Survey of Recent Halakhic Periodical Literature

MIZVOT IN THE POLAR REGIONS AND IN EARTH ORBIT

I. THE PROBLEM

Some time during the early period of space exploration, this writer was present at a gathering at which Milton Himmelfarb delivered a talk on the state of the Jewish community. After pointing out that Jews had achieved acceptance, and indeed prominence, in the professions, public service, finance etc., he digressed to note that there had been no Jewish astronauts. To explain that exception to the already well-established norm, Himmelfarb lapsed into Yiddish in explaining that no Jew wished to become a pioneer in space travel: "Dort ken men doch derharget veren —A person could get killed out there!" Afterward, this writer commented, only partially tongue in cheek, that Jews perforce abjure space travel because of a quandary with regard to the proper time for prayer and because of confusion with regard to observance of Shabbat.

Although Himmelfarb's comment was ominously prescient, with regard to Jews choosing space travel as a profession, time has proved both of us to have been wrong. In the ensuing years there have been a significant number of Jewish astronauts. The first was Dr. Judith Resnick who flew on the maiden voyage of Discovery in 1984 and who was aboard the ill-fated Challenger in which she perished with the rest of the crew shortly after takeoff. At the time of her planned flight there were reports, perhaps apocryphal, that she had expressed curiosity with regard to determining the proper time for kindling Sabbath candles. Later, for some reason, another Jewish astronaut, Scott Horowitz, took with him an artifact described as a "space Torah" and subsequently presented that memento to a temple in Houston. David Wolf flew on three shuttle flights and spent four months, including Chanukah, on the Russian space station Mir. Although kindling a menorah would have been dangerous in the oxygen-rich atmosphere of the space station, he

did spin a *dreidel* which Wolf claims he was able to spin in zero gravity for an hour and a half on a single twirl.¹

Most recently, in January of 2003, after repeated postponements, Colonel Ilan Ramon, the first Israeli astronaut, joined a crew of NASA astronauts aboard the space shuttle Columbia on a mission that ended in tragedy sixteen days later on February 1st. Kosher food of a type that can be reconstituted in space was prepared for the Jewish astronaut by a company in Illinois. He also consulted a rabbi identified with the Lubavitch movement serving in the vicinity of Cape Canaveral with regard to the proper method of determining when to observe *Shabbat*. Colonel Ramon indicated to one reporter that he was not strictly Sabbath observant and would also find it impossible fully to observe *Shabbat* during his mission in space, but that he nevertheless felt that in participating in the space program he was "representing all Jews and all Israelis" and therefore should endeavor to conduct himself accordingly.²

One may surely hope that the interest and discussion evoked by Colonel Ramon's query will impress upon others the importance of Sabbath observance. In any event, the sentiments he expressed are themselves quite salutary: A Jew may not have developed the spiritual fortitude that fosters consistency in abiding by the demands of Judaism but may nevertheless intuitively shrink from public transgression. The Jewishness that was at the core of his being caused him to recoil from unnecessary Sabbath desecration that was *be-farhesiya*, i.e., public and notorious. With the eyes of the world focused not only upon the flight of the space shuttle but upon the Israeli crew member in particular, the actions of that individual were indeed public and were perceived as representative of the Jewish people as a whole.

The issue of Sabbath observance aboard a space ship is a novel extension of the much older question of Sabbath observance in the polar regions and adjacent areas in which daylight and darkness extend for months at a time rather than alternating in periods of approximately twenty-four hours. Determination of the prescribed time for morning, afternoon and evening prayers as well as for other time-bound *mizvot* presents the identical problem. Jewish commercial travellers reached areas relatively close to the North Pole long before anyone, Jew or gentile, seriously dreamed of space travel.

Those questions received serious attention but hardly unequivocal resolution either because of doubt engendered by disagreement with regard to the proper solution of the problem or because measurement

of time at the antipodes and/or in space is a matter of intrinsic halakhic doubt to which there is no resolution. The rabbinic attitude vis-à-vis proper comportment in the polar regions is eloquently captured in a letter written in 1886 by Rabbi Simcha ha-Levi Bamberger to his son that is published in the former's response collection, Zekher Simhah, no. 30. Rabbi Bamberger's son was considering a trip to Norway for some business purpose and consulted his father regarding the appropriateness of the halakhic ruling of an unnamed Norwegian rabbi with regard to Sabbath observance. After discussing the problem and offering his own opinion, Zekher Simhah concludes: "However, all this is Halakhah but in practice my inclination is: Why should a person, even during weekdays, place himself in a state of doubt with regard to reading the Shema and prayer? At the minimum, do not remain in that country on Shabbat [where] there is doubt with regard to what to do. Nothing prevents God from bestowing blessing and success wherever your feet tread for good." A rabbinic decisor's fatherly advice and blessing to his son was to avoid halakhic doubt and find divine bounty elsewhere.

II. R. JACOB EMDEN

The first rabbinic authority to address the question of time at the polar regions was the eighteenth-century scholar R. Jacob Emden whose opinion gained wide currency due to its citation in *Sha'arei Teshuvah*, *Orah Hayyim* 344:1. R. Jacob Emden is quoted in that source as ruling that "those traveling below the polar region where the day is prolonged into a month or two months and [in some places] six months should count six days of our twenty-four equal hours," i.e., the advent of *Shabbat* should be deemed to occur after six periods of twenty-four clock hours have elapsed. In context, the implication of *Sha'arei Teshuvah*'s citation of R. Jacob Emden's view is certainly that the seventh cycle of twenty-four hours is to be regarded as *Shabbat* in every respect. However, a careful examination of R. Jacob Emden's comments in his *Mor u-Kezi'ah* 334 in their entirety reveals a certain ambiguity in Rabbi Emden's position. *Mor u-Kezi'ah* comments:

It is necessary to reflect upon [the manner in which] those who dwell or travel in the lands near the poles should conduct themselves. For, in proportion to proximity [to the pole], the day becomes lengthened. There [are places in which] a month or two months and even longer may be a day to the extent that there exists a place where the day is

prolonged to half a year and similarly the night is half a year. And under the pole there is no day and night at all; rather there is twilight [during] the entire year for in that place there is no sunrise or sunset because the [celestial] equator is its horizon. If so, how should they establish *Shabbat* there? It seems to me that there it is necessary to count seven equal days of twenty-four of our equal hours, and calculating from the day that one arrived there, one should count days by means of hours and sanctify the seventh in the manner mentioned earlier with regard to a traveller in the desert.

Mor u-Kezi'ah's assertion that there is neither night nor day at the North Pole itself (or at any other place that might be denoted by the phrase "under the pole") because the sun never rises and never sets is simply an empirical error. It is true that a person standing at the North Pole who looks out over the horizon will observe all stars north of the equator because, at the North Pole, the celestial equator can be seen on the horizon. However, it is precisely at the North Pole that day and night are each six months in duration and at no place is there year round twilight. Assuming, however, that Mor u-Kezi'ah's description is factually accurate and that, in the absence of sunrise and sunset, the halakhic day is to be calculated as a period of twenty-four clock hours, it remains necessary to determine when the sequence of days begins in order to determine the seventh day of each weekly cycle. Logic would dictate that "time" at the North Pole began when time began for the rest of the planet. However, instead of being contingent upon a sequence of sunrises and sunsets, time at the North Pole is calculated by means of clock hours. If that is the case, then Shabbat should be observed on the North Pole on the same "day" that it is observed elsewhere in the globe although, to be sure, Shabbat would begin and end throughout the year at the same hour. In effect, the North Pole would have its own "local" time just as the day begins and concludes at every other geographic point on earth in accordance with its own local time. The sole difference being that "local" time at the North Pole is idiosyncratic in that it is to be determined by consulting the clock while elsewhere local time depends upon sunrise and sunset.

But *Mor u-Kezi'ah* says something astoundingly different. He rules that the week commences with the arrival of the traveller who then counts six days before sanctifying the seventh. Apparently, every traveller begins calculating his own weekly cycle upon arrival regardless of which day of the week it might be elsewhere on the globe.³ The resultant situation is certainly anomalous: Not only do two travellers observe *Shabbat*

on two different days but neither of them observe *Shabbat* on the day of the week on which it is observed by Jews elsewhere in the world!⁴

Moreover, *Mor u-Kezi'ab* rules that the identical procedure must be followed not only in fictitious places where the sun always shines but also in areas in which the cycles of daylight and darkness are a month, two months or six months in duration despite the fact that in those locales the phenomena of sunrise and sunset do occur, albeit at intervals that vary greatly from other places.

It seems to this writer that the key to understanding the import of Mor u-Kezi'ah's ruling is in his concluding phrase: "and he sanctifies the seventh in the manner that has been mentioned earlier with regard to a traveller in the desert." If one reflects upon that comment for but a moment it seems to be entirely inappropos. To be sure, the rule codified in Shulhan Arukh, Orah Hayyim 344:1, is that a traveller in the desert who becomes confused and no longer knows which day of the week it is counts six days and sanctifies the seventh. But the days that he counts are conventional solar days, not twenty-four hour clock days. Moreover, that halakhic provision in no way reflects the notion that the days of the week are to be determined in an arbitrary, subjective or individual manner. Quite to the contrary, doubt with regard to the identity of each day of the week-and hence the objective determination of Shabbat—is not at all dispelled by adoption of an arbitrary convention. For that reason, the rule as recorded by Shulhan Arukh is that since the traveller remains in a quandary he must refrain from activity forbidden on Shabbat on each and every day.5 The traveller is permitted to perform any act necessary to sustain life and such acts are permitted even on the day that he observes as Shabbat. Thus, he may cook as much food as necessary to meet his minimum requirements on each day of the week, including the day that according to his arbitrary calculation is Saturday. He is also permitted to do whatever is necessary in order to emerge from the desert as quickly as possible so that he may return to proper Sabbath observance and he may engage in such travel even on the day that he observes as Shabbat. The confused traveller observes the day designated as the Sabbath solely through recitation of kiddush, havdalah and Shabbat prayers.⁶ Those observances are rabbinically ordained for the day designated by the traveller as his personal Sabbath lest the confused traveller forget the very concept of Shabbat.⁷

Application of that rabbinic decree to a hypothetical geographic area in which there is perpetual daylight is problematic to say the least. Its application to locales in which the day is inordinately long in dura-

tion is even more baffling. There is no hint in that rabbinic decree indicating that in a place where there is no sunrise or sunset the day is to be calculated as twenty-four clock hours in length and certainly no suggestion that where there is sunrise and sunset that the "days" cannot be weeks or months in duration. Moreover, the rabbinic decree is limited solely to matters of liturgy and ritual but does not permit transgression of even rabbinically ordained strictures on any day of the week.

It seems to this writer that Mor u-Kezi'ah regarded the establishment of halakhic time, and hence of the Sabbath, in the places under discussion to be a matter of unresolvable doubt. To be sure, as clearly enunciated by R. David ibn Zimra, Teshuvot ha-Radvaz, I, no. 76,8 determination of the onset and conclusion of Shabbat is determined locally. Leviticus 23:3 mandates that the Sabbath be observed "in all your habitations." That phrase is understood by Radvaz⁹ as signifying that the onset and conclusion of Shabbat is to be determined in accordance with sunset at each particular "habitation."¹⁰ Shabbat is designed as a "sign between Me and between you" (Exodus 31:13) and accordingly, is to be observed during the period representing the culmination of six days of labor in each person's locale. The Sabbath day, which includes a period of darkness and a period of daylight, is roughly twentyfour hours in length in all places other than in the extreme northern and southern regions. As a result, the Sabbath is observed on the same day of the week in all parts of the globe. Accordingly, Mor u-Kezi'ah assumes that in locales in which that cannot be the case there is no discernible method for determining the days of the week. Hence, determination of the advent of Shabbat remains either a matter of irresolvable doubt or, alternatively, there is no concept of halakhic time in such places. Therefore, Mor u-Kezi'ah rules that a person finding himself in such a place faces a problem that is no different from that confronting a person lost in the desert or confused with regard to a sequence of days and must conduct himself in an identical manner. That is precisely the import of Mor u-Kezi'ah's concluding phrase "in the manner indicated earlier with regard to one who travels in the desert," i.e., he may perform no forbidden act on any day of the week and must recite kiddush and havdalah on the seventh day of every seven-day cycle subsequent to his arrival.

But even that understanding of *Mor u-Kezi'ah*'s position remains problematic if there is no halakhic time in such regions. Were that the case, there would be no *Shabbat* and hence no forbidden acts. Rabbinic legislation regarding *kiddush* and *havdalah* might well be cogent as a means of keeping the concept of *Shabbat* alive but the element of doubt

that renders proscribed acts impermissible on any day that might possibly be *Shabbat* is not at all present in an area in which there is no time and hence no *Shabbat*. Accordingly, it would seem that *Mor u-Kezi'ah* should be understood as assuming that halakhic time does exist in the polar regions but that a method of calculating the passing of time in such areas is not available to us. Accordingly, all matters requiring a determination of time remain a matter of irresolvable doubt in such areas.

Understood in this manner, Mor u-Kezi'ah's position is cogent but nevertheless open to objection. As a matter of general principle, rabbinic legislation was designed for the usual and the anticipated but *milta de-lo* shekhikhah lo gazru ba rabbanan, the unusual and the unanticipated are not subsumed within the ambit of rabbinic legislation. For the Sages, the possibility of becoming lost in a desert was certainly not farfetched; however, travel to the polar regions would not merely have been unanticipated but would have been inconceivable. Moreover, rabbinic legislation is to be interpreted on the basis of the principle of strict construction. Talmudic decrees apply only to specified conditions under specified circumstances. The Sages promulgated an edict requiring recitation of kiddush and havdalah in a situation in which the proper day for observance of the Shabbat is known to one and all with the exception of an isolated traveller who has become confused. Even the confused traveller is obligated to observance of the proper day as a matter of objective certainty; the problem is that he does not know what everyone else does know, viz., which day that is. Hence the Sages promulgated a decree requiring at least some form of observance for even this individual lest he become entirely desensitized to the notion of Shabbat.

However, *Shabbat* in the polar regions is a matter of doubt for everyone. There is no evidence of a rabbinic decree requiring *kiddush* and *havdalah* on any day in a situation in which no one knows and no one can possibly know which day is *Shabbat*. Even though we might think it wise and spiritually edifying to legislate some form of positive *Shabbat* observance even is such circumstances, the notion of strict construction would lead to the conclusion that, since such a contingency is technically outside the parameters of existing rabbinic legislation, there is, in reality, no such obligation.

There is a much more fundamental difficulty in understanding the view that *Mor u-Kezi'ah* apparently espouses. If halakhic time does exist even in the absence of sunrise and sunset but its calculation is always a matter of irresolvable doubt it is not clear why such doubt does not persist even after the phenomena of sunset and sunrise reappear with

the change of the seasons. Since there is no intrinsic reason why a single day must be twenty-four hours in duration, the "time" elapsed may be more or less than on the rest of the globe. If so, in any place in which there is no sunset or sunrise for any extended period during the year there is no way to gauge the period of time that elapses during that interval. Hence, the entire calendrical system in such a locale becomes subject to doubt that is generated during the period of constant daylight or constant darkness.

That problem is even more severe than may appear to be the case. For Rabbenu Tam who maintains that *zet ha-kokhavim*, or night, occurs only when the sun's angle of declension is 16.1 degrees below the horizon there is no "night" during some days of June as far south as London. If one were to adopt the theory herein outlined all calculations of the days of the week as well as the dates of the month in areas north of fifty-two degrees latitude would, according to Rabbenu Tam, be subject to doubt. Indeed, the identical problem presents itself north of sixty degrees latitude, an area that includes places such as St. Petersburg, even according to those who disagree with Rabbenu Tam.¹¹

III. TIFERET YISRA'EL

Perhaps the most widely cited source with regard to Sabbath observance at the North Pole is a note authored by the nineteenth-century authority R. Israel Lipschutz and published in his classic commentary on the Mishnah, Tiferet Yisra'el, as an addendum to his commentary on the first chapter of Berakhot. Tiferet Yisra'el carefully distinguishes between places such as his own city of Danzig, as well as Copenhagen and Stockholm, in which there is always at least a brief period of dusk and places further north in which "there is no night at all but only daylight during the months of June and July." He also expresses concern with regard to people who sail close to the North Pole in order to catch "whalefish" because in that locale there are a number of months during the summer in which there is only daylight. Tiferet Yisra'el does not cite Mor u-Kezi'ah but adopts a position that is remarkably similar to that of R. Jacob Emden in one salient aspect. As did his predecessor, Tiferet Yisra'el rules that each twenty-four hour period constitutes a day. In support of that conclusion he draws upon the fact that the sun can be observed as completing a full circle above the horizon each twenty-four hour period. However, his position is fundamentally different from that of Mor u-Kezi'ah in that Tiferet Yisra'el maintains that the day is deter-

mined objectively rather than individually by each traveller. Thus throughout the year *Shabbat* occurs at the North Pole the same day as it does on the rest of the globe and is objectively determined by the "revolutions" of the sun in the sky. In the polar regions the sun is observed as moving in a circular pattern and completes a full circuit in the overhead sky every twenty-four hours. Each of those twenty-four hour circuits, maintains *Tiferet Yisra'el*, represents a single day.¹² However, *Tiferet Yisra'el* fails to identify a phenomenon that might serve to demarcate successive days during the polar night when the sun is entirely concealed.¹³

Adoption of that thesis serves to establish the "day," i.e., the twenty-four hour period, on which Shabbat occurs but provides no method for determining when Shabbat begins or when it concludes. Nor does it provide a means by which one can determine the proper time for recitation of the Shema or the several daily prayers. Without citing evidence or precedent for his view, Tiferet Yisra'el opines that the traveller should adopt the clock of "the place from which he departed" (makom she-yaza me-sham) in determining the beginning and end of each day and the various divisions thereof.¹⁴ There is some ambiguity with regard to Tiferet Yisra'el's precise meaning: Does "the place from which he departed" connote the locale of the traveller's former residence or his port of embarkation?¹⁵ A similar position is advanced by R. Pinchas Eliyahu Hurwitz, Sefer ha-Brit, I, ma'amar 4, chapter 11. With regard to a person who finds himself in the polar regions, Sefer ha-Brit declares that "after he counts six times twenty-four hours on the clock he should make Shabbat."16 Sefer ha-Brit presumably means that the clock to be used for this purpose is one that shows the current time at the port of embarkation.¹⁷

Tiferet Yisra'el himself notes one resultant incongruity: A traveller arriving at the North Pole from England and a traveller arriving from America would both observe Shabbat on the same "day" but at different hours. The European would recite kiddush while the American might legitimately perform all manner of labor; some twenty-four hours later the European would recite havdalah while the American is engaged in the recitation of the Shabbat minhah service. One can only ponder the situation of children born to an American man who marries a European woman at the North Pole. When does Shabbat begin and end for the children of that marriage? The issue is not one of custom, with regard to which the father's custom prevails, but one of law. There seems to be no reason why, normatively, children should be governed

by one parent's clock rather than by the clock of the other parent. Indeed, that situation serves to highlight the underlying problem, *viz.*, why should children be governed by their parents' clock? The time reflected by that clock is neither the time of the child's prior residence nor of the child's port of embarkation. Indeed, by what reason is the traveller himself governed by the clock of his place of embarkation or of previous domicile?

At least in part because of this incongruity, *Tiferet Yisra'el* recognizes that infraction of Sabbath prohibitions in the polar area do not occasion statutory punishment. The phraseology employed by *Tiferet Yisra'el* may be readily understood as implying that *Tiferet Yisra'el* recognizes that *Shabbat* observance in the polar area in the manner that he describes is not biblically mandated but is in the form of a rabbinic obligation, presumably similar to that of a person who loses track of time in a desert.¹⁸

Putting aside the question of how the beginning and end of each day is to be determined as well as the question of whether Sabbath obligations in such areas are binding by virtue of biblical law or rabbinic decree, *Tiferet Yisra'el*'s basic position, i.e., that the passing of days is to be calculated on the basis of twenty-four hour periods, is accepted by R. Chaim Joseph David Azulai, *Mahazik Berakhah* 344:4; *Sha'arei Teshuvah*, *Orah Hayyim* 344:1; R. Jehoseph Schwartz, *Teshuvot Divrei Yosef*, no. 8; *Sefer ha-Brit*, I, *ma'amar* 4, chap. 10; *Teshuvot Rav Pe'alim*, II, *Sod Yesharim*, no. 4; *Kaf ha-Hayyim*, *Orah Hayyim* 344:2; R. Yechiel Michal Tucatzinsky, *Bein ha-Shemashot* (Jerusalem, 5789), p. 55; R. Yechiel Michal Gold, *Me'aseph le-Khol ha-Mahanot*, *Orah Hayyim* 18:25; and R. David Spira, *Teshuvot Bnei Zion*, *Kuntres Midot ha-Yom*, secs. 21-23.¹⁹

IV. AN UNCONSIDERED VIEW

Tiferet Yisra'el cites no evidence is support of his view. The phenomenon of the sun's circular movement over the horizon each day is certainly not a demonstration that each twenty-four hour period in which such a revolution takes place constitutes a halakhic day. Quite to the contrary, Scripture records "and it was evening, and it was morning, one day" (Genesis 1:5). Read literally, the day is defined in terms of alternating periods of light and darkness, not in terms of a revolution of the earth upon its axis or of the circuitous movement of the overhead sun. How this might have occurred prior to the creation of the sun on the third

day is a matter that has engaged the attention of numerous biblical commentators, most particularly, Rambam and Seforno, Genesis 1:5; Rabbenu Bahya, Genesis 1:13; Rashbam, Genesis 1:4 and 1:14; R. Isaac Arama, Akeidat Yizhak, sha'ar shlishi; and Malbim, Genesis 1:5.

This concept also appears to be reflected in the words of *Pesikta Rabbati* 15:1. Citing the verse "Who appoints the moon for seasons; the sun knows its going down" (Psalms 104:19), *Pesikta Rabbati* comments, "Because 'the sun know its going down'—from here [it is derived] that we do not calculate according to the moon unless the sun has set." In context, *Pesikta Rabbati* declares that even though the nascent moon has been sighted a new month does not begin until the sun sets. The import of that statement would certainly seem to be that a new day can begin only upon the actual setting of the sun.²⁰

There is another way of viewing the passing of days at the poles, a method that is simple and obvious in conception but entirely strange in application. As noted earlier, there is strong reason to assume that the halakhic day is demarcated by sunset and sunrise. There is no obvious reason for assuming that a day must be approximately twenty-four hours in duration. If so, it might readily be argued that a day should always be defined as the period that elapses between one sunset and the next sunset, regardless of how many hours have elapsed between those two phenomena. Thus, if at the North Pole a single sunset is followed by six months of darkness and those six months of darkness are followed by six months of daylight culminating in the next sunset, the length of a "day" at the North Pole is equal to a full year. After six such days elapse the following "day" of twelve months duration would be Shabbat. According to that theory, Shabbat would occur at the North Pole only once in seven years but would last for an entire "sabbatical" year. Calculation of the sequence of those year-long days would begin no later than from the creation of the sun.

Application of the same theory to other areas in the far north where a summer "day," i.e., the period between one sunset and the next may be, for example, two months in duration, would result in considering that two-month period to be a single day within the seven day cycle of a "week." *Shabbat* would then be determined by recalculating the sequence of the days of the week by taking the two-month day into consideration as a single day. Those calculations would also have to be refigured from the day of creation. The result would be highly inconvenient to say the least, both because *Shabbat* would not be observed on the same day as it is observed on the rest of the globe and because

observance of *Shabbat* would fluctuate each year from one day of the week to another.

It should also be pointed out that adoption of this thesis leads to the result that, according to Rabbenu Tam, *Shabbat* may not coincide with Saturday even in areas as far south as London. On days that the sun does not decline at least 16.1 degrees below the horizon it is, according to Rabbenu Tam, at least doubtful whether a new day has begun.²¹ If a new day has not begun, then the entire period during which the sun does not decline 16.1 degrees is part of a single day²² and, accordingly, the ensuing *Shabbat*, and all future Sabbath days, must be calculated on the basis of that consideration.²³

Fortuitously, a thesis of this nature²⁴ has not been espoused by any scholar.²⁵ However, an unnamed interlocutor whose comments are recorded by R. Jehoseph Schwartz, *Teshuvot Divrei Yosef* (Jerusalem, 5622), no. 8, did formulate such a view. That scholar adduces a statement found in *Pirkei de-Rabbi Eli'ezer*, chapter 52, in support of this view. *Pirkei de-Rabbi Eli'ezer*, commenting upon the phenomenon described in Joshua 10:13, maintains that Joshua caused the sun to remain in a fixed position in the sky for a period of twenty-four hours and that the miracle was performed by Joshua on a Friday. That entire period was regarded as a weekday rather than as *Shabbat*, thereby enabling completion of the military engagement without descration of the Sabbath. The anonymous scholar is reported to have cited those comments as suggestive of the notion that a day may be of indeterminate length.

Divrei Yosef dismisses this argument by citing the full comment of Pirkei de-Rabbi Eli'ezer which indicates that Joshua interfered not only with the motion of the sun but also with the motion of the other luminaries, i.e., the moon and the stars. That statement, asserts Divrei Yosef, demonstrates that not only the sun but all the celestial bodies remained suspended in the sky. Hence, in effect, Joshua caused time to be suspended. That phenomenon, declares Divrei Yosef, is quite different from the purely local phenomenon that occurs at the North Pole.

The anonymous interlocutor is further quoted as rejecting his own proposed thesis because the Palestinian Talmud, *Kelayim* 9:13 and *Ketubot* 12:3, reports that a similar phenomenon occurred on the Friday on which the funeral of R. Judah the Prince took place. However, the Palestinian Talmud reports that on that occasion the participants in the funeral considered themselves to have desecrated the Sabbath. The latter statement, he argues, establishes that the demarcation of successive days does not necessarily depend upon the declension of the sun below the horizon. 25a

The reason why such a thesis does not merit consideration is not immediately evident, particularly if there is no intrinsic reason why a day must be approximately twenty-four hours in duration.²⁶ The only reason that suggests itself to this writer is that, although the beginning and end of a day and intermediate divisions of the day certainly depend upon local sundown and sunrise, the identity of any given day is the same throughout the globe with the minor exception presented by the necessary adjustment for the dateline. The dateline phenomenon is not an exception to the basic principle because that phenomenon is the logical result of the movement of the sun as perceived in all places throughout the globe except for the polar areas. The notion that in one locale it may be Shabbat while in another it may be some time on Friday and in another locale it may be some time on Sunday is readily understood. But a thesis that will posit that Shabbat can occur in some geographic area on a day that is, for example, Wednesday elsewhere is incompatible with the very nature of a calendrical system.

V. AN ALTERNATIVE VIEW

There is however another possibility that, to this writer, seems to be the most cogent way of viewing "time" in the polar regions. It may be suggested that in the absence of the halakhic criteria of sunset and sunrise there is no halakhic day and hence no halakhic time. Locales in which that is the case have no time because they "transcend" time. The result would be that obligations with regard to time-bound *mizvot* are simply non-existent in such places.²⁷

Thus, since a day is defined as the period between sunset and sunrise, allowing for variation in its beginning and end, the day of the week must be the same throughout the globe, there is no "day" at the North Pole and hence no *Shabbat*. Similarly, there are no days of the month and hence no festivals. Since there is no day to be divided into hours, there is no obligation with regard to reciting the *Shema* or any of the time-bound prayers.²⁸

This is true also in northern areas below the North Pole in which the summer day and the summer night are weeks or even months in duration. But this is true only during those periods of prolonged daylight and prolonged darkness. During the periods of the year in which

there is sunrise and sunset, regardless of the brevity of the day or night, time-bound *mizvot* are fully binding and the day of the week as well as the date in those areas is identical to the day and the date everywhere else on the globe.

In order to appreciate this concept fully it is helpful to think of time as a "place." A person in outer space or a person near the polar region in which a single day extends for a period much longer than twentyfour hours "transcends" time and hence is "outside" the "place" called Shabbat. When the same traveller returns to earth, when the person in the polar area travels out of that region, or when summer or winter becomes fall or spring in the polar region, the individual has in effect "reentered" the place called "time." He reenters an objectively defined time that is identical for him and for all other individuals. The term "sunset" is used to denote the end of the day. Whether the day ends at sunset or at zet ha-kokhavim, i.e., when it is actually night as evidenced by the appearance of stars is, of course, a matter of halakhic doubt. Hence, there will be locales in which obligations with regard to observance of time-bound mizvot will be a matter of parallel doubt, i.e., in areas in which, on some days during the year, the sun sets but does not decline below the horizon sufficiently for it actually to become night, the very existence of time is doubtful and hence the obligation with regard to time-bound *mizvot* becomes a matter of doubt.

According to this thesis, the days that elapse elsewhere on earth during the periods of prolonged polar daylight and darkness which are not halakhically recognized as "days" have no effect on subsequent calculation of time in the polar areas. Similarly, the calendrical system is unaffected in those areas during other periods of the year. There is no "time" in those areas either the entire year or for portions of the year, depending upon proximity to the pole, because those areas are *lema'aleh min ha-zman*, i.e., in those areas time is transcended. But the reappearance of the phenomena of sunrise and sunset in those areas signifies a return to the realm of time. Moreover, those locales return to the spot on the continuum of time that is shared by the entire globe.

Metaphorically, the matter can be compared to a group of people seated together on a carousel moving round and round in a circle. If one of the group gets off the moving carousel he is no longer in motion or in any way subject to motion. Nevertheless, the person exiting the carousel can observe his companions and, although he is a spectator who "transcends" their motion, he can be fully cognizant of their continued circular movement. If he stands outside and waits

while the carousel completes one or more "revolutions" or circuits and then rejoins his companions at the same spot on the carousel at which he left them on an earlier circuit he will continue to ride with them in precisely the same spot as he would have ridden had he never exited from the carousel.

It is also possible that time may not only be transcended by a space traveller or in the polar regions but that, at times, all of planet Earth may transcend time. The import of that notion is that time, once created, enjoys an independent ontological existence even when time is nowhere manifest. Time, under such circumstances, would continue to march and Earth, when it returns from its state of transcendence, would return to the spot on the continuum of time that it would have occupied had it not temporarily transcended time.²⁹

Strange as that thesis may appear, it serves, in this writer's opinion, to explain two difficult aggadic statements³⁰ that have long been a source of puzzlement. Scripture records that in the war against Gibeon undertaken by Joshua the sun stood still in the sky in order to enable the conquest to become complete: "And the sun stood still and the moon stayed until the nation avenged itself of the enemies . . . and the sun stayed in the middle of the sky and did not hasten to go down for a whole day" (Joshua 10:13). Based upon differing interpretations of that verse, the Gemara, Avodah Zarah 25a, records a dispute with regard to whether that "day," i.e., the hours of daylight, was twenty-four, thirtysix or forty-eight hours in duration. In Avodah Zarah 25a there is no hint that the entire time period described together with the normal period of darkness counted for other than a single calendar day. However, Pirkei de- Rabbi Eli'ezer, chapter 52, adopts the view that the sun shone for thirty-six hours and reports that the battle occurred on Friday "and Joshua saw the anguish of Israel lest they desecrate the Sabbath . . . and each [of the luminaries] remained stationary for thirtysix hours until the conclusion of the Sabbath."

Pirkei de-Rabbi Eli'ezer obviously maintains that the additional twenty-four hours of daylight were not "extra-calendrical." Nevertheless, although that twenty-four hour period corresponded to the Shabbat day, Sabbath restrictions were not incumbent upon Jews during that period. When the sun did set, it was at the "conclusion of the Sabbath." It must therefore be concluded that during the twenty-four hour period during which the sun remained in the sky, time was not suspended but was "transcended." Since all of Earth was affected, time was transcended by the entire planet. Moreover, when the sun did set,

Earth returned to normal patterns of time and did so as if there had been no interruption in the flow of time.

In addition, a number of sources, including the Palestinian Talmud, Berakhot 8:6; Bereishit Rabbah 11:2, 12:6 and 82:17; Midrash Tehillim 92:4; and Pesikta Rabbati 23:6, record that there was no period of darkness during the very first Sabbath which came after the six days of creation; rather, there was a period of thirty-six hours of daylight followed by nightfall marking the conclusion of the Sabbath day. Yet that thirty-six hour period included a "day" deemed to be the Sabbath and was followed by a day deemed to be Sunday.³¹ Again, it may be postulated that terrestrial time was temporarily transcended rather than suspended³² and that, when normal time patterns based upon alternating periods of light and darkness marked by sunrise and sunset resumed, time continued as if it had not been interrupted.³³

It must then be presumed that whenever alternating periods of daylight and darkness of approximately twenty-four hours in length do not occur "time" does not exist, but when such alternating periods are reestablished the reckoning of temporal sequence must take into account the "time" that would have elapsed under normal conditions.

The notion that a Jew in outer space or in the polar areas is exempt from even some mizvot³⁴ has been branded far-fetched or worse by a number of rabbinic writers.35 Indeed, one can readily empathize with that reaction and, despite the fact that the alternative theses that have been advanced seem to be at least as far-fetched, this writer would not have the temerity to advance that thesis without at least minimal support. Support for this view is found in the writings of an anonymous scholar quoted by R. Joseph Mashash, Teshuvot Mayim Hayyim, Orah Hayyim, no. 111. Rabbi Mashash reports that he was shown a manuscript authored by an unnamed scholar described as "one of the sages of the generation." That scholar is certain that persons finding themselves in such locales are exempt from Sabbath observance "because the Torah predicated the matter upon days, as it is written 'six days shall you labor and on the seventh you shall rest' (Exodus 34:21). Unless otherwise specified, "days" are composed of twenty-four hours. Since [in the polar regions] there are no days, there is no *Shabbat* there.³⁶ Although Rabbi Mashash cites this view only to disagree with it, this writer finds the thesis advanced by this anonymous scholar to be entirely cogent and finds it instructive that neither Rabbi Mashash nor any other scholar has advanced evidence to counter that view.

VI. ORBITING THE EARTH

If there is no obligation with regard to time-bound *mizvot* in the polar regions because a person finding himself in such a locale has transcended time, the same is certainly true for a person on a space journey. If there is no halakhic time in the polar regions, *a fortiori*, there is no halakhic time in outer space. Outer space is literally "above" time, i.e., an area that is transcendental to time. Thus, although other *mizvot* are personal in nature and hence, in this writer's opinion, fully binding even in outer space³⁷ time-bound *mizvot* are not at all binding in celestial regions. Time-bound *mizvot* contingent upon the sanctity of the land of Israel be biblically binding outside the confines of that country.

That, however, is not the situation of the Jewish astronaut circumnavigating the planet in earth orbit. *Sefer ha-Brit*, cited by J.D. Eisenstein, *Ozar Yisra'el* (New York, 1952), V, 112, poses an intriguing question: If, upon conclusion of *Shabbat*, a person ascends to the sky in a "flying balloon" and there finds the sky to be illuminated, may he engage in forbidden acts of labor? The answer would appear to be that, despite the fact that this dirigible or airplane traveller observes a sun that has not yet set, i.e., a sun that is visible to him as he looks across his horizon, he is in no way bound by Sabbath restrictions.

The basic principle is that for all halakhic purposes time is calculated at ground level. The Gemara, *Shabbat* 118b, reports that R. Jose exclaimed, " May my lot be with those who inaugurate the *Shabbat* in Tiberias and with those who end the *Shabbat* in Sepphoris (Zippori.)" Reflected in the words of R. Jose is the notion that *Shabbat* begins earlier in Tiberias than it does in Sepphoris and consequently ends in Sepphoris later than in Tiberias.³⁸ R. Jose followed the "clock" of Tiberias and began observance of the Sabbath earlier than required in the locale in which he found himself and followed the clock of Sepphoris is concluding the Sabbath later than required in the locale in which he found himself. R. Jose was practicing *Tosefet Shabbat*, i.e., he was adding to the duration of his observance of the Sabbath. That practice is praiseworthy and deserving of reward.

Teshuvot Ri mi-Gash, no. 45, observes that Tiberias and Sepphoris are really in close proximity to one another but that Tiberias is in a valley and Sepphoris is located at the top of a mountain. For that reason there was a significant discrepancy in the time of sunset in those two cities. The higher one's elevation the more one can see of the curvature of the

earth with the result that a person at the top of a mountain will not see the declining sun disappear from sight until sometime after the sun is observed to have set below the horizon by a person standing at the base of the mountain. The Gemara's statement indicates that *Shabbat* begins later in Sepphoris than it does in Tiberias because sunset — and hence time — is determined at ground level. Ground level is not uniform; rather it depends upon the topography of the area and hence may be represented by the bed of the valley or the top of the mountain.³⁹ Accordingly, the beginning and the end of the day at the mountain top is different from the beginning and the end of the day in the valley.⁴⁰

But Shabbat for a person in a tower or on the roof of a tall building does not begin later than it does for a person standing in the street.⁴¹ Sunset is determined by observation at ground level but the time established in that manner is normative ad coelum.42 Thus, R. Moshe Feinstein, Iggerot Mosheh, Orah Hayyim, III, no. 96, s.v. u-le-inyan, states unequivocally that an airplane traveller must determine the time for prayer on the basis of sunrise and sunset as observed at ground level.⁴³ Hence if it is no longer Shabbat on the ground it is also no longer Shabbat in a dirigible or airplane flying above that spot.⁴⁴ If that is true for an airplane passenger flying 35,000 feet above the ground it should also be true for a person in earth orbit higher in the sky. To be sure, once a person travels significantly beyond that point he is no longer "above" the earth or above a place in which conventional time exists; at that point he "transcends" time. But so long as he is in orbit it seems clear that he is indeed above an identifiable spot on earth and, accordingly, at any given moment time in the spaceship is identical to time at the spot that he is overflying.

For the Jewish astronaut orbiting earth, the day of the week is the same as it is on earth. But as he orbits earth every ninety minutes he will at one moment find himself over a geographic point where the Sabbath has already concluded but, since he is flying faster than earth's rotation, some minutes later he will find himself overflying a place where it is still *Shabbat*. That cycle can repeat itself over and over again in the course of a single *Shabbat*.

To take an example involving two cities familiar to everyone, an astronaut may find himself over New York at 1:00 P.M. Shubbut afternoon. At that moment it is 8:00 P.M. in Jerusalem. The astronaut will have completed shaharit and musaf prayers, will have recited kiddush and eaten the Sabbath meal. Approximately one hour later, traveling east to west and circumventing the globe every ninety minutes, he will

be over Jerusalem. In Jerusalem it is 9:00 P.M. while in New York it is 2:00 P.M. Since it is after the conclusion of *Shabbat* the astronaut will recite *havdalah*. But approximately one half-hour later the astronaut will again be over New York at 2:30 P.M. New York time.⁴⁵ Since he has flown back into an area in which it is *Shabbat*, all restrictions upon performing prohibited acts of labor are binding upon him. Those cycles repeat themselves throughout the day and obviously apply not only to New York and Jerusalem, cities that are given only for purposes of illustration, but to all points on the globe.

The strangeness of the result has led at least one scholar adopt a differing position.^{45a} Nevertheless, it seems to this writer that the astronaut may perform acts of labor while overflying areas in which it is already night but is forbidden to perform such acts while overflying areas in which there is yet daylight and that in the course of a single day he will experience multiple alternating periods during which he is permitted to perform such acts and periods during which he is forbidden to do so.

This result notwithstanding, there is no reason why the astronaut should be required to recite *kiddush* or to offer any of the statutory prayers more than once during the course of a day. The astronaut is, in effect, "leaving" and "reentering" an identifiable day; having discharged the obligation of *kiddush* or prayer for that day there is no factor that would generate a new obligation for that day.⁴⁶

The foregoing is predicated upon the thesis that Shabbat is determined entirely by the geographic area in which a person find himself and hence if a person could somehow travel from a place where it is Shabbat to a place where it is a weekday he might cease observance of Shabbat⁴⁷ even though he has not experienced nightfall.⁴⁸ Thus, R. Kalman Kahana, Ha-Ish ve-Hazono (Tel Aviv, 5724), p. 100, writes that Hazon Ish declared that a person who, in the course of traveling by ship from east to west, crosses the halakhic dateline sometime during Shabbat may cease observance of the Sabbath and must observe the following day as Shabbat.⁴⁹ Similarly, a person traveling from west to east who crosses the dateline on Shabbat, and is then on the eastern side of the dateline where it is Sunday, may cease observance of Shabbat entirely⁵⁰ and not observe Shabbat again until the end of the week.⁵¹ Hazon Ish refuses to distinguish between a traveller and a permanent resident or between a person who intends to return to his port of embarkation and a person who has no such intention "for Shabbat was given to man at the place where he is."52 Hazon Ish sees no difference between that situation and the situation of a traveller who crosses the dateline. A traveller commences and

ceases observance of *Shabbat* on the basis of the time of sunset in the locale in which he finds himself rather than on the basis of the time of sunset at his place of residence. Similarly, R. Betzalel Stern, *Teshuvot Be-Zel he-Hokhmah*, IV, no. 83, assumes as a matter of course that a traveller crossing the halakhic dateline from west to east on Sunday must observe the balance of the day as *Shabbat*.⁵³

R. Moshe Feinstein, *Iggerot Mosheh*, Orah Hayyim, III, no. 96, and *Be-Zel he-Hokhmah*, I, no. 31, sec. 8, similarly rule that a person traveling by plane form west to east on *Tish'a be-Av* may break his fast as soon as he experiences nightfall⁵⁴ even though he has not fasted a full twenty-four hour period.⁵⁵ The same principle would apply to determining the onset of the eighth day for purposes of circumcision of an infant,⁵⁶ for determining the proper time for a woman's immersion in a *mikveh*⁵⁷ and for various other halakhic matters.⁵⁸ In each of those cases there is no reason why a person may not embark upon a trip in which such a phenomenon will occur. That would also appear to be the case with regard to crossing the dateline in circumstances in which the duration of the traveller's observance of *Shabbat* or of his fast will be diminished.⁵⁹

In a similar vein, R. David Menachem Babad, Teshuvot Havazelet ha-Sharon, I, Yoreh De'ah, no. 47, points out that a child becomes a bar mitzvah on his thirteenth birthday wherever he may find himself even though he may no longer be in the city of his birth and even though in the place of his birth it may still be the previous day. Havazelet ha-Sharon applies the same general principle in permitting the slaughter of a calf immediately after nightfall following the day on which its mother was slaughtered even though the calf may be in a locale in which nightfall occurs while it is still day in the locale in which the mother was slaughtered.⁶⁰ The same principle is applied by R. Eliezer Chaim Deutsch, Teshuvot Duda'ei ha-Sadeh, no. 25, to observance of a Yahrzeit and by R. Alter Saul Pfeffer, Teshuvot Avnei Zikaron, II, no. 87, sec. 1, to observance of laws of mourning.⁶¹

However, R. Aryeh Zevi Fromer, *Teshuvot Erez Zevi*, no. 44, adopts a somewhat different position with regard to observance of *Shabbat*. Citing *Avnei Nezer*, *Orah Hayyim*, no. 89, *Erez Zevi* asserts that the obligations pertaining to Sabbath observance throughout the entire Sabbath day become effective at the very beginning of the day. Accordingly, he rules that a person who is in a place where it becomes *Shabbat* at nightfall becomes obligated to observe the entire ensuing twenty-four hour period as *Shabbat* even if he crosses the dateline during that period.

Despite the weight of opinion to the contrary, R. Menachem Kasher, Torah Shlemah, I, Bereishit 1:430, expresses doubt with regard to this matter. Without citing sources, he suggests that Shabbat observance requires the observance of a period of a full twenty-four hours. He further argues that on Yom Kippur a fast of a full twenty-four hours is required by virtue of the fact that Scripture requires that on Yom Kippur "you shall afflict yourselves" and proceeds to prescribe the observance of Yom Kippur "from evening to evening" (Leviticus 23:32).62 That position is reiterated by Rabbi Kasher in his Kav ha-Ta'arikh ha-Yisa'eli, chapter 58. In chapter 73 of the same work Rabbi Kasher reiterates that view with a slight variation: he questions whether performance of a forbidden act of labor under such circumstances involves a capital transgression or if it is only a negation of the positive obligation to rest on the seventh day. Elsewhere in Kav ha-Ta'arikh ha-Yisra'eli, chapters 39 and 53, Rabbi Kasher argues that there is a "personal" Shabbat at the end of every seven day cycle that is independent of solar phenomena.⁶³ In chapter 53 he argues that observance of that "personal" Sabbath is mandated solely by the positive commandment regarding rest on the seventh day but not by the negative prohibitions entailing capital punishment.64

VII. AN AFTERWORD

The foregoing is an attempt to formulate the normative rules for a Jew finding himself in the polar areas or orbiting earth. Whether a Jew should seek to place himself in such a situation is an entirely different matter. Zekher Simhah's advice to his son is worthy of citation in regard to that issue. Zekher Simhah finds a comment of the Gemara, Berakhot 31a, to be instructive with regard to the situation in which his son found himself:

Mari the grandson of R. Huna the son of R. Jeremiah the son of Abba taught: A person should not take leave of his fellow other than with a matter of Halakhah for thereby he will remember him. R. Kahana escorted R. Shimi the son of Ashi from Pum Nahara to Be-Zenyata of Babylonia. When he arrived there he said to him . . . what is meant by the verse "Through a land that no man had passed through and where no man dwelt" (Jeremiah 2:6)? Since no one passed through, how could anyone dwell? It is to teach you that any land which Adam decreed should be inhabited is inhabited and any land which Adam decreed should not be inhabited is not inhabited.

The comment does indeed serve to illuminate the meaning of the scriptural passage but does not at all appear to illustrate any matter of halakhic import. Yet the comment is cited as an anecdote in illustration of the dictum counseling that one should part from a friend with "a matter of Halakhah," not with a matter of scriptural interpretation or an aggadic *bon mot*.

Zekher Simhah regards the statement of the Gemara as reflecting a matter having halakhic import: Adam decreed that only areas in which *mizvot* might be observed should be inhabited; he decreed that areas in which *mizvot* are not fully binding should remain desolate and uninhabited. The halakhic moral is simple. Man should seek to maximize the opportunities for fulfilling *mizvot*. That is not possible in polar areas or in outer space in which time-bound *mizvot* are irrelevant.⁶⁵

It may be added that Deuteronomy 11:21 records that God commanded *mizvot* "so that your days will be prolonged upon the land which the Lord your God gave you." Scripture does not speak of "prolongation of life;" instead it speaks of prolongation of "days." In light of the foregoing it may be observed that man can experience longevity and his life can be prolonged even though his "days" are not prolonged, *viz.*, he may live to a ripe old age in a polar region or in outer space. But for a Jew that is not a blessing, or at least not the blessing that God seeks to bestow upon him. Life devoid of time-bound *mizvot* is not the blessing God seeks to bestow; God's blessing is "that your days be prolonged," i.e., that a Jew enjoy life filled with "days" and fulfillment of time-bound *mizvot* for which the concept of a halakhic day is a *sine qua non*.

NOTES

- 1. See Mark Mietkiewcz, "Jews in Space-part 1," Canadian Jewish News, June 27, 2002, p. 15.
- 2. See the London Jewish Chronicle, May 24, 2002, p. 10 and Jewish Week, July 12, 2002, p. 3. See also JTA Daily News Bulletin, July 15, 2002, p. 2.
- 3. See, however, R. Joseph Chaim David Azulai, Mahazik Berakhah 344:4, who asserts that Mor u-Kezi'ah does not mean to imply that the traveller's calculation begins with Sunday but that Mor u-Kezi'ah means to say that the traveller commences calculating further twenty-four hour days from the day of of the week that he arrives in such a locale. Cf., R. Samuel David Siegel, Ahuzat Sadeh (Baltimore, 5740), p. 106, who disputes that understanding of Mor u-Kezi'ah.

- 4. Cf., however, the immediately preceding comment of *Mor u-Kezi'ah* in which he entertains such a possibility with regard to travellers who circumnavigate the globe in different directions.
- 5. See Mishnah Berurah, Bi'ur Halakhah 344:1, who rules that such a person must also don tefillin every day, including the day he observes as Shabbat. Cf., however, Kaf ha-Hayyim, Orah Hayyim 344:6, who cites a conflicting opinion. See also R. Simcha Levy, Simhat ha-Levi, no. 32.
- 6. See Mishnah Berurah 344:3. Cf., however, Kaf ha-Hayyim 344:5 who cites authorities who maintain that the weekday payer should be recited even on the day observed as Shabbat. Kaf ha-Hayyim himself rules that the Sabbath prayer should be recited but that the musaf prayer should be omitted.
- 7. See R. Yekuti'el Yehudah Halberstam, *Teshuvot Divrei Yaziv*, Orah Hayyim (Netanya, 5756), no. 108, sec. 15, who understands *Mor u-Kezi'ah* as positing only a rabbinic obligation.
- 8. See also Parashat Derakhim, Drush 23, s.v. od nakdim; R. Israel Lipschutz, Tiferet Yisra'el, Berakhot, note appended to Bo'az, end of chapter 1; R. Chaim Joseph David Azulai, Birkei Yosef, Orah Hayyim 242:1; R. Joseph Saul Nathanson, Teshuvot Sho'el u-Meshiv, mahadura revi'a'ah, no. 154; and R. Benjamin Aryeh Weiss, Teshuvot Even Yekarah (Lemberg, 5654), no. 11.
- 9. A similar interpretation of that verse was earlier advanced by Seforno in his commentary *ad locum*. See also the interpretation of Exodus 31:16 advanced by the Zohar, Genesis 56a. The verse "And the children of Israel observed the Sabbath to make the Sabbath for their generations (*le-doro-tam*)" is rendered by the Zohar as "to make the Sabbath for their dwellings (*le-dirotam*)."
- 10. R. Abraham ibn Ezra, in his commentary to Genesis 33:10, understands the verse "And the sun rose upon him" (Genesis 32:32) as reflecting this underlying solar phenomenon, i.e., the sun rose for Jacob in the locale in which he found himself but did not rise simultaneously in other areas.

R. Isaac di Trani, renowned as the author of Teshuvot Maharit, declares in his Zofnat Pa'aneah (Venice, 5413) Drush le-Parashat Bereshit, that the work of creation did not cease throughout the globe at a single instant. Rather, the process of creation came to a halt at each point when night fell at that spot. In effect, in observing Shabbat as determined by local sunset, man emulates the Creator who ceased from the process of creation at different times in different places. Hatam Sofer, cited by R. Israel David Jaffe, Hazon le-Mo'ed, no. 8, sec. 7, also stated that this was the case during each of the six days of creation: the work of each day did not take place simultaneously throughout the world; rather, the entities created on each day of the week were created in every geographic area while it was day in that locale. This, Hatam Sofer asserts, applied even to the "ten things" which the Mishnah, Avot 5:6, declared to have been created on the sixth day between sunset and nightfall, i.e., those objects were created in different places at different times. Hatam Sofer interprets the verse "And God finished on the seventh day . . . and He rested on the seventh day" (Genesis 2:2) as referring, not to a single act of cessation of labor, but to a divine comportment at two different places, viz., God completed the work of creation at one locale while at the same time resting at another locale.

See also R. Yechiel Michal Tucatzinsky, Bein ha-Shemashot (Jerusalem, 5729), p. 53; idem, Yomam, (Jerusalem, 5703), p. 73; and R. Ben-Zion Uziel, Mishpetei Uzi'el, Orah Hayyim, II, no. 29. Cf., R. Menachem Kasher, "Shabbat Bereshit u-Shabbat Sinai," Talpiyot, vol. 1, no. 1 (Tishri 5704), pp. 415-420.

Cf., however, Teshuvot Sho'el u-Meshiv, mahadura revi'a'ah, who candidly acknowledges that, in observing Shabbat according to local time "in all their habitations," Jews do not observe Shabbat during the same time period in which the Creator ceased from the work of creation. Moreover, he regards that concept to be reflected in the otherwise problematic words of the musaf prayer: "a people who sanctify the seventh day (am mekaddeshei shevi'i)." Jews sanctify the month and hence the festivals which are calendar dependent. Shabbat, however, is predetermined and does not require sanctification of the new moon by the Bet Din. Nevertheless, explains Sho'el u-Meshiv, since Jews must observe Shabbat "in all their habitations" at different times they are indeed a "people who sanctify the seventh day."

- 11. See R. Chaim Druck, Orot Hayyim (Jerusalem, 5730), p. 466.
- 12. R. Kalman Kahana, Ha-Ish ve-Hazono (Tel Aviv, 5724), p. 100, quotes an unpublished section of the manuscript of Hazon Ish's "Kuntres Yod-Het Sha'ot" in which *Hazon Ish* similarly declares that, in the polar regions, the sun's completion of a twenty-four hour circuit represents a full day and the seventh circuit is the Sabbath day. A similar opinion is also espoused by R. Yechiel Michal Tucatzinsky, Bein ha-Shemashot, p. 55, who cites that view as earlier expressed by R. Jehoseph Schwartz, Teshuvot Divrei Yosef (Jerusalem, 5621), no. 8. [See also Teshuvot Even Yekarah, no. 11, who also addresses the problem of the biblical reference to "days" prior to the creation of the sun and comments that the biblical "day" is to be defined as the length of time required for the earth to make a complete revolution on the axis, i.e., twenty-four hours.] However, neither Rabbi Tucatzinsky nor Hazon Ish offer a clue with regard to the point in the sky which, when traversed by the sun, marks the beginning and the end of Shabbat. See infra, note 13. R. David Spira, Teshuvot Bnei Zion, III, Kuntres Midat ha-Yom, sec. 21, states that, during the polar winter, days are demarcated by the circuit of the stars in the overhead sky. Teshuvot Divrei Yaziv, Orah Hayyim, no. 108, sec. 11, suggests that the day's beginning and end should be regarded as congruent with the beginning and end of the day in the Land of Israel, Cf., infra, note 15.

R. Yechiel Michal Gold, Me'asef le-Khol ha-Mahanot, Orah Hayyim 18:25, finds what he terms "clear evidence" for the underlying assumption that the "day" may be defined in terms of the revolution of celestial bodies rather than by the appearance of the sun in the comments of Rabbenu Bahya, Genesis 1:13. Rabbenu Bahya questions the cogency of the verse that declares "and it was evening, and it was morning" with reference to the first three days of creation, i.e., before the creation of the sun. Rabbenu Bahya explains that the reference is not to "the light" but to "the sphere in which it revolves for, with regard to every portion of the sky, when it ascends that is its morning and when it sinks [below the horizon] that is its evening." See also Ramban, Commentary on the Bible, Genesis

1:5. However, although Rabbenu Bahya's comments may provide support for the notion that demarcation of successive days may be determined on the basis of the rising and setting of celestial bodies other than the sun, those comments have no bearing upon the question of whether completion of a 360 degree rotation in the overhead sky has a similar import. See, however, R. Eliezer Ashkenazi, *Ma'asei ha-Shem* (Venice, 5343) Genesis 1:5, who asserts that the first day of creation was determined by circuitous movement of the heavens whose return to the point of creation marked the completion of a day. *Ma'asei ha-Shem* expressly applies that concept to the polar area in declaring, "There is no doubt that even one [for whom] the pole is above his head is obligated to observe *Shabbat* on the seventh circuit even though there was no darkness there at all."

13. In a note appended to Mo'adim u-Zemanim, II, no. 155, R. Moshe Sternbuch opines that "the day changes at precisely the moment that the sun reaches its most distant point and begins to draw closer." The "most distant point" to which Mo'adim u-Zemanim refers is presumably the point most distant in the sky from the point at which the sun makes its first appearance at the beginning of the polar spring. Mo'adim u-Zemanim declares that "night" in such areas is no more than a split second in duration.

It may be noted that at the North Pole the sun neither rises nor declines in the course of its daily circuit. Rather, the sun is observed as circling the horizon once each day in a constant orbit that is a bit higher over the horizon each day until it reaches a height of approximately 23.5° at the time of the summer solstice. However, as one proceeds some distance south of the Pole, the sun, although it does not descend below the horizon during that period, may nevertheless be observed during the course of its daily circuitous movement above the horizon. In those areas—and only in those areas—it might be contended that day and night begin and end when the sun is at its lowest point above the horizon. See R. Eliyahu Baruch Kepetsch, *Korez Bet Aharon ve-Yisra'el*, Tishri-Heshvan, 5757, p. 150 and cf., R. David Heber, "When Does One Pray When There Is No Day?" *Kashrus Kurrents*, Autumn, 2002, pp. 17f.

Adopting a somewhat different position, R. Jehoseph Schwartz, *Teshuvot Divrei Yosef* (Jerusalem, 5622), no. 8 and *idem*, *Divrei Yosef*, *Tevu'ot Shemesh* (Jerusalem, 5603), *Derekh Mevo ha-Shemesh*, p. 61b, states that the point in the sky occupied by the sun at its first appearance in the polar region in the spring represents the beginning of each "day" and the point at which the sun is last seen before it sets in the fall represents the beginning of each "night." Accordingly, "day" and "night" commence when the sun reaches those points in the sky during the course of each twenty-four hour circuit. *Divrei Yosef*, p. 62a, asserts that during the winter months a similar determination is made on the basis of the position of the "two stars of the Little Bear, [which are in the] vicinity of the star of the Pole (the North Star)," i.e., the position of their first sighting in the fall marks the beginning of the "night" and "day" begins when those stars have moved 180 degrees across the sky.

Divrei Yosef's description of the astronomical phenomena during the polar winter is both imprecise and inadequate as a basis for resolution of the

problem. Pherkad, a third magnitude star, and Kochab, a second magnitude star, are known as the "Guardians of the Pole" because they circle Polaris (the North Star). All three stars are part of Ursa Minor (the Little Bear). The first two stars of Ursa Minor to become visible are Kochab and Polaris (the North Star). Both are second magnitude stars. However, the first celestial bodies to become visible are the planets Venus and Jupiter. Those planets do not become clearly visible until close to the end of civil twilight, i.e., when the sun drops six degrees below the horizon. At the North Pole civil twilight does not end until October 8. The first star to become visible north of the celestial equator is the zero magnitude star Arcturus in the constellation Bootes and is followed closely by the slightly smaller star Vega in Lyra and then by Capella in Auriga. However, even the largest star is not visible to the naked eve until the sun has declined approximately nine degrees below the horizon. At the North Pole, the sun disappears a little after the time of the autumn equinox but does not reach a declension of nine degrees until October 16, a little more than three weeks later. During that intervening period neither the sun nor any star is visible. The same is true during the period immediately prior to the spring equinox when the sun is not visible but is less than nine degrees below the horizon. Thus, for more than six weeks each year neither the sun nor any star is visible. During those periods, days cannot be demarcated by means of the circular rotation of stars in the overhead sky. Even if Venus and Jupiter are used for this purpose, there are four weeks in the year during the polar twilight in which those planets are not visible. I am indebted to Mr. Joe Rao of the Havden Planetarium for making this information available to me.

14. In accordance with his view cited supra, note 13, R. Jehoseph Schwartz, Teshuvot Divrei Yosef, no. 8, and idem, Derekh Mevo ha-Shemesh, p. 62a, asserts that the twenty-four hour day should be divided into two equal parts yielding a twelve-hour "day" and a twelve-hour "night." Cf., however, R. Moshe Sternbuch, Mo'adim u-Zemanim, II, no. 155, cited supra, note 13.

Rav Pe'alim, II, Sod Yesharim, no. 4, follows Divrei Yosef in ruling that in the polar region "day" and "night" are each twelve hours in length "as in places located at the equator." However, Rav Pe'alim does not state explicitly that day and night begin and end at 6:00 A.M. and 6:00 P.M. as is the case at the equator. Moreover, at the North Pole, all longtitudes—and hence all time zones—converge. Therefore, to say that day and night begin and end at 6:00 A.M. and 6:00 P.M. does not at all resolve the problem. The crucial issue that remains to be determined is according to which time zone is the clock to be set? Cf. R. David Heber, "When Does One Pray When There Is No Day?" Kashrus Kurrents, Autumn, 2002, p. 16.

15. There are oral reports of undetermined reliability that Scandinavian communities adopted the time frame of Hamburg in determining the beginning and end of *Shabbat* and of the various fast days. See Sholom Klass, "When Does *Shabbos* Begin and End in Alaska?" Response of Modern Judaism, III (New York, 1965), 46-47. Since there is always some period of dusk in those locales, that convention, as pointed out by both Tiferet Yisra'el and Zekher Simhah, was clearly an error. However, assuming that

during the spring there is only daylight in such communities, their practice seems to be based upon the position of *Tiferet Yisra'el* with one significant variation: Instead of each individual adopting the clock of his prior place of residence or of his port of embarkation, the clock of the closest Jewish community was adopted. At the time the practice was instituted, Hamburg was probably the closest city with a significant Jewish population and, if not, the individuals who established communities in Scandinavia presumably thought it to be the closest community with a Jewish population.

The individual who advised Col. Ramon to observe time-bound *mizvot* in accordance with Houston time presumably relied upon the position of *Tiferet Yisra'el*. See *JTA Daily News Bulletin*, July 15, 2002, p. 2 and *Jewish Week*, July 12, 2002, p. 3. However, since the port of embarkation was Cape Canaveral, Florida time would have been more appropriate than Houston time. The fact that mission control was located in Houston is of no halakhic import. Col. Ramon's own instinct was to adopt Jerusalem time which, arguably, was his place of residence. See *Jewish Chronicle*, May 24, 2002, p. 10. See also the opinion of R. Levi Yitzchak Halperin, *infra*, note 45a.

- 16. Sefer ha-Brit offers the intriguing observation that aggadic references to the time-limited activities ascribed to the Deity or to angels are references to Jerusalem time. Thus, for example, angels sing daily praise of God when it is morning in Jerusalem. Parashat Derakhim, Drush, 23, s.v. od nakdim, also asserts that matters such as the return of the wicked to Gehenna and the tranquility of the river Sambatiyon are determined by Jerusalem time. See also, infra, note 30.
- 17. The incongruity of two travellers observing Shabbat at different hours is pointed out in the immediately following discussion. Earlier in the herein cited paragraph, Sefer ha-Brit accepts a similar incongruity with regard to observance of Shabbat in a single locale on two different days by passengers on two ships that cross the halakhic dateline from different directions. Thus it is likely that Sefer ha-Brit similarly assumes that a traveller continues with his prior calculation of clock hours.
- 18. See R. Samuel David Siegel, Ahuzat Sadeh (Baltimore, 5740), p. 108, and Teshuvot Divrei Yaziv, Orah Hayyim, I, no. 108, sec. 15, who understand Tiferet Yisra'el in this manner. Tiferet Yisra'el's language is certainly unclear. Tiferet Yisra'el remarks, "In any event it seems to me that, if [the traveller] performed [an act of] labor on that day he is liable to neither capital punishment nor to a sin-offering for he is no better than one who went into a desert and does not know when it is the Sabbath." The confused traveller is, however, biblically required to refrain from labor on every day that might in fact be Shabbat and, presumably, is liable to bring a sin-offering if he performs a non-life-preserving act on the day that actually is Shabbat. Subsequently, after describing the anomaly of the two travellers arriving from different directions, Tiferet Yisra'el repeats the statement with regard to lack of culpability and concludes "for they are not thus obligated other than rabbinically." If, as appears from his concluding comment, Tiferet Yisra'el maintains that the obligations with regard to Sabbath observance in the polar area are entirely rabbinic in nature, that position is

problematic because, as noted in the previous section, the regulations governing a confused traveller do not serve as evidence supporting the existence of a rabbinic decree of this nature.

- This also seems to be the conclusion reached by R. Chaim Eleazar Shapiro, *Teshuvot Minhat Elazar*, IV, no. 42, and is undoubtedly the view of *Ma'asei ha-Shem, supra*, note 12. It is also one of three alternative possibilities suggested by R. Jacob Halprin, *Nahalat Ya'akov* (Padua, 5382), no. 4, who appears to have been the first scholar to advance a suggestion of this nature. For the other possibilities suggested by *Nahalat Ya'akov* see *infra*, notes 25 and 27.
- 20. See Nahalat Ya'akov, no. 4.
- 21. The doubt is a reflection of the unresolved halakhic question of whether the day begins and ends with sunset or with nightfall, i.e., zet ha-kokhavim which, according to Rabbenu Tam, occurs when the sun is 16.1 degrees below the horizon.
- 22. Thus, for example, examination of p. 16 of the tables appended to R. Meir Posen's Or ha-Me'ir (London, 5733), reveals that, according to Rabbenu Tam's view regarding sunset and nightfall, there is no "night" in London during the six-day period beginning June 3 and ending June 8.

Rabbi Posen, Or ha-Me'ir, pp. 318-319, cites a letter addressed to him by R. Yekuti'el Judah Halberstam, the Klausenberger Rebbe, in which the latter advances a novel view to the effect that, according to Rabbenu Tam, in places such as London in which there is no zet ha-kohavim, day and night, and hence the passage of successive days, depend entirely upon sunset and sunrise. That position is developed at length by Rabbi Halberstam in his Divrei Yaziv, Orah Hayyim, no. 108, sec. 12-17. Rabbi Posen himself, *ibid.*, pp. 317-318, suggests that there is a fundamental theoretical dispute underlying the controversy between Rabbenu Tam and R. Elijah of Vilna with regard to the astronomical phenomena that serve to define sunset and nightfall. R. Elijah of Vilna, asserts Or ha-Me'ir, maintains that there cannot be "nightfall"-and hence a new day-unless there is an absence of illumination. Rabbenu Tam, he asserts, maintains that it is simply the disappearance and reappearance of the sun that determines the advent of a new day. Consequently, opines Or ha-Meir, according to Rabbi Tam, there is no "night" in locales such as London during some days of the year and hence no obligation with regard to *mizvot* that can be performed only at night, but the calendar remains unaffected, at least in such places. Cf., Ahuzat Sadeh, pp. 108-109.

- 23. See Teshuvot Divrei Yaziv, Orah Hayyim, I, no. 108, sec. 15.
- 24. R. Meir Posen, Or ha-Me²ir, pp. 319-324, espouses a somewhat similar but yet different position. Rabbi Posen maintains that the day of the week remains constant until the sun sets. However, when the sun does set, the next day of the week and the date is the same in such areas as on the rest of the globe. He reasons that the date as well as determination of the particular day of the week is determined by the sun's position vis-à-vis planet Earth and hence is constant throughout the globe. However, for inhabitants of Earth, the day does not draw to a close until sunset. Accordingly, if the first day of the polar spring occurs on Shabbat the entire spring and

summer must be observed as *Shabbat*; similarly, if the first day of the polar spring occurs on a weekday there in no *Shabbat* at all during the polar spring. It would, however, seem to this writer that, according to Rabbi Posen's thesis, the determining factor would logically be the day on which the polar autumn begins, i.e., if the sun sets in the fall on a Friday, the entire ensuing twelve months would be *Shabbat* whereas if the sun sets for the polar autumn on a weekday there would be no *Shabbat* for an entire twelve-month period. A view similar to that of Rabbi Posen is entertained by *Teshuvot Minhat Elazar*, IV, no. 42.

- 25. Nahalat Ya'akov, no. 4, does offer, as one of three alternative possibilities, the suggestion that *Shabbat* must be observed at the North Pole for a period of twelve months. A bare intimation of such a thesis does appear in the writings of an eminent eighteenth-century Moroccan authority, R. Raphael Mekanes, Teshuvot Mishpatim Yesharim, I, no. 76. In a few cryptic words, Mishpatim Yesharim questions whether one arriving in the polar region on Shabbat should observe the Sabbath for a period of six months. However, he fails to analyze the implications of that position, including the fact that the full Sabbath "day" should be twelve months rather than six months or the question of how to determine which twelve-month "day" is the Sabbath. Indeed, Mishpatim Yesharim may have intended to espouse a view consistent with that of Or ha-Me'ir and Teshuvot Minhat Elazar cited supra, note 24. R. David Luria, Bi'ur Radal, Pirkei de-Rabbi Eli'ezer, chapter 52, note 1, also seems to have entertained the feasibility of the thesis herein described. See also idem, Peirush Radal, Pesikta Rabbati 23:1, note 6. Cf., however, Teshuvot Divrei Yosef, no. 8, who dismisses such a view as preposterous.
- 25a. Cf., however, the discussion of the import of the narrative recorded in the Palestinian Talmud *infra*, note 26, as well as notes 30-31 and accompanying text.
- 26. The Gemara, *Shabbat* 118b, speaks of commencing observance of *Shabbat* at an early hour in Tiberias and concluding its observance at a later hour in Sepphoris, i.e., observing *Shabbat* for longer than a twenty-four hour period. The principle that both the beginning and end of *Shabbat* is determined by local criteria would yield the result that a person traveling from Sepphoris to Tiberias would observe Shabbat for *less* than twenty-four hours.

R. Chaim Avraham Gatinyo, *Tirat Kesef* (Salonica, 5496), p. 5b, endeavors to demonstrate that *Shabbat* must be observed for a minimum period of twenty-four hours on the basis of the narrative recorded by the Palestinian Talmud, *Kela'im* 9:3 and *Ketubot* 12:3. R. Judah the Prince died on a Friday. The sun did not set that evening until much later than its usual time and hence observance of the *Shabbat* did not begin until that late hour. That miraculous phenomenon occurred in order that every participant in the funeral, including those who had traveled from other cities, might have sufficient time to return home and "prepare a barrel of water and kindle the lamp" before the advent of the Sabbath. Shortly after the sun finally set, the crowing of the rooster was heard. Experiencing daybreak so quickly after nightfall, people realized that they would not be observing a full twenty-four hour period as *Shabbat*. The populace feared

"lest they had desecrated the Sabbath" during the period of time that the sun's movement was arrested. Thereupon, a heavenly voice proclaimed that all those who had participated in the funeral of R. Judah were assured a portion in the world to come. Excluded from that promise was one individual, a laundryman who had not participated in the funeral. *Shittah Mekubezet, Ketubot* 103b, cites a certain Rabbenu Kalonymus who explains that the populace had actually transgressed *Shabbat* prohibitions because the *Shabbat* had indeed begun at its proper time but people inadvertently failed to commence observance of the *Shabbat* in a timely manner because the sun was still high in the sky. Nevertheless, they were forgiven because of their participation in R. Judah's funeral. The laundryman also failed to begin his observance of the Sabbath at the proper time for the same reason but because he was remiss in not participating in the funeral he was not forgiven. The laundryman was forgiven only subsequently when, out of great anguish, he hurled himself from a roof and died.

Rav Pe'alim, II, Sod Yesharim, no. 4, disputes Tirat Kesef's understanding of this narrative. Rav Pe'alim asserts that there is no evidence that the Shabbat that occurred on the morrow of R. Judah's death was less than twenty-four hours in duration. At first, people were confused, contends Rav Pe'alim, because of the premature crowing of the rooster. The rooster's circadian clock, he asserts, was attuned to a twenty-four hour cycle. Moreover, contends Ray Pe'alim, there is no indication that the populace acted in an inappropriate manner (indeed, the heavenly voice may be construed as having endorsed their behavior) but only that they were afraid lest they had acted incorrectly. [Rabbi Tucatzinsky, Bein ha-Shemashot, p. 55, suggests that the populace acted correctly because the sun had not set. However, people were confused because they feared that the sun had indeed set and the illumination they perceived emanated from a supernatural source. Cf., infra, note 32.] Furthermore, argues Rav Pe'alim, the Sabbath is to be observed on the seventh day "in all your habitations" (Leviticus 23:3), i.e., the occurrence of *Shabbat* is determined both at the beginning and end of the day by the setting of the sun in the locale in which a person finds himself, regardless of the length of the intervening day. R. Ephraim Zalman, Margolies, Teshuvot Bet Efravim, Yoreh De'ah, no. 76, similarly disagrees with Rabbenu Kalonymus in asserting that Shabbat is determined solely by the setting of the sun.

Rav Pe'alim further remarks that, having properly ushered in the Sabbath at sunset, it would be ludicrous to observe Shabbat for a portion of the following day in order to achieve a complement of a full twenty-four hours. See also R. Elijah Isaac Shemesh, Yedei Eliyahu, (Jerusalem, 5790), no. 44. Thus, Rav Pe'alim declares that a person who is able to travel long distances on Shabbat by employing a Divine Name or in some other miraculous manner may cease his observance of Shabbat immediately at nightfall in his new locale even though he has observed Shabbat for much less than twenty-four hours. That is also the position of a host of other authorities including R. Yechiel Michal Tucatzinsky, Bein ha-Shemashot, p. 55; Teshuvot Minhat Elazar, IV, no. 42; Teshuvot Bnei Zion, III, Kuntres Midat ha-Yom, secs. 23-24; R. Alter Saul Pfeffer, Teshuvot Arnei Zikaron, II, no. 87, sec. 2;

and R. Ben-Zion Abba Sha'ul, Or le-Zion, I, Orah Hayyim, no. 14, Cf., however, infra, note 56, as well as notes 61-62 and accompanying text.

27. This possibility is entertained by *Teshuvot Dirvrei Yaziv*, no. 118, sec. 11 and is also one of the three alternative possibilities set forth by *Nahalat Ya'akov*, no. 4. *Nahalat Ya'akov* adds the comment that "It is revealed and known to [Him who possesses] perfect knowledge and thus it is recorded before Him on high that the children of Israel who observe [the] commandments[s] will not have a course or path to [the Pole] from now and for evermore; rather, He will give them habitation among all the nations where He will lead them." It would then appear to follow that a *niddah* finding herself in such an area would not be able to count the prescribed number of days in order to become able to immerse herself in a *mikveh*. Cf., *Divrei Yaziv*, *ibid.*, sec. 15. The same consideration would apply, for example, to the circumcision of a child since circumcision cannot be performed until the eighth day following birth.

It should be noted that if *Tiferet Yisra'el* is understood as giving expression to the determination of a rabbinic obligation (see *supra*, note 18), the thesis here presented, since it is designed to explain the biblical notion of time and of *mizvot* consequent thereupon, is not in contradiction to the position of *Tiferet Yisra'el*.

More significantly, if, as the authorities cited *supra*, note 12, apparently maintain, *Tiferet Yisra'el*'s view is based upon acceptance of the principle that successive days are demarcated on the basis of the rotation of the sun or celestial bodies in the overhead sky, it follows that *Tiferet Yisra'el's* thesis is not applicable in outer space. Thus, the herein formulated view that there are regions that transcend time may be valid even according to *Tiferet Yisra'el* with regard to space beyond the orbit of earth.

- 28. Cf., however, infra, note 40.
- 29. The elusiveness of the nature of time has been recognized at least since the time of Zeno. Zeno formulated a number of classic paradoxes designed to negate the view that an extended line or time interval might be composed of unextended points or instants. See Aristotle, *Physics* 231a-231b and *De Generatione et Corruptione* 316-317. Later, Augustine, *Confessions*, Book XI, chaps. 14-28, struggling with the mysterious nature of time, acknowledged that, although he had an intuitive grasp of the concept of time, he could neither formulate an adequate definition of time nor explain how it can be measured.

The notion employed herein in developing a halakhic notion of time is consistent with the concept of time espoused by philosophers such as Descartes and scientists such as Newton. In his *Principles of Philosophy*, Part I, sec. 57, Descartes distinguishes time from duration taken in general and describes time as "a mode of thinking this duration" or as a common measure of different durations and in sec. 21 he says of time that "its parts do not depend one upon the other and never co-exist." Elsewhere, in a letter to a contemporary, Descartes declares that "all the moments of [the world's] duration are the one from the other." See Charles Adam and Paul Tannery, Oeuvres des Descartes,V (Paris, 1903), 53. Thus, for Descartes, all moments of time are discrete and independent. At the same time, in

Meditation III of his *Meditations on Philosophy*, Descartes recognizes time as having ontological existence independent of other entities.

In formulating a proof for the existence of God based upon the notion of constant conservation or continuous creation, Descartes assumes what can probably best be categorized as a quantum theory of time. According to Descartes, time is discontinuous and consists of a series of discrete timequanta arranged in a continuum. The universe's existence is circumscribed by those quanta and the universe cannot be transposed from one such quantum to another; rather, the universe must be recreated anew in each moment of time. Thus, the universe could not exist from one moment to the next save for a renewed act of creation on the part of the Deity. Newton regarded time as an infinite number of moments within which God created the material universe. Adhering to an absolute theory of time, he spoke of an "absolute, true and mathematical time" which "of itself and from its own nature flows equally without relation to anything external." See J.J.C. Smart, "Time," Encyclopedia of Philosophy, ed. Paul Edwards (New York, 1967), VIII, 129. Leibnitz, to the contrary, regarded the notion of absolute time as composed of an infinite number of absolutes to be a figment of the imagination and argued that space and time are merely sets of relations between things that are "in" space and time. See The Leibnitz-Clarke Correspondence, ed. H. G. Alexander (Manchester, 1956), p. 15 and The Philosophical Works of Leibnitz, ed. G. M. Duncan (New Haven, 1890), p. 271. Einstein's theory of general relativity postulates not only that time and space were created simultaneously with everything else in the universe but that they are elastic. See Encyclopedia of Philosophy, VIII, 29. As Einstein once said, "Space and time are modes by which we think, not conditions under which we live," by which he meant that both space and time are observer-dependent. See "Time in Modern Physics," Encyclopedia of Time (New York, 1994), p. 465. More significant to this discussion, among Jewish philosophers, Rambam, Guide of the Perplexed, Book II, chap. 13, and Ralbag, Wars of the Lord, Sixth Treatise, part 1, chap. 10, regard time as dependent upon motion. Rambam speaks of time as an accident (using the term in its Aristotelian sense) of motion and of motion as an accident of matter. Thus, Rambam, regards time as an accident of an accident and hence as devoid of independent ontological reality. See also the notion of time developed by R. Hasdai Crescas, Or ha-Shem, First Treatise, klal bet, chap. 11.

The foregoing presents no compelling reason to reject the halakhic analysis of time presented herein. Halakhah establishes its own conceptual categories. Arguably, those categories reflect man's perception of the operation of natural phenomena rather than the objective reality of the physical universe. As a halakhic category, time, regardless of its true nature, may be described as an ontological entity. Indeed, the theoretical halakhic construct and the concommitant halakhic notion of geographic and cosmic areas that "transcend" time may be harnessed to give expression to the philosophical notion of a Deity who transcends time. In turn, the need for such a philosophical model to explain the transcendent nature of God may be associated with the rationale underlying the halakhic construct.

- 30. Another source, *Midrash Tanhuma*, *Parashat Ki Tissa*, sec. 36, cites Daniel 2:22 and Psalms 139:12 as establishing that there is no darkness in heaven and proceeds to discuss how Moses, during the forty-days in which God transmitted the Torah to him, could tell when it was day and when it was night. *Teshuvot Rav Pe'alim*, II, *Sod Yesharim*, no. 4, cites that discussion in support of his position that the day is determined on the basis of twenty-four hour periods. See, however, the sources cited *supra*, note 16, who maintain that the references of such nature are to Jerusalem time. Moreover, that discussion may be understood metaphorically whereas the two aggadic statements discussed herein have halakhic ramifications.
- 31. R. David Spira, *Teshuvot Bnei Zion*, III, *Kuntres Midot ha-Yom*, sec. 21, cites these aggadic sources as evidence that the length of a day is determined on the basis of twenty-four clock hours.
- 32. Cf., however, *Bein ha-Shemashot*, p. 54. Rabbi Tucatzinsky suggests that even on the first *Shabbat* the sun set at its normal time and that the illumination that was perceived was provided by the primordial light that was created before the sun. That explanation is supported by a comment found in *Bereshit Rabbah* 11:1.
- 33. For a discussion of calculation of time during the period of the Deluge when, according to one opinion recorded in the Palestinian Talmud, *Pesahim* 1:1, as well as in *Bereshit Rabbah* 25:2 and 34:15, the constellations did not move in their orbits, see *Siftei Hakhamim*, Genesis 8:22, *Teshuvot Minhat Elazar*, IV, no. 42; R. Jonathan Eibeschutz, *Tiferet Yonatan*, Genesis 6:18; and *Divrei Yaziv*, no. 108, sec. 6, and no. 109. See also *Rav Pe'alim*, II, *Sod Yesharim*, no. 4, who cites that source in support of the position that days are calculated in terms of twenty-four hour periods.
- 34. See R. Ben-Zion Firrer, No'am, XIII, 196-202.
- 35. See R. Joseph Mashash, *Teshuvot Mayim Hayyim*, no. 111 and R. Menachem Kasher, "Ha-Adam al ha-Yareah," *No'am*, XIII (5730), 51-54.
- 36. See also R. Naphtali Joseph Freund, Teshuvot Pnei Levi (Pietrkow, 5663), Kuntres Nozer ha-Brit, sec. 46.
- 37. For a discussion of other views regarding a general obligation to observe *mizvot* in space see this writer's "Mizvot on the Moon," Contemporary Halakhic Problems, I (New York, 1977), 211-212.
- 38. Cf., however, the entirely different interpretation of that exclamation cited by Rabbenu Yonah, *Berakhot* 53a, s.v. *hayah mehalekh*.
- 39. Thus, R. Yechiel Michal Tucatzinsky, *Bein ha-Shemeshot*, pp. 52-55 and 60-61, declares that, in mountainous regions such as Sepphoris, sunset is determined by actual observation and hence occurs later than at the base of the mountain. Cf., however, R. Iser Zalman Meltzer, *ibid.*, p. 158, who takes issue with that position and maintains that sunset is to be determined uniformly on the basis of observation at sea level. See *infra*, note 43.

Rabbi Meltzer notes that Rabbi Tucatzinsky would concede that the elevation of a man-made tower is to be ignored and that visual observation from the vantage point of an airplane is similarly to be discounted but R. Iser Zalman asserts that he fails to appreciate a difference between a man-made structure and a natural geological formation. However, both in *Bein ha-Shemashot*, p. 53 and in a note appended to p. 55, Rabbi Tucatzinsky

explains his view quite clearly. His position is based upon the notion that the Sabbath begins at the time that divine labor ceased at the time of creation; since that labor was effected on earth, the duration of the Sabbath is determined by conditions on "earth" rather than in the sky. See *infra*, note 42. The mountain is integral to the "earth" and existed at the time of creation; hence, sunset is determined at the mountaintop. Artificial structures such as a tower or skyscraper are ignored because they did not exist at the time of creation. Indeed, Rabbi Tucatzinsky, *Bein ha-Shemashot*, p. 53, asserts that mountains that did not exist at the time of creation should also be ignored.

Nevertheless, Rabbi Tucatzinsky concedes that in a valley such as Tiberias surrounding geological structures are to be viewed in the same manner as one would regard an artificial wall and hence should be ignored. That distinction is supported by the terminology employed by Rashi, *Shabbat* 118b, who speaks of the sun being "covered" or hidden in Tiberias because of its location in a valley. That terminology lends the impression that the inhabitants of Tiberias commenced observance of *Shabbat* earlier than was actually necessary. [Cf., however, the terminology employed by Rabbi Tucatzinsky's position in predicating sunset on the top of a mountain upon visual observation at that site while at the same time discounting the depth of a valley as self-contradictory.

It seems to this writer that Rabbi Tucatzinsky's position is entirely consistent. Assuming that sunset is determined at ground level, it nevertheless seems logical to assume that, if there are mountains on the west which hide the sun before it sinks below the horizon, the effect of such interposed mountains should be ignored since, were the mountains not hiding the sun, the sun would be visible at ground level. Indeed, if one were to circle the mountain, the sun would remain clearly visible on all sides of the mountain. Accordingly, it may be presumed that Rashi speaks of the sun being "covered" or hidden in Tiberias, not because Tiberias is located in a depression, but because it was surrounded by mountains of such nature. Hence, the inhabitants were forced to commence observance of *Shabbat* earlier than actually necessary because they could not observe the sun as it set. See *Bein ha-Shemashot*, p. 52.

40. Cf., however R. Aryeh Leib Lipman, Or ha-Yom (Vilna, 5661), sec. 44, who cites sources indicating that sunrise is determined by the first appearance of the sun as observed from the top of any proximate mountain rather than by is visibility at ground level. Thus, Or ha-Yom's position is that there is a possibility that sunset is determined for an entire area on the basis of the disappearance of the sun below the horizon when observed from the top of the highest mountain or structure within visual distance. This was also the view of R. Joshua Leib Diskin as recorded by R. Hiya David Spitzer in the latter's Nivreshet le-Nez ha-Hammah be-Zion (Jerusalem, 5658), I, p. 59b. In the introduction to his Nivreshet le-Nez ha-Hammah be-Zion, Rabbi Spitzer records his efforts to determine the time of sunrise for the city of Jerusalem on the basis of the sun's appearance at the top of the Mount of Olives. Or ha-Yom then expresses doubt with regard to whether that principle is applicable only to determination of

sunrise, which has halakhic significance primarily in the determination of the time of arousal from sleep (*sha'at kimah*) for purposes of recitation of the *Shema*, or if it applies as well to determination of sunset which has calendrical significance. A distinction of that nature is developed at some length by R. Aaron Fried in his commentary on the Mishnah, *Halat Aharon* (Munkács, 5653), *Berakhot* 1:1, sec. 3. Cf., *Teshuvot Minhat Elazar*, I, no. 69. In sec. 55, Or ha-Yom asserts that, if the time of sunset for the entire area is determined from the vantage point of the mountain top, only mountains within visual distance of a person standing at ground level need be considered. See also Nivreshet le-Nez ha-Hammah, pp. 5a and 58b-59b. Or ha-Yom further asserts that, although the height of a tower planted in the ground may similarly be taken into account, sunset is in no way contingent upon visibility of the sun to a bird flying in the sky. Assuredly, Or ha-Yom would likewise ignore the sun's visibility as observed from an airplane.

R. Moshe Sternbuch, Mo'adim u-Zemanim, II, no. 155, cites the comment of Rashi, Shabbat 118b, that speaks of the sun being "covered" or hidden in Tiberias because of its location in a valley and notes the implication that the inhabitants of Tiberias commenced observance of Shabbat earlier than was actually necessary. Accordingly, he advances a position similar to that of Or ha-Yom in asserting that, in a locale in which there is a mountain of medium height in relatively close proximity, sunset for the entire area is determined by observation at the top of the mountain. Cf., however, supra, note 39. See also the comments of R. Shneur Zalman of Liady in the section of his Siddur titled Seder Hakhnasat Shabbat, reprinted in Shulhan Arukh ha-Rav (Brooklyn, 5724), II, 414, which lend themselves to a similar interpretation. At the same time, Rabbi Sternbuch cites and dismisses the suggestion of Or ha-Yom to the effect that, if there is a skyscraper in the city, sunset may perhaps be determined by observation at the top of the building.

Assuming that sunset is determined at ground level, it nevertheless seems logical to conclude that, if there are mountains on the west which hide the sun before it sinks below the horizon, that phenomenon would be ignored since, were the mountains not hiding the sun, the sun would be visible at ground level. Indeed, if one were to circle the mountain, the sun would remain clearly visible at ground level on all sides of the mountain. Nevertheless, Rabbi Sternbuch, loc. cit., cites R. Joshua Leib Diskin, as recorded in Nivreshet le-Nez ha-Hammah, as maintaining that sunset is determined by the disappearance of the sun even if such disappearance is due to the interposition of a mountain. Actually, Nivreshet le-Nez ha-Hammah, p. 59b, reports that Rabbi Diskin declined to rule with regard to the question of sunset as it affects observance of Shabbat. Curiously and inexplicably, Rabbi Sternbuch declares that R. Joshua Leib Diskin's view should be heeded if the mountain to the west is only of moderate height but at the same time asserts that sunset in the entire area is determined by observation at the top of a mountain of moderate height located to the east. That position reflects an inconsistency since, if sunset is determined by observation at the top of the mountain, there should be no difference

between situations in which the mountain is located in the east and situations in which the mountain is located in the west. A mountain on the west hides the sun only from someone standing at the base of the mountain; the sun is not at all hidden when observed from the peak of the mountain located in the west.

41. Cf., supra, notes 39 and 40. Intuitively, it seems certain that a gargantuan figure (e.g., Og, king of Bashan, whose proportions, as described in the *Midrash*, were phenomenal), would not commence observance of *Shabbat* later than an average earthling standing next to him simply because the former's head is high enough above the ground to see the sun even as it sinks below the curvature of the horizon.

To this writer, the distinction between a tall building and a mountain seems to be predicated upon the halakhic notion that the base line is ground level and the domain established at ground level extends ad coelum. The height of attached structures and, a fortiori, the elevation of unattached entities is ignored because, although such entities constitute a different domain for purposes of *Shabbat* regulations, time is determined entirely by observation of the sun at the earth's surface. This thesis yields the further conclusion that the times of sunrise and sunset at the top of a mountain are determined on the basis of observation of the sun at that site rather than at the base of the mountain only if the angle of ascent is less than 24.624°. The Gemara, Shabbat 100a, declares that a mound in a public thoroughfare that rises ten *tefahim* above ground level within an ascending distance of four amot (i.e., twenty-four tefahim, since each amah equals six tefahim) is regarded as an independent domain. See Mishnah Berurah 345:5. The angle of elevation of a right triangle having a height of ten and a hypotenuse of twenty-four is 24.624°. Thus, even natural topography rising at an angle steeper than 24.624° would constitute an independent domain and be ignored for purposes of establishing the time of sunrise and sunset. Mountains generally rise at an angle much gentler than 24° and hence the entire mountainside is regarded as ground level for purposes of establishing the beginning and the end of the day on the basis of actual visual observance of the sun by a person standing on the mountain. At the same time, early darkness at the bottom of a deep pit is ignored because the angle of the walls of the pit are much steeper.

- 42. Cf., however, Bein ha-Shemashot, p. 55, where Rabbi Tucatzinsky expresses doubt with regard to whether sunset at the top of a tall tower or in an airplane "so high that the sun is visible all night" is determined by the individual's own visual observation or whether it is sunset at ground level that governs. Rabbi Tucatzinsky does not predicate the latter possibility upon a simple *ad coelum* principle but upon the consideration that, at the time of creation, cessation from labor occurred on the ground rather than in the atmosphere. Therefore, he reasons, the commandment requiring rest on the Sabbath is to be fulfilled in accordance with conditions on the ground rather than in the sky.
- 43. Cf., the glosses of R. Iser Zalman Meltzer appended to R. Yechiel Michal Tucatzinsky's *Bein ha-Shemashot*, p. 158, in which Rabbi Meltzer insists that sunset is determined by the declension of the sun below sea level

rather than at ground level. See also Mo'adim u-Zemanim, II, no. 154. According to Rabbi Meltzer, the inhabitants of the mountainous region of Sepphoris prolonged the Sabbath at its conclusion more than was actually necessary just as the inhabitants of Tiberius conducted themselves at its commencement. In both cities, sunset might have been calculated on the basis of sea level had it been empirically possible to do so. As noted *supra*, note 40, Rashi, *Shabbat* 118b, seems to contradict that position.

- 44. A similar view was earlier expressed by R. Joseph Leib Sofer, Lekutei Sofer al Taryag Mizvot (Paks, 5673), mizvah 31, sug holkhei derakhim. See also R. Yisra'el Taplin, Ta'arikh Yisra'el (Lakewood, 5759), no. 1, note 40, who reports that R. Shlomoh Zalman Auerbach expressed a similar view in the name of R. Iser Zalman Meltzer. Rabbi Auerbach's source was undoubtedly a statement by Rabbi Meltzer in glosses appended to R. Yechiel Michal Tucatzinsky's Bein ha-Shemashot, pp. 157-158, in which he states that the height of a mountain and the depth of a valley are to be discounted in determining the times of sunrise and sunset. Rabbi Meltzer makes the same point with regard to a person finding himself at the top of a tower or in an airplane and observes that reason dictates "that it is impossible to say that at one spot it may be Shabbat below and yet a weekday above."
- 45. An interesting question would present itself if the astronaut failed to recite minhah prayers while flying from New York to Jerusalem but did recite havdalah while over Jerusalem. May he recite minhah upon his return to New York where he "reenters" Shabbat? It seems to this writer that he may not do so for much the same reason that the blessing upon sitting in the sukkah is not recited on Shemini Azeret. The stated reason is that, in ordaining blessings, the Sages did not countenance a tartei de-satrei, i.e. prayers that express a contradiction. There is an inherent contradiction between pronouncing the blessing "who has commanded us to sit in the sukkah" and recitation of "this day of Shemini Azeret" in shemonah esreh and kiddush. Thus even in Israel, where there is no rabbinic decree with regard to the sukkah on Shemini Azeret, a person who recites the evening service before nightfall is nevertheless prohibited to eat outside the sukkah but may not recite the blessing *lei-shev ba-sukkah* because it is contradictory to the shemoneh esreh prayer that he has already recited. Similarly, if the astronaut has already recited havdalah, recitation of the Shabbat minhah prayer would constitute a contradiction.
- 45a. In a letter dated 21 Heshvan 5762, published on a website maintained by Yeshivat Kerem be-Yavneh, R. Levi Yitzchak Halperin of the *Makhon le-Tekhnologia* asserts that the astronaut must follow the rule applicable to a person lost in a wilderness and count six twenty-four hour periods and observe the seventh twenty-four hour cycle as *Shabbat*. He further opines that, if the astronaut wishes to do so, he may begin those calculations as of the time that he first overflies Israel and then observe the Sabbath each week during the period *Shabbat* is observed in Israel and disregard the alternating periods of day and night that he experiences. R. Halperin also opines that morning, afternoon and evening prayers be recited every twenty-four hours but only when the astronaut experiences day or night as

appropriate to the prayer. That ruling is rather curious since morning and afternoon prayers as well as the *Shema* must be recited during specific periods of the day, whereas R. Halperin, since he bases his ruling upon the rabbinic edict concerning a person lost in the wilderness, apparently rejects the *ad coelum* thesis presented herein and assumes that the astronaut does not experience halakhic "time." See *www.kbv.org/ikhs/space/rhalperin*.

46. See R. Yechezkel Roth, Teshuvot Emek ha-Teshuvah, I, (Jerusalem, 5735), no. 22, who presciently describes a person who circles the globe multiple times in a single day and remarks that there can be but a single obligation each day with regard to recitation of the Shema and the statutory prayers. Similarly, R. Ben-Zion Abba Sha'ul, Teshuvot Or le-Zion, I, Orah Hayyim (Jerusalem, 5747), Orah Hayyim, no. 14, requires a traveller crossing the dateline from east to west on Saturday evening to recite the Sabbath prayers again during the ensuing day. Nevertheless, if the same traveller recrosses the latitude the same evening there seems no reason for the traveller to recite the weekday evening prayer a second time. A similar position with regard to repetition of Sabbath and holy day prayers on the second day was earlier advanced by R. David Spira, Teshuvot Bnei Zion, I, Orah Hayyim, no. 14, sec. 21. Teshuvot Bnei Zion, however, expresses doubt with regard to whether, on a festival, pronouncement of the she-hehiyanu blessing should be repeated.

Teshuvot Or le-Zion further rules that a traveller who crosses the halakhic dateline on a weekday, e.g., the traveller who crosses from the east on Monday and finds himself west of the dateline where it is Sunday, should, for reasons rooted in kabbalistic considerations, repeat the *she*moneh esreh conditionally, i.e., that he should recite the prayer with intention to fulfill the halakhic obligation if such an obligation exists but that, if no such obligation exists, the *shemoneh esreh* be deemed a voluntary prayer.

Interestingly, both Nishmat Shabbat, VII, no. 541 and Teshuvot Emek ha-Teshuvah, I, no. 22 suggest that since the traveller crossing the dateline has become obligated anew to observance of Shabbat he may be required to recite a havdalah a second time upon termination of that obligation. Nishmat Shabbat makes no similar suggestion with regard to kiddush. Kiddush is occasioned by the sanctity of the day and the traveller has "reentered" the identical day; havdalah, arguably, is occasioned by renewal permissibility of labor that may occur as it does in such situations, more than once in the course of a single day. Cf., however, R. Chaim Meir Yechiel Shapiro, Kovez u-Me'asef Siftei Hakhamim, no. 3, (Kislev 5741), p. 23, who assumes as a matter of course that the traveller need not repeat havdalah.

- 47. Cf., however, Teshuvot Bnei Zion, I, no. 14, sec. 29, who suggests that a sea voyager must continue to observe the balance of the day as Shabbat so long as the ship has not docked. Cf. also, R. Menachem Kasher, Kav ha-Ta'arikh ha-Yisra'eli (Jerusalem, 5737), chap. 54, as well as infra, notes 62 and 64 and accompanying text. See also the responsum of R. Koppel Reich published as an addendum to R. Eliezer Deutsch's Teshuvot Duda'ei ha-Sadeh (Sejny, 5789), s.v. ve-hineh.
- 48. Teshuvot Or le-Zion, I, Orah Hayyim, no. 14, rules that the traveller should recite havdalah immediately but should omit the blessing over fire. Or le-

Zion presumably means that recitation of that blessing should be delayed until nightfall.

- 49. R. Abraham Mordecai Alter, Mikhtevi Torah, no. 35, reprinted in Piskei Teshuvah, ed. R. Abraham Pietrekovsky, (Pietrkow, 5693), III, no. 252, adopts the curious position that one who crosses the dateline from west to east after completing the observance of Yom Kippur or of Passover need not fast or observe the holy day a second time. Teshuvot Mishpatim Yesharim, no. 77, followed by Teshuvot Kokhavei Yizhak, II, no. 11, expresses doubt with regard to this matter. See also, R. Yisra'el David Harfenes, Nishmat Shabbat, VII, no. 541 as well as Yisra'el ve-ha-Zemanim, I, no. 7, sec. 36 and no. 46, chap. 4, sec. 1 and II, chap. 13, sec. 6.
- 50. See also R. Yechiel Michal Gold, Me'asef le-Khol ha-Mahanot, Orah Hayyim 18:25. Cf., however, Teshuvot Minhat Elazar, IV, no. 42 and R. Moshe Stern, Teshuvot Be'er Mosheh, VII, Kuntres Elektrik, no. 93, who rule that, having begun observance of Shabbat, the traveller must continue that observance until nightfall. Cf., R. Betzalel Stern, Teshuvot Be-Zel he-Hokhmah, IV, no. 84, sec. 5 and no. 133.
- 51. Emek ha-Teshuvah, no. 22, raises two related questions:

1) If a child travels on his *bar mizpah* day to an area in which it is still one day earlier, does he revert to the to the status of a minor? It would seem to this writer that the answer is yes because the child has, in effect, travelled back in time. Cf., the statement of the Palestinian Talmud, *Ketubot* 1:2, *Nedarim* 6:9, and *Sanhedrin* 1:2, regarding the status of a girl whose third birthday occurs during the month of Adar. If the *bet din* later adds an intercalated month she retroactively acquires the status of a pre-three year old infant. The same principle applies to a child who reaches his thirteenth or her twelfth birthday in Adar. Thus, *Shulhan Arukh, Orah Hayyim* 55:10, describes the case of one child born on 29 Adar I and a second child born on 1 Adar II and rules that thirteen years later, in a year having but a single Adar, the younger child becomes *bar mizvah* on the first day of the month while the older child does not become *bar mizvah* until the 29th day of the month. See also Rashba, *Mishmeret ha-Bayit, bayit shevi'i, sha'ar shlishi.*

2) If a woman immersed herself in a *mikveh* on the evening following the expiration of her seven clear days and subsequently travels to an area in which it is still the seventh day, does she revert to a state of ritual impurity? It would seem to this writer that the answer is negative because purity and impurity do not depend upon expiration of a prescribed number of days *per se* but upon efficacious immersion. Since at the time of her immersion, the immersion was valid there appears to be no reason why her status should undergo a change.

- 52. Ha-Ish ve-Hazono, p. 99.
- 53. See also Teshuvot Bnei Zion, I, no. 14; Teshuvot Or le-Zion, I, Orah Hayyim, no. 14; Teshuvot Nishmat Shabbat, VII, no. 541; and R. Yisra'el David Harfenes, Yisra'el ve-ha-Zemanim (New York, 5764), II, chap. 13, secs. 6-11.
- 54. Iggerot Mosheh explicitly asserts that, conversely, a person traveling east to west on a fast day must continue fasting until nightfall occurs in the place in

which he finds himself. Cf., however, R. Elijah Zlotnick, Pri Eliyahu, III, no. 17; and R. Samuel ha-Levi Woszner, Teshuvot Shevet ha-Levi, VII, no. 76 and VIII, no. 261. See also Yisra'el ve-ha-Zemanim, I, no. 46, chap. 4.

- 55. R. Eliezer Rotter, Mevakshei Torah, no. 25 (Sivan, 5759), p. 384, in discussing the situation of a person travelling during the night preceeding a fast day from west to east e.g., from Israel to the United States, reports that R. Joseph Shalom Eliashiv informed him that the traveller must observe the fast from the time that the fast begins in his place of arrival and hence, if the plane flies the route which takes the traveller over Greenland, where it is day, and then south, where it is again night, the period of daylight may be ignored. This writer assumes that the terminology in which this ruling is conveyed is imprecise and that the essence of Rabbi Eliashiv's response was that commencement of the fast is not determined by the time at the point of embarkation but at the place where the traveller finds himself and hence, travelling from west to east, it will never be earlier than the time of daybreak in the United States. If so, that position is unremarkable. However, Rabbi Eliashiv's ruling with regard to the period of overflight in an area in which it is already day is subject to challenge. Presumably, a person who crosses the halakhic dateline to an area in which it is Shabbat would, according to *Hazon Isb*, be required to observe the period he spends on that side of the dateline as *Shabbat* even if he intends to recross the dateline the same day.
- 56. See R. Elijah Posek, Koret ha-Brit, (Lemberg, 5653) 262:2 and R. Shabbetai Lipschutz, Brit Avot (Munkács, 5674), no. 10, kuntres aharon.
- 57. See Teshuvot Be'er Mosheh, VII, Kuntres Elektrik, no. 116.
- 58. The gloss of *Dagul me-Revavah* to *Shakh*, *Yoreh De'ah* 195:4 is of seminal importance in establishing the principle that halakhic provisions dependent upon completion of a period of a day or of a multiple number of days do not require expiration of a full twenty-four hour period or periods.
- 59. However, some authorities maintain that it is improper to cross the halakhic dateline in order to avoid observance of the Sabbath. See *Teshuvot Erez Zevi*, no. 44, who cites a comment of the *Mekhilta* cited by Ramban, Exodus 20:8, "'Remember [the Sabbath day]' before it comes," as establishing an obligation to assure in advance that the seventh day be observed as the Sabbath. See also *Teshuvot Bnei Zion*, I, no. 14, sec. 21 and R. Chaim Kanievsky, cited by *Ta'arikh Yisra'el*, no. 1, note 42, s.v. ve-od.
- 60. See also Me'asef le-Khol ha-Mahanot, Orah Hayyim 18:25.
- 61. See also the responsum of R. Koppel Reich published as an addendum to *Teshuvot Duda'ei ha-Sadeh*.
- 62. That argument is certainly not compelling. A person may receive nutrients intravenously even though he will not suffer the "affliction" of the fast. See this writer's *Contemporary Halakhic Problems*, III (New York, 1989), 129-140. See also *Havalim be-Ne'imim*, IV, no. 3, who comments, "Is it then forbidden to sleep on *Yom Kippur* even though [when sleeping] one experiences no afflictions?" *Havalim be-Ne'imim* dismisses the notion that one must observe *Shabbat* and *Yom Kippur* for a full twenty-four hour period as entirely without basis. See also *supra*, note 26.
- 63. See also R. Menachem Kasher, Shabbat Bereshit ve-Shabbat Sinai," pp. 400-401 and p. 410.

- 64. Cf., R. Menachem Kasher, *Teshuvot Divrei Menahem*, (Jerusalem, 5737), I, no. 3. In *Teshuvot Divrei Menahem*, Rabbi Kasher advances an apparently contradictory position in suggesting that it is forbidden to cross the dateline is a manner that curtails Sabbath observance because the traveller thereby actively abrogates a positive commandment by removing himself from its ambit. That statement is surely in contradiction to his parallel assertion that the traveller remains bound by Sabbath obligations. Cf. also, *supra*, note 47.
- 65. This is not to suggest that removing oneself from the ambit of a mizvah constitutes an actual transgression. To be sure, a person may not place himself in a position in which he is prevented from fulfilling a mizvah already incumbent upon him because of force majeure. Thus, Rashba, Torat ha-Bayit, Bayit Rishon, sha'ar 5, cites Hullin 31a in demonstrating that a person may not slaughter a bird in circumstances in which it is clear that he subsequently will not be able to fulfill the commandment concerning covering the blood with earth (kisuy ha-dam). Quite certainly, as is readily apparent from Shulhan Arukh, Orah Hayyim 13:3, under ordinary circumstances, a person may not don a four-cornered garment on Shabbat to which, because of Sabbath restrictions, he cannot attach zizit.

[See however, Mordekhai, Menahot, Halakhot Ketanot, sec. 944, cited by Magen Avraham, Orah Hayyim 13:8. According to Magen Avraham, Mordekhai maintains that donning a four-cornered garment on Shabbat lacking zizit is forbidden only by rabbinic decree. For various analyses of Mordekhai's position, see, inter alia, Teshuvot Helkat Yo'av, hashmattot, no. 1; R. Yechiel Ya'akov Weinberg, Seridei Esh, III, no. 93; R. Ya'akov Kanievsky, Kehillat Ya'akov, Bava Kamma-Bava Batra, addenda, no. 6 and Menahot, no 21; R. Samuel Rozowsky, Shi'urei ha-Grash Razavsky, Yevamot, no. 4; and Mo'adim u-Zemanim, I, no. 35. See also additional sources listed by R. Joseph Ben-Arza, Yosef Da'at, no. 65 (Menahot 32-44), chap. 7, sec. 14.]

Whether a person may perform a delayed circumcision on Thursday with the knowledge that it will then become necessary to violate the Sabbath on behalf of the patient is a matter of controversy between Ba'al ha-Ma'or and Ramban, Shabbat 134a. For analyses of that controversy see Teshuvot Hatam Sofer, Even ha-Ezer, I, no. 1 and VI, no. 97; Teshuvot Mizpeh Aryeh, I, no. 31; R. Meir Dan Plocki, Hemdat Yisra'el, II, no. 10; and R. Eliezer Waldenberg, Shevitat ha-Yam, chap. 6, sec. 8. Hayyei Adam 155:30 writes that a person should not allow himself to become inebriated on Purim if, as a result, he will not be able to recite the statutory prayers. See also Bah, Orah Hayyim 585, s.v. u-mefaresh, who declares avoidable loss of a shofar to be tantamount to willful non-performance. More generally, Helkat Mehokek, Even ha-Ezer 50:16, citing Teshuvot Ramban, no. 272, writes that "if one causes duress to oneself, it is not duress but willful." That principle is also reflected in a ruling of Shulhan Arukh, Yoreh De'ah 232:17, in the context of nonfulfillment of a vow. See also Teshuvot Maharit, I, no, 21; R. Meir Dan Plocki, Hemdat Yisra'el, I, Kuntres Ner Mizvah, sec. 1; idem, Klei Hemdah, Parashat Balak, sec. 4; and R. Nachum Weidenfeld, Hazon Nachum, I, no. 28, and II, Teshuvot Yosef

Engel, sec. 13. R. Israel David Hofernes, Teshuvot va-Yevarekh David, II (Brooklyn, 5749), no. 168, presents an exhaustive list of sources discussing whether a person is at all obligated to make necessary preparations for performance of a mizvah before the mizvah actually becomes incumbent upon him and whether a person may place himself in a situation in which it will later be impossible for him to fulfill the mizvah. See also the examples and sources discussed by R. Yitzchak Yonah Ehrman, Shirat Yizhak (Jerusalem, 5762), pp. 124-179.

One source not adduced by any of the scholars who address this issue is the statement recorded by the Gemara, *Shabbat* 15a, reporting that forty years prior to the destruction of the Temple the members of the Great Sanhedrin left the lishkat ha-gazit (Chamber of Hewn Stone) located on the Temple Mount and removed their chambers to a location elsewhere in Jerusalem. They did so because capital punishment could not be imposed by the inferior courts having jurisdiction over most capital cases unless the Great Sanhedrin was present in its chambers on the Temple Mount. The purpose of the voluntary exile of the Great Sanhedrin was to prevent imposition of capital punishment in homicide cases. Apparently, since, at the time, there was a "plethora of murderers" (nefishei rozhim), the members of the Great Sanhedrin felt that the fear of capital punishment no longer served as a deterrent and hence capital punishment was not serving its purpose. However, since imposition of that punishment is mandatory when the requisite provisions of law have been met, the sole manner in which such punishment could be avoided was for members of the Great Sanhedrin to remove themselves from their chambers on the Temple Mount.

However, since imposition of capital punishment constitutes fulfillment of a commandment, this expedient had the effect of removing those obligated to its performance from the ambit of the *mizvah*. Accordingly, it seems to this writer that those authorities who maintain that a person may not take steps to avoid fulfillment of a mizvah even before the mizvah has become incumbent upon him would concede that a person may engage in measures that would prevent others from becoming obligated to fulfillment of a *mizvah*. Thus, even if a person may not intentionally depart from Jerusalem before the fourteenth of Nisan in order to avoid offering the paschal sacrifice, he may nevertheless transport another person (for example, a person who is asleep and does not acquiesce in the expedient) to a place outside of Jerusalem so that the latter individual may avoid the obligation of the paschal sacrifice. In effect, since no actual infraction is involved, such conduct is not within the ambit of the prohibition against "placing a stumbling block before the blind." If so, the Great Sanhedrin acted appropriately in vacating their chambers on the Temple Mount since the effect of that action was not to avoid their own obligation but to obviate the *mizrah* incumbent upon members of the inferior courts charged with executing those guilty of homicide.]

See also Bi'ur ha-Gra, Orah Hayyim 8:1, who, citing Pesahim 48b, rules that it is not permissible to divide a large amount of dough into smaller quantities in order to avoid the obligation of hallah.

Those situations are quite different from the situation of a person who sells his house and becomes an itinerant traveller thereby exempting himself from the obligation to affix a *mezuzah* to his doorpost or of a person who rounds the corners of a four-cornered garment thereby relieving himself of the *mizvah* of affixing *zizit* to his garment. Similarly, a person who travels to a locale in which there is no "time" or a person who crosses the halakhic dateline on *Shabbat* and in the process exempts himself from the obligation of a *mizvah* incurs no technical infraction. Cf., however, the opinion of *Erez Zevi* as well as *Teshuvot Bnei Zion* and R. Chaim Kanievsky, cited *supra*, note 59 and *Teshuvot Divrei Menahem*, *supra*, note 64. Nevertheless, intentional avoidance of incurring an obligation may result in additional punishment "at a time of anger" as described by the Gemara, *Menahot* 41a. See *Teshuvot Or le-Zion*, I, *Orah Hayyim*, no. 14. See also *Mo'adim u-Zemanim*, II, no. 155, who states, "Therefore, in truth, a Jew should not dwell in such places on a permanent basis."