שהעולם - ממעשה האלוה, ושהוא נצחי; ונתן העילה גם כן בנצותו, והוא אמרו, עליו אין להוסיף וממנו אין לגרוע' - שזוהי עילה להיות 'יהיה לעולם' - כאילו אמר, כי הדבר אשר ישתנה אמנם ישתנה מפני חסרון שיש בו - וישולם, או תוספת בו, אין צורך אליה, ותחסר התוספת ההיא; אמנם פעולות האלוה, אחר שהם - בתכלית השלמות, ואי אפשר התוספת בהם ולא החסרון מהם, ואם כן הם יעמדו כפי מה שהם בהכרח, שאי אפשר מביא לשינויים (ספר מורה נבוכים - חלק ב' פרק כ"ח).

Solomon himself has stated that these works of God, the Universe, and all that is contained in it, remain with their properties forever, although they have been created. For he says, "Whatever God does, it shall be forever: nothing can be added to it, nor anything taken away from it" (Eccles. 3:14). He declares in these words that the world has been created by God and remains forever. He adds the reason for it by saying, "Nothing can be added to it, nor anything taken from it;" for this is the reason for the perpetuity, as if he meant to say that things are changed in order to supply that which is wanting, or in order to take away what is superfluous. The works of God are absolutely perfect, admitting no addition or deduction, must remain the same for ever. It is impossible that anything should exist that could cause a change in them.⁸

6 Jefferson T. *Notes on the State of Virginia*, London: John Stockdale 1787, p. 52

7 Arlen J. Large, "Lewis and Clark meet the American Incognitum," in Robert A. Saindon, ed., *Explorations into the World of Lewis and Clark* Vol. II, Great Falls, MT: Lewis and Clark Trail Heritage Foundation 2003), p. 856.

8 Maimonides, *Guide for the Perplexed* 2:28, Jerusalem: Mossad HaRav Kook 1977, English translation by M. Friedlander, New York: Dover Publications 1956

According to Maimonides, since God's creation was perfect, it is not possible for either new species to appear or existing species to become extinct. The former would indicate that creation was lacking, and the latter would indicate that these species were not really necessary; either way, it would mean that creation was imperfect, which is impossible. Maimonides here may be incorporating the Aristotle's static view of the static nature of the universe; later, we shall explore another way in which Maimonides explicitly adopts Aristotelian doctrine that rules out extinction.

In 13th century Spain, a similar view was published in the *Sefer HaChinnuch*. The anonymous author writes that, since God created the world with absolute perfection, one should not attempt to add to the variety of species:

שלא נסרס אחד מכל המינין, לא אדם ולא בהמה ולא עוף... משרשי המצוה, לפי שהשם ברוך הוא ברא עולמו בתכלית השלימות, לא חסר ולא יתר בו דבר מכל הראוי להיות בו לשלימותו, והיה מרצונו ובירך בעלי החיים להיותם פרים ורבים, וגם צוה הזכרים ממין האדם על זה, למען יעמודו, שאם לא כן, יהיה המין כלה אחר שהמות מכלה בהם, ועל כן המפסיד כלי הזרע מראה בנפשו כמי שהוא קץ במעשה הבורא ורוצה כהשחתת עולמו הטוב: (ספר החינוך - מצוה רצא)

We may not castrate any species, neither man, animal nor bird... Of the roots of the commandment are that God created His world with the ultimate perfection, neither lacking anything nor possessing anything superfluous to anything that is needed for its perfection. And it was from His will to bless animals to reproduce, and He also commanded the males of the human species regarding this, such that they should perpetuate. For otherwise, the species⁹ would become extinct after death overtakes them. Therefore, someone who ruins the organ of reproduction demonstrates himself to be as one who disdains the work of the Creator and wishes to destroy His good world.¹⁰

While he does not explicitly state here that the perfection of the world means that animals cannot become extinct, it is certainly inferred that part of creation's perfection is that creatures are endowed with the ability to survive forever (later, we shall see that he explicitly negates the possibility of animals becoming extinct, but for different reasons). A similar position is found in Nachmanides' (1194-1270) comment to the verse stating that when God created the first species – plant life – He saw that it was good:

"וירא אלהים כי טוב" - קיום המינין לעד. (רמב"ן על בראשית פרק א' פסוק י"ב)

9 The Hebrew word *min* is not identical in meaning to the modern scientific term "species." Generally, although not always, *min* represents a broader system of classification. However, even with this broader meaning, there are still countless *minim* (i.e. families of animals radically different from those today) that have become extinct.

10 (Anon) *Sefer HaChinnuch*, "Mitzvah" 291

“And God saw that it was good” (Gen. 1:12) – the survival of species (is) forever.¹¹

Rabbi Moshe Chaim Luzzatto (Italy, 1707-1746) does not directly address the concept of extinction. However, he does note that every part of creation, which would include every species, is a necessary part of the whole:

חלקי הבריאה הזאת, מי שמביט עליהם לפי ראות עיניו, בתחלה לא יראם אלא ענינים מפורדים ומפורדים, פירוש, בלתי מתקשרים כולם אל תכלית אחת, אלא כל אחד ענין בפני עצמו, לתכלית מיוחדת... אך מי שיעמיק בחכמה, ימצא היות כל הנמצאות כולם מתקשרים קשר גמור זה בזה, שכולם צריכים להשלים הענין שאליו כיוונה החכמה העליונה בבריאה, וכולם מתקבצים לתכלית אחת, שתנאי רבים וסדרם עמוק מאד, והם הם כל חלקי הבריאה הרבים האלה. (ספר דעת תבונות – קכ"ח)

One who looks at the components of creation according to their superficial appearance, will at first see nothing other than scattered and disparate parts. That is to say, they are not connected to a single purpose, but rather every one is distinct, for a special purpose... but one who goes deeper in wisdom will find that all parts of creation are tied together with a proper knot, as they are all required to complete the concept that the Higher Wisdom intended with creation, and they are all united in a single purpose.¹²

Such a concept would serve well as a basis for conservationism – Ramchal anticipates the twentieth-century concept of the ecosystem. But it may also signify a belief that species simply cannot become extinct as it would be contrary to the goal of creation, which was implemented by the Higher Wisdom. This would apply to all species, even those that, to our eyes, appear superfluous:

Even things which appear to you to be superfluous in the world, such as flies, fleas and mosquitoes, are also part of the creation of the world, and God performs His operations through the agency of all of them, even through a snake, mosquito or frog.¹³

Of everything that the Holy One created in His world, He did not create anything in vain. He created the snail as a cure for scabs, the fly as an antidote for hornet stings, the mosquito as an antidote for snakebite, snakes as a cure for sores, and spiders as an antidote for the stings of scorpions.¹⁴

11 Nahmanides, “Bereshit, Chap. I v. 12” in *Commentary to the Torah*, Jerusalem: Mossad HaRav Kook 1996.

12 Rabbi Moshe Chaim Luzzatto, *Da'as Tevunos*, Jerusalem 1948, p. 128

13 *Midrash* “Bereishis Rabbah” 10:7

14 *Talmud*, “Shabbos” 77b. Cf. *Talmud Yerushalmi* (*Berachos* 64a), where Rabbi Nehoray states that these creatures serve no purpose, but when people sin. God says that since He sustains these useless vermin, He will

The line of reasoning that rules out extinction of any species is straightforward. God created a perfect world; He could not allow it to become damaged; every species contributes to this perfection;¹⁵ hence no species can become extinct.

The Great Chain of Being

The German philosopher Gottfried Leibniz (1646-1716), while allowing for *subspecies* to become extinct and for species to change somewhat, held that species extinction was impossible.¹⁶ For Leibniz, this was tied into the concept of the 'Great Chain of Being' – a major theme in classic and medieval thought, according to which there is a hierarchy from the lowest part of nature all the way up until God.¹⁷ Everything in the natural world must fit into this chain. Incorporated into this idea was the notion that the chain has to be complete – that there cannot be any discontinuous leaps, but rather the chain must be a smooth gradation from highest to lowest. This notion, also called 'the principle of plenitude,' was expressed by Plato, who claimed that every possible kind of creature (all of which can be fitted along the chain) *must* exist.¹⁸ Furthermore, as the eighteenth century poet Alexander Pope noted, a break in one link of the chain would render the entire chain broken:

Vast chain of being! which from God began,
Natures ethereal, human, angel, man,
Beast, bird, fish, insect, what no eye can see,
No glass can reach; from Infinite to thee,
From thee to nothing. On superior powers
Were we to press, inferior might on ours:
Or in the full creation leave a void,
Where, one step broken, the great scale's destroyed:
From Nature's chain whatever link you strike,
Tenth or ten thousandth, breaks the chain alike.¹⁹

also sustain mankind. The Talmud then records the response of Eliyahu, that these creatures do indeed serve a purpose, as per the medicinal purposes described here.

- 15 Cf. R. Avraham Yeshayah Karelitz (the "Chazon Ish"), *Emunah U'bitachon* 1:7: "Animals are of utility to man, such as an ox for a yoke and a donkey for a burden, and they prepare food for man, milk and eggs, and from some of them we obtain wool to wear, and some of them are themselves food for people... Some of them people do not benefit from, such as predatory animals, and snakes, and vermin, and insects; however they possess sublime necessity and benefit. Sometimes man is punished by way of them, and sometimes man learns wisdom and ethics from them. We are already used to their existence, and we feel that without them the world would be lacking, and the world is not beautiful and perfect except when there are predatory animals in it".
- 16 Lloyd Strickland, "How modern was Leibniz's biology?" in *Studia Leibnitiana* 37 (2005), pp. 186-207; Letter from Leibniz to Wilhelm Ernst Tentzel (3/13 August 1696), at <http://www.leibniz-translations.com/tentzel.htm> (URL accessed November 25, 2009); Thomas Lovejoy, *The Great Chain of Being*, Harvard University Press 1936, p. 256.
- 17 For full discussion, see Lovejoy.
- 18 Lovejoy, *ibid.* p. 50.
- 19 Alexander Pope, *Essay on Man*, Cassell & Company, 1891

Accordingly, it would not be possible for part of the chain to disappear, i.e. for a species to become extinct.²⁰ The Great Chain of Being is the creation of God, and it must endure forever.

In the Jewish world, the concept of the great chain of being was presented by Rabbi Meir Leibush ben Yechiel Michel (1809-1879), better known by the acronym Malbim:

Creation progressed from level to level; inanimate matter, plants, animals, and man. Everything that came earlier was a preparation for that which came later. After God established the luminaries – without which life could not survive – He gave instruction for the creation of animal life. It is known that also in rising up through the ladder of stages, creation did not proceed in discontinuous leaps, but rather through intermediate stages. Thus, coral is intermediate between inanimate matter and plants, polyps are intermediate between plants and animals, and monkeys are intermediate between animals and man. Similarly, every level rose in an order of lower to higher, as we have written with the formation of plant life, where it rose from herbage to grasses to trees. So too did it proceed with the formation of animal life...²¹

It is possible that Malbim based this idea on kabalistic sources regarding *hishtalshelut*. However, given Malbim's extensive schooling in secular studies, it is entirely plausible that he was utilizing the classic concept of the Great Chain of Being. While he does not explicitly link this point with a denial of extinction, elsewhere he *does* rule out extinction as a possibility, due to the assurance concerning all of God's creation:

לדור ודור אמונתך כוננת ארץ – וגם הארץ שאינה קיימת לעולם, כי צאצאי הארץ הווים ונפסדים שזה מרמז במלות לדור ודור, שהוא הזמן המתחלק בין דורות החולפים ומתחדשים, בכ"ז שם נצב אמונתך – שהיא ההבטחה שלא יכלו המינים, כמ"ש עושה פרי למינו, כל נפש חיה למינה, פרו ורבו, שצוה שיפרו וירבו וישארו המינים קיימים, וע"י האמונה הזאת כוננת ארץ ותעמוד. (מלבי"ם על תהילים פרק קי"ט פסוק צ' – חלק באור הענין)

“For generation upon generation, You established the earth with Your faithfulness” (Psalms 119:90). Even with regard to the earth, which does not exist forever – for the offspring of the land exist and die – as is alluded to with the words “for generation upon generation,” which is the period of divisions between the old and new generations – nevertheless, there You

20 Stephen M. Rowland, “Thomas Jefferson, extinction, and the evolving view of Earth history in the late eighteenth and early nineteenth centuries,” in *Geological Society of America Memoirs* (2009) v. 203, p. 227.

21 Malbim (Meir Leibush b. Yechiel Michel). “Commentary to Genesis 1:20”, in *Commentary to the Torah (HaTorah VeHaMitzvah)*, Bnei Brak: Mosdot Chassidei Alexander, 2000

have established Your faithfulness, which is the assurance that species will not become extinct, just as it states “making fruit according to its kind,” “every living creature according to its kind,” “be fruitful and multiply” – that He commanded that they should be fruitful and multiply and the species should remain in existence. And by way of this faithfulness, You established the earth and it endures.²²

Malbim sees the blessing “be fruitful and multiply,” as an assurance that animals will multiply and endure on the earth and that no species will ever become extinct. When this verse in Psalms speaks of God’s *emunah*, God’s faithfulness in establishing the earth, it is a reference to this assurance.

Providence for Species

Another factor in the belief that species cannot become extinct was the understanding of divine providence held by the *Rishonim* and *Acharonim*. This can perhaps be seen in the quintessential conservation story, the episode of Noah’s Ark: Why is it necessary to save the animals on a boat; surely God could simply create new ones? The implicit idea is that providence would take care of existing species and ensure that representatives of each species would survive the flood to repopulate the earth. The Book of Job also contains this idea. God’s speech from the whirlwind in response to Job’s complaints is to describe the great care with which He tends to the natural world. The implicit message is that God’s providence ensures the perpetual survival of all species. Malbim draws out this idea:

...והודיע איך השגחתו הפרטית משתרע על כל מעשיו, בין בבריאת המציאות בכלל, בין על כל בריה ביחוד, שישגיח על כל עניניו להמציא לו המזון והמעון, ולהשגיח על קיום מינו, הן בענין לידתו, הן בפרנסת ילדיו, וכ”ש שהשגחה זו תתפשט על האדם מבחר היצורים... (מלבי”ם על איוב פרק לז פסוק כד - חלק באור הענין)

God made known how His special providence extends upon all His creations, whether with regard to the creation of existence in its entirety, or with regard to each individual creation. For He cares for the needs of everything, to enable it to find sustenance and shelter, and to care for the survival of its species, whether with regard to its birth, or the sustenance of

22 Malbim to Psalms 119:90, *chelek be'or ha-inyan*. Similarly, in his commentary to Proverbs 30:18: “Who placed the power of procreation amongst all the animals, that by way of mating they can give birth in their image and form, and by way of this nature, the species are preserved in all creation... this is a divine command, that He established this in the entirety of the creation, for it is not part of the nature of the *hyuli* matter and the interaction of elements, only by way of the Creator of everything, in His desire, that He commanded and created them and established them for all eternity, that by way of this the species shall be preserved in existence.”

its young, and all the more so does this providence extend upon man, the most choice of creations.²³

Maimonides, in his lengthy discussions on providence, also explains that this means the perpetual survival of all species:

והדעת השני - דעת מי שיחשוב שקצת הדברים יש בהם השגחה והם בהנהגת מנהיג וסדר מסדר, וקצתם נעזב ומונח אל המקרה - וזה דעת אריסטו. ואני אבאר לך דעתו בהשגחה, הוא רואה שהאלוה ית' משגיח בגלגלים ומה שבהם - ומפני זה התמידו אישיהם על מה שהם עליו. וכבר כתב אלכסנדר ואמר, שדעת אריסטו - שהשגחת האלוה תכלה ותפסק אל גלגל הירח. וזה סעיף משרשו בקדמות האולם - שהוא חושב שההשגחה היא כפי טבע המציאות - אם כן אלה הגלגלים ומה שבהם, אשר אישיהם מתמידים, ענין ההשגחה בהם הוא התמדתם על ענין שלא ישתנה; וכמו שהתחייב ממציאותם דברים אחרים, אין אישיהם מתמידי המציאות, אבל מיניהם, שפע גם כן מן ההשגחה ההיא מה שחייב השאר המינים והתמדתם, ואי אפשר השאר אישיהם.

...והראיה על היות שאר בעלי החיים בלתי מושגח בהם, רק במין ההשגחה אשר זכר אותה אריסטו - מאמר הנביא... ולא תחשוב שזה הדעת יסתור אותו אמרו, "נותן לבהמה לחמה וגו'", ואמרו, "הכפירים שואגים לטרף וגו'", ואמרו, "פותח את ידיך ומשביע לכל חי רצון", ומאמר ה'חכמים' גם כן, "יושב וזן מקרני ראמים ועד ביצי כינים". והרבה כמו אלה המאמרים שתמצאם, ואין בהם דבר סותר דעתי זה, כי אלה כולם - השגחה מינית, לא אישית, וכאילו הוא מספר פעולותיו ית' בהכינו לכל מין מזונו ההכרחי וחומר עמידתו. וזה מבואר נגלה. וכך רואה אריסטו שזה המין מן ההשגחה הכרחי נמצא, כבר זכרו גם כן אלכסנדר בשם אריסטו - רצוני לומר, הכנת מציאות מזון כל מין לאישיו - ולולא זה היה המין אבד, בלא ספק; וזה מבואר במעט הסתכלות. (ספר מורה נבוכים - חלק ג' פרק י"ז)

The second theory is that whilst one part of the Universe owes its existence to Providence, and is under the control of a ruler and governor, another part is abandoned and left to chance. This is the view of Aristotle about Providence, and I will now explain to you his theory. He holds that God controls the spheres and what they contain: therefore the individual beings in the spheres remain permanently in the same form. Alexander has also expressed it in his writings that Divine Providence extends down to, and ends with, the sphere of the moon. This view results from his theory of the Eternity of the Universe; he believes that Providence is in accordance with the nature of the Universe: consequently in the case of the spheres

23 Malbim to Job 37:24, *chelek be'or ha-inyan*.

with their contents, where each individual being has a permanent existence, Providence gives permanency and constancy. From the existence of the spheres other beings derive existence, which are constant in their species but not in their individuals: in the same manner it is said that Providence sends forth [from the spheres to the earth] sufficient influence to secure the immortality and constancy of the species, without securing at the same time permanence for the individual beings of the species.

...The view that other living beings are only governed by Divine Providence in the way described by Aristotle, is supported by the words of the Prophet... Our opinion is not contradicted by Scriptural passages like the following: "He gives food to the beast" (Ps. 147:9); "The young lions roar after their prey, and seek their meat from God" (Ps. 104:21); "You open Your hand, and satisfy the desire of every living thing" (Ps. 145:16); or by the saying of our Sages: "He sits and sustains everything, from the horns of *re'emim* to the eggs of lice." There are many similar sayings extant in the writings of our Sages, but they imply nothing that is contrary to my view. All these passages refer to Providence in relation to species, and not to Providence in relation to individual animals. The acts of God are as it were enumerated; how He provides for every species the necessary food and the means of subsistence. This is clear and plain. Aristotle likewise holds that this kind of Providence is necessary, and is in actual existence. Alexander also notices this fact in the name of Aristotle, viz., that every species has its nourishment prepared for its individual members; otherwise the species would undoubtedly have perished. It does not require much consideration to understand this.²⁴

If we look at how some *Rishonim* explained certain *mitzvot* as preventing 'conceptual extinction,' we also see how providence would have been linked to the idea that God would never allow a species to become extinct:

"If you happen across a bird's nest..." (Deuteronomy 22:6) – this commandment is also clearly similar to "It and its young (you shall not slaughter on the same day)" (Leviticus 22:28). For the reason with both of them is that we should not have a cruel heart that does not have compassion. Alternately, Scripture does not permit us to engage in destruction, to uproot a species, even though it did allow the slaughter of animals of that species. And if one kills a mother and young on one day, or takes them both together when they could have flown away, it is as though he is exterminating that species.²⁵

24 Maimonides, *Guide for the Perplexed* 3:17

25 Nachmanides, Deuteronomy 22:6; also Rabbeinu Bechaya ad loc.

Nachmanides equates killing both mother and young with exterminating an entire species. The reasoning behind this appears to be that killing both mother and young reflects a lack of care for the perpetuation of the species. In other words, according to Nachmanides and Rabbeinu Bechaya, there is an equivalence between not caring about the perpetuation of a species, and bringing about its annihilation. But this would presumably also work the other way around. Accordingly, for God to allow a species to become extinct would mean that He does not care about the species, which is inconsistent with the classic understanding of God.²⁶

Many rabbinic opinions state that animals only have identity in terms of the species, not the individual, with regard to Divine Providence. Therefore, it only 'matters' if the *species* is surviving, not if any given *individual animal* is surviving.²⁷ At first glance, providence for species seems to work differently than providence for individuals. Providence for individuals clearly does not mean that those individuals live forever, whereas providence for species seems to mean that those species will endure forever. This is what emerges from Ramchal's discussion of providence:

ואמנם בהיות שנשתנה המין האנושי מכל שאר המינים, שניתנה לו הבחירה והיכולת במה שהוא לו קניית שלימות או חסרון, ונמצא בבחינה זו פועל ומניע ולא נפעל, גם ההשגחה עליו מוכרח שתשתנה מההשגחה על שאר המינים, הנא יצטרך להשגיח ולהשקיף על פרטי מעשיו, להמציא לו כדרכו וכפרי מעלליו... וזה ממה שאין שייך בשאר המינים, שאישיהם נפעלים ולא פועלים, ואינם אלא כפי מה שראוי לתשולם המין ההוא כפי מה שהושרש בשורשו. שהנה תהיה ההשגחה לקיים השורש ההוא וענפיו... (ספר דרך ה' - חלק ב' פרק א' - בענין השגחתו ית' בכלל)

Now, inasmuch that the human species is different from all other species, that it has been granted the choice and the ability in acquiring perfection or deficiency, and in this respect it exerts influence and cause rather than being influenced, so too the providence upon it must be different from the providence upon other species. It must concern itself and observe every detail of his actions, providing for him according to his ways and according to the fruits of his actions... And this is not relevant with other species... where [providence] is only applicable as necessary for the completion of

26 Cf. Nachmanides in his commentary to Leviticus 19:19: "The reason for the prohibition of cross-breeding is that God created all the species of the world, every living thing amongst the plants and among the moving creatures, and He gave them the ability to reproduce, so that those species should survive forever, as long as the Blessed One desires the existence of the world. And He directed this power that they should produce after their own kind, and should never change, as it says with all of them 'after its kind' (Genesis 1)."

27 Maimonides, *Guide For The Perplexed* 3:17; *Sefer HaChinnuch Mitzvos* 169, 294, and 545. Others state that Divine Providence also extends to individual creatures; see R. Yitzchak Abuhav, *Menorat HaMaor, Klal Shlishi*, Chapter 3.

that species, in accordance with that which is entrenched in its root—that the providence serves to maintain that root and its branches...²⁸

However, this difference is illusory. Providence for individuals means that the individual is looked after until it reaches the end of its allotted time in this world. The same is true for species: providence means that they are looked after for the duration of their time in this world. Ramchal makes this clear earlier:

א. ידוע ומבואר הוא, שכל הנבראים כלם שנבראו, בין העליונים ובין התחתונים, הנה נבראו לפי שראתה בהם החכמה העליונה צורך ותועלת למה שהוא התכלית הכללי של הבריאה. וכל חוקותיהם ומשפטיהם הטבעיים הוחקו והוטבעו כפי מה שגזרה החכמה העליונה היותו נאות לפי הכונה שכוונה בנברא ההוא. ואולם מאותו הטעם עצמו שנבראו, ראוי גם כן שיתקיימו כל זמן היות בם תועלת לכלל הבריאה כמ"ש. ועל כן האדון ב"ה שברא כל הנבראים האלה, לא ימנע גם כן מלהשגיח עליהם לקיימם באותו המצב שהוא רוצה אותם בו: (ספר דרך ה' - חלק ב' פרק א' - בענין השגחתו ית' בכלל)

It is known and clear that all the creations that were created, whether in the upper or lower regions, were created because the Higher Wisdom saw a need and benefit for the general purpose of creation. And all the rules and natural laws were enacted and established according to what the Higher Wisdom decreed would be appropriate for the intent with each creation. And for the very reason that each thing was created, it is fitting that it should also endure for as long as it has a benefit for the totality of creation, as we have written. And therefore the Master, Blessed is He, Who created all these creations, does not refrain from caring for them, to keep them in existence in the state in which He wants them to be.²⁹

The difference between providence for individuals and that for species is that for species, the duration of their existence is not limited. Furthermore, to conform with Ramchal's concept of the unity of creation, which we discussed earlier, presumably there is no point at which a species becomes of no benefit to the rest of creation. Each species is always an integral part of creation, and therefore providence will always ensure that it is preserved.

An even more explicit statement that God's providence prevents the possibility of extinction is found in the *Sefer HaChinnuch*:

מצות שלוח הקן: לשלח האם מן הקן קודם שיקח הבנים, שנאמר [דברים כ"ב, ז'], שלח תשלח את האם ואת הבנים תקח לך: משרשי המצוה לתת אל לבנו שהשגחת

²⁸ Ramchal, *Derech Hashem* 2:1:3

²⁹ Ramchal, *Derech Hashem* 2:1:1

האל ברוך הוא על בריותיו במין האדם בפרט... ובשאר מיני בעלי חיים במינין דרך כלל, כלומר שחפצו ברוך הוא בקיום המין, ועל כן לא יכלה לעולם מין מכל מיני הנבראים, כי בהשגחת החי וקיים לעד ברוך הוא על הדבר ימצא בו הקיום, ובהניח האדם דעתו על זה יבין דרכי ה' ויראה כי המשכת קיום המינין בעולם שלא כלה ואבד אחד מכולם מביצי כנים ועד קרני ראם מיום שנבראו הכל במאמרו וחפצו על זה. וכמו כן ידע האדם כי אשר ישמור מצוות בוראו ויישיר כל דרכיו והוא נקי כפים ובר לבב תהיה השגחת האל עליו ויתקיים גופו זמן רב בעולם הזה ונפשו לעד לעולם הבא, (ספר החינוך - מצוה תקמה)

One must send the mother from the nest before taking the young, as it says, "You shall send away the mother, and take the young for yourself" (Deuteronomy 22:7). Among the roots of this commandment is that we should internalize that God's providence is upon all of His creatures; amongst the human race, with individuals... and with other types of animals, with the species as a whole. That is to say, **the desire of God is for the survival of the species, and therefore no species shall ever become extinct** from all the species of creatures, for through the providence of the Living and Eternal upon something, it finds its survival. And when a person gives thought to this, he understands the ways of God, and realizes that the continued existence of species in this world – that **not one of them, from the eggs of lice to the horns of *re'emim*, has ever become extinct**, from the day that all were created – is via His word and desire for it. And likewise, a person comes to know that if he observes the commandments of his Creator and is straight in all his ways and is innocent and pure-hearted, God's providence will be upon him, and his body will live long in this world and his soul in the next world.³⁰

God's providence was a bedrock of people's faith. This would have been especially true for Jews, who could never take their survival for granted. It was only to be expected that the religious worldview would develop a model of God's benevolent providence that would not allow for a species to die out entirely.

A New Model: Different Worlds

By the end of the eighteenth century, it gradually became undeniable that some species had indeed become extinct. The fossils of gigantic dinosaurs and mammoths were discovered in ever-increasing numbers; and with few parts of the world left unexplored, it seemed unlikely that these still existed somewhere. How was this to be reconciled with the aforementioned theological beliefs in the impossibility of extinction?

30 *Sefer HaChinnuch*, Mitzvah 545

Rabbi Naftali Tzvi Yehudah Berlin (Netziv, 1817-1893) justified the extinction of dinosaurs on the grounds that they were not naturally-occurring creatures, but rather the results of sinful cross-breeding experiments by the generation of the Flood.³¹ He does not explicitly say why he addresses the nature of their existence, but it seems that it was indeed to account for the question of how God could permit creatures to die out entirely.

However, in general, the initial nineteenth century method of reconciling the extinction of dinosaurs and mammoths with theology was to relegate all such creatures to previous eras – stages in God's creation that He had catastrophically destroyed and replaced with our own world. This has been described as the emergence of the 'former worlds' paradigm.³² Rabbi Yisrael Lipschitz (1782-1860), author of the *Tiferes Yisrael* commentary on the Mishnah, presented this view at length:

דאמרי' בב"ר. ויהי ערב ויהי בוקר ודק' וכי מאחר שלא היה עדיין שמש בעולם, ערב ובוקר מניין? א"ר אבוה מכאן שהי' סדר זמנים קודם לזה וכו', מלמד שהי' הקב"ה בונה עולמות ומחריבן, בונה עולמות ומחריבן ואמר דין הניין לי ודין לא הניין לי: וכדי למסור לנו הבטה והשקפה עגולית על כל הענין, גלה לנו רבינו בחיי סוד נעלם בשם המקובלים בפרשת בהר, בפסוק ושבתה הארץ שבת לה' וגו', דזה ירמוז על סוד נפלא, שיהיה העולם נבנה ונחרב ז' פעמים, כנגד ז' שמיטות שביובל, שהם יחד מ"ט אלפים שנה. וכתב עוד, שבכל שמיטה ושמיטה הנ"ל, יהיה העולם נברא בהשלמה יתירה יותר מבתחילה...

...ועתה אחי ידידי ראו על איזה בסיס אדני תה"ק מונחים, כי הסוד הזה שנמסר לאבותינו ורבותינו, והם גלוהו לנו זה כמה מאות שנים מצאנוהו שוב שהטבע ברורה לעינינו בזמנים המאוחרים כבזמנינו הבהירה ביותר. דהרוח המשתוקק שבאדם, החפץ לגלות כל העלומות, חקר וחקר ויחפש כחולדה בקרבים של האדמה בהרים היותר גבוהים שבעולם בהרי *פירענען* *ובקארפאטישען* *געבירגען*, ובהרי קארדיללען באמעריקא, ובהרי היממעל, בגבול כינא, חפרו וחתרו ומצאו שכולין נתהוו ע"י פדרי סלעים נוראים שמונחים כאילו הושלכו בלי סידור זה על זה בכח חזק ונורא, ותלויים תלולים זה על זה על רוחב שיערה עד שלא ישוער שנתהווה כזאת רק ע"י *וועלטען* *רעוואלוטציאן* שהיה פעם א' על ירו ית' הגוער בארץ ותתהפך כרגע:

עוד לא הסתפקו בזה כ"א גם חתרו במעמקי ארץ ובקרכיה איזה מאות קלאפטור עמוק החת פני העליון של הארץ חפשו בבערגווערק, ומצאו תוך עובי האדמה ד' סדרים וכל אחת למעלה מחבירתה כל א' מין אדמה אחרת, ובין סדר לסדר מונחים

31 Netziv, *Haamek Davar*, Genesis 7:23.

32 Rowland, p. 229.

ברואים שנתקשו ונתהוו *בתוארם לאבן אשר משם הוכיחו שהארץ נתהפכה ונחלפה פניה כבר ד' פעמים...

וכן מצאו בשנת אלף והת"ז למספרם, במדינת [זיביריען] בקצה צפון של העולם תחת הקרח הנורא אשר שם תמיד, פיל א' גדול מאד בכמו ג' או ד' פעמים מאשר מצאנו עתה... וכ"כ ימצאו במעמקי ההרים היותר גבוהים בארץ, חיות הים אשר נתקעו והיו לאבן, וחכם אחד חוקר טבעי קופיער שמו, כתב שמכל ע"ח מיני חיות שמצאו בתחתיות הארץ יש מהן מ"ח מינין שאינם נמצאים כלל בעולם העתיי... מכל האמור נראה ברור שכל מה שמסרו לנו המקובלים זה כמו מאות שנים, שכבר היה עולם פ"א ושוב נחרב וחזר ונתקומם זה ארבע פעמים, ושככל פעם העולם התגלה בשלימות יתירה יותר מבתחלה, הכל התברר עכשיו בזמנינו באמת וצדק.

...As regards the past, Rabbi Avahu states at the beginning of *Bereishis Rabbah* that the words "and it was evening, and it was morning" indicate that there was a series of epochs before then; the Holy One created worlds and destroyed them, approving some and not others. The Kabbalists expanded upon this statement and revealed that this process is repeated seven times, each Sabbatical cycle achieving greater perfection than the last...

We are enabled to appreciate to the full the wonderful accuracy of our Holy Torah when we see that this secret doctrine, handed down by word of mouth for so long, and revealed to us by the Sages of the Kabbalah many centuries ago, has been borne out in the clearest possible way by the science of our generation. The questing spirit of man, probing and delving into the recesses of the earth, in the Pyrenees, the Carpathians, the Rocky Mountains in America, and the Himalayas, has found them to be formed of mighty layers of rock lying upon one another in amazing and chaotic formations, explicable only in terms of revolutionary transformations of the earth's surface. Probing still further below the earth's surface, geologists have found four distinct layers of rock, and between the layers fossilized remains of creatures. Those in the lower layers are of monstrous size and structure, while those in the higher layers are progressively smaller in size but incomparably more refined in structure and form.

Furthermore, they found in Siberia in 1807, under the eternal ice of those regions, a monstrous type of elephant, some three or four times larger than those found today...

Similarly, fossilized remains of sea creatures have been found within the recesses of the highest mountains, and one natural scientist, Cuvier, has calculated that of every 78 species found in the earth, 48 are no longer found in our present epoch...

From all this, we can see that all that the Kabbalists have told us for so many years about the repeated destruction and renewal of the earth has found clear confirmation in our time.³³

While R. Lipschitz is not addressing the theological issues of extinction per se, his approach was the same as those in the non-Jewish world who were addressing these issues. Relegating extinct species to prior epochs in history, catastrophically destroyed by acts of God in creating a new and better world, enabled these extinctions to be theologically acceptable.

Extinction as being Providentially Arranged

Gradually, evidence emerged that, not only had extinction occurred many eons ago, but even in human history. The first modern species recognized to have become extinct was the dodo. This large, fat and flightless bird prospered on the remote island retreat of Mauritius where there were no predators. But when Mauritius was discovered by man, the dodo was an easy source of meat and it was doomed. Adults dodos were easily killed by people, while introduced pigs, rats and monkeys raided their nests for eggs. Within a century of their discovery, there were none left. An early nineteenth century magazine, upon including an article about the extinction of the dodo, prefaced the article with a fascinating editorial footnote:

We are aware that the destruction or total extinction of any of the species of animals of contemporaneous creation with man, is a point of much controversy among philosophers. The best reply to this doubt is the repeated discovery of the fossil remains of animals entirely different from the existing species; proving their extinction to form a part of the scheme of creative wisdom.³⁴

The editor insists that extinction has taken place, but carefully notes that it was “part of the scheme of creative wisdom”, i.e. divinely ordained. In the article, there is a reference to a paper by John Vaughan Thompson, a naturalist who searched in vain for dodos in Mauritius. Thompson elaborates upon the divine providence that would have been involved in the extinction of this species:

33 Rabbi Yisrael Lipschitz, “Derush Ohr HaChaim” in *Mishnayot Nezikin*, Danzig, 1845.

34 Todd, Mabel Lewis. “The Dodo,” in *The Mirror of Literature, Amusement and Instruction*, vol. 20 no. 575, London: J. Limbird, 1832, p. 311

(Dodos are) the only vertebrated animals which we can make certain of having lost since the creation. If we seek to find out what link in the chain of Nature has been broken by the loss of this species, what others have lost their check, and what others necessarily followed the loss of those animals which alone contributed to their support, I think we may conclude that, the first (extinction) being seen by the Omniscient Creator, at least no injury will be sustained by the rest of the creation; that man, its destroyer, was probably intended to supplant it, as a check; and that the only other animals which its destruction drew with it, were the intestinal worms and pediculi peculiar to the species.³⁵

The only way that extinction would not present the theological problems described earlier was if it could be understood as being itself part of the perfection of creation. In other words, it may be considered to be part of God's plan that species are gradually replaced by other species. But if extinction is widespread and occurs at many points in history, then it suggests that the disappearing species are replaced by a host of new ones, which in turn suggests the idea of evolution. All this requires a radical overhaul of one's understanding of the nature of God's creation; but such an understanding can be found in the writings of Rabbi Avraham Yitzchak Kook:

The evolutionary way of thinking, so popular as a result of recent scientific studies, has caused considerable upheaval among many people whose thought had been wont to run in certain regular, well-defined paths. Not so, however, for the select, hard-thinking few who have always seen a gradual, evolutionary development in the world's most intimate spiritual essence. For them it is not difficult to apply, by analogy, the same principle to the physical development of the visible world... Evolution itself, moving upwards coordinately and undeviatingly from the lowest to the highest, demonstrates most clearly a pre-vision from afar—a pre-set purpose for all existence. Divine greatness is thereby enhanced and all the goals of faith confirmed, and trust in and service of the divine is all the more justified... Since all strives upwards and man has it in his power to improve and perfect himself and his world, he is manifestly thereby doing the will of his creator. Spiritual perfection is thus seen to be in the center of all existence....³⁶

With medieval Jewish understandings of God creating a perfect world, extinction was not possible. Only the transformation attempted by R. Kook makes possible the idea that species can become extinct as part of the natural order.

35 Thompson, "Contributions towards the Natural History of the Dodo," *Magazine of Natural History and Journal of Zoology, Botany, Mineralogy, Geology and Meteorology*, vol. II, 1829, p. 448

36 Kook, Rabbi Avraham Yitzchak, *Orot Ha-Kodesh*, Jerusalem: Mossad HaRav Kook, 1985, pp. 559, 565

Man's Fault, Not God's Plan

The concept of species becoming extinct as part of the natural order of things, as part of the ongoing evolution of life on earth, can be incorporated into the Jewish worldview via R. Kook's approach. But what about extinction that occurs as a result of reckless destruction by humans? Mankind's hunting, destruction of natural habitats and pollution have caused the overwhelming majority of extinctions in the last millennia, most of which have occurred within the last century. This indicates that man has the power to harm the perfection of God's creation, which itself could indicate a deficiency in God's creation – that He did not make it 'damage-resistant.' How are such extinctions to be reconciled with Jewish theology?

There is a Midrash, which assists here. God did not render His creation impervious to permanent damage through man's inappropriate implementation of free will. The Midrash presents precisely this point as being part of man's responsibility in this world:

“Look at the work of God, for who can rectify that which he has damaged” (Ecclesiastes 7:13) – At the time when God created Adam, He took him around the trees of the Garden of Eden, and He said to him, “Look at My works, how beautiful and praiseworthy they are! Everything that I created, I created for you; take care that you do not damage and destroy My world, for if you damage it, there is no one to repair it afterwards!”³⁷

There is, perhaps, a tension between this Midrash and the classic/medieval notions of providence and perfection. God provides and cares for all species within the context of the natural order; but He does not prevent them from being permanently destroyed by man's irresponsible behavior. Yet, this is what the Midrash presents as the awesome responsibility placed upon man's shoulders.

Conclusion

Outside the *yeshivah* that I attended, few people today are aware that medieval Torah scholars denied the possibility of extinction. But the theological worldview upon which this denial was based is still prevalent. There is a trend in contemporary ultra-Orthodox circles to deny the existence of global warming.³⁸ One factor of many may be the belief that God will ensure that the world will stay the way He wants it,³⁹ and thus we need not take responsibility.

37 *Midrash Koheles Rabbah* 7:19

38 Jonathan Rosenblum, “The Global Warming Hustle,” *Yated Ne'eman*, August 29, 2007; “Who are the Real Empiricists?” *Yated Ne'eman*, September 2, 2009; Avi Shafran, “The People Problem,” <http://www.cross-currents.com/archives/2009/10/16/the-people-problem>.

39 Cf. Shafran, writing that global natural disasters have been averted by “human creativity and Divine guidance.”

The *Sefer HaChinnuch* insisted that no creature, “from the eggs of lice to the horns of *re'emim*,” has ever become extinct. His phraseology is based on a saying that appears in the Talmud:

יושב וזן את כל העולם כולו מקרני ראמים עד ביצי כנים (תלמוד בבלי מסכת
עבודה זרה דף ג/ב)

God sits and sustains everything from the horns of *re'emim* to the eggs of lice.⁴⁰

The *re'em* is the aurochs, *Bos primigenius*. Aurochsen were the huge and wild ancestors of domestic cattle.⁴¹ As the most powerful animals in Biblical lands, they represented the upper extreme of God's all-powerful abilities to sustain the world. God is not only careful to maintain the perpetual survival of the tiniest creatures; He is also powerful enough to maintain the perpetual existence of the *largest* creatures.

But aurochsen went extinct in 1627...

The medieval Torah scholars who denied the possibility of extinction were tragically mistaken. From the eggs of dodos to the horns of aurochsen, countless species *have* become extinct. Accepting the reality of extinction requires one to modify the classic and medieval understanding of God's creation in two ways. First, it requires one to replace the notion of creation as a static model expressing perfection with a dynamic model in which the beauty and magnificence of creation is expressed in its continual evolution. Second, it requires one to accept that God has given man the choice and ability to harm this plan. But only with such an evolution in our theology will conservation become accepted as important.

Additional references

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⁴⁰ *Avodah Zarah* 3b

⁴¹ Menachem Dor, *HaChai BiYmei HaMikra, HaMishnah VeHaTalmud*, pp. 37-38; Yehuda Feliks, *Nature and Man in the Bible*, p. 263.