

Toldot Mazzaroth

תולדות מזרות

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A Note Concerning Dates and Years

In the material that follows, years are represented according to the Terran (earthly) Jewish quasi-lunar calendar, which for most of history was the only widely accepted Jewish system of time.

As has long been the convention among scholars and commentators who recognize the applicability of *halachot* in extra-Terran environments, all such dates are preceded by the symbol [t]. Similar notations exist for other calendars, including Chen's Martian calendar [m] and Wilk's own Universal Pan-Galactic calendar [u] — though neither appear herein. Though she takes no credit in her introduction, the standardization of dates in what follows is due to Rabbi Dr. Isha Cohen of the Terran Theological Institute, Judaism Section.

Introduction by Rabbi Dr. Isha Cohen, TTI-J

The remarkable life of Dovid Wilk began on 3 Tevet [t] 5883 in Brooklyn, New York and ended 17 Kislev [t] 5974 st Colonia Charlie, Mars. Of all the various writings he produced in the second half of his long life, his *Toldot Mazzaroth* is both the most recognized and least understood. The misunderstanding springs from two sources: the unusual character of Wilk himself, and the strange history of the *Toldot* itself. Dovid Wilk is best known to Jewish history as the co-inventor of a universal pan-galactic *halacha* of time. His theological and legal output, most of which is still suppressed by home-planet religious authorities, is dense, technical and rather adventurous in form and thus has tended to daunt the casual reader and scholar alike (if for different reasons.) Wilk's *Toldot Mazzaroth*, though not devoid of these characteristics, is his most accessible work. Its partial publication in [t] 5968 caused a minor stir in the Jewish world, but it has nonetheless never appeared in its fullness according to Wilk's original design — an injustice which the present edition seeks to remedy.

As this new, complete version of Wilk's *Toldot* demonstrates, the author finds his true readership not in the halls of our universities or yeshivas, but in the warm circle of the storyteller. Both here and in the longer *Sefer Ma'adim* (essentially a journal Wilk kept during his life-defining journey to Mars) the reader may learn much about Wilk's personal and spiritual character. For though he eschewed all honorifics and labels throughout his extra-Terran life and career, he can be seen as our first out-world *maggid* — a tale-weaver, a connector of ideas and a guardian of the soul of

the Jewish people during our most daunting journey since the sojourn in the desert — our passage to the stars.

Dovid Wilk was educated in applied physics at Yeshiva University and MIT. Though an engineer and inventor by early occupation, he was a lifelong student of Jewish law and ideas, producing his first religious writings in his early thirties. His research in the area of macrostructural and dynamic physics allowed him to contribute significantly to the underlying science of orbital crane and ion-drive technology that defined his era. Widowed in his forties, Wilk was devastated by a second tragedy before his fiftieth birthday when his only son Jonathan, at the time beginning a promising career as a volcanologist, was killed on the slopes of *Olympus Mons* while on a scientific mission. Consumed by despair and a deep sense of obligation to ensure a religious burial for his son, Wilk ventured to Mars in person to organize the difficult arrangements. As is recalled in his *Sefer Ma'adim*, neither he nor the remains of his son ever returned, and thus was the purpose of Wilk's life — and indeed the entire course of extra-Terran Judaism — forever altered.

For the present, however, it suffices to note that among the students and rag-tag galactic neo-Hasidim who eventually formed a circle around our author and his own teacher, Rabbi Roberta Chen, Dovid Wilk came to be known affectionately as the *Amazoner* — a reference to the expansive Martian plain that became his home and the center of his scholarship. Though not actually a Rabbi, Wilk remains the only non-earthling to lend his name to any kind of Rabbinic dynasty. The merits of this remarkable pattern are left to the reader to ponder, but their

singularity in all of history cannot be denied. Wilk himself, it should be said, was deeply suspicious of the phenomenon of the ancient *rebbe* and steadfastly resisted the attempts of his followers to cast him in any such role.

Portions of *Toldot Mazzaroth* were published in [t] 5968 in the *The New New Yorker*, a popular literary magazine of New York City, America. This city, which was also Wilk's birthplace, was in this time still barely habitable, though environmental and societal conditions were rapidly deteriorating. In the era in question *The New New Yorker* was in the midst of a decade-long editorial project to center extra-Terran voices that would interest its rapidly diversifying, diasporic audience. Two brief mentions of notable material published in *The New New Yorker* during this period set an interesting historical scene for the *Toldot*. In the year before Wilk's piece appeared, the poet Mary English published her beautiful ode to the earliest terraforming experiments entitled *Greendorm*. Even more famously, Paul Akpan's *Cold Sleep* appeared only weeks before Wilk's *Toldot* — this long essay still represents our best contemporary, popular meditation on physiological stasis (now regarded as a rather barbaric vestige of the era, but in Wilk's day a daunting inhibitor and required element of interplanetary travel.)

The Hebrew word *toldot* (תולדות) means "generations" or "line" or also "lineage" and "tale". The word appears frequently in the Torah, often to signal a lengthy list of "begats" (so-and-so begat so-and-so) which the ancients used to relate the various chains of continuity between the eras and ancestries of the Jewish people. The word *mazzaroth* (מזרות) is by contrast more curious. It appears but once in the entire Hebrew Bible -- thus making it a *hapax legomenon*, or linguistic

singularity. Though such words are by definition black holes of meaning, usually devouring whatever definitional speculations scholars may throw their way, *mazzaroth* is commonly translated as “constellations.” It makes its cameo in the book of Job, chapter 38, where it is written:

Can you bring forth the constellations [מזרות] in their seasons, or lead out the Bear with its cubs?

What Wilk supposed this word to mean is not known. That said, it is perhaps reasonable to suspect that he may have had something like "cosmos" in mind, though he chose not to use that particular word in Hebrew despite's availability as a Greek loanword. In any case, the choice of *any* Hebrew rather than English title for a work otherwise written in English is certainly significant, and a proper translation of this particular title is difficult. *A Lineage of the Cosmos* is an inadequate, but workable, attempt.

The New New-Yorker published its version of the piece under a different title: *The Jews and the Stars*. At the same time it omitted over half of the material, preserving only Wilk's rather jaunty meditation on Israel and ancient cosmology (sections I-IV, a highly modified section V and a truncated section VII.) It simply deleted all of the blatantly mystical/ecstatic portions of the text, including the prayer which comprises part VI and both of the final two chapters, which acquire a polemical tone which must not have been palatable to the magazine. On one hand, this editorial approach served to provide focus to the piece as an accessible lineage of ideas, but on the other it

completely removed the *Toldot's* mystical underpinnings in a way that Wilk found entirely unsatisfactory.

To be sure, the piece (*qa* popular article) needed some sort of editing. It tends to meander and at times loses itself in a thicket of extra-textual references. It does not, even in its relative brevity, make for a quick read. One could spend much time tracing out the various tendrils that emerge from the later sections, which are packed full of ideas and fragments from across Jewish time and space. To be sure, it is a disappointment that few scholars have actually regarded the piece with enough seriousness to do this. In the present edition I have attempted to provide a set of notes that should help to guide the average reader through the religious and textual pointers that Wilk includes in the *Toldot* without drowning out the author's voice. But a deeper, contextual look at the *Toldot* and indeed the whole of Wilk's literary output remains to be written.

Let us nevertheless rejoice! For at its heart *Toldot Mazzaroth* is an exercise in Holy Joy — a *simcha* in words. It gleefully repudiates the kind of blind religious authority that was prevalent in Wilk's time, ecstatically argues that the pursuit of scientific truth is a *mitzvah* (an uncontroversial notion to most of us now, but a revolutionary idea in Wilk's day) and is even so bold as to entreat God and the Angel of Death to destroy humanity's central "error" — the blind pursuit of what Wilk's elsewhere calls "toxic continuity." In truth, at the time of writing the *Toldot*, Wilk himself was in need of all possible joy, balm and mettle. By the time of its composition his more formal scholarship had already been greeted poisonously by his Orthodox peers (recall that in the 60th century, Orthodoxy/non-Orthodoxy was still the prevalent dividing line within all of galactic

Judaism.) By this time, most of Wilk's various responsa were banned in Eretz Yisrael, and, broadly speaking, Wilk was regarded by the still-dominant Terran Haredi as at best a somewhat comical un-person and at worst a dangerous and heretical terrorist.

Dovid Wilk's response to this and other rejections was not despair but rather a gracious humor and a kind of mystical passion. For this reason alone, I commend the *Toldot* to any reader. In the face of death, personal exile and the obviously-poor prospects of his central religious project, Wilk reaches forward and backward in time with words of joy and wonder. In the irony and almost luxurious exultation of the *Toldot Mazzaroth*, he sketches a past-present-future in which the boundaries and strictures that bind the minds and spirits of the Jewish people fall away in the face of the pure awe of God's dream-story, which is to say our cosmos. And in so doing, Wilk provides us a sidelong glimpse of what he calls Cosmic Torah -- the unknowable, unreachable center of Jewish belief and identity. In the end, all of Israel is exhorted not only to hear, but to see -- to "look up and look out" -- to marvel at the miracle of the Jewish People's continued survival in this infinitely mysterious cosmos.

A Note on the Text

Toldot Mazzaroth as presented here is adapted from Wilk's final draft as submitted to (but not published by) the New New-Yorker in [t] 5968, with minimal editorial modification from myself and with none of the edits imposed by the magazine some 150 years ago. Wilk's physical draft (written in pen and ink!) is permanently preserved in the TTI-J Martian Jewish Archive on

Station 14, and traces its origin to the bequest of Rabbi Roberta Chen Z”L, who inherited Wilk’s personal papers after his death. The text is original to Wilk, though I have made selective, though necessary, grammatical and spelling modifications.

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I Creation

Before God made a single human being, The Master of the Universe forged the sun and the moon and the planets and the stars. And God made the galaxies and the supernovae and the pulsars and black holes. And Elohim created dark matter and energy and all of the particles and sub-particles and elements and wave-particles of energy and matter of every kind — all were fashioned on that day.

Let us never forget this.

But let us return to the sun and the moon. These two emerged together, tangled but equally luminous like a celestial Jacob and Esau. And therefore the moon was jealous of the sun, and daring to approach the Cosmic Throne entreated:

“Can two kings wear one crown?”¹

Elohim sighed to themselves — creation was an exhausting business and anyway who had the time for pointless disagreements?

This, therefore, was the swift ruling of the Holy One on that day: that the moon should be dimmed, and its light should be reduced to one-tenth of the sun’s brilliance.

¹ Chullin 60b

And it was so.

In recompense, God further ruled that the moon should receive certain benefits and privileges — including the prerogative to govern time.

The moon was immediately dissatisfied with the bargain and slunk away angrily, muttering within earshot of the throne, thereby becoming the first created thing to hide from God, though far from the last.

“I have sinned,” thought God to God-self, well aware of the moon's quiet but audible sulking and feeling that their ruling had been harsh and rather affected by the stress of creating the sum total of all that would ever exist — and all in only six days.

Thus, in a swish of the divine rod, The Creator fashioned the stars and planets (and all of the contents of the cosmos) to keep the moon company and to tend to it on its journey through the firmament. And for these reasons was our cosmos formed in all its infinity — because God had a bad temper, and because God's creations were liable to complain.

These themes are constant of our universe. Like the speed of light.

II Israel's First Astronomical Society

Would it not have been considerate of the Holy One of Israel to provide just a little more information concerning the new lights in the sky? Indeed, what were the stars and planets to us, God's children? What were they for? Why were they there?

Eve our mother discovered that certain stars were organized in fixed arrangements in the sky like so many little sign posts, and thereby could a person find their way home (though not back to the garden.) But in the long years that followed we figured out precious little else about the stars and their ways. And who could blame us? We had other problems to deal with, like floods and famine and exile and the years in the desert and the settlement of The Land and everything that followed.

But the ache to know more lingered in our bones like a family secret. Every night while we sojourned, the lesser lights spread themselves out above us like an array of tiny coins, just beyond the reach of understanding and desire. And if we ever tried to count them we could never finish before dawn and had to start over at dusk — so numerous and complex were they. In time the love of stars moved from our bones and into our dreams, and thence into the work of our hands.

We made the Holy Menorah of pure gold, and we gave it six arms and one central stem. At the leftmost arm was for *levanah* the sulking moon, and the next stem for *kohav* of many faces, and the next for bright *nogah* and the next low branch for red *ma'adim* and the next for jolly *tzedeq* and the rightmost for *shabbatai* of eternal repose. And above them all shone *hammah* the sun, bright and ruinous.²

A golden object for all Israel to enjoy! What could possibly go wrong?

At this time, too, was formed among the Levites a secret society of astrological Priests. This brotherhood persisted for many hundreds of years, until the time of the Kings. Like so many furtive freemasons they were, an old boy's association of winks and secret handshakes and sidelong glances. They were a club more than anything else — one whose members inspected skin lesions and slaughtered heifers by day but assembled in dark groves outside the Temple walls at night to carouse, tell stories and observe God's stars with simple convex mirrors of their own invention which they blessed with secret *brachot*.

This society remained undiscovered for a very long time under the protection of their patron symbol, the Holy Menorah. But one night while passing by the Temple walls on dubious

² Wilk here cites the five planets and one moon known to the ancients by their Hebrew names. The identification of the branches of the Menorah with the heavenly bodies as known to the ancients appears in the writings of Philo of Alexandria in *The Life of Moses* and then, shortly thereafter, is expounded upon by Josephus in his *Antiquities of the Jews*. Philo in particular cites the curvature of the Menorah's arms as evidence that orbital dynamics were explicitly suggested by its construction. There seems to be little historical evidence for this claim, and indeed no original *textual* evidence that either the early Rabbis or the ancients regarded the Menorah as an item of astronomical significance. Present scholarship and archeology, however, have bolstered the idea that such objects were commonplace in the ancient Terran Near East, and indeed the record now suggests that imagery related to the stars, moon and astrological signs was commonly present in ancient near eastern domestic and religious settings.

business of his own, King Yoshiahu of Judah (a rigid, unforgiving sort) smelled the incense and heard the chatter of the secret Priests in the night air, and thus were they betrayed. The next day, sitting huffily on his oversized throne, the King ordered that the entire society be carried off to the valley of Kidron and burned alive³ along with their primitive telescopes, which the King's advisors mistook for the idolatrous poles of the local goyim.

Thus was Israel's first astronomical society utterly destroyed.

God, not content with the obliteration of all of our knowledge of the heavens, sent forth the Holy Prophets to rub it in. On the one hand they taunted us for our powerlessness:

*Let now the stargazers stand up and save thee*⁴

... and on the other reminded us of our failed attempt at understanding the mysteries that — according to them — only the divine aught to know:

*He who made Pleiades and Orion*⁵

And in this vein, too, was Job taunted in his impotence.⁶

³ see 2 Kings 23:4

⁴ Isaiah 47:13

⁵ Amos 5:8

⁶ Job 38:32: Can you lead forth the *Mazzaroth* in their season, or can you guide the Bear with its children?

III Jacob's Staff

O sun, O moon, O Jacob, O Esau.

When Jacob, in terror of his brother, drove his sundered children and flocks across the river *Jabbok*, he held aloft his staff and bellowed:

*I am not worthy of all the mercies and all of the truth which you have shown!*⁷

Our ancestor felt the nearness of death. Dividing his family into two groups that he might perhaps preserve one from his brother's henchmen, he advanced timorously into the Land expecting a deadly angel to come forth at any moment — a fell and shrieking menace in the black of night. Esau's arrows did not miss their mark, and his brother's kin could see as well in the dark as they could at noon. It was the first day of Nisan, which meant that the moon was asleep, leaving behind its resting servants, the stars. Jacob held aloft his staff as he shouted and cried. Without quite knowing why, he aligned the curiously grooved tip of the thing with the brightest star he could see. He chose the one that precedes the foot of *Kesil*⁸, the fool, who still frolicked low in the sky at this time of year, wrapped tightly in his rich dancing-belt of jewels. Suddenly Jacob laughed, and strode forward with a new bravery. "Am I not a fool myself?" he demanded of no one in particular (though the Torah does not record this utterance) "a fool driving a parade of fools?"

⁷ see Genesis 32:11 — the scene in which Jacob fords the *Jabbok*, immediately prior to his nocturnal wrestling match.

⁸ That which the Greeks called Orion. The star in question is Sirius, also known as the dog star, or Orion's dog.

But Jacob was no fool. Nor was *Kesil* a constellation at all, but a sinuous, lurking angel. Nor was his staff only a staff. Had our ancestor known it, he held in his hand the first *astrolabe* or *inclinometer* -- which is to say the first device capable of precisely measuring the arrangement of the stars — the very first, indeed, that could be used to map the sky. "I had only my staff when I crossed the Jordan," said Jacob, many years later. He was right, though he understood little what his words meant. In this respect we can suppose that Jacob was fool after all — for the truth he uttered would have been nonsense to any that lived in his time. But as he spoke he felt a light inside of his body such as he had not sensed since his youth -- a light even in the dark, as if everything in the world was new again and the *Jabbok* had no end.

There are times where we must surrender everything that we've ever know to gain that which we do not yet understand. Sometimes even our names.

The battle of the sun and moon did not end with the moon's diminishment on the fourth day — indeed it lasted to the end of the American Imperium, as will be explained hereafter.⁹

In the last days of the second Temple this debate reached a fearsome new height. The early Rabbis, staunch champions of the moon, would emerge from their towers at the time of the

⁹ See section VIII *The Death of Time*

harvesting of the *omer* and “with great demonstration” pantomime the proper time of reaping of corn according to the lunar fluctuations.¹⁰ Attendance by the local populace was compelled at point of sword.

Meanwhile, the ragged Sadducees and even more bedraggled Essenes looked on disapprovingly from their crags, silently deriding the ostentatious corruption of the city. These desert people were the champions of the sun’s calendar, by which they neatly divided the year into four quarters of thirteen weeks of seven days, in repudiation of what they regarded as lunar inaccuracies.

Moon! Sun! Moon! Sun!

The argument echos over the ages and through the black-listed texts of Enoch and Jubilees¹¹ and indeed in the Mishnah itself.

Even before the time of the Rabbis, the Greek mathematicians imagined the universe as a system of concentric spheres. The earth, they supposed, was utterly stationary and at the center of all. Surrounding it like so many Ukrainian dolls were a system of celestial orbs, whose mathematical natures determined the path of the various heavenly bodies, including the moon, whose positions they could, with modest accuracy, predict.

¹⁰ See Menachot 10:3

¹¹ The book of Enoch precisely describes an ancient Jewish solar calendar, though its method of intercalation (adjustment to prevent seasonal drift) was not specified. Had such a method been described, the calendar of Enoch would be as accurate as the Julian calendar.

Israel for its part had a less complex view, and generally rejected Greek thought on this matter — apparent correlation to reality be damned. To the Rabbis, the earth was a vast disk afloat in an infinite lake, with the heavens above it and the underworld below.

Need I even remark that both Jews and the Greek were wrong about these matters. Though one of us, in a sense, was less wrong.

Not even God could save Israel from Nebuchadnezzar's armies as they laid waste to the first Temple, and thus were our ancient intellectuals removed to Babylon. There, by the waters of the Euphrates and Tigris dwelt the greatest astronomers of the ancient world, and after many centuries of assimilation we began to learn about the heavens for the first time since the days of the eradicated Priestly society.

One of the most remarkable Rabbis of Babylon was a man named Samuel, the son of a silk merchant in the city of Nehardea.¹² There he made much Torah and founded the great *yeshivot* of Babylonian Jewry. But it was his skill as an astronomical mathematician that won Israel great favor with the Persian kings. Due to his prowess as a calculator and recorder, Samuel could

¹² Samuel of Nehardea b. [t] 3925 was one of the great first generation *amoraim* and known as the havruta of Rav (Abba Arikha) who himself was one of the principal compilers of the Babylonian Talmud.

predict the timing of the festivals some sixty years hence — sixty years! And he knew the position of the stars in Eretz Yisrael, even though he had never lived there.

“I am, however, an ignoramus when it comes to comets,” he was known to say (for his trademark was modestly.) He was often to be found alone in the house of study, hunched over a scroll, or pacing the floor and fidgeting with his large *kamarband*¹³ from which hung a rustic slide-rule¹⁴. But his many students knew that his powers were indeed great, for Samuel’s knowledge of the movement of the heavens knew no bounds.

Nevertheless, we must emphasize that Samuel of Nehardea and his descendants were a tribe of *calculators*. Excellent calculators, but calculators only. They compiled great tables of numbers and figures, and employed the local lettered youth in increasing their stockpile of predictions until there was little in the sky left to tabulate. But did they ever wonder at the inner workings of the stars? Did they consider by what physical mechanisms the planets moved in their steady courses? Did they challenge the ancient Hebrew model of the cosmos — did they poke holes in the firmament, did they dig down through the underground lake? Did they incline their heads to the heavens and wish to cross over into new and infinite worlds? In short, did they engage in *cosmology* and not predictive astronomy only?

They did not.

¹³ A kind of Babylonian belt

¹⁴ An ancient analog calculating device.

And so layer upon layer of tables and ledgers were amassed, and papers settled like the sediments of a great mire. Sheaves were sewn together to form weighty tomes, and over generations these were reverently consulted. Libraries of celestial accounting and predictions were erected, and concordances and great codices were laid in horde. Mathematical facility slowly declined, replaced by accountancy and clerkship. Precision and ingenuity became confused, and settled at last into mere toil. The great inventor became the archivist, and Samuel's slide rule became a in later days a relic and a curio, but no longer a living tool.

Thus the light of Nehardea dimmed even until the days of our sage Ibn Ezra, whose own tomes of celestial tables dwarfed the commentaries for which is he better remembered. After Ibn Ezra's life took him far away from Italy, no one wished to deal with the vastness of his astronomical holdings. The particularly observant in the community, bestirring themselves against witchcraft and divination, refused even to pass by his library. Eventually the astronomical tables became such a *shande* to the Ibn Ezra's son Isaac that he hid them inside a hollow mountain in in the Italian Alps. There they remained a secret for many years until Isaac's eventual conversion to Islam caused him to forgot about such matters.¹⁵

¹⁵ A charming anecdote that admits no textual or historical proof. Wilk appears to have entirely invented the notion that Ibn Ezra inherited a trove of ancient astronomical sources that were later hidden and preserved by his descendants. The great sage did indeed write extensively on both astrology and astronomy, and did consult near-eastern (mostly Arabic) sources in his scholarship. But as far as we know, there was no hidden subterranean archive in the Italian Alps, though his son Isaac did indeed become a Muslim.

One day in the year [t] 5231 a Spanish Jew of Salamanca, one Abraham Zacuto¹⁶ — court mathematician to the Spanish King — had a dream.

He was crossing a river at night with a great host before him. Though the gently-flowing water ran no deeper than his shins, the river extended past his vision and appeared to be of infinite width, much like the sea. Zacuto found himself dressed in a rough woolen cloak (not his usual garb) and in his hand he held a great staff of terebinth (he was more typically seen wielding a pen.) As he trudged across the river with the crowd of women and children and armed men and animals of all kinds, he heard a voice speak up over the surrounding din, and knew at once that he himself was the speaker, and that he spoke, or rather bellowed, with great and unexpected fury:

“Mercies! Truth!” he cried. “Mercies! Truth!” again he yelled once more, even louder.

And when he spoke these words the wooden staff in his hand began to change and transform. The wood hardened and became cold and smooth, like metal. And the staff shortened and became sharp, like the hand of a clock, and Lo! there was a circle all of metal around it. And he saw that the staff now pointed directly at a particularly bright star in the winter sky — Sirius, the dog star of Orion. And then he dreamed no more.

¹⁶ Avraham ben Schema Zacut b. [t] 5212

When Abraham Zacuto awoke, he knew at once what he must do. He strode without pausing to the back of his study and gathered all of the dusty charts and ledgers of astrometric data together (for he had inherited most of Ibn Ezra’s horde, which had been shipped to Spain from Italy at great expense to the King and without own approval¹⁷) and he threw them all at once out of the window of his study, which was perched high on a hill. The parchments floated down over the rooftops like a flock of weightless birds.

Immediately he set to work, the strange dream still lingering in his mind. And so was begun his *Ha-hibbur ha-gadol*, his “great book” of navigation. It was in fact a small book, a manual, but it contained the secrets of computing latitude from anywhere in the world using only Jacob’s staff — a navigational feat previously taken to be impossible. And it was this book that Christopher Columbus, in [t] 5253, grasped in his own hand as he saw the first Caribbean island. And it was this book that Vasco da Gamma consulted in the approaches to India. And on each of their ships was an *astrolabe* of Zacuto’s own devising, a little staff of Jacob, surrounded by a circle.

¹⁷ Wilk’s interest in the astronomical activities of Ibn Ezra is curious but not exactly at odds with his wider philosophy. Perhaps he considered the great sage to be a connection point between the ancient world and the medieval. It is known that Wilk regarded Ibn Ezra with great reverence, and in his later years wrote several papers defending his underlying religious philosophy. In doing so he joined a project that began centuries before with Spinoza, who argued that — particularly in regard to his commentary on Genesis 12:6 — Ibn Ezra was well aware that the Torah was not authored by Moses himself, but nonetheless urged that this dangerous truth be kept secret within the heart of whoever should come to know it. “... there is a secret meaning to the text. Let the one who understands it remain silent” etc. It may be further supposed that an element of fantasy colors the anecdote of the throwing of the papers, since Wilk struggled under the burden of the outdated temporal *halacha* that preceded his own work, and it may have wished to enact an analogous defenestration himself, if such a thing were possible on Mars.

Thus, in the end, was Israel vindicated and the light of Samuel of Nehardea revived¹⁸, and so we come to the end of our tale-within-a-tale.

And yet not — for Abraham Zacuto himself was cast out in the year of Columbus' fame and sent into piteous exile in Africa on pain of death, and so was a child of Israel exiled, rather than rewarded, for his virtue and genius.

And this theme too is a law of nature. Like the speed of light.

¹⁸ Wilk (somewhat uncharacteristically) fails to temper his exultation by mentioning the many horrors that flowed from the so-called “discovery” of the so-called “New World” by Columbus and its subsequent colonization by Spain and other European powers. To name but a few of these disasters: the annihilation or enslavement of the indigenous peoples of the Americas (on one Bolivian mountain alone, over one million indigenous slaves perished while mining silver for the Spanish), the virtual destruction of *all* ancient civilizations and languages of the Americas and the beginning of an age of European hegemony across the Terran globe that would last for centuries and cost untold millions of lives. Perhaps Wilks felt the exilic fate of Zacuto himself provided a sufficient narrative counterbalance, but the conclusion to this section reflects what most current historians would consider to be a problematic bias.

IV The Closed Eyes of Serpents

When Nicolaus Copernicus declared that the Greeks were mistaken about the central, unmoving place of the Earth in the cosmos and that it was in fact the sun about which the Terran globe revolved, he found swift support among certain of his fellow gentiles. The half-nosed¹⁹ Dane Tycho Brahe lent merit to Copernicus's notion with his precise celestial measurements. Brahe's assistant in the court of Prague, Johannes Kepler, taught the three laws by which the planets move in their courses.²⁰ And it was Galileo — then of Padua in Italy — who confirmed beyond any doubt the universality of Copernicus' rules by dint of observation with a revolutionary telescope, and in a rapturous letter to his contemporary in Prague declared:

I think, my Kepler, we will laugh at the extraordinary stupidity of the multitude ... Verily, just as serpents close their eyes, so do these men close their eyes to the light of the truth.

Though the squint-eyed serpents Galileo had in mind no doubt wore the red robes of the Catholic Cardinal, it is with shame that we must recall that Jewish authorities greeted the new revolution with little less hostility than the Church. Indeed, only a few hundred years had passed since

¹⁹ Wilk's mention of Brahe's facial deformity seems rather juvenile given the greatness of both men, but Tycho Brahe did indeed lack a significant portion of his nose. A later account by the ethicist and plastic surgeon Kun Hwang recounts the following:

When he was 20, Brahe lost part of his nose in a sword duel with his third cousin, Manderup Parsberg. Manderup's blade cut away most of the nasal bridge, leaving the nasal cavity and septum exposed. To hide his deformity, he constructed a prosthetic device made of wax, but it was unsatisfactory. Thus, he made a mold around the wax nose and fabricated a brass prosthesis. An artist matched the color of his skin. The prosthesis was held in place with glue. It is thought that this deformity altered his personality. He became defensive, depressive, and secretive. (Archives of Plastic Surgery 44(4): 257–258)

²⁰ Kepler's three laws: the orbit of a planet is an ellipse with the Sun at one of the two foci, a line segment joining a planet and the Sun sweeps out equal areas during equal intervals of time and, finally, the square of a planet's orbital period is proportional to the cube of the length of the semi-major axis of its orbit. These three laws provide a complete classical description of the motion of the planets.

Maimonides granted approbation²¹ to the Greek cosmology. The *Rambam* was the first of our great sages to do this, though the approval came more than a thousand years too late to be of any use whatsoever. The only discernible effect of Maimonides' opinion was the profound suppression of further mainstream Rabbinical consideration of these matters. Indeed, so enduring was the deep freeze in this area of inquiry that the last Rabbis to countenance the Greek model of the universe themselves lived in the era of the first moonwalk -- a strange set of circumstances for anyone who wishes to ponder them.

But let us not accelerate time too greedily, tempting as it might be to skip over the full lineage of disgrace in this period of "enlightenment". Indeed it is in the nature of any *toldot* to bind us — to obligate us to soberly regard the unpleasant facts and acknowledge them with humble hearts.

It is with Rabbi David Gans of Prague²² that we must begin. Gans: mathematical genius, apprentice to Brahe and Kepler, Jew. What better envoy could we have wished for, what more capable representative at the dawn of this new enlightened age? But alas, Gans's savvy was exceeded only by his timidity, and therefore he refused to contradict the Maimonides and accept the centrality of the sun, despite Brahe and Kepler's copious proofs, some of which he himself helped perfect.

²¹ From Mishnah Torah, Foundation of the Torah 3: *The celestial spheres are called heaven, firmament, habitation and nebula, and there are nine such spheres; the sphere nearest to us is the Moon; the second above it is the sphere wherein is set the star Mercury; in the third sphere above it is Venus; in the fourth sphere is the Sun; in the fifth sphere is Mars; in the sixth sphere is the star Jupiter; in the seventh is Saturn; in the eighth sphere are set all the stars which are seen in the firmament; the ninth sphere is the sphere which traverses daily from east to west, and encompasses and encircles all.*

²² born [t] 5301 in Germany, died [t] 5373 in Prague

But Rabbi Gans was far from alone in his doubt and terror among the worthies of the Jewish people of this time. The philosopher and polymath Abraham Yagel²³, though he was fond of great rhetorical flourishes and once compared Galileo favorably to Samuel of Nehardea, likewise failed to embrace the new truth. The great Ashkenazi physician Tuvia Cohen²⁴, whose anatomical illustrations and understanding of the human body caused a revolution in medicine, reserved a special sort of bile for the Copernican cosmology, entitling the fourth chapter of his rather encyclopedic, self-titled work:

Bringing all the claims and proofs used by Copernicus and his supporters and shewing that the sun is at rest and the earth is mobile; and know how to refute them, for he is the firstborn of Satan.

Let us name several other famous links in this shameful lineage: David Nieto, Israel of Zamosc, Moses Sofer, Menachem Mendel Schneerson and Pinhas Veberman.²⁵

Understand! We name them not to bring disrepute on our Great Ones -- no. We recite this lineage to remember and to learn, but not to blame. If we can remember Korach in his wickedness, then surely we can recall those among us who have been mistaken about less grave matters -- if

²³ born [t] 5313 in Italy

²⁴ born [t] 5412, Metz

²⁵ For an excellent overview of these and other figures from a late-Terran pre-Imperial perspective, see Brown, Jeremy: *New Heavens and a New Earth: The Jewish Reception of Copernican Thought*, available at the antique books section of the Oxford University Press Galactic Open Archive. Given the contents of this section, it is highly probable that Wilk possessed a copy of this invaluable reference.

indeed they are any less grave. In abiding in our memory these great ones serve as both warning and example. It is the job of a Jew to remember -- even when we would sooner forget.

V Galileo Rabbeinu

There once was a Jew of Crete, one Josef Delmedigo,²⁶ whose heart was as big as the world and whose mind was a clutter of stars.

At sixteen, in [t] 5368 he was admitted to the great university at Padua to study medicine and natural philosophy. There, in the Great Hall, he devoured the lectures on mathematics, ship-building, anatomy, engineering and ballistics given by Galileo Galilei, who at that time not yet particularly famous. Indeed, Galileo had not yet published his ultimate conclusions concerning the Copernican system, though he had lately undertaken secret investigations with the new telescope which he had long labored to perfect.

The young Delmedigo was the sort of shifty boy who found it difficult to sleep at night. He therefore acquired a habit of wandering the streets of Padua to gaze at the stars and contemplate the secrets of the night sky. One moonless evening while passing by Galileo's tower, he spied a light in the window. Unable to resist, he crept up the many flights of stairs to discover what engaged the professor at such a late hour. Peeking around the open doorway at the top of the stairs, Josef could see that the light he had spied from below emanated from a bank of candles

²⁶ Josef Delmedigo, b. [t] 5351 was a polymath, scientist and the first true Jewish Copernican. He is the hero of this section V, and in many ways serves as the fulcrum of the entire *Toldot Mazzaroth*. Wilk, having described both the early failures and triumphs of the Jewish people vis-a-vis the cosmos, now addresses the story of Israel's full engagement with science, time and ultimately our exodus from the Earth itself. The single narrative that comprises this section is the longest sustained story in the *Toldot*. It serves as a (some would say welcome) detour into linear storytelling before the stark ignition of the more mystical and ecstatic material that is to follow, beginning with the prayer in section VI.

perched on a large wooden table, and from a single stout candle burning low atop a canted writing desk which also supported mounds of paper. Galileo himself was next to the open window, crouched with his back to the door upon a low stool, his face peering up into the end of what appeared to be a slender copper tube.

“Magister,” stammered the boy, bowing so low that his oversized hat launched off of his head and rolled across the floor on its vast brim, revealing Josef’s disheveled curls and small black *kippah*.

“Settima generazione!”²⁷ squawked the boy, scampering after his hat.

Galileo arose with a displeased grunt, nearly knocking over his telescope and invoking such a commotion that several papers were propelled from off of the lectern and fell to the floor. He recognized Delmedigo at once. The boy was a truculent, etherial sort of creature — a man-child not quite of this world. Unfortunately he was also a Jew with a quick of mind — and what’s worse a Jew who spoke before considering the consequences of Jews speaking.

“Mark me,” a slithery religious colleague had whispered in Galileo’s ear a few days before, “That young Hebrew’s mouth will lead him to the gallows within five years for lack of caution -- thither, or else to the palace.” The librarian’s eyebrows arched as he glided away down a stone

²⁷ Literally, *seventh generation* in antique Italian. Perhaps a malediction. It is not clear that Wilk spoke Italian or had any particular knowledge of Renaissance Italy.

passage. The man had been far too joyous in his pith, thought Galileo, but he was not exactly wrong.

The Monk's comment was attributable to an incident that had recently occurred in the Great Hall immediately after one of Galileo's recent lectures. At that time, Delmedigo approached the podium, and quite without invitation or introduction launched into an inappropriately long (if entirely valid) recitation of various objections to the Greek cosmology. Galileo's lecture that day had been on the subject of the predictive limits of this same Ptolemaic system, but had as always confined itself to such measured, diplomatic and pious terms as would not lead him directly to the Cardinal's prison. The young Josef's diatribe, on the other hand, cascaded from his wide Cretan mouth in such a screeching register that was audible to all nearby, including several snooping clergy.

And yet Delmedigo was plainly well acquainted with the relevant mathematical and conceptual details of Copernicus's theory. Had the boy actually read Copernicus' treatise? But how was this possible? Copies of the work were few and precious. The two that were held by the university were kept locked and under constant guard in the deepest recesses of the Grand Library on Galileo's personal orders. And why, in any case, was the boy so interested in this most sensitive matter? To Galileo, it all seemed uncanny at best, and a trap at worst. It must not be assumed that the Cardinal was above tricking his enemies into acts of public heresy with just this sort of ruse.

His diatribe complete, Delmedigo seemed at last to have exhausted himself and stood before the master expectantly, his breath heavy with excitement. Galileo simply nodded, turned and walked away. But had there been a curl to his lip and a glimmer in his eye as he'd turned to go? Yes! There had been! There must have been!

Galileo for his part knew that this silent dismissal was uncharitable, but it was best for a person in his position stay away from flammable young men, particularly since he had his own potential immolation to worry about. But the master kept an eye on young Delmedigo from that day forward, marking him silently as either a future acolyte or else an emerging nemesis. And now the same boy appears in the dead of night, here in his own chambers — a lanky phantom in the doorway, unexpected, impertinent, clumsy and *now* — at this very delicate moment in his researches?

Galileo almost dismissed the boy. Much work remained to do that night and distrust lingered like smoke. But something stirred at the great man's heart as he observed Delmadigo struggling to explain his presence while comically pursuing his hat as it rolled this way and that across the floor. As he watched the young man, a certain instinct bloomed in Galileo's heart. Josef scampered back to the doorway, hat in hand, his mouth still moving anxiously.

It was not easy to sleep Magister! I have been walking the streets you see. Looking at the stars I mean, not just walking the streets for no reason — of course I would do no such thing! — and also the wandering lights. Did I mention the wandering lights? I always look for the wandering

lights. And there was your light Magister and I wondered if you too were gazing heavenward — as the rumors after all ... the rumors say you do each night, and ...

Josef's face flushed and his eyes became black searching pools. At last, his mouth came to rest.

This was no spy.

Galileo arose, re-aimed the telescope and calmly replaced two sheets of fallen paper on the lectern. Each movement of his hand was deliberate and measured, almost meditative. When he turned at last toward Delmadigo, he gazed severely at the young man. Josef blinked and gulped.

"Sit down," said Galileo at last. "Be still. Speak no words ere I ask you a question." Delmedigo sat on the small stool as the master had commanded. He placed his hat primly on his lap. "You know of the two great lights?" asked Galileo in a soft, grave voice.

"The sun and the moon, Magister", Josef replied.

"No, not those." Galileo replied. "One of the lights of which I speak is our great teacher Ptolemy of Egypt. And surely you know of the other."

"I know," said Josef.

“And do you know which is the greater of these two lights? For not long ago you made disputation with me in the hall before many, leaving little secret as to your ... opinions on this matter.” Galileo folded his hands in front of him, his gaze not straying from the youth.

“If Ptolemy be the moon, then is not Copernicus the sun?” said Josef, *sotto voce*. It was a question, but not a question. Delmedigo held Galileo’s eyes while he spoke these words. The great man was silent for a moment.

Then Galileo began to speak. His tale was long, and is not here recounted. But this much might be said — he spoke first of the wisdom of the Greeks. On their observations of the stars and experiments he expounded, and of Ptolemy’s spheres and how they foretell the complex motions of the heavens. And upon mathematics he spoke, for it was on the shoulders of this mighty science that the power of all predictive models rested, though no man could say why. The mystery of mathematics’s predictive power awed Greek and Arab alike, and so its flame was sheltered even as it flickered out in other lands. It is only through this wisdom, is it not, that we have been able to demonstrate that the wandering lights conform themselves to simple principles of geometry? So compelling was Galileo’s ode to the wisdom of the Greeks that Joseph found himself doubting the master’s loyalty to the revolution. But then Galileo paused, and the same nearly imperceptible smile that had flashed across his face in the Great Hall curled his lip once more.

“We will speak of your sun, young Josef. I have not forgotten him. But first let us suspend speech for a while. There is something that I wish for you to see for yourself.”

To Delmedigo's great astonishment — for he knew nothing of the device mounted on the wooden tripod before the window — Galileo beckoned Josef to draw closer to the telescope, and helped him place his eye on its tapered end. Josef stared hard into the thing, his eyes dilated with excitement. But he stared too hard, and all was dark and indistinct.

“Stare not!” snapped Galileo, “Or are you a monkey? Release the eye from your face’s grip by Jove! It will see what it is destined to see.”

Delmedigo exhaled and relaxed, and then, almost as if by magic, a white circular shape came into view through the tube — a large, round blotch of light, bright and distinct.

“What is it that you see?”

“I see a light, Magister. A great light and bright to behold.”

“Do you know upon which light you now look?”

“No.”

“You gaze upon that wandering light which your fathers call the *tzedek*.”²⁸

Josef gasped and withdrew, both because the light of the planet blazed forth with the brightness and size of a near-moon, and also because he was not used to hearing words in the Holy Tongue from the lips of gentiles, however great. Galileo frowned and motioned for him to resume his observation. Josef peered back into the telescope and felt awe begin to stir within him.

“What else do you see?” asked Galileo. “Does the *tzedek* walk alone?”

“No Magister ... no ... there are two stars in his company.”

“Two? Look closely boy!”

“Three! There is a third.” said Josef quickly. His voice was reduced to a whisper now, as if for once in his life words were difficult to produce.

“You spy the attendants of *tzedek*.” Galileo resumed his seat and began address the back of the room, as if his true audience stood behind the crouching student. As if he were speaking to someone who was no longer there. As if he were speaking to a ghost. “And these three never leave his mighty side, but dance about him in regular mathematical orbit, for so I have observed these several months.”

²⁸ The planet Jupiter.

Delmedigo's face flushed, though his hands were suddenly cold. In his heart he knew the terror and wonder of the master's words. A line of sweat descended his forehead from the nest of his hair. If these wandering stars attended the *tzedek* and were in orbit around him, then this was proof beyond any question that the earth was not at center of all spheres. There were other orbital centers besides our own — other fixed, unmoving points. But the truth was still more terrible than this. For if the *tzedek* was attended by orbiting lights and was their lord, then how could it be that the earth was itself stationary? There were surely other kings besides the *tzedek* around which the lights paraded in regular order? Copernicus made his argument for the fixed sun, but had lacked all but Kepler's mathematical proofs and certain other incomplete guesses. But here, with his own eyes, before his very face, Josef could see the truth itself.

In that moment some part of Josef Delmedigo died. At that moment some part of him was created, as if from the blackness surrounding the planet he now observed. As he looked, an Angel of Fire reached down into Josef's mind and ordered his scrambled stars into a geometrical system complete in both beauty and power. It was as if the hand of God had touched the earth, planting *Truth* right here in the gray, disappointing, filthy streets of Padua.

O Sun! O Moon! O Copernicus! O Ptolemy! What terror and love abide in these moments. Had God not ceased after the sixth day? And if not, would creation ever cease?

These were the thoughts of young Josef Delmedigo even as a strange vision of his home island came unbidden into his mind's eye. His brothers and sisters, mother and father sat at table in a dim, low-ceilinged room. Bread and wine and candles were laid out before them. A cat stirred in the corner. The soft breezes of the sea troubled white curtains. Josef's eyes focused back on the glowing *tzedek*. Then, to his own astonishment, he heard himself whisper these words in the Holy Tongue:

ויכלו השמים והארץ וכל־צבאם

and the heaven and the earth were finished in all their array ²⁹

The light of the planet suddenly blazed and faded like white fire, and Josef's eyes overflowed. He withdrew his face from the telescope, wiped his reddening cheek and turned to face Galileo.

“Rabbi?” he whispered.

This is the *Toldot* of Josef Delmedigo, Jew of Crete:

²⁹ From the Talmud, *Shabbat 119b*:

Rava said, and some say it was Rabbi Yehoshua ben Levi who said: Even an individual who prays on Shabbat evening must recite the passage: “And the heavens and the earth were finished [*vaykhullu*]” (Genesis 2:1–3), as Rav Hamnuna said: Anyone who prays on Shabbat evening and recites the passage of *vaykhullu*, the verse ascribed him credit as if he became a partner with the Holy One, Blessed be He, in the act of Creation.

Delmedigo begat Spinoza³⁰, who treasured a copy of the former's *Sefer Elim* -- the first book in which a Jew endorsed the Copernican cosmology.

And Spinoza begat the unlucky Hungarian David ben Meir Cohen Friesenhausen³¹ who wrote that:

This planet Earth is tiny and inconsequential, and it is lost among the infinite number of planets. But your soul should rejoice at God's creation, and your tongue should praise his righteousness. For among all of these creations he chose Israel on this tiny dot and made them holy with his holiness.

And thus did Israel become a people of the telescope, the observatory, the laboratory, and the fusion reactor — and not only the book.

And we are still becoming, even to this very day.

³⁰ Baruch Spinoza, b. [t] 5392, the renowned Dutch-Sephardic rationalist.

³¹ David ben Meir Cohen Friesenhausen b. [t] 5516. An astronomer, mathematician and Rabbi, Friesenhausen was an early figure in European *Haskalah* -- the first broad Jewish movement to integrate rationalism, liberalism and intellectual renewal into Jewish life. Friesenhausen struggled for the majority of this life to make a sustainable living, and clashed frequently with the regional Jewish authorities of this time. It was not an easy life, but a good life -- and one lived in anticipation of ages yet to come.

VI A Prayer for the Torah of the Universe

Shaddai, destroyer, mother, *echad*

To Israel you grant life through eternal Torah. You lead us by cloud and fire and star and astrolabe and telescope and semiconductor and ion drive and terraform. We praise You for the wisdom You bestow.

And yet how often and how loudly we complained down the generations that Your commandments and wishes for us were obscure. We trudged through millennia of pointless disputation concerning the stars and planets and the quarks and atoms. Little did we comprehend Your slothful messengers and angels with their muddled, confusing instructions that divided the minds of Israel into myriad factions and consumed the souls and bodies of our ancestors in the hot but lightless fire of debate.

Indeed, when Your angels visited, little was ever resolved. Consider them after all: An unknown wrestler. An invisible spirit who spoke only to donkeys. Three strangers who predicted an impossible birth. A ladder-full of spirits, walking endlessly up and down a glowing ziggurat. What, after all, was Israel to do except debate endlessly over what exactly was to be learned from these messengers?

But that flame which consumed us is now quenched in the cold depths of space. The confusion in our hearts has settled at last to Holy ash. For in these recent times, O Merciful One, as humanity has accelerated with awesome rapidity, as we begat new Jewish generations among the planets and stars, the cacophony of debate about the universe and the place of scientific endeavor has at last met its final arbiter in the workings of Your great cosmos. A Jew who undertakes to live upon another world, in Terran orbit, or outer space -- such a one is either a scientific Jew or — God forbid — is dead.

Truth emerges more readily from error than from confusion.

So observed Francis Bacon.³² It is the very error present in our theories and understandings that renews our knowledge, from generation to generation. To be wrong is to evolve. Error changes not only the answers to questions but the nature of the questions themselves. As Thomas Kuhn observed:

To reject one paradigm without substituting another is to reject science. ³³

³² Sir Francis Bacon b. [t] 4321 (a curious number) -- scientist, statesman, influential in developing the scientific method.

³³ Thomas Kuhn, an American philosopher and theorist who revolutionized our understanding of how science works. His rather popular magnum opus (which as the historian Helena Zee points out, was one of those books that many claimed to have read but rather fewer actually had) was entitled *The Structure of Scientific Revolutions*, and introduced the idea of the *paradigm shift*.

And to reject science in these days is to reject the possibility of human continuity. Let us therefore sanctify Adonai who brings us to this place where truth is as present and inescapable as death itself.

Rabbi Roberta Chen³⁴ proclaimed the end of *pilpul*³⁵. No longer, Chen argued, would minute clarification or distinction suffice as the primary currency of Rabbinic discourse. In certain matters of *halacha* in particular, to preserve and clarify was no longer enough to ensure Jewish survival. And yet how quickly -- even in these days -- are we pulled back into nostalgic fiddling with our familiar dialectic. We are much like an adolescent in search of the comforts of a fleeting childhood who plays idly with a once-treasured toy, now outgrown. In our age, the truth must renew itself not by subdividing into more specific truths, but rather by uniting in Holy Error. Certainty must be overthrown to re-emerge. That which we know must be perpetually destroyed and thus recycled, or it will destroy us.

Therefore, bring Your judgement upon us O Holy One! Indict us in our error, and cleanse every illusion from our minds. May Your Holy Fire burn within us. Become the slayer of our folly, and

³⁴ Rabbi Roberta Chen b. [t] 5904, Toronto, Canada is considered the founder of early extra-Terran Jewish thought and trans-galactic *halacha*. For more on Rabbi Chen, please see TTI-J's archive of her writings, including the forthcoming publication of her collected responsa and journals. Also recommended is Dr. Sven Shneerson's compelling biography of Rabbi Chen, entitled *Red Destiny*, which, though currently the subject of legal a legal dispute with the chief Rabbinate's Council of the State of Israel (terraform Ib) is still available in and outside of Israel.

³⁵ *Pilpul* is the traditional method of dialectic and comparison employed while studying Talmud and other Rabbinic texts. Rather than seeking to re-imagine or fundamentally re-base halachic rulings, *pilpul* regarded the Talmud as a unified, consistent system that need only be explained, dissected and inspected with enough precision to reveal its underlying systematic harmony. Fundamental shifts in assumptions, substance and precedent are foreign to this method, and the formulation of Chen's extra-Terran *halacha* was the occasion for her argument about its obsolescence. It should be noted, however, that even some classical sources expressed a significant level of frustration with *pilpul*, considering it either a useless Rabbinical game or (worse) an occasion for substance-less ostentation. The *Marahal*, for instance, once declared that it would be better to learn carpentry or another trade, or sharpen the mind by playing chess.

brook no trace of falsehood in Israel's midst! We pray that in place of Your muddling angels You would send more of Your servants of illuminating flame: the Messengers of Death who come among us to remove illusion. We bless the memories of Your departed destroyers: Abraham Avinu, the spectral Angel of Egypt, Galileo Rabbienu, and the Prophet Albert Einstein. All those who plant the seeds of inner truth even while smashing the idols of our falsehoods.³⁶

But did not Israel perceive truth's shadow even in the days before our life among the stars brought it into the full light? We knew without yet knowing. What else would explain our disproportionate representation among the very earliest astronauts? As we strapped our Jewish bodies to the tips of those deathtrap rockets, we brought with us a scroll.³⁷ And we lifted it aloft in weightless orbit and faced the blue splendor below and read from the Holy Torah through the porthole:

בראשית ברא אלהים את השמים ואת הארץ

Bereishit bara Elohim et hashamayim ve'et ha'aretz

³⁶ It is as if Wilk presents a small *toldot* of "death angels" within his larger *Toldot Mazzaroth*. Abraham is included because of the midrash that has him smashing the idols of his father (apparently *Terach* was a builder of idols -- the creator begat the destroyer, see part VII, *The Death of Time*) The angel of death for clear reasons, though one is compelled to speculate as to whether any enlightenment accompanied the freedom that resulted from its genocidal actions. Albert Einstein destroyed the distinction between space and time, thus introducing a new complication to the contemporary conception of Judaism as (in the words of Abraham Joshua Heschel) "a religion concerned with the sanctification of time." (Can we sanctify that which is illusory?)

³⁷ To quote the *Times of Israel* in [t] 5776 on the matter:

In February [t] 5756, Jewish astronaut Jeffrey Hoffman took a Torah with him on the space shuttle Columbia. Hoffman became the first astronaut to read in Hebrew in space when he unrolled the perfectly kosher parchment scroll to reveal the first seven paragraphs of the book of *Bereishit* ... which speaks about the creation of the world. 10 years later, in September [t] 5766, Steve MacLean of Canada brought a Torah aboard the Atlantis when he journeyed to the International Space Station. Between the dates of these undertakings, there was also a tragedy: Ilan Ramon, the first Israeli astronaut, and six crewmates perished on the Columbia during reentry to the Earth's atmosphere in [t] 5763. Ramon had brought along a Torah that was saved from Bergen-Belsen, as well as a teenage camp inmate's drawing of the earth from space. Both the Torah and the drawing were also lost.

We floated. We blessed the world that we loved -- the very blue world upon which we'd all emerged from the dust. But as we davened we turned our backs to the silent Holy Ones who loomed all around. Etherial columns and choirs beyond count were arranged behind us: an infinity of planets, stars, galaxies, supernovae, pulsars, quasars, nebulae, dark matter, black holes and clusters of all dimensions. Had we looked over our shoulder for but one second, in the direction of the cave of the *heikhal*³⁸, we would have perceived with our soul's eye that the enclosure had suddenly expanded to encompass this infinite multitude that blessed us fervently in return, silently and with infinite whispers — more than could be uttered in a million million lifetimes.

Blessed are you Lord God, Destroyer of all falsehood.

ברוך אתה אדני שוודד שקר

³⁸ the ark of the traditional synagogue, wherein rest the Torah scrolls.

VII The Death of Time

Every journey begins with a death.

Abraham was called forth from Ur only after smashing his father's collection of idols³⁹ — and so our lineage was born amidst the dead gods of that place. Moses led the people out from Egypt in the turbulent wake of the spirit of death, for it was this terror alone that shattered the hardness of Pharaoh's heart. Our great exile from the land in [t] 3690 was occasioned by the destruction of our Temple and all of its practices and relics. And I cannot justly recount, even in part, the many decimations of our ancestors in various parts of the Earth — Spain, Europe and (recently) England — each of which occasioned a fresh *lech-lecha* as we fled from place to place across the Terran globe.

But what death has marked our greatest journey? What loss has ushered Israel into the most dramatic of human voyages — the forsaking of our home planet, the colonization and terraforming of other worlds, and the conquering of space itself? The Earth, to be sure, has long danced with death, though somehow it still survives. New York, the city of my birth, is inundated

³⁹ Bresheit Rabbah 38.13

and beset by bandits. The land of Israel will soon be imprisoned in a protective bubble.⁴⁰ But what internal, eternal currents accompany these outer omens?

Rabbi Abraham Joshua Heschel asserted that Judaism is a religion of time rather than of space.⁴¹ So engrained has this dictum become among the Jewish people that one would be forgiven for mistaking it for a Biblical precept, as many no doubt have. For centuries upon centuries, we have been a people of the clock as much as the book or the laboratory. The timings of our observances are laid out with a precision matched only by Ibn Ezra's old astronomical tables. The yoke of Torah is to some as much an obsession with *punctuality* as with the other stringencies of law and practice. But assent to Heschel's maxim is not required of us by God -- nor is it a law of the universe.

Time is dead. We killed it when we took to the stars.

⁴⁰ Wilk wrote these words in [t] 5968, but had last visited New York (or anywhere on earth for that matter) some sixteen years earlier. These years did indeed correspond to a period of rapid change in the city, during which average sea levels rose to the point that the majority of New York was declared an exclusion zone by the American Republic. What happened next is well known to even casual observers of New World history, and although New York eventually become a ghost city, it was in those years entering a state of rapid transition, and ended the 60th century with only about 700,000 residents, all unregistered.

For its part, Israel had by [t] 5968 experienced so many critical heat events that it had not only lost half of its peak population to emigration, but was obliged to adapt to its extreme conditions through the construction of subterranean environments in Jerusalem, Tel Aviv, New Ramallah and Haifa and to its dearth of rain by cloud seeding, desalinization, illegal terraforming and the construction of the large climate domes which characterize the Land today. The rains once again came "in their season", but only by dint of the latest technology. The peak of the reverse *aliyah* had passed by this time, but the legal and policy debate regarding the status of safety of various climate measures reached new heights even as the domes and related infrastructure were under construction. The opposition to these measures was both fiscal and religious. The expense was enormous and put the State in perpetual debt to the Chinese Alliance, whereas Haredi authorities objected to the very notion of human manipulation of the environment in Eretz Yisrael, which they considered (then as now) to be controlled directly by God. TTI-J has for many years supported deep scholarship on various matters related to Israel, climate and tradition which the reader is encouraged to explore by accessing our archives.

⁴¹ "Technical civilization is man's conquest of space. It is a triumph frequently achieved by sacrificing an essential ingredient of existence, namely, time." A. J. Heschel, *Sabbath*, [t] 5711

In the great initial bloom of Hasidism in Old Europe, our relationship with time began to weaken. It was as if the far-seeing Hasids perceived the tiny beginnings of a tear in the fabric — their ecstatic eyes peering into distance and seeing that which conventional minds miss. We are told that a certain Rabbi Avraham Katzenelbogen of Brisk asked the wild sage Rabbi Levi Yitzchok of Berditchev⁴²:

Why do your Hasidim miss the correct time for the Shema?

Rabbi Levi Yitzchok replied:

My dear Rabbi of Brisk, we never heard that there is a clock in heaven, with angels standing near and looking at the hands of the clock in order to determine the exact time of prayers.

This slight tear in time perceived by Levi Yitzchok became a full rupture in the mind of Albert Einstein. Einstein's genius showed with mathematics what the Hasidim could only intuit: that the passage of time was not the same for all observers or in all places. There was indeed no clock in heaven, but rather a clock in every human soul, and at each point in space and in every Jewish heart. Each human clock, or that of each atom or particle is separate from all others, inexorably

⁴² Rabbi Levi Yitzok of Berditchev b.[t] 5500 , aka the *Berditchever*, *Kedushas Levi* and other names besides was a Hasidic master and Jewish leader who is known for his deep compassion for every Jew, and assiduous defense of Israel before God.

estranged and alone. Universal time, or so Einstein famously maintained, is no more than a "stubbornly persistent illusion."⁴³ It is no coincidence, therefore, that mere decades after Einstein's revelations and scant years after his own death the first Jew forsook the Earth for space, and thus began a new chapter of our lineage -- our true *Toldot Mazzaroth*.

Objections are to be expected. After all, is it not a *birth* rather than *death* that begins a *toldot*?

But it is written:

the living know that they will die ⁴⁴

Which is to say we are born with death inside of us, and with the knowledge and certainty of it. And no lineage would be necessary absent death — for we would live in perpetuity without the need of any generational wisdom. Every human story is written in the new blood of birth upon a scroll made by and of the dead themselves. Indeed all wisdom is prepared by those who are dead for those who are not yet born. Those of us who live right now are but its temporary guardians.

⁴³ Albert Einstein b. [t] 5639. In a letter to the survivors of his dear friend Michele Besso in [t] 5715 wrote: *People like us, who believe in physics, know that the distinction between past, present, and future is only a stubbornly persistent illusion*. This characterization has scientific force and is broadly consistent with Einstein's theory of special relativity. It is also, in this context, a perfect example of how scientific truth may be illuminated by the functions of the human heart. Einstein loved his friend Besso, and was comforted as well as enlightened by this truth.

⁴⁴ Ecclesiastes 9:5

Accordingly, our Torah is a living thing. If we look closely at our scrolls we see that they are composed of *klaf*⁴⁵ and ink — skin and oil.

We must confront a question: what is a Jew when taken away from the earth that produces the stuff of organic life? For that matter ... what is a Jew without a sunrise? Or with eighteen orbital sunrises in twenty-four hours? What is a Jew with no rainwater? With no moon at all, with no sun? Or with an alien sun and an unknown moon, or moons, or suns? With these yawning questions the earliest spacefaring Jews confronted the somewhat annoyed Rabbis who reluctantly began the legal record on these subjects. Alas, we are still busy cleaning up the mess that they have made.

In [t] 5730 Rabbi Ben Tzion Ferrer ruled that time-bound *mitzvot* do not apply outside of earth, for as we read in *Parshat Va'etchanan*, these rules apply *all the days that you live upon the earth*⁴⁶ (as opposed to anywhere else.) But Rabbi Menachem Kasher countered that these *mitzvot* are required in any environment and should be observed in the way that had become the norm in earth's polar regions (where there are no sunrises or sunsets during parts of the year) for more than a century. But it was the gifted American Rabbi, scientist and polymath, Dr. Azriel

⁴⁵ *klaf* is the kosher parchment or vellum made of the tanned skin of an animal and prepared according to Talmudic formulations. It is used by our *soferim* to write the Holy Scrolls, including the Torah scroll itself.

⁴⁶ Deuteronomy 4:10

Rosenfeld⁴⁷ who first surveyed the entire field of opinion, and offered a comprehensive approach. His investigations into Jewish practice in space span several papers and responsa including *The Sabbath and the Space Age*⁴⁸ and were the first of their kind. In an excerpt from this article we may sample Rosenfeld's thought:

In the cases of four of these problems (equatorial satellite, polar space station, lunar base, interstellar expedition) there is no practical possibility of living by the sky schedule. The individual or community in question will necessarily follow a clock and calendar schedule, probably based on some standard terrestrial time zone ... Imagine also a 16-hour [day] planet on which the community adapts itself, through the regular use of stimulants and sleeping drugs, to live a 32-hour day; is this an admissible community clock day for halakhic purposes? A final intriguing question: What are the implications for Sabbath observance of relativistic time dilation effects?

Dr. Rosenfeld's contributions, under-appreciated at the time, were the first serious exploration of how temporal *halacha* might be reimagined to account for Jewish spacefaring. But by the time Rosenfeld offered this hope, the great journey had already begun. Its first Jewish scout was the Soviet cosmonaut Boris Volonov, followed by the Judith Resnick and the aforementioned Hoffman and Ramon. Prior to his expedition, Ramon sought the advice of a Floridian Rabbi on

⁴⁷ Dr. Azriel Rosenfeld b. [t] 5691 was a scientist, Rabbi and polymath. He published over 30 books and some 600 articles on scientific and religious subjects. We know that Dovid Wilk was very aware of Rosenfeld's halachic work, and it may be wondered whether Wilk felt a sense of kinship with him, since both were practicing scientists and also religious thinkers. Rosenfeld, it seems, was able to pursue both activities in parallel throughout his working life, while Wilk (though he dabbled in Jewish thought beginning in his 30s) largely left his scientific pursuits behind after his arrival on Mars and the events that are chronicled in *Sefer Ma'adim*.

⁴⁸ originally published the now-defunct magazine *Tradition* in [t] 5724.

the subject of observance while in orbit, who in turn appealed to various authorities in Israel for guidance which was duly issued.

The first full responsa from the both the chief Rabbinate and the Lubavitcher of the day confined themselves to practical advice for those early explorers. The Rabbis seemed content to gently extend various other rulings on observance in polar areas of the earth, or during long sea or desert voyages where a traveller might no longer be able determine (with any certainty) the current day of the week⁴⁹. But these authorities were far more cautious than Rosenfeld and avoided the question which he approached boldly: were those who abided in the depths of space, on other planets, or even in orbit, to pretend for purposes of law that they were still living on the earth (ie: bind themselves to the sky-events of Terra) or were they permitted to look toward local celestial and planetary phenomena for purposes of Holy timekeeping? Or were they to do something even more bold — something that Rosenfeld circles, but does not name? Could they find another standard altogether -- another constant reference of neither earth nor sky — and use that instead?

Over the following century a disorganized debate about Jewish time ensued, downed out as it was by our age's catastrophes of climate instability and war. The moon and the sun were set aside, once mighty figures in our debates, now nearly irrelevant. But the rhythms of the argument were the same as ever:

⁴⁹ The circumstance under which one would not be able to determine the day of the week while traveling outside of polar regions are left to the reader to ponder.

Sky! Abstraction! Abstraction! Sky!

The very authorities that Rosenfeld feared would be unable to abandon the sky-calendar proved indeed that they were incapable of this leap. They ruled in [t] 5844 that all extra-Terran Jewish time should be reckoned according to the skies above Jerusalem.⁵⁰ It was no coincidence that the first permanent settlements on Mars were under construction at this time, nor that the first Jewish residents of Terraform Alpha arrived on Mars in [t] 5849.

It is to slander the dead (as some have) to hold that Judaism did not not accompany these pioneers. Rabbi Chen said:

*wherever there are Jews there is Judaism*⁵¹

But she also taught that the presence of a Jewish community does not guarantee a clear, workable legal framework. Contemporary authorities, especially in Israel, seem content to bury their burning heads in the sand for as long as they can. To them, there are no Jews in space — no Jews living under different skies, or by different clocks. Or at least there are none that matter. To these authorities, we extra-Terran Jews are like distant and forgotten cousins cast into the depths of so many sunless wells or confined in dark cages at the bottom of the sea. When pressed they will

⁵⁰ This ruling was issued by the (since renamed) *Scientific Panel of the Consolidated Chief Rabbinate of Israel*. The panel was not really a panel at all but a single man — one Rabbi Aaron Z. Gordon b. [t] 5782. Rabbi Gordon was not a trained scientist, though he was an acknowledged Talmudist in his generation. The panel was supposed to have two other members, but the wider Chief Rabbinate's appointment council had been unable approve a single new member for more than fourteen years due to disputes over candidates, some of whom possessed legitimate scientific backgrounds, and some of whom certainly did not.

⁵¹ Chen: *An Inverted Halacha of Time 14a*

admit regret over has become of us, but quickly add that they reckon that nothing can be done. To them we are like so many Josephs or Jonahs — our dim souls perhaps technically alive, but lost beyond all human help pending some miraculous redemption by God.

But a Jew was buried — Jewishly! — on Mars in [t] 5852, and the first *b'nai Yisrael* was born here in [t] 5886 when the population of the Amazonian stations was yet in the low single-thousands.⁵² So in what sense can it be said that there was no Judaism on Mars in those early days? Rabbi Chen, herself born in this era, steadfastly rejected the notion that her life's work was in any sense foundational to Jewish life on the planet. Such life was already present when she began to consider it systematically.

The innovations of my teacher and leader Rabbi Roberta Chen of Mars are not here discussed. They are both technical and copious, as big and wide as the sky. For an understanding of their broader points, though not a complete exploration of all of their deepest meanings, I refer you to my formal commentaries on her *Martian Halacha* and *An Inverted Halacha of Time*.⁵³

It is here that our *Toldot* intrudes upon both contemporary matters and personages that deserve deeper, more careful treatment and therefore must draw to a close. For it is the function of a

⁵² The death Wilk refers to is that of Joshua S. Cooper, an engineer and member of the American military who died in the year referenced while engaged in building our early infrastructure. Carter was buried in the martian subsoil since he had declined cremation. Transport of human remains back to Earth in those years was not practically possible. A Rabbi from Seattle presided by downlink. The fact that Wilk's own son died and was interred on the planet -- an event that occasioned his reluctant emigration from Earth and profound transformation (see *Sefer Ma'adim*) -- lurks behind this portion of the *Toldot Mazzaroth*. The [t] 5886 birth he refers to is that of the curiously-named Carmen Zoo Cohen, the first Jewish child to be born on any planet besides Earth.

⁵³ Both available from the TTI-J archive.

lineage to connect the uttermost past to a story's present, and having exhausted this task, rest and speak no more.

VIII A Stubbornly Persistent Illusion

No lineage is ever complete as long as its people endure.

Our *Toldot* must be constantly re-written and re-edited by each subsequent generation, whose wisdom and access to the truth (God willing) increases year upon year. To know that what certainty we possess today may one day be invalidated demands humility. And yet to this broken bridge we must trust our full weight. We have no other choice, except to lay ourselves down in the dust.

Who knows which of today's working theories will be disproven— or disapproved of, or simply fall out of use in the generations to come? The best work of our minds could well be overthrown by our children, or their children, from generation to generation. Indeed it is the fifth commandment that is perhaps the least understood. It is in their rebuke of our certainties that our children do us the greatest honor. In disproving our broken ideas, they take on the mantle of their inheritance.

And yet it is not fruitless to adhere to such wisdom and knowledge as we have. For at the core of belief is a substance of infinite strength. Try as Israel might, there are some realities from which

the Jewish soul cannot seem to divorce itself. The writer Philip K. Dick⁵⁴ was exactly wrong about this matter: reality is not “what belief does not touch”, but rather what belief embodies totally. Our great sage Maimonides was likewise mistaken: belief is not commanded of us by God, nor is it possible -- even in theory -- to construct a Jewish creed.⁵⁵

Belief cannot be required of us — it is off-limits to God by God's own design. To think otherwise is to mis-apprehend the universe as it has been created. Belief is the core of wonder and awe in the heart that we are unable to extinguish, no matter how hard we may try or how far we may roam. Belief is like the speed of light — it is the same for every Jew, no matter what facts about the world we each accept or how profoundly we disagree with each other on matters of soul and morality. At belief's core is an unfathomable mystery. It is like the past, the present and the future all at once — it is the *all-time* of the *heikhal* that is deadly for the unprepared⁵⁶. It is

⁵⁴ Philip K. Dick b. [t] 5688, author of *Blade Runner* and *The Man in the High Castle* among many other important works is a giant of pre-galactic literature who needs little introduction. Wilk was an acknowledged fan and amateur scholar of Dick -- a preoccupation that was in fashion then as it is now. The strident disagreement expressed in this section should be seen in light of one of the *Toldot's* main themes -- to disagree is to honor.

⁵⁵ The *Rambam* attempted this nonetheless in his *Thirteen Principles of the Jewish Faith*, which appears in his introduction to part 10 of *Tractate Sanhedrin*. Of the thirteen items on the list, twelve begin with the word "belief", implying that the essence of Judaism is in some sense built upon assent to these principles. The propositions themselves range from the uncontroversial (belief that God is One) to the entirely debatable or even downright dubious (the divine authorship of the Torah, its immutability, the resurrection of the dead etc.) The somewhat clandestine Rabbinical acceptance of a Jewish belief mandated by God was a feature of Terran Orthodoxy for many centuries. As is well known the work of Linda Sayers and the Canadian School now provides a coherent alternative. Wilk's characterization of Jewish belief in this short section in many ways presages Sayers and her movement who argued that it is both *contextually involuntary* and *universally necessary* to Jewish continuity. The particular content of belief changes and evolves with the ages and generations. But the nature and “way” of belief is eternal and definitive of the covenant. Another way to summarize this position might be to say that Jews are (in part) Jews because of our continual struggle with the (capital -T) Truth as expressed in our traditions. As Sayers and her school explained, these ideas have obvious mythical/literary echos in the struggle of Jacob with the Angel.

⁵⁶ Wilk's meaning here is unclear, though he intends to point to the mystery of his idea of belief by comparing it to the mystery of the Holy of Holies which proved fatal to *Nadab* and *Abihu*. Sayers, in her book *Jewish Discontinuities*, relates the idea of time (the subject of the *Toldot's* previous section) to the incident in Leviticus 10 by positing that Aaron's sons died when they became entangled in a spacetime singularity. This idea becomes more fathomable if we consider that even classical sources connect the fate of *Nadab* and *Abihu* to acts of divination — which can be seen as a form of attempted time travel.

indeed death as much as it is life — it is both. And yet there is no human choosing in it, no laying before us of the options and deciding between this and that, between left and right. There is only the act of belief itself, involuntary, eternal, *echad*.

The miracle is that we believe at all. The miracle is that we cannot stop ourselves. The miracle is that we have survived to believe anew, generation to generation. If we Jews were to no longer believe, Israel would cease to exist. Not fade, not depart, not slow, but cease altogether. Our central irony as a people is that we are sustained by a God who is unable to require the one necessity that for us is by its very nature involuntary. God cannot demand and we cannot choose, and so are we equally bound. We are like binary stars — unable to exist alone.

Belief is the gravity that connects us. Were it to cease, Israel would become like a nonsensical mathematical equation, its symbols scrambled and meaningless. We would become like an undocumented language whose last speaker has died. We would become like an ungrammatical sentence, a speech delivered in gibberish, an unsolvable riddle, a nullity. Jewish belief is inconvenient, unseemly, embarrassing and elusive. It is like time itself -- we cannot help but participate in its fiction. Belief is not a mitzvah -- it is not something we are commanded to do.

It is who we are.⁵⁷

⁵⁷ This section hints at Wilk's understanding of free will, which is obviously related to his idea of belief. His ideas in this area were once again consistent with those of Sayers. What is less recalled is the support this viewpoint finds among certain of the Hasidic masters, including Rabbi Mordechai Josef Leiner, the *Izbicer* Rebbe. For an early but illustrative discussion of these matters, see Sam Lebens' article *The Izbicer Rebbe and Freewill* ([t] 5771.) Lebens argues, in the name of one Rabbi Herzl Hefter, that the free will we experience within our world akin to the free will of Hamlet within the world of his play. There are stories within stories within stories. Dreams within dreams. The distinguishing characteristic of God's dream is that it forms not a fiction but the universe itself.

IX A Dudele

In the beginning God created the Torah and the cosmos. According to our mystics, the cosmos was constructed through the secret manipulation of the 22 letters of the Hebrew alphabet, along with the 10 *sefriot* (emanations or numbers) for a total of 32 symbols -- which is the number of the human eye (two) taken to the power of the number of the human hand (five.)

In the *Sefer Yetsirach*⁵⁸ we read:

He drew them, hewed them, combined them, weighed them, interchanged them, and through them produced the whole creation and everything that is destined to come into being.

The cosmos is God's dream in words. Our mother Eve and father Adam desired to understand the secrets of the its authorship directly and were thereby laid bare. For this reason God repented and sent guides, and also closed the garden and hid the words themselves from us, seeking to preserve the secrets of their making. To aid us we now have the Rabbis, mystics, Prophets,

⁵⁸ *Sefer Yetsirach* 4.4

scientists and mathematicians. May they forever continue to aid Israel in our perplexity and protect us from the fate of our Father and Mother.⁵⁹ We read in the Talmud:⁶⁰

When Moses ascended on High to receive the Torah, the ministering Angels said before the Holy One, Blessed be He: Master of the Universe, what is one born of woman doing here among us? The Holy One, Blessed be He, said to them: he is here to receive the Torah. The Angels said before Him: the Torah is a hidden treasure that was concealed by you 974 generations before the creation of the world, and you seek to give it to flesh and blood? As it is stated: "The world which he commanded to a thousand generations." Since the Torah, the word of God, was given to the twenty-sixth generation after Adam, the first man, the remaining 974 generations must have preceded the creation of the world.

According to our mystics, the Torah is older than the universe itself. It is part of a lineage that exists outside of time. What can we say of it now that time itself is dead?

⁵⁹ There are many mystical readings of the legend of the *Pardes*, the Talmudic tale concerning the four Rabbis, three of whom do not endure their ascent to the realm of divine Truth. Sven Schneerson relates a midrash of Rabbi Chen's that casts the four exemplars as early spacefaring scientists, and their "ascent" as a literal one into inner Terran orbit in order to conduct the first deep-space experiments:

The first Rabbi/Scientist refuses to believe what his early zero-gravity experiments show due to his caution and preconceptions -- he immediately dies. The second discards all caution and leaps to conclusions that lie beyond what the evidence her work demonstrates. In her wild speculation and fantasy, she goes mad. [Let those of us who write about science and Torah be warned! - ed] The third sneaks into the space station's laboratory during a stasis-shift and destroys the delicate instrumentation, thereby ending the whole inquiry. The fourth (corresponding to Akiva in the original tale) accepts what the experiments show, draws reasonable, modest conclusions and returns to Earth in peace.

This is related to a commentary of the *Izbicer* Rebbe on the death of Aaron's sons, and by extension on the general approach to mystical Truth: A person should not be too clever, nevertheless a person must consider all probable outcomes in a prudent way before making a decision. (See *Mei HaShiloach*, *Parshas Shemini*.) Be brave, but not too brave.

⁶⁰ *Shabbat* 88b.7

Let us answer this question by seeking the blank space that is left by our previous observations. If God is the weaver of this story, we, Israel, are both the Torah's subjects and its audience. For this reason we are granted the power to read, to listen and to hear and to act. We are granted the power to experiment, to conjecture, to test and to observe. In short, God has created us for science, and science has been created for us.

What's more, we are commanded to study. We are commanded to discover. We are commanded to hear. We are commanded to read. We are commanded to theorize, investigate, experiment and prove. The nature of the cosmos is the *Toldot* we are commanded to pass on to our children, to be destroyed by them, created by them— to be eternally renewed and destroyed again and again and again.

This cycle is a constant of the universe, like the speed of light.

With the sin of the garden consummated, Adam and Eve hid themselves from God.⁶¹ They were like two teenagers grown weary of a jolly parent. To be fair, the Almighty was in fact omnipresent (most parents, we may note, are not) and did make a habit of using divine power to

⁶¹ Genesis 3:8 They were thus the second and third creations to do this, the moon being the first — see Part I.

"accidentally" bump into our ancestors at very awkward moments. A parent's occasion for love is so often a child's occasion for chagrin.

For instance, once upon a time, Adam and Eve were sampling a new (permitted) fruit. God appeared just as the juices dribbled down Adam's face and into his lap. *Ha!* Laughed the Creator of all Things in gentle, awkward mirth. Adam pretended not to care, but he could not hide his blushing. He could not hide anything in those days. Similar incidents occurred while the couple stroked the fur of a prototypical vacuña,⁶² and again when they were unexpectedly pricked by the spines of the first porcupine. (A perfect mini-sphere of blood appeared on eve's brown finger. Adam's upturned face glowed as he tenderly licked it clean. God sighed rapturously. But let us say no more of such things.)

Ever since those days in the garden we have tried to escape the inescapable -- we have hidden from God in God's universe and desired our own place, apart from the Presence. There has been no limit to this human tendency -- no amount of running that we have not been willing to do in order to escape the company of the Creator. Our running is sometimes known as *idolatry*. Our running is sometimes known as *adventure*. But however shining our idols, however enticing our journeys, however clever our concealments and escapes, we are never alone.

⁶² An extinct animal of Peruvian origin with exceptionally soft fur.

Let us therefore sing *A Dudele* ⁶³ -- the song of Rabbi Levi Yitzok of Berdichev (he who first denied the heavenly clock). Wherever we may look, and whether we like it or not, the One has gone before. Whether or not this everywhere-ness is best regarded as a blessing or rather as a cosmic annoyance the *Berdichever* never specifies. The words to the song can be read both ways, sometimes at the same time. Here they are in part:

Master of the Universe! I'll sing a song for You.

Wherever I go: You. Wherever I stay — You.

East — You west — You south — You north — You

Heaven — You earth — You above — You below — You

Wherever I turn — You. Wherever I go — You You You

It is only with the closed eyes of serpents that we fail to see the Creator's mark in even the ultimate reaches of time and space, in the breadth and depth of all. She abides in the working of the atom and the quantum field. His presence lives in the devices of the ion drive and terraform, in our new explorations of the time-gate⁶⁴ and the mysteries of the galaxies and singularities and mega-clusters, the great curtain of dark matter and in the fabric of spacetime itself. Whatever child of Israel looks up at the sky or out from a window upon the mysteries of space and wonders at the undiscovered worlds laid out before us in the heavens like an array of tiny coins — such a

⁶³ This song is traditionally attributed to the *Berdichever*, who's custom was to sing it at havdalah.

⁶⁴ Wilk's assessment of the prospects of the time gate technology here mentioned were of course far too optimistic, though time gating was very new in his day and had caused a rather significant rush toward public grappling with the implications of rapid, targeted time travel. Needless to say, though the phenomena involved are far better understood in our age than Wilk's, time gates still resist real-world applications outside the laboratory.

one becomes a link in this *Toldot Mazzaroth*. So it has been from our earliest days in the desert, and so will it be forever.

Look up O Israel! Look out O Jacob!

As our earliest ancestors did, weaving tales of the sun and the moon and counting the passage of time.

Look up! Look out!

As in the ancient desert, where we followed the *mazzaroth* in their parade through the sacred lenses of our secret Priests.

Look up look out!

Through Jacob's staff, Zacuto's astrolabe and Galileo's telescope, as we felt the Hand of God touch the sullen earth and re-order the stars in our mathematical minds.

Look up! Look out!

As in those earliest days of spacefaring, when we risked the fate of Aaron's sons and the four Rabbis in our quest to escape the confines of the Terran globe, saying *kaddish* for time itself.

Look up! Look out!

As our sages Josef Delmedgio, Baruch Spinoza, Rabbi Levi Yitzchok, Rabbi Mordechai Josef Leiner, Albert Einstein, Rabbi Abraham Joshua Heschel, Rabbi Azrial Rosenfeld, Rabbi Roberta Chen and Dr. Linda Sayers did -- they who dared others to follow bravely the paths that their minds blazed.

Look up! Look out!

Through ion drive and orbital crane. Through terraform and time-gate.

Look up! Look out!

To a billion billion skies, a billion billion suns and uncountable Jewish worlds.

Look up! Look out!

We are commanded to set forth. We have no choice. We refuse all fear.

For there is only *echad*. Everywhere and always.