

The author of this essay is an internationally renowned scientist, who presently heads The Lautenberg Center for General and Tumor Immunology at The Hebrew University—Hadassah Medical School, Jerusalem, Israel.

## JUDAISM AND EVOLUTIONARY HYPOTHESES IN BIOLOGY: REFLECTIONS ON JUDAISM BY A JEWISH SCIENTIST

### INTRODUCTION

#### *Causes and Dimensions*

Large numbers of Jews have been lost to Judaism, and continue to be lost, because they are unable to reconcile what they believe to be basic articles of faith with assumedly contradictory information accruing from modern scientific study.

The area of science purported to pose the greatest difficulty to the Jew who aspires to an encompassing Torah perspective of reality is that dealing with the origin and evolution of species. It is here that many Jews have felt it necessary to choose between the demands of religious conviction and the prerogatives of intellect. The polar options that have been offered are, on the one hand, an allegiance to Judaism that must perforce be maintained in defiance of reason, or, on the other hand, a commitment to the facilities for rational thought and inference that compels abandonment of faith.

The losses which Judaism and the Jewish people have incurred in this arena are the more tragic for the spuriousness of the conflict. For the Jew, the confrontation between “religion” and “science,” in any area, is phantasmagoric, a wholly alien battle; in permitting himself to be drawn into the fray, he acquiesces to a mortal tilting against windmills that loom out of foreign value systems.

The struggle to asseverate religious dogma and practice in societies that endeavor analytic insights into the processes and

phenomena of nature is one that indeed may be, or may have been in the past, unavoidable for Christianity. Christianity has, accordingly, tended to deprecate or resist scientific inquiry as inherently dangerous to key elements of its canon and posture. An understanding of natural events, and a degree of human mastery over natural processes, can indeed erode fundamentalistic, limited, and essentially static readings of ancient sacred texts; such reading cannot be avoided in absence of the dynamic, living corpus of precept and law that Judaism possesses, uniquely, in the cojoint integrated body of *torah she'bektav* and *torah she'baal'peh*. Traditional attitudes of Christianity perceived the dimension of spirit and the dimension of nature in human cognition as pervasively hostile to each other, each exerting imperative forces that clash for validation. The study of nature—natural science—is a hazardous occupation when human spirituality is defined, in essence, as the realm in which the person can function only by divesting himself of the sensibilities and passions of body and intellect: The knowledge gained by study can then only be to the loss of the soul.

But Judaism's ethic is categorically other. The apposition of the dimensions of spirit and of nature is one of complementarity, not of antithesis.<sup>1</sup> Judaism will not have man polarized, but integrated. Nature is the daughter, the hand of God, the manifestation of the means by which the Creator has chosen to create and to act in creation.<sup>2</sup> The workings of nature are in themselves miracles; the miraculous transpires within the matrix of natural occurrences.<sup>3</sup> God is in need of no other agents for His management of the universe, and of the fate of individual man and of nations, than His great host of created things.<sup>4</sup> The Jew celebrates God in nature, and strives for transcendence not by a denial of his physical being but by the sanctification of his daily drives and functions. For him, widened comprehension of the material world and of his own total being can be worship, and a means of reaching closer to the Creator; all knowledge can be celebration. And the Jews' impulse to learn and to know can well be held to include scholarship of the physical universe which serves as His footstool.<sup>5</sup>

By enlisting in wars against scientific exploration, the Jew is only giving proof to the sociological axiom that minorities often adopt, unwittingly, values and causes of an ambient majority, even where these may be antagonistic. The Jew, shrinking back from unconditional curiosity and examination of the world about him, places himself, and loses himself, in a cause at categorical variance with the commitments that distinguish and differentiate Judaism. And by suppressing or distorting apperceptions to which his facilities of

reason impel him, the Jew turns renegade: He denies the uses of the gifts of mind with which the Creator has endowed him, and he bears false witness to a shrunken, inadequate Torah, and to a Torah insufficient to subsume the (limited) capacities of human understanding.

### *Framework and Belief*

There is another root source to the fallacy of the Jew on guard against the “heresy” of evolutionary hypotheses in biology. It lies with the common misconception of laymen that the (intelligent) investigator holds scientific “beliefs.” A question very often asked of the observant scientist by fellow Orthodox Jews is whether he “believes in evolution.” The semantics employed create the problem that isn’t. Judaism and its God are jealous. There is no room for any belief at the side of the *en ’od*. If the Jewish scientist were, in effect, to cherish “beliefs” in evolutionary patterns—or, for that matter, in the four-leggedness of rodents—the very adoption of the “beliefs” might rightly suggest a fundamental conflict.

But, in fact, it is not “beliefs” that scientists and science propose. It is frameworks of conceptualization that are advanced—hypotheses, theories—which serve to delineate, interpret, and anticipate bodies of cognate observations, and which always stand to be measured against the hypothesis of null, that is, that the conceptual framework proposed is, in fact, mistaken. (For Judaism, the animating beliefs may perhaps be said to have undergone a not wholly dissimilar testing—by the Patriarchs, who came to the conclusion that the correct numerical value of the faith is One, not null; and we, their descendants, have gone on from there to enrich our encounters with that One.) The record of the encounter between Jew and God differs wholly from scientific hypothesis; it is salvational narrative, sacrosanct and transcendent. Proof of its authenticity lies not only with the objectively discerned manifestation of God in nature and in the sage of man, but also with subjective receptivity to the Ineffable. Acceptance by the Jew of the record as matrix and meaning for his personal existence requires “faith,” in the sense of affirmation of the evidence that comes from history, nature, and inner individual sentience against the challenges of chaos in collective and single human experience.

Scientific hypotheses, in contrast, are invested with no sanctity. They deal only with the finite and the material, and only extrinsic criteria tangibly perceivable by every observer with germane training can be applied to their testing. There can be complementarity, but not collision, between systems of ideation and apperception that

function on different planes and that are endowed with wholly distinct value qualities.

### *Banality*

Nonetheless, attempts to discredit evolutionary concepts in general on the grounds of real or projected uncertainties of particular corollaries remain a not uncommon exercise of Jews who would defend the faith. Such essays at skewed extrapolation often come dangerously close to intellectual dishonesty, and in Judaism they are theologically offensive. Labored and clearly partisan efforts to invalidate hypotheses held on the strength of exceedingly persuasive evidence by the overwhelming majority of several generations of leading scholars will not lay to rest doubts that derive from erroneous premises of the claims of Judaism and those of modern science. A defense that resorts to half-truths and distortion can only reenforce the deplorably mistaken supposition that Judaism has something to fear from the light cast by any scientific inquiry. Every venture to demonstrate the relevance of traditional Judaism for all times must make this a point of departure: one cannot rescue from apostasy Jews moved to question by offering them specious treatments of scientific data, nor by imposing restraint on intellectual capacity and reach; and, those Jewishly educated must sense in the demand for such retreat an alien imposition.

Neither can shaken religious conviction find buttress in facetious evasion — “after all, evolutionary ideas are only theory, not fact” (and further analysis will happily prove them wrong!) — nor in the strange admixtures of recognition and naive invention that have been offered as remedy for misled crises of faith. Thus, it is improbable that many Jews will find solace in the proposition that the Creator brought into being the evidence that admittedly makes for evolutionary formulations, as a test of the staunchness of belief by the faithful to the contrary! Perceptive Jewish students don’t tend to be put off by straws. Whatever may be the ultimate adjudication of veracity of the many elements that enter into evolutionary postulation, banality will have contributed nothing to resolving their supposed conflict with Judaic principles.

### BASIC ELEMENTS OF EVOLUTIONARY HYPOTHESES

The essential, common elements of evolutionary conceptualizations of the living world, and the observations from which they are inferred, are summarized critically in the succeeding paragraphs.<sup>6</sup>

- A. The basic properties and organization of living organisms show profound similarities, on subcellular, cellular, tissue, and organismal levels, and with regard to both structure and physiological function.
- B. There is persuasive indication for the occurrence of patterns of an ongoing differentiation and diversification with time of protista and of plants and animals, by germ line mutation. The appearance of groups of living forms of increasing complexity and/or increasingly varied specialization is strongly suggestive of sequence and progression along multiple, distinct lines, each unit exhibiting particular relationships to forms that appeared earlier along that course. A unit of living entities is designated "species" when it differs "appreciably" from another related unit; sets of species with marked commonality of characteristics are grouped together in distinction from other categories of species into larger taxonomic sets—genera, orders, classes, and phyla. The features that distinguish one species from another in the same larger grouping may be small or pronounced, and there is often considerable arbitrariness in setting and applying species designation.
- C. In many instances, the dissimilarities that separate one existing species from the seemingly most closely "related" one also still in existence are rather extensive. The fossil data that point to the preceding occurrence of "intermediary," connecting units of living forms are often sparse, erratic, and conjectural. It is frequently not known, moreover, what periods of time are likely to have elapsed in the origin of distinct species of affinitive lineage; what the precise nature of the sequential differentiative events has been; and, whether the steps of transition from one given species to another are consistently very small and gradual, or, at times at least, more sudden, abrupt, and definitive.
- D. Given environmental conditions favor the survival and distribution of individuals with compatible characteristics. Where these characteristics are transmitted genetically, the appropriate environmental circumstances act selectively toward the establishment in nature of that grouping of living organisms. Precipitous and telling changes in environment can favor habitation of apt mutant clones that differ phenotypically to relatively large extents from the immediately preceding, predominant precursors, and can hasten species transition. The relationship between the processes of selective adaptation of families, strains, and species, and of the progressive appearance of more complex ("higher?") forms along certain lines (that is, "evolutionary development"),

remains unclear, however. It has been pointed out repeatedly that many “low” categories of life—for instance, certain bacteria, coelenterates, annelids—surpass in reproductive ability, adjustment in their ecological niches, and survival tenacity many “higher” living units that are thought to have evolved from them. It is also evident that biological economy and efficiency—one is tempted to say “ingenuity”—are, on the whole, as developed among the supposedly most simple and most ancient organisms as among the most complicated and recently arisen ones; the groundplan of life seems to have reached required perfection in many regards already at the outset of being of the living world.

- E. The evolutionary “unfolding” of more complex from simpler forms of life, and the adaptive colonization of taxonomic entities, as postulated, by mutation, selection, and differential reproductive opportunity, demand a time dimension very many orders of magnitude greater than six millennia, by whatever precise mechanisms the processes can be imagined to take place in scientific terms. Evidence coming from the apparently sequential associations of currently existing species, from their observed behavior as species in field and laboratory, and from fossil records is similarly persuasive of an age of the living world, and of the time span of distinct species, that must be reckoned not in millennia but in periods of tens of million years.

The core, common elements of evolutionary concepts, summarized in the preceding paragraphs, offer a more satisfactory interpretation today of the appearance and population dynamics of species than any other formulation that has been advanced. Current research in virtually all areas of biology is rooted solidly in this conceptual framework.

## EVOLUTIONARY HYPOTHESES AND THE TENETS OF JUDAISM

### *Apposition and Scope*

Evolutionary theory is not, and cannot conceivably be, in conflict with any tenet of Judaism. Its articles pertain to an analytic description of the tangible, of material phenomena as they are; they posit a rational perspective of the living world as it exists, and they endeavor to reconstruct the history of life as it was in the past. Evolutionary theory does not address itself to inchoation or eschatology,

to ultimate questions of beginnings, ends, and purpose of the universe and its biosphere. These questions fall within the purview of philosophy and religion, and methods other than those of the natural scientist are demanded for their study.

Neither, for that matter, does evolutionary ideation, nor any other formulation in the natural sciences, furnish an easy grasp of the staggering complexities patent in the organization and continuity of the cosmos and its compartments of life. The explosive accretion of knowledge in biology during the past several decades has, in fact, cast light on only the outlines of some of the individual processes that make up the functioning of cells and organisms. The integration of component structure and reactivity that is mandatory for the being of even the simplest units of life remains still virtually unexplored territory. This is true for all other disciplines of modern science as well: only beginning insights have been achieved.

This caveat of limitations is not offered with a view to securing a refuge for God. The God of Judaism does not lurk in the recondite; He becomes more cognizable in His attributes as scientific discovery brings the wondrousness of nature in its entirety into clearer focus. It is intended, rather, to place into balanced perspective the accomplishments of science so far, and to encourage a modesty of pride in scientific achievement. The illusion of human hegemony in any area of thought or action precludes realistic estimation of the scopes of the known and unknown before man, and of the likely ranges of his authority and dominion.

It must be stressed at the same time that predictions of ultimate boundaries to the reaches of intellectual and experimental penetration in science are undeniably foolish.<sup>7</sup> It can never be stated at any one moment where scientific exploration will eventually lead, nor how far the domains of human power in nature will extend. Scientific sophistication and human ability to intervene in nature will undoubtedly advance—and the attainment of growing understanding and control is, precisely, the protean assignment given man at his inception.<sup>8</sup>

### *Randomness*

The one sweepingly restrictive axiom that is perhaps permissible for the natural sciences, retrospectively and for the future, is that the origin and maintenance of the universe, and of life within it, cannot be explained by any postulate of inclusive randomness. Mathematical consideration dismisses as wholly improbable the proposal that

chance concatenations of physical and chemical forces can account for the origin and diversity of matter, for the beginning of life and its unfolding, and for persistence.<sup>9</sup> Nor, clearly, can the argument of chance relate to the being of primary forces in themselves. The essential mystery of being remains for all the progress that has been made, and will be made, in recognition of its instrumentalities. R.E. Gross has aptly asked: "If protoplasm is ever 'explained' as it might well be, in terms that equate it with forces in the non-organic world, will that bring organic life down to being a form of the non-organic world . . . ?" He answers: "These 'explanations' may reduce the number of mysteries in the universe, but they shift the ultimate mystery to a deeper level."<sup>10</sup> The concerns of Torah are decisively not with the methodology of creation, but with its moral parameters and with the ultimate mystery.

It is, indeed, the impermissibility of comprehensive randomness as a coherent statement of creation and being that has impelled not a few scientists to make the initial affirmation of a religious belief: the affirmation of a force beyond nature as nature's progenitor and lord. The only alternative to that attestation is self-imposed constraint of total awareness—of the ultimate as well as of the finite—and, in fact, evasion of exceedingly compelling inference accruing from scientific investigation. Natural science and religious creed indeed cannot *prove* or *disprove* each other, but in the unifying Judaic apprehension of all dimensions of existence, one road to faith begins with knowledge of the material universe.

It appears to be true that individual events within a cognate set often do occur at random. Thus, the quantum position and velocity of a single electron at a point in time cannot be predicted; neither can the locus and precise nature of a mutation affecting one of a chain of neighboring genes on a chromosomal segment. Foresight of the fate of the integer in a field of similar integers is commonly imprecise or impossible. In statistical terms, biological occurrences, and especially those involving complex interactions between distinct units, do not fit deterministic models; they must be analyzed as probability, or stochastic, processes:

Any description of . . . possible changes . . . with time must take account of the fact that things could turn out quite differently . . . a probability model is essential to describe the pattern of happenings that could occur with their relative chances of occurrence. We must therefore envisage the existence at any one point of a probability distribution . . . instead of the single value specified by a deterministic model.<sup>11</sup>



Thus, we can say with near-certainty that a particular event shall take place among seemingly identical constituents of a set, and approximate its frequency, but we cannot identify with any accuracy the integer that will be so affected within the stochastic matrix. This applies at all levels of organization, from the subatomic to the polymolecular, for the inanimate as well as for the animate, and the more so for the human species with its superimposition of the dimensions of will, choice, and conscience. Deterministic laws that do appear to fit certain phenomena in nature express, in effect, the cumulative results of individually random events.

In the language of science, the designation "random" imputes fortuitousness, the absence of assignable cause. Absence of scientifically comprehensible causality cannot, however, negate invocation of an agency that stands behind and above nature. It is to the percipience of such agency that religion aims. The person moved to religious conviction, by whatever reasoning or intuitive knowing, can perceive in both individually "random" events and in the aggregative constellation the will and supervision of Divinity, where the agnostic finds singular happenstance, and an undirected determinism for the whole that arises from a cancelling out of the differential possibilities that delimit each one component.

### *Investment and Language*

The distinction of view is a matter of *a priori* value investment in discernible occurrence. The human mind is given the capability of sensing in natural phenomena a dimension of spirit, and thereby of purpose. Man can see in the evolution from chaos to order a "deeply planned creativeness"<sup>12</sup>—or an incredible accretion of random events whose origin is divorced from all hypothesis, and which in their totality somehow obey an orderly sequence of cause and effect, to no particular end.

In recording the discovery of religious value in natural phenomena, an appropriate language is required. That language and the one of natural science are parallel. They cannot meet in the finite reach of man, and they cannot contradict each other. When they do seem to clash, it is because they have been preempted mendaciously in warfare between protagonists of "science" or of "religion"; as emphasized repeatedly in this discussion, such warfare is ignorant, and a distorted reduction of oneness in the universe.

Joint, coincident usage of the two languages affords, to the contrary, a picture of the universe that is fuller and that comes closer to

accuracy in its completeness. When the Tania declares that the spark of Divine creativity remains resident forever in every atom of matter, and must so remain if matter is not to revert to chaos,<sup>13</sup> the assertion is at no variance with the atomic analysis of the modern physicist. "Sparks of divinity" is a value finding; enumeration and depiction of the constituent particles and charges of the atom is a telling of the material structure within which the intangible quality of spirit is held to dwell. But more than this. The semantics and concepts of the atomic physicist do not rationally explain why the atom is and why, in fact, it does not rather commonly collapse, or spin off, into chaos. The Tania, on the other hand, arrogates a comprehensive theory, not testable by the equipment of the physicist, but which affords an interpretation of being lucidly rational by its terms of reference. Without the cojoint lexicon of the Tania and of that of normative Judaic thought for which the author speaks, the vocabulary of the physicist alone would seem deficient in approximating even a "scientific" rendition of reality.

Scientific posture to the universe can strengthen and complement faith as it is propounded in normative Judaism; it cannot weaken such faith.

## INQUIRY

The warning has been voiced that allegiance to Torah entails a recoiling from inquiry into that which is "hidden." There is, indeed, a pervasive reticence in much of Judaic thought at entering orchards of metaphysic introspection. The danger is too great that the way will be lost, and that contemplation of the arcane may seduce the mystic to arrogations of authority in the dimension of spirit. The tree of forbidden knowledge, the Tower of Babel, suggest landmarks of demarcation. Final vision is withheld from Yaakov.<sup>14</sup> The hidden remains a province exclusive to God; the call to the Jew is to occupy himself with that which is given him as task. The mishnah in Hagigah reasserts: Whoever would honor his Maker will not wrest another way, will not take himself out of the human dimension of *mitsvot* to foray alone into the above and below, the before and after — better he had not been created than to so embark.<sup>15</sup>

The way, in Judaism, is not directed at meditative penetration of the ultimate. The focus of Torah's imperatives to the Jew is on the present, on the need that cries out the instant for acquittal. Transcendence is mapped closely by overt action, and by study purposed to the perfection of deed.<sup>16</sup> The active remembrance of *Shab-*

*bat*, its doing, brings the Jew to the vestibule of eternity. For the prophet, veils may be lifted, momentarily. Ezekiel perceives the Presence in the Merkavah.<sup>17</sup> For every Jew, the labor is to discover the ubiquity of *shekhinah* in all corners of existence. "And I, Daniel, alone saw the vision . . . the men that were with me saw not . . ."—even Haggai, Zechariah, Malachi.<sup>18</sup> The granting of the vision is a gift, rare, not to be forced. The vision *is*. That knowledge is sufficient impulse to live and do. It is the mystique of action in *mitsvot* that in their weave, the vision may be neared and man fulfilled. Panlucid sighting is deferred, the ultimate promise and goal, beyond material being.

But against the hesitancy to aim at gnosis of the ultimate there is juxtaposed in Judaism another value: Know before Whom you stand!<sup>19</sup> The Talmud in Hagigah gives man free reign to "inquire from the end of the heavens to the end of the heavens."<sup>20</sup> The boor cannot attain to righteousness.<sup>21</sup> From Abraham, the Jew has questioned the meaning and ways of divinity; and even when the answers remained shrouded—"I shall be what I shall be"<sup>22</sup>—the questioning has continued, and the King asserts His kingdom over the House of Israel in the teeth of all query, all doubt, of even His rejection by the individual Jew.<sup>23</sup> Doubt is not forbidden the Jew, only its extrapolation to a theory of null. N.L. Rabinovitch concludes correctly that "Judaism not only tolerates but actually enjoins free enquiry."<sup>24</sup> And, in the unknown journeys, there is assurance of safety: The King will reign in Israel, in all His mysterious glory.

What, then, delimits the arcanum toward which man should not trespass, what the lines of thought and testing he is encouraged to pursue? We stand before a field of tension, as so often in Judaism, and before the obligation not to polarize but to integrate.

Jonathan ben Uzziel completes his interpretation of the Prophets, and the earth quakes, and the Voice from Heaven demands: Who is this that has revealed My secrets? And Jonathan ben Uzziel arises and answers: "It is I who have revealed Thy secrets to mankind; it is fully known to Thee that I have not done this for my own honor or for the honor of my father's house, but for Thy honor have I done it . . ." But when he pursues to reveal the inner meaning of Hagiographa, the Voice cries out: Enough! The Talmud explains: Because the time of the Messiah is foretold in it. And Jonathan ben Uzziel is silent.<sup>25</sup> In this passage, we might discern the guidelines. Perhaps the criterion of legitimacy at the outset of all inquiry is that the search be in His honor. The effort, small or large, is sanctified if it is for the sake of Heaven.<sup>26</sup> And perhaps the permissible frontier of

the seeking lies, too, with its frame of reference, and with the instruments that are employed.

The reference is the partnership in which man stands to the Divine. The responsibilities of the partners are defined; assumption of the prerogatives of the Crown is encroachment.

The implements we hold are for grappling with the knowing of His manifestations and will, not for probing His essence. The material world is the dimension given to man the partner, to perfect; the ultimate before and after and why lie exclusively in His premises. Intelligence of the Kingdom is human obligation, but attempts to catalogue its immanence are dissuaded, interdicted, perhaps because man is not equipped for that analysis, and unequipped is adrift and easily lost. It may be correct to say that scientific study, as all learning, can be *mitsvah*; the presumption to grasp of His nature and intents is hubris. Perhaps that is why all that pertains to man's workings in the material world, to halakhah, is set in Talmud and thereafter into a matrix of searching dialectic and is binding in adjudication, whereas that which is aggadic remains open, challenging, and excepted from orthodoxy by the very construct of post-biblical epistemology.

The ranges considered desirable for man the questioner are not drawn with exactitude; guidelines have been proposed variously by respected Jewish thinkers, and they vary also with the pulses of emphasis in Judaic thought broadly. What does emerge as principle is that any stricture on intellectual confrontation with the material universe is an imposition counterfeit to mainstream Judaism. The Jew has nothing to fear from the rhythms and forces of nature, nor the Jewish scientist from unconditional curiosity about the created world.

### *Specifics*

It has been argued in the preceding pages that scientific inquiry and adherence to Judaic belief and practice can in no way disaccord with each other, if the nature and functions of each of these dimensions of human experience are perceived correctly; that, to the contrary, these domains are complementary, and that the study of nature can as such lead to deeper affirmations of faith; and, that the validity of evolutionary hypotheses, as of all scientific theories of natural phenomena that have been formulated and will be formulated in the future, are subject solely to the critique of reason — by the committed Jew as by any other scholar.

Deeply ingrained misconceptions are not readily dispelled, however; effective refutation often requires more than generalized disavowal. The need for detailed retort appears to be particularly pronounced with regard to the threat to faith which evolutionary hypotheses in biology have been thought to hold for the Jew; findings that imply the antiquity of the universe, and that have been misconstrued to insinuate simian ancestry into genealogies believed unblemished, have caused much alarm. That the fears are groundless has been made clear repeatedly, in the classical writings of authorities in halakhah and Judaic philosophy and, during the past decades, by Jewish scientists whose comprehensive view of the world is Torah centered. All that need be said to lay to rest the spectre of scientific heresy in Judaism has been said, convincingly,<sup>27</sup> and pungent novelties are hardly possible on this problem — whose rather perverse and diaphanous fatuity would, for that matter, hardly seem to deserve genius of confutation. But, some solecisms have hydra-like qualities of tenacity. Let us in the following paragraphs summarize, once again, the compatibility with the principles of Torah and normative Judaic thought of the specifics, as well as of the generality, of evolutionary formulations.

The age of the universe, and of the planet earth and life on it, is not a parameter to which doctrine, dogma, or faith attach in Judaism. A duration of 5740 “years” is the accepted count of the Jewish calendar. However, even elementary familiarity with rabbinic literature reveals uneasiness with this as literal estimate.

The Jew is free to choose from among the resolutions proffered by the rabbis of the Talmud, gaonim, rishonim, and akharonim. He can accept literally the number 5740, and attempt to reconcile the patent difficulties by positing, somehow, wholly disparate transactional and experiential capacities for the quanta of time that mark the events of archigenesis and those thereafter, east of Eden.<sup>28</sup> (It might be asked, nonetheless: Even without any reference to contradictory scientific data, are our comprehension and appreciation of Divine creativity really elevated by a literal reading of twelve *hours* as the time span covering all that transpired between the gathering of the dust that became Adam and his expulsion from innocence?<sup>29</sup>) He can, however, also translate the same vocabulary of transition to designate, in different instances, different scales, including the allegorical;<sup>30</sup> the argument that the “days” of creation were in fact vast epochs, in the sense of the “hours,” “days,” and “years” which punctuate the halakhic calendar and the numeration of the geologist, cannot be “disproven.” The Jew is at liberty within the faith of

Judaism to entertain the proposition that 5740 is reasonable approximation, by the time standards perceptible to him, of the tenure of the "world" of man, the world in which man has intervened, partner to the Creator, as potent factor in redemptive history. In such a view, he finds himself in the company of the rabbis who held that numerous "worlds" preceded this one which is permeated by the dialogue between God and man.<sup>31</sup> It is a matter of personal predilection, not a principle of faith, whether one attempts to relate to history by means of the cognitive faculties with which the present is perceived, or by the coinage of theses divorced from these faculties.

Judaism does not demand recourse to that which is fanciful by the criteria of human logic, in those areas of ideation where logical construct is possible. Judaism obligates acknowledgment of the Master of an ordered universe in which man is commanded to function as moral creature, of a Master forever concerned with His creation in mercy,<sup>32</sup> in search and in need of man for creation's fulfillment in Torah.<sup>33</sup> Acceptance of that obligation—of the yoke of the Kingdom of Heaven and of the dominion of *mitsvot*—is endangered by *no* surmise of the age of a universe formed by a timeless Creator. Insistence on the orthodoxy of any one conjecture would seem rather, an arrogance of usurpation—the marvel of creation and the power of the Creator frozen by latitudes of human ingenuity. In his response to a seemingly far greater difficulty than the antiquity of the universe—the Platonic teaching of its eternity—the Rambam expresses a greater confidence in the validity of Judaism, that is, its ability to stand the test of any philosophic and scientific scrutiny, than many of the Jewish thinkers who would be his spiritual descendants today:

We do not reject the eternity of the universe because certain passages in Scripture confirm the creation; for such passages are not more numerous than those in which God is presented as a corporeal being. Nor is it impossible or difficult to find for them a suitable interpretation. We might have explained them in the same manner as we did in respect to the incorporeality of God and this might have been easier . . . However, we have not done so . . . for the eternity of the universe has not been proved and there is no need for scriptural passages to reject it . . . If we were to accept the eternity of the universe as taught by Plato, we should not be in opposition to the fundamental principles of our religion. . . . The scriptural text might have been explained accordingly . . . But there is no necessity for this expedient, so long as the theory has not been proved . . .<sup>34</sup>

The pragmatic security of Maimonides in the faith of Judaism is salutary; had it been the currency of rabbinical thinking in the crucial

early decades of Emancipation and Haskalah, articles like the present would not need to be written in the late twentieth century.

A caveat to modesty applies equally to our imagery of *the development of species of life, including ourselves*. Here, too, orthodoxy is limiting artifice, intrinsically untenable, apart from any modern scientific reflection. From the beginnings of recorded rabbinic thought to the present, a spectrum of opinion on the nature of the Divine impetus to creation has found expression within the stream of normative Judaism. The inception of every discrete form of life, and indeed of all things and all forces and of the laws that govern their behavior, has been deemed contingent, in one view, on the immediate, individual creative fiat of the Maker, compressed into the six “days” of creation, each generative act an unapproachable mystery onto itself.

Against this synchronicity of origins there has been posited another perspective, that of a creation progressively unfolding and ascending upon the summons that set it in motion. In this alternative conception, God is perceived as direct architect of the primary components and properties of the cosmos—of its resources—which in their design are pregnant with potential for action and interaction toward the unraveling of all that is. Realization of the seminal potential is a continuous, dynamic process, not confined in time to the scriptural epoch of Genesis. The unfolding is intrinsic in the germ of creation; all that the Maker has willed to be inheres in the embryo of primary creation from nought (of *יש בראין*). The manner in which creation develops is denominated the “laws of nature”; in the parallel language of the Jew, the manifestations of the means He has taken to order the universe to which He has given impulse. The essence and motives of the impulse are a mystery; its manifestations open challenge to our understanding.

The suggestion of Gross that “a belief in Torah would seem to render a belief in some form of evolution inescapable”<sup>35</sup> seems well founded in light of this perspective (with the reservation that, as indicated above, the words “hypothesis of” are more appropriate than “belief in” with regard to scientific formulations). And, as the writer points out,

most of the objections raised against Darwinists arise from an acceptance of one of their unwarranted claims. They seem to think that by postulating a system of random creation of different sorts whose survival is determined by a fitness standard, measured in terms of adaptability to environment, they have explained away the necessity for positing a Creator. Assuming that the Darwinists have correctly described the mechanism of creation [I would substitute

“of physical origin and survival of species”] . . . all they have done is to disestablish the Creator as mechanic-mason-carpenter of a static world, but at the same time they have unwittingly established Him as an engineer-architect . . . of a self-adjusting, complex, dynamic world and the Creator or legislator of the fitness standards and rules of adaptability. This is precisely the picture that the Torah has drawn.<sup>36</sup>

To the extent that theoreticians in current biology still make the unwarranted claim, the Jew might well rejoin with Rabbah (in defending R. Meir’s continued study with Elisha ben Abuyah after the latter’s apostasy) “he found a pomegranate; he ate the fruit within it, and the peel he threw away!”<sup>37</sup> And it is precisely within the matrix of events that transpire without assignable scientific cause that the Jew can perceive most readily the web of supervision spun over individual and species, “from the horned buffalo to the brood of vermin.”<sup>38</sup> and recognize an ever-concerned Creator as the intelligence that sets the differential conditions making for fitness to survive and act. In the absence of a guiding intelligence, it would be a perplexing task to visualize coherent patterns of evolutionary progression against the background of highly efficient adaptation of so many of the more primitive classes of life. Indeed, there is no inherent biological imperative for evolution to have attained to man; the process could well have terminated at one of the lower vertebrates!

“Nothing in the Torah is contradicted by any knowledge in the world that emerges from research,” Rav Kook wrote in summarizing his attitude to the “problem” of evolution, and, even more strongly: “The theory of evolution, which is at present increasingly conquering the world, is more in harmony with the mysteries of Kabbalah than all other philosophical theories.”<sup>39</sup> Whatever may have been the scheme of material reactions in the genesis and diversification of life, the Jew can find disclosure of the Master’s attributes. By whatever methodology he explains the living world, the Jew rightly addresses himself each day to a God Who “in his benevolence daily renews the work of creation,”<sup>40</sup> whose creative will remains eternally manifest in the constitution of the cosmos over which His concern hovers in infinitude. The immanence of God in nature is not impoverished by ascribing any manner of design to His wisdom. The Jew stands in equal awe before the Master when he calls on Him, by the dictates of his reason, as “Creator of heaven and earth, Master of the makings and evolvment of protein and ribonucleic acids to readiness for Thy spirit,” as when in traditional phrases drawn before present insight into the structures of life was attained. “For Thou hearest in mercy the prayer of Thy people Israel in every tongue.”<sup>41</sup>



And what, then, of the dreaded spectre of *a simian lineage to man*? Can the Master be thought to have stamped His visage on the offspring of anthropoid creatures? Or, perhaps, the visage on man is illusory? The fear is canard; the abhorrence, ignorant. Canard, because the illimitable value and significance of man are falsely placed in the balance, and a lie levelled at Judaism: The Faith is fragile and transient in the mirror of modern scientific inquiry, its weaknesses defensible only by retreat of its partisans to know-nothingness. Ignorant, because many of the rabbis have offered opinions of the physical origin of man that are, in fact, rather remarkably consistent with current evolutionary thinking.

The similarity of biologic blueprint of creatures, and of their primeval origin from like elements—dry earth, alluvial mud, water—is clearly intimated in Talmud ([*Hullin* 27b]: “fish were created out of the water . . . birds were created out of the alluvial mud. R. Samuel of Cappadocia said [in a discussion regarding the ritual requirements of their preparation as food], you can prove this from the fact that birds have scales on their legs like the scales of fishes.” R. Samuel had no recourse to texts on comparative anatomy.). Man, too, emerges from similar stuff, and there is the suggestion<sup>42</sup> of his metamorphosis from the stone-like lifelessness of a golem, to a creature capable of movement *like the animals and fish* (“וְאִזְּ חִזְרָה הָאָדָם לְהִיּוֹת נֶפֶשׁ חַיָּה שִׁיתְנוּעַע בָּהּ כְּמֹן הַחַיּוֹת וְהַדְּגָיִם”) to, finally, a being imbued with a rational soul. Man is “transformed into another man”<sup>43</sup> and becomes wholly a living *human* soul—is made replete in his human essence—*when* he is invested with the spirit of intellect and speech. Man rising by stages from inanimate substance to perfection in body, spirit, and skill is not uncommon portrayal, in talmudic, midrashic, and exegetic imagery.<sup>44</sup> (There is indeed the notion of man created with a tail, which God removes from him later, for his honor;<sup>45</sup> and, that the fingers of his hand were joined together (webbed?) until the time of Noah<sup>46</sup>). In attaining to humanness, he is endowed successively with the “souls” of growth, “like that of a plant” movement, and reason-speech.<sup>47</sup>

These progressions of man are a function of time—time elapses, too, before the facilities of rationality and speech attain to higher levels of abstract ideation<sup>48</sup>—and they are set into a clearly discernible, if perhaps rudimentary, conceptual framework that today is termed comparative, evolutionary biology. Indeed, aggadic literature ventures that the Adam who became receptacle of Divine spirit, the final man to whom God addresses Himself and who can respond as creature of sentience and conscience, appeared only after hundreds

of generations of earlier men who were swept away because of their evil.<sup>49</sup> The concordance of these rabbinic expressions with current theories in biology is not less salient for the difference in time scales to which reference is made.

It is with the progeny of the completed Adam that Judaism is preoccupied, with their potentials and strivings, not with the ancestral stages of Adam's climb from loam. Moral history *begins* with the moment in time at which there is added to the body of man the spirit of his Maker and man becomes unique amalgam of soma and soul, subject to both the laws that pertain to all flesh and blood and to those of the spirit. The sanctity that endows the total being of man, the transient and the eternal in his composition, devolves on him with the breath of God into his nostrils; it is not conditioned on the makeup or metamorphoses of the inclosure. The chimerical nature of man's substance and the singularity of his significance are captured luminously by the same authority, Nachmanides, who speaks with equanimity of man's evolvment from golem:

And God said, Let us make man. The making of man was by a special command because of the greatness of his superiority, since his nature is not like that of the beasts . . . which were created by the preceding command. The correct interpretation of the word 'We shall make' ('na'aseh,' the plural form) is . . . that God created from nothing ( )'N א ש') only on the first day, and thereafter He fashioned and made from those (already) created elements. Thus, when He gave the waters the potential to bring forth 'a living soul,' the command to them (had only to be) 'Let the waters swarm'; the command to (bring into being) cattle (animals), 'Let the earth bring forth.' (But) for man (He said) 'Let us make,' meaning, I and the aforementioned earth, let us make man, the earth to bring forth the body from its elements as it did for cattle and beasts, as it is written 'And the Lord God formed man of the dust of the ground' and He . . . to give the spirit from His mouth, as it is written 'And He breathed into his nostrils the breath of life.' And He said 'In our image, in our likeness' . . . man will resemble both . . . in the manner of his body, the earth from which he was taken, and in his spirit, which is not body and shall not die, the higher beings. In the second verse, He says 'In the image of God He created him,' to relate the distinctiveness by which man is distinguished from the rest of created beings. This is the meaning of Scripture . . . the most acceptable of all the thoughts given to it . . . Thus man is similar to both the lower and higher beings in appearance and glory, as it is written 'And hast crowned him with glory and honor,' to say, the goal before him is wisdom, knowledge, and skill. In real likeness, then, his body resembles the earth, and his soul the higher beings.<sup>50</sup>

It is the exceptional command that brings into the world the human being, creature *sui generis*, in his quality of form and spirit fused unprecedented in creation. We may rephrase: The advent of

man is truly and undeniably a quantum bound from *whatever* came immediately before, earth, dust, other creature, golem, perhaps even “men” not yet capable of responding to moral law.

It is the gift of spirit that bestows the novel inheritance of humanity. Man knows full well that his individual physical beginning is a drop of semen, and his end nourishment for worms;<sup>51</sup> he has no cause for aggrandizement in his corporeal arrangements. Nor is there ground for religious anxiety over the constitution of that from which the human sprang when the quantum was transversed. It is not the channels of development that matter, but the act of humanization by the spirit. No analysis of the material makings and antecedents of the species man can demystify the nature of the crossing. Not dust and not living creature are potent to give rise to spirit. It is only the Source of all spirit from which the breath of soul can have entered into . . . whatever. It is assuredly God who created man, *ab initio* in spirit from the void of spirit in matter made before; and however closely he may resemble in structure and biological functionality the shaping of his precursor, man was given birth child of God only by the act of God, and only the instant the breath was transmitted.

Certainly, Judaism is not absorbed with the genealogies of man’s past. In its engrossment with the Now,<sup>52</sup> it is the completed human being which Torah embraces,<sup>53</sup> with aspiration: to be community within which the Breather can sanctify Himself. And certainly, it seems vain assumption to favor or decry any vessel which the Maker may have seen fit to propell into humanness. It is His dignity which is man’s legitimate concern, His participation in the conceiving of each individual, now with father and mother<sup>54</sup> as with the products of earth at the onset, and His supervision of man and of all that He has created.

## SUMMATION

Karl Popper’s appreciation of scientific research as spiritual adventure<sup>55</sup> provides an appropriate mental colophon for the Jew’s approach to *all* scientific inquiry. The supposed conflicts between modern science and normative Judaism are synthetic, in essence and by definition. The rabbis, and authoritative spokesmen of Judaic thought to the present, have illuminated the unmitigated compatibility of narrative intent, warrants, and commands of Torah with *all* conceptions of the nature and origins of the physical universe, and many of the views expressed in classical Judaic literature are indeed anticipatory of current formulations in the natural sciences.

Reference to the sources offers more than only reenforcement for the admissibility of intellectual freedom. It leads to the conclusion that the God of Israel is not served by strained obscurantism; apprehension of His wondrous ways mandates enlightenment to all in which He is manifest. It is free prerogative of each Jew to weigh the findings of scientific exploration by their inherent persuasiveness in his eyes; it is obligation to recognize the Master of the universe in all the processes of nature of which intellect persuades. It is his obligation, too, to desist from alien crusades, as of other religions against the right to knowledge; and, he must know how to answer the apostate.

The modern Jew must realize that the extension of presumed orthodoxy, in any sense, to validation of ideas on the material universe is a mistaken reading of the moral purpose and thrust of Judaism's constitutional texts. The error can be destructive. The unfathomable greatness of the Creator is assaulted by confining Him to one, static perception of creativity; and Jews who would be loyalists but will not wear man-fashioned blinders are repelled. Scientists, including polemicists of evolutionary doctrine, have not always eschewed narrowness and arrogance in their assertions; misplaced zeal and confinement of vision by the defenders of an unlimited God are not responses genuine to Judaism or in its interests.

The God of Judaism is not placed into question by evolutionary hypotheses of the physical origin and progressive appearance of species on earth, and the ultimate mysteries of His essence and of the beauty of order in the world remain untouched by any scientific formulation. The thought of God as master architect of an evolving universe is no less elevated than any other postulate of the nature of His workings. Neither is the dignity of God's partner in the world, man, impugned by any means ascribed to his making; man's honor devolves on him from the Spirit, not from any product of which Adam's tissues were fashioned.

There is another shibboleth that has come to be affixed to the term "evolution," that acceptance of such theory entails acquiescence to selective processes that, blind of moral consideration, entitle, or disenfranchise, man to the right of life. This, too, is fear grown large from misunderstanding: It is precisely man of all creatures who has been given the means and the responsibility—dominion!—to intervene, with the Creator, in setting the conditions that make for survival, in applying the standards of fitness. Man alone in the world is subject to a law higher than any bioecological determinism. As partner, man is obligated by the higher law of Judaism to walk earth in awe and love ("בְּדַחֲלֵל וּרְחִימֹ" <sup>56</sup>), in *imitatio dei*.<sup>57</sup> He must

stand in respect before all that has been created and has been placed in his stewardship; and he must act ceaselessly to encourage and preserve the life of every human being. The criteria of human existence are not circumscribed by mere physical adaptability to the parameters of environment; they are encoded in the transcendent law revealed to him. Man is indeed constrained to apply his powers of dominion—to the perfection of a world in which all men can live. The mishnah in Peah<sup>58</sup> recited in the introduction to daily morning prayer, “These are the things to which there is no finite measure: the corners of the field, the first fruits, the offerings brought on appearing before the Lord at the three festivals, the practice of charity, and the study of Torah . . . ,” is preceded in Sfarad and Ari editions of the liturgy by the words “And they shall place My name on the Children of Israel and I shall bless them.” For the Jew who accepts the placing of the Name, the nature rules of selection of the best adapted are no more and no less than model challenge, to superimpose the criteria of higher law to which man is bound.

כלִּיא כלִּא ארעא זיו יקרא.... בריך יקרא דה' מאתר בית שכינתה

## NOTES

The references here presented in support of some of the arguments advanced are no more than exemplificative. It is beyond the scope of this article—and of the writer’s abilities—to present exhaustive documentation of its salient proposals. Even casual acquaintance with the “sea of Torah” and its derivative literature make it evident that to most of the citations here proffered, voluminous relevant addition can be made. It is no less evident that substantive divergences of opinion and inflection characterize much of talmudic and post-talmudic thought, even that which bears credentials as “normative,” and that selective citation from among a wealth of sources runs grave risk of denominating as central a theme or attitude that is, in fact, minor, marginal, or eventually discarded from the norm. The dialectic nature of much of the source material counterindicates as such all attempts to legitimize a thesis by restricted, discretionary authentication. Cognizant of the caveat, the writer has sought to identify in his perforce exceedingly limited illustrations such positions in Judaic thought as appear to indeed represent durable and recurrent elements of classic conception. The disclaimer is requisite, nonetheless, that the essay—reflections by a Jewish scientist—delineates, at best, a line of apprehension admissible in the perspective of Torah.

1. David W. Weiss, “The Dimensions of Nature and Religion—Conflict or Complementarity?” in *Reflections on Progress*, ed. O. Westphal, and U. Westphal, (Denzlinger Druck- and Fotosatz-Center, Denzlingen: Privatdruck, Freiburg i. Breisgau), 1980. Lecture presented at Symposium, “Reflections on Progress,” Max Planck Institute, Freiburg, November, 1979.

2. Meir Simcha Hacoheh M'Dvinsk, *Meshech Hokhmah on Pentateuch*, opening paragraphs on Behukathai.
3. Ramban (Nachmanides), *Commentary on the Torah*, on Exodus 6:2.
4. See, for instance, Joel 2:25.
5. Rambam (Maimonides), *Hilkhoth T'Shuvah, Sefer Hamada*, concluding paragraph ("One only loves God with the knowledge with which one knows Him. According to the knowledge, will be the love. . . . If the former be little or much, so will the latter be little or much . . . A person ought therefore to devote himself to the understanding and comprehension of those sciences and studies which will inform him concerning his Master, as far as it lies in human faculties to understand and comprehend—as indeed we have explained in the Laws of Foundations of the Torah." Translation by Moses Hyamson, Edition of Boys Town Jerusalem Publishers, 1965).
6. A simplified outline of some of the central elements of evolutionary hypotheses in biology, and a discussion of actual and possible attitudes within Orthodox Judaism, is presented in the AOJS Students' Questions Panel, *Challenge. Torah Views on Science and its Problems* ed. A. Carmell, and C. Domb (N.Y.: Feldheim Publishers, 1976) pp. 254–285, and in several other thoughtful essays in this collection.
7. P. Medawar, "The Philosophy of Prediction Illustrated by Medical Science," in *Reflexionen über Wissenschaft*, ed. H. Staudinger, and U. Westphal, (Denzlinger Druck-und Fotosatz-Center, Denzlingen: Privatdruck, Freiburg i. Breisgau, 1979). ("I want to give literally one word of advice to any young members of the audience who may be asked in the year 2,000 what is going to happen in the next thousand years. If they are asked this question, will they please remember. . . . my. . . . advice: don't.")
8. See commentary by Samson Raphael Hirsch on Genesis 1:26–28.
9. See AOJS in *Challenge. Torah Views on Science and its Problems*. An interesting discussion is presented in the same volume by A. Carmell ("Freedom, Providence, and the Scientific Outlook," pp. 306–342), especially with regard to the inapplicability of deterministic conceptions of material phenomena to the areas of human personality, conscience, and decision making.
10. R.E. Gross, "On Creation and Evolution," in *Challenge. Torah Views on Science and its Problems*, pp. 236–239.
11. N.T.J. Bailey, *The Mathematical Approach to Biology and Medicine*, (N.Y.: John Wiley & Sons, 1967) pp. 23–44.
12. Gross, pp. 236–239 (see Note 10).
13. Shneur Zalman of Liadi, *Likutei Amarim—Tanya*, Shaar Hayichud Ve'Haemunah, Chapter 1.
14. *Pesahim* 56a.
15. *Mishnah Hagigah* 2:1.
16. *Kiddushin* 40b: "Is study greater, or practice? R. Tarfon answered, saying: Practice is greater. R. Akiba answered, saying: Study is greater, for it leads to practice. Then they all answered and said: Study is greater, for it leads to action" (Soncino Edition). See also: *Mishnah Avot* 3:22, 4:6.
17. Ezekiel 1.
18. *Megillah* 3a.
19. *Berakot* 28b.
20. *Hagigah* 11b: "the rabbis taught: 'For ask thou now of the days past,' one may inquire, but two may not inquire. One might have thought that one may inquire concerning the pre-creation period, therefore Scripture teaches: 'Since the day that God created man upon the earth.' One might have thought that one may (also) not inquire concerning the six days of creation, therefore Scripture teaches: 'The days past that were before thee.' One might have thought that one may (also) inquire concerning what is above and what is below, what before and what after, therefore the text teaches: 'And from one end of heaven unto the other.' (Concerning the things that are) from one end of heaven unto the other thou mayest inquire" (Soncino Edition).
21. *Mishnah Avot* 2:6.
22. Exodus 3:14.

23. *Midrash Rabbah* on Exodus 3:14, "I am that I am:" "R. Johanan said: 'I am that I am' to individuals, but as for the mass [community—DWW], I rule over them even against their desire and will, even though they break their teeth, as it is said: 'As I live, saith the Lord God, surely with a mighty hand and with an outstretched arm, and with fury poured out, will I be King over you' (Ezekiel 20:33)" (Soncino Edition); and the commentary on the *Midrash, Matnat Kehunah*, amplifies: "the individual who desires and chooses me, to him I shall be God; and if he does not so desire, it is given him to cast off the yoke, but to the mass (that is, the People of Israel) I do not give the option of casting off the yoke of heaven."
24. N.L. Rabinovitch, "Torah and the Spirit of Free Inquiry," in *Challenge. Torah Views on Science and its Problems*, pp. 54–67.
25. *Megillah* 3a.
26. *Berakot* 17a: "A favorite saying of the Rabbis of Jabneh was: I am God's creature and my fellow is God's creature. I rise early for my work and he rises early for his work. Just as he does not presume to do my work, so I do not presume to do his work. Will you say, I do much [by the study of Torah—comment by I. Epstein] and he does little [as a non-student—I. Epstein]? We have learnt: One may do much or one may do little; it is all one, provided he directs his heart to heaven" (Soncino Edition).
27. The compatibility of modern scientific thought with the principles of Torah is well illustrated in *Challenge. Torah Views on Science and its Problems*; the harmony is evident over a wide range of views.
28. S. Schwab, "How Old is the Universe?" in: *Challenge. Torah Views on Science and its Problems*, pp. 164–174.
29. *Sanhedrin* 38b.
30. The admissibility of symbolic reading of non-halakic texts, albeit clearly within certain limits, is a distinguishing feature of Jewish theology and philosophy, not only with regard to rabbinic thought (see Shmuel Hanaggid, Introduction to the Talmud, comment on Aggadah) but also with regard to narrative elements of Scripture [see Rambam (Maimonides), *Guide of the Perplexed* Introduction; translated and annotated in: *Challenge. Torah Views on Science and its Problems*, pp. 126–130].
31. For treatment of this theme, see E.E., Urbach, *The Sages. Their Concepts and Beliefs* (Jerusalem: Hebrew University, The Magnes Press, 1975), Chapter IX, pp. 184–213; and, Note 49.
32. Talmudic and midrashic literature is insistent with the perception of the Creator as God of mercy to all His creation. Only one passage is here cited in illustration of the puissance of the definition: *Avodah Zarah* 3b: "Rab Judah said in the name of Rab: 'The day consists of twelve hours; during the first three hours the Holy One, blessed be He, is occupying himself with the Torah; during the second three He sits in judgment on the whole world, and when He sees the world is so guilty as to deserve destruction, He transfers Himself from the seat of Justice to the seat of Mercy; during the third quarter, He is feeding the whole world, from the horned buffalo to the brood of vermin'" (Soncino Edition). See also Note 57.
33. God in need of man, of Israel, for the fulfillment of creation and its perfection ("to perfect the world under the Kingdom of the Almighty" *Olenu*, closing prayer of the daily liturgy) is a cornerstone of normative Judaic thought. God would sanctify Himself within the corpus of the People of Israel (Leviticus 22:32). God and man invoke each other in reciprocity [*Berakot* 6a: "R. Nahman b. Isaac said to R. Hiyya b. Abin: 'What is written in the *tefillin* of the Lord of the Universe?'—He replied to him: 'And who is like Thy people Israel, a nation one in the earth.' Does, then, the Holy One, blessed be He, sing the praises of Israel? Yes, for it is written: 'Thou hast avouched the Lord this day. . . and the Lord hath avouched thee this day.' The Holy One, blessed be He, said to Israel: You have made me a unique entity in the world, and I shall make you a unique entity in the world. 'You have made me a unique entity in the world,' as it is said: 'Hear, O Israel, the Lord our God, the Lord is one.' 'And I shall make you a unique entity in the world,' as it is said: 'And who is like Thy people Israel, a nation one in the earth.'" (Soncino Edition); Hymn of Glory (Anim Semiroth), Judah the Pious, recited at close of Sabbath morning liturgy: "His glory

rests on me, and mine on Him"; indeed, "every single person of the House of Israel is an organic member of the shekhinah" (see citation on p. 9 of *Mesekhet Avoth Im Perushe Rabbenu Yisrael Ba'al Shem Tov*, Brooklyn, NY, Moriah Offset Co., 1976)]. The very purpose of creation is provision of a receptacle for Torah and God's love, man—Israel [*Midrash Rabbah*, Genesis, 12:2, 12:9 15:4; Tan. d. b. El., p. 163; *Midrash Rabbah*, Exodus, 34:1, 3; the midrash (*Midrash Rabbah*, Exodus, 40:1) declares (R. Tanhuma b. Abba) "Had it not been that God foresaw that Israel would receive the Torah, He would not have created the world," and the Talmud (*Shabbat* 88a): "the Holy One, blessed be He, stipulated with the works of creation and said thereto, 'If Israel accepts the Torah, ye shall exist; but if not, I will turn you back into emptiness and formlessness.'" (Soncino Edition)]. Man is referred to in Rabbinic literature as partner with the Creator in making creation complete (*Shabbat*, 119b: "R. Hamnuna said: 'He who prays on the eve of *Shabbat* and says 'and (the heavens and the earth) were finished,' Scripture considers him as though he had become a partner with the Holy One, blessed be He, in the act of creation"), and indeed also in the unfolding and unravelling of the meaning of Torah itself ("The Holy One, blessed be He, gave the Torah unto Israel like wheat from which to derive fine flour, or like flax from which to make a garment" [*Seder Eliahu Zuta*, Chapter 2, Friedmann Edition, p. 172].)

34. Rambam, *Guide of the Perplexed*, Part II, Chapter 25, edited by M. Friedländer (N.Y.: Hebrew Publishing Co.) pp. 118–120.
35. R.E. Gross, pp. 236–239 (see note 10).
36. R.E. Gross, pp. 236–239 (see note 10).
37. *Hagigah* 15b (quoted from Soncino Edition).
38. See citation from *Avodah Zarah* (Note 32). The midrash has even plants under direct heavenly supervision: "R. Simon said: There is not a single herb but has a constellation in heaven (*mazal*) which strikes it and says 'Grow'. . . ." (*Midrash Rabbah*, Genesis, 10:6 cited from Soncino Edition); R. Shimon Yitschaki (Rashi) translates *mazal* as *sar*, guardian angel (on Talmud in *Megillah* 3a). It would follow *a fortiori* that Divine surveillance envelopes the individual human being (see, for instance, *Hullin* 7b: "R. Haninah further said, No man bruises his finger here on earth unless it was so decreed against him in heaven, for it is written, 'It is of the Lord that a man's goings are established. How then can man look to his way?' "—Soncino Edition).
39. Cited from J. Feliks, *Encyclopedia Judaica*, Vol. 6 (Jerusalem: Keter Publishing House, Ltd., 1971) p. 1004.
40. Daily morning liturgy, following first blessing preceding the *Shema*.
41. Daily morning liturgy, *Amidah*; formulation as in some Sfarad and Ari editions.
42. Ramban (Nachmanides), *Commentary on the Torah*, on Genesis 2:7.
43. Ramban, *Commentary on the Torah*, on Genesis 2:7.
44. For instance, see: *Midrash Tanhumah*, on Genesis 5; Ramban (Nachmanides), *Commentary on the Torah*, on Genesis 2:7; also: E.E. Urbach, *The Sages. Their Concepts and Beliefs*, Chapter X, pp. 214–254.
45. *Midrash Rabbah*, Genesis 14:10.
46. Cited from J. Feliks, see Note 39.
47. Ramban (Nachmanides), see Note 42.
48. N.L. Rabinovitch, see Note 24.
49. *Midrash Rabbah* 3:7; *Shabbat* 88b; see also Note 31.
50. Ramban (Nachmanides), *Commentary on the Torah*, on Genesis 1:26.
51. *Mishnah Avot* 3:1.
52. The transcendent significance of every moment, of the opportunity and obligations most immediately before the individual, is a recurrent principle in Judaic thought. It is expressed, for instance, in the irreducible significance invested in every moment of life, even of the terminally ill (see I. Jakobovits, *Jewish Medical Ethics*, Bloch Publishing Company, N.Y., 1975), and in the halakhic consideration that active involvement with a religious obligation directly at hand may relieve the doer of fulfilling a coincident commandment (see, for instance, the debate in *Megillah* 3a, b on precedence and priority of study, temple service, and the reading of the *Megillah*, and on the priority ranking of a number of other commandments; see also rabbinic and post-talmudic discussion of the axiom,



- העוסק במצוה פטור מן המצוה he who is occupied with the task of a commandment is relieved of obligation to engage in another'—*Sukah* 25a–26b; *Berakot* 11a, 16a; Rambam (Maimonides), *Mishneh Torah, Hilkhhot Sukkah* 6:4). The urgency of action in the confronting moment is palpable in the dictum of Hillel "say not anything which cannot be understood at once, in the hope that it will be understood in the end; neither say, When I have leisure I will study; perhaps thou wilt have no leisure" (*Mishnah Avot* 2:5), and in the categorical emphasis on the Now to which the Rebbe of Ger exhorts his followers before the Day of Atonement (M. Buber, *Tales of the Hasidim. Later Masters*, (N.Y.: Schocken, 1948,) pp. 306–307.).
53. "The primary interest of the Sages was focused on the offspring of the First Man—on living man" (E.E. Urbach, *The Sages. Their Concepts and Beliefs*, p. 232, and *vide infra*).
  54. *Kiddushin* 30b; *Niddah* 31a.
  55. K.R. Popper, *The Poverty of Historicism*, (London: Routledge & Kegan Paul, 1961) pp. 55–56: "the . . . view (to which I personally incline) that science is most significant as one of the greatest spiritual adventures that man has yet known."
  56. *B'dhiluh u'rehimuh*, "in awe and love;" Aramaic; common Judaic designation of the stance appropriate to man *vis-a-vis* God. [Dr. Aaron Batt of Jerusalem called the writer's attention to the interesting use of 'בדחילון' in Targum Jonathan ben Uzziel on Genesis. The biblical text (Genesis 5:24) describes the righteous Hanoch in the words 'ויתהלך חנוך את ה'; and the Targum renders the words as 'וּפְלַח חֲנוּךְ בְּקוֹשְׁטָא קֳדָם ה', and Hanoch labored in *truth* before God.' In describing the merits of Noah, Scripture (Genesis 6:1) employs the same terms, 'בִּדְחִלְתָּא דֵּהּ הֵלִיךְ נֹחַ', but here the Targum translates 'אֵת ה' הִתְהַלֵּךְ נֹחַ', in *awe* of God walked Noah.' A mishnah in Tractate *Avot* proclaims the mercy of God in waiting ten generations, between Adam and Noah, until bringing the Flood on the world: "There were ten generations from Adam to Noah, to make known the patience of God, seeing that all those generations continued provoking Him, until He brought upon them the waters of the Flood"—*Avot* 5:2. A question that arises is, why did God tolerate evil in the world until Noah, on whose righteousness He could build a new generation of men, when already Noah's ancestor Hanoch, described identically as virtuous, could have served as the nucleus for a new start? A suggested answer lies with the terminology of the Targum: Truth alone may not be adequate basis for a new world of man, but awe before God is, and the Creator had to await the appearance of that quality in man's character before He could venture new beginnings.]
  57. The imperative to walk in imitation of God—Who Himself visits the sick, clothes the naked, extends mercy and justice to the defenseless, comforts the mourner, studies His Torah, dons tefillin, indeed teaches Israel the art of prayer (*Rosh Hashanah* 17b)—permeates the Judaic view of man's relationship to the Divine. The exhortation of Moses "Ye shall walk after the Lord your God" (Deuteronomy 13:5) is taken literally, to impell the following of His ways: "R. Hama son of R. Hanina further said: What means the text, 'Ye shall walk after the Lord your God?' Is it, then, possible for a human being to walk after the *shekhinah*; for has it not been said, 'For the Lord thy God is a devouring fire?' But (the meaning is) to walk after the attributes of the Holy One, blessed be He. As He clothes the naked, for it is written, 'And the Lord God made for Adam and for his wife coats of skin, and clothed them,' so do thou also clothe the naked. The Holy One, blessed be He, visited the sick, for it is written, 'And the Lord appeared unto him by the oaks of Mamre,' so do thou also visit the sick. The Holy One, blessed be He, comforted mourners, for it is written, 'And it came to pass after the death of Abraham, that God blessed Isaac his son,' so do thou also comfort mourners. The Holy One, blessed be He, buried the dead, for it is written, 'And He buried him in the valley,' so do thou also bury the dead" (*Sotah* 14a—Soncino Edition). It is a tragedy of errors that many Jews have in recent times tended to accept blandly Christian claims that the attributes of love and mercy in God are, in essence, discoveries of Christianity, the *imitatio dei* a new way, when these concepts were in fact definitive and compelling already in the early, formative periods of Jewish theology.
  58. *Mishnah Peah* 1:1.