Sciences of What and the Science of Who

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In the *Shulhan Aruch*, the code of law that governs traditional Jewish life, the following is found among the laws governing the recitation of blessings:

One who sees a Jewish *hacham* [usually translated as "Sage"] says: "Blessed is he who gives of his wisdom (*hochma*) to those who fear him."

One who sees a non-Jewish *hacham* who is a scholar of worldly knowledge, says: "Blessed is he who gives of his wisdom (*hochma*) to a being of flesh and blood."¹

We may note that the same Hebrew word, *hacham*, is used to describe both the man of learning who devotes his life to the natural sciences and the rabbinic Sage, as he has come to be known, who devotes his life to studying and understanding the depths of the Tora. Similarly, both the knowledge acquired by the study of Tora and worldly knowledge, which is to say the sciences, are designated by the same word, *hochma*. The aim of this study is to shed light on this analogy. In the first part, I will analyze the attitude of Jewish tradition towards science; in the second, I will explore the manner in which knowledge that derives from the Tora is also understood to be science—and what, therefore, is its place as science in the body of all knowledge. The talmudic Sages had before them an example of an exact science. Already in antiquity, the field of astronomy had reached a high level of development. The Greeks and Chaldeans observed the movements of the stars with great precision, and they were able to make accurate predictions. It is therefore only natural that the Talmud's approach to science was formulated, first and foremost, with respect to astronomy.

First question: Does scientific knowledge have value in itself? Or, alternatively, are its value and importance derived solely from its practical applications? One unambiguous answer is offered in the Talmud, in the tractate Shabbat:

Rabbi Shimon ben Pazi says: He who is able to make calculations of astronomy and does not do it, of him it is said: "But they regard not the work of the Lord, nor consider his handiwork."²

The primary meaning of the verse cited from Isaiah has no connection with astronomy. This becomes clear as soon as the verse is read in its proper context:

Woe unto them that rise up early in the morning, that they may follow strong drink; that continue until night, till wine inflame them! And the viol, and the harp, the drum, and pipe, and wine, are in their feasts. But they regard not the work of the Lord, nor consider his handiwork.³

The prophet Isaiah was unconcerned with astronomy; rather, he was describing the life of sensual pleasure of the men of his time, and reproached them for drinking themselves into a stupor without reflecting on the deeper meaning of things. It was not Rabbi Shimon ben Pazi's aim to explain this primary, obvious meaning of the verse, but rather to add another dimension to it. In the simple reading, contemplation of the works of the Eternal is a religious idea. Rabbi Shimon ben Pazi gave it new meaning: Contemplating the works of the Eternal leads one, by definition, to embrace the scientific vision of the world, the vision of rigorous, mathematical laws hidden from the world of the senses. Conversely, knowledge of those laws, through which man is able to bring natural phenomena under his control, takes on an intrinsic value which goes beyond its utility. The scientific approach is a true perspective on reality; "a vision of the works of the Eternal."

This initial observation raises a new question: Is science merely a way of seeing things, merely an approach to the knowable world, or does it also have a theoretical value? Is it also a model of thinking? The following passage clarifies matters:

Rabbi Shmuel bar Nahmani said in the name of Rabbi Yohanan: From where do we know that one is obligated to make calculations of astronomy? As it is said: "Keep therefore and do them; for this is your wisdom and your understanding in the eyes of the nations."⁴ What is wisdom (*hochma*) and understanding (*bina*) in the eyes of the nations? It is astronomy.⁵

Here again the verse cited is given a different meaning than its simple reading yields in context. The passage from which it is taken discusses not astronomy but the laws of the Tora:

Behold, I have taught you statutes and judgments, even as the Lord my God commanded me as you should do so in the land where you go to possess it. Keep therefore and do them, for this is your wisdom and your understanding in the eyes of the nations.⁶

The distortion that Rabbi Shmuel bar Nahmani adds to the simple reading of the text suggests that in his view, astronomy, like the laws of Tora, may be understood as *hochma* and *bina*, wisdom and understanding. Astronomy is itself of value in the general realm of knowledge. Science is not merely a preferred relationship with the knowable world, as we have already established. Now its value as a theoretical activity is also acknowl-edged. Astronomy is a *hochma*, a wisdom, an extension of the knowledge we receive through the Tora.

In the same interpretive act, Rabbi Shmuel bar Nahmani asserts that the Jewish people should not limit its intellectual horizons only to knowledge of Tora. The latter must necessarily be completed through scientific activity. It is a necessary condition for the Jewish people to be a light unto the world. The belief that the study and practice of Tora can by itself earn the Jewish people the esteem of other peoples is an illusion. We may note in passing that, generally speaking, the obligation under discussion has in fact been put into practice, and as a result, the role of Jewish people in the development of the sciences has been significant indeed.

We turn now to a question of an epistemological nature: When science produces truth, should we accord it an absolute value or only a relative value? Is it tainted with doubt simply because of its nonrevelatory origin? When reason and human experience are properly channeled, is it possible for them to attain the status of undisputed truth?

The texts cited above might be enough to suggest an affirmative answer. But an important passage by Maimonides removes all doubt. In the *Mish-neh Tora*, after laying down the rules for calculation of the Jewish calendar, Maimonides writes as follows:

The reason for all these calculations, the way all of this was known and can be proven, constitutes the science of astronomy and of geometry, about which the Greek scholars wrote numerous books which are now in the hands of our Sages. But the books written by the Israelite scholars from the tribe of Issachar during the time of the prophets have not come down to us. However, given that all these things can be demonstrated by flawless proof that no one can contest, we are not concerned about who the author was, whether he be a prophet or a foreign scholar. For anything whose rationale is clear and whose truth can be demonstrated by indisputable proof, we do not rely on the man who said it or who taught it, but on its proof and its reasoning.⁷

For Maimonides, human reason and experience constitute sources of authentic truth, with the proviso that they are to be used with caution. If the reason for the phenomenon seems clear and if the theoretical or experimental proofs are indisputable, one must believe what the scientist says. There is no reason to hide behind a veil of skepticism in order to minimize its value. Evidence and proof are sufficient to indicate authentic truth.

It should be noted that Maimonides allowed a measure of disquiet to reveal itself between the lines. Not every reason that seems clear is in fact evident; a proof can be contrived or incomplete. This raises a new question: Is it possible that science can be perverted? Cannot that which is presented as an objective proof sometimes be an illusion? Ultimately, is there not room for a measure of self-censorship with regard to certain teachings or research? Immediately after the passage from the tractate Shabbat that we cited above, we find the following passage that clarifies this point by introducing a crucial distinction:

What is a *magush*? Rav and Shmuel disagreed. One said, "It is a sorcerer"; the other said, "It is a blasphemer" [Rashi,⁸ ad loc., interprets this as a militant of an idolatrous doctrine]. We can see it is Rav who said "it is a blasphemer," for Rabbi Zutra said in the name of Rav: "He who learns something from a *magush* deserves death." Whereas with regard to sorcerers it is said: "You shall not learn to do after the abominations of those nations."⁹ [This implies that] you must not learn in order to practice, but you may learn in order to understand and legislate.¹⁰

Thus the Talmud distinguishes between two different ways in which truth may be perverted. The first is defined in terms of *sorcery*. It is concerned with the exploitation of popular credulity in all its varieties; anything to do with charlatans, necromancers, and diviners comes clearly and directly from this idea of sorcery. The classical understanding of such practices begins in the books of Moses and is then developed by the Talmud and rabbinic commentaries. But it is reasonable to include here every form of intellectual fraud, ancient or novel. The catalog of illusions, lies, and tricks that have accompanied scientific progress is a long one. It is almost as if each science, especially at its beginnings, had its own kind of sorcery. Astrology, alchemy, magic potions, and the fountain of youth are but a few examples. Closer to home, psychoanalysis, though itself grounded in genuine scientific principles and research, has provided and might still be providing the opportunity for numerous abuses, whether in psychoanalytic practice itself or, above all, in the ideological and moral conclusions to which it sometimes leads.

What is the attitude of the Talmud toward the phenomenon of sorcery? It can be summarized in the three terms that appear in our text: *Learn, understand, legislate*. An attitude of systematic and *a priori* rejection is not recommended for sorcery. The battle against sorcery is waged through a profound knowledge of its manifestations, by a meticulous distinction between true knowledge and mystification, and in the end by the use of the appropriate juridical means for its elimination.¹¹

The second kind of perversion our text addresses is *idolatry*. We are not talking here about idolatry as a practice but as a concept. The doctrine which is mainly targeted by the text is the dualism which was widespread in Babylonia, where Rav taught; but this is only one example. Generally speaking, with respect to any ideology whose principles clearly contradicted those of the Jewish way of thinking, the Sages of the Talmud and their successors adopted an attitude of rejection. Commenting on our text, Rashi writes that "It is forbidden to learn even the teachings of the Tora from the mouth of an idolater."12 At first, this principle seems to reflect a mistrust of the seductive power of the charismatic personality. But it also means the refusal of syncretism: The notion that Judaism could develop by integrating within itself ideas taken from alien ideologies or religions is absent from the traditional literature. It is possible that scholars in the history of ideas can show that, in specific cases, external doctrines have influenced the development of Jewish thinking. But such would be an exceptional case, a kind of invasion. It is contrary to the insistence, explicitly formulated and constantly repeated by the traditional authorities, on rejecting the intrusion of external ideologies within Judaism. If the Sages recommend an attitude of knowledge and analysis with respect to sorcery, when it comes to the ideological and religious domain they lean decisively towards systematic rejection.

We may add two comments on this point. The first is that these considerations do not apply to philosophy. The attitude of Jewish tradition towards philosophy is decidedly ambiguous; at times the study of philosophy is condemned, at others it is praised. In fact, it may be shown that the ambiguity of the Sages towards philosophy stems from ambiguity in the nature of philosophy itself. Does it comprise the search for objective truths, demonstrable and verifiable? Or is it inevitably tainted with ideology and dogmatic affirmations that by their nature escape all possible examination? It is this equivocal character of philosophy which prevented the Sages from adopting a clear position on this matter. Second comment: The negative attitude of our tradition towards foreign ideologies is mainly meant for internal use. The fact that objectively these ideologies played a role in human progress, even when they erred, is not denied. A progressive process of trial and error constitutes a possible way to arrive at the truth. This theme was developed in particular by Judah Halevi in his work The Kuzari,¹³

We now turn to the second part of this study. How does Jewish tradition perceive its relationship to science? Where does Jewish tradition position itself in relation to science? We have already observed that the same word, *hochma*, encompasses simultaneously the truth revealed in the Tora and its later expansions, and the truth produced by the sciences. In other words, for the Jewish tradition, Tora and science are two modalities or domains which share a common horizon, the horizon of knowledge. The distinction frequently drawn between the realm of faith and belief on the one hand, and that of rational knowledge on the other, is foreign to the way Jewish tradition thinks of itself. For Jewish tradition, Tora and science are two domains that belong to the same plan—the unveiling of the truth. This approach is furthermore confirmed through the expression *hochmot hitzoniot*, "outer sciences," which is the name given to science in general, as opposed to the knowledge of Tora. But within this common horizon, are Tora and science parallel tracks with equal importance, or is there a hierarchy? A passage in the tractate Avot sheds important light on the problem:

Rabbi Eliezer says: The nests and the first signs of impurity are in the body of the law itself; astronomy and geometry are the periphery of wisdom (*parperaot lahochma*).¹⁴

A few remarks about this text. The word "nest" is generic: It refers to the group of laws concerning the sacrifice of birds that a woman brought to the Temple after she gave birth. "The first signs of impurity" is also generic. It refers to the body of law, very complex at the time, concerning the periods of purity and impurity of the woman. Finally, the concrete meaning of the Hebrew word *parperaot*, which I have translated as "periphery," is either the dessert after a meal or the aperitif before it. It comes from the same Greek word from which the English "periphery" is derived.

The nests and the first signs of impurity constitute, in the minds of talmudic Sages, typical examples of very sophisticated laws that raise numerous problems but which, at first glance, have little to do with universal moral principles. They are presented in our text in opposition to astronomy and geometry, which are venerable, exact, universally accepted sciences. Thus, the most arcane elements of Tora law are compared with the most brilliant fields of the "outer sciences." The relationship that the text has established between these two domains is precise: The law constitutes the central part of *hochma*; astronomy and geometry are the periphery of *hochma*—aperitif or dessert, if you will.

Why this hierarchy? As we have seen earlier, it is not founded on the difference in the degree of truth attained respectively by Tora and science. Nor is it founded on a dogmatic theological consideration: That the Tora would be obtained through prophetic revelation, whereas science would result from the effort of human reason alone. But this is not the heart of the problem.

What distinguishes Tora from science is its content. The principal aim of Tora is to define appropriate human conduct. In other words, it is conceived as a science of man *as* man, which means at once free, conscious, responsible, bound by obligations stemming from the full range of human relationships in which he finds himself. All the relationships that man has, foremost with other people but also with nature, with himself—all his aspirations to worthiness, to perfection, to transcendence are considered, analyzed, and judged. A search that one could reasonably describe as infinite comes to an end with the *halacha*, or law, a rule of right action or conduct; but it is a search that really never ends, for it is forever deepened or expanded when new situations or new relationships arise in history.

In other words, the aim of the Tora is to answer the question, "Who is man?" Not man as substance or as an object for the discernment of his properties. We are not looking to answer the question, "What is man?" but rather "Who is man?"—as a subject and a person. The immediate implication of this way of defining the question is that the Tora addresses itself to both man's will and his thoughts.¹⁵ Its content presents itself immediately and imperceptibly as both knowledge and norm, because in the answer to the question, "Who is man?" it is impossible to distinguish between what is and what ought to be. The ideal and the future, the project of realizing and being that one has to undertake, are as much a part of the definition of man as are his past and his identity as presently constituted. One cannot be satisfied here with "I think, therefore I am" or "I am, I exist"; for I do not yet exist.

But each of the "outer sciences" investigates a particular field of content, one aspect of reality, aiming to answer the questions, "What is there?" and "What is it?" No longer the question "Who" but the question "What." Whether we are talking about natural sciences such as physics or biology, the social sciences, or even the sciences of the mind such as psychology or psychoanalysis, each one, with its own approach and in its own field, seeks to describe and understand a particular aspect of objective reality. They are unable to contemplate man as man, as a person, as a moral being in the broadest understanding of the term. This field transcends all the others, even those to which it is most directly linked, such as politics, economics, or sexuality.

An example will help us draw this distinction more clearly. As is well known, one of the Ten Commandments received at Sinai is the prohibition against murder (lo tirtzah). The need for such a prohibition is self-evident. A society which permitted murder could not survive, the latter's legalization being perfectly incompatible with any political life or economic order. But is that the essential meaning of this prohibition? We could easily be convinced that we are talking here about considerations that are solely practical, almost technical, in nature, which would not justify the presence of this prohibition in the context of revelation. Its real foundation, however, lies in man's own humanity, which carries the implication of recognition and respect of the other man as such, and therefore above all the recognition of the value of his life and his uniqueness. And here lies the revelation within the prohibition. Each commandment, whether prohibition or positive obligation, possesses this dual nature to one degree or another—necessary or desirable because of pragmatic considerations on the one hand, yet built on some aspect of the humanity of man, on the other.

It goes without saying that things are rarely quite as simple as I have just made them out to be. Certainly one should not lie. But should one accord this rule a universal extension, as Kant seems to say? Can't one lie in some cases, out of modesty or a sense of decency, or in order to avoid hurting someone or to make peace between brothers who have become enemies? We therefore need a science of the permitted lie. More generally, each person finds himself positioned amid a network of relationships and loyalties—to spouse, family, city, people, humanity, and even the animal, vegetable, or mineral worlds. For man as man, the multiplicity of these positions has as its corollary a multiplicity of responsibilities. How may they be reconciled, how far do they go, and what are their limits and interactions? The science of man as such—the "science of Who"—also may be called the science of responsibilities. Man also has a history, and this is especially true of the Jew for whom history tends paradoxically to be immemorial. What aspects of it must one take for granted, commemorate, or relive?¹⁶ What remains of it, what duties flow from it, how has it been distorted? It is not the role of the historian to produce such a normative science of history, no matter how accurate the accounts he provides.

These considerations, partial and provisional as they may be, open up a huge field of inquiry. One cannot answer these questions just by spelling out a few generous and general principles. The variegation and intricacy of the problems at hand push us to the point of vertigo, and no individual effort could articulate them all, much less solve them. This work can only be done by a collectivity, one thoroughly dedicated to the task, which would inherit conclusions from the past, develop them, and pass on new results to subsequent generations. One can recognize here the constitutive process of all science. Within the multiplicity of the "outer sciences," the distinguishing feature of the Tora does not reside in formal qualities but within the tradition's own understanding of its content. According to the formula of Leon Ashkenazi, who made it central to his teachings, the Tora is *sefer toledot adam*, the book of the annals of man.¹⁷ This is what I have tried to express by the title of this study: Tora is the "science of Who," the other sciences are the "sciences of What."¹⁸

This having been established, an important question arises: Is knowledge of the "outer sciences" useful, even necessary, for the deepening of the Tora itself? This question has two sides to it, one technical or pedagogical, the other theoretical.

From the technical or pedagogical point of view, there is no doubt what the answer should be. As numerous authors have noted, in particular Judah Halevi, the calendar of holidays, the laws of family purity, and those of slaughtering animals for food, all require a broad knowledge of astronomy, anatomy, or medicine to be understood. There is practically no area of the law which is independent of the experience of the real world. Moreover, the utility of a general education for the development of the spirit has scarcely been contested. It was mainly during and after the historical circumstances surrounding the advent of the Emancipation, in the face of an extraordinary threat of assimilation, that a powerful distrust of general knowledge sometimes emerged. But this phenomenon was mainly of a marginal, contingent character.

On the other hand, the theoretical aspect of the question is more delicate and has been the object of controversy. Is knowledge of the "outer sciences" necessary for a good understanding of Tora from a metaphysical standpoint? One cannot say there is a consensus on this question. It seems to me nonetheless, when push comes to shove, that once all the circumstantial fears have been eliminated, one must answer this question in the affirmative. At any rate, this is how Maimonides expressed it:

You, however, know how all these subjects [heaven, angels, world, soul] are connected together; for there is nothing else in existence but God and his works, the latter including all existing things besides him; we can only obtain a knowledge of him through his works; his works give evidence of his existence, and show what must be assumed concerning him, that is to say, what must be attributed to him either affirmatively or negatively. It is thus necessary to examine all things according to their essence, to infer from every species such true and well-established propositions as may assist us in the solution of metaphysical problems.

Again, many propositions based on the nature of numbers and the properties of geometrical figures, are useful in examining things which must be negatived in reference to God, and these negations will lead us to further inferences. You will certainly not doubt the necessity of studying astronomy and physics, if you are desirous of comprehending the relation between the world and Providence as it is in reality, and not according to imagination. There are also many subjects of speculation, which, though not preparing the way for metaphysics, help to train the reasoning power, enabling it to understand the nature of a proof, and to test truth by characteristics essential to it.... Consequently he who wishes to attain to human perfection, must therefore first study Logic, next the various branches of Mathematics in their proper order, then Physics, and lastly Metaphysics.¹⁹

Closer to our own time, the Vilna Gaon encouraged one of his students, Rabbi Baruch, to translate Euclid's books of geometry into Hebrew. This student related the following in the name of the Vilna Gaon:

To each deficiency in the knowledge of the other sciences corresponds a hundredfold [deficiency] in the knowledge of the Tora, since the Tora and science are linked together.²⁰

One should not go overboard in drawing conclusions from such a sentence. It is precisely the uncertainty that surrounds it that is significant. The fact that it is only related in the name of, and not written by, the Vilna Gaon; and conversely, the fact that later it was accepted as authentic, and that notably Rabbi Kook drew certain inferences from this one sentence, shows us both the importance and the danger of what it suggests.

There is in this sentence the affirmation of the ultimate unity of knowledge. Tora and science are two distinct but indivisible manifestations of a single truth. The risks inherent in such a conception are clear; it could indeed lead to a simplistic reduction, to the confusion of Tora with a medical textbook, removing from it its dimension of inwardness and transcendence to recast it as a kind of scientism, where Tora ceases to be the "science of Who" and becomes yet another "science of What" among many. The unity of science and Tora that is postulated here is not the unity of a blend or the unity of a synthesis. It is, in a way, a unity by correspondence, the unity which links the internal face to the external face of a single vessel. Final question: During the last two centuries, science has developed on an unprecedented scale. This development has entailed a change of approach or attitude with regard to numerous problems. As a consequence of this evolution, should we anticipate a deepening of the tradition? Here is, in any event, the opinion of Rabbi Kook:

Gradually, as scientific research finds precise laws amid the chaos of phenomena... the science of "the work of the creation" is increasingly exposed and explained in public, nourishing numerous spirits.... In parallel, higher truths that have always constituted the strength of the Sages and illuminated Israel as a whole... come progressively within reach of everybody. From now on it is going to be impossible to explain even simple notions of faith to average people without recourse to the most hidden notions, which stand at the top of the world.²¹

Thus, with the advance of science, there have increased both the insistence and the ability of the human spirit to receive truths once considered too subtle to be understood. These new exigencies do not necessitate a reconsideration of traditional truths, nor even a conflict with them. They do imply, however, an effort of purification of their formulation, the elimination of confused or erroneous representations which were introduced in the shadow of external influences. Furthermore, the categories and the formulae of Scholastic theology of the Middle Ages, at least taken in their literal sense, are no longer sufficient to explain the fundamental doctrines of Judaism.

What new paths may be explored? How is it possible, from an immense treasure of texts, laws, and traditions, to fashion new syntheses? Perhaps we are required, as Rabbi Kook puts it, to call upon "notions which stand on top of the world"—an expression which he consistently used when referring to the teachings of the Kabbala.

The attitude of Jewish tradition towards science can therefore be summarized as a conditional acquiescence: Acquiescence to the claim of science to be an authentic vision of reality, acquiescence to its important place in the theoretical order as objective and true thought. But this acquiescence is still conditional, and it comes with a few restrictions: Rejection of sorcery of any kind; rejection of alienation of man by ideology; and finally the limitation of the sciences to their proper place, meaning to the periphery of truth. The "sciences of What" cannot replace the "science of Who." The center of truth remains the Tora, *sefer toledot adam*, the book of the annals of man.

Notes

- 1. Rabbi Joseph Karo, Shulhan Aruch, Orah Haim, 224:6.
- 2. Isaiah 5:12; Shabbat 75a.
- 3. Isaiah 5:11-12.
- 4. Deuteronomy 4:6.
- 5. Shabbat 75a.
- 6. Deuteronomy 4:5-6.
- 7. Maimonides, Mishneh Tora, Laws of Sanctifying the New Moon 17:24.

8. Rashi: Acronym of Rabbi Shlomo Yitzhaki, eminent commentator of the Bible and the Talmud, born in Troyes in 1040. It is practically impossible to read the Talmud without referring to his commentary.

9. Deuteronomy 18:9.

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10. Therefore, since Rav forbids "learning" from a *magush*, this cannot be applied to a sorcerer and therefore, he is the one for whom *magush* means blasphemer. Shabbat 75a.

11. For a more thorough discussion of this point, see "Esthetic and Idolatry," in Georges Hansel, *Explorations Talmudiques* (Paris: Odile Jacob, 1998).

12. Rashi's commentary on Shabbat 75a.

13. Judah Halevi, *The Kuzari: An Argument for the Faith of Israel*, trans. Hartwig Hirschfeld (London: G. Routledge & Sons, 1906).

14. Mishna Avot 3:18. The translation of the word *gematriot* as *geometry* was given by the Maharal of Prague in his book *Derech Haim*; the lines that follow are in large part inspired by his comments.

15. This idea is developed by Rabbi Kook in his book *The Lights of Holiness* (*Orot HaKodesh*) (Jerusalem: Mossad Harav Kook, 1985). [Hebrew]

16. "In each generation, everybody must consider that he himself has come out of Egypt." Pesahim 116b.

17. See also Nahmanides, Commentary on the Tora, Genesis 5:1-2.

18. The centrality given to Tora and man should, of course, not be confused with an anthropocentrism relating to the physical world. The earth indeed revolves around the sun, but, as one midrashic text has it, the fact that there is nothing new "under the sun" does not mean there is nothing at all "above the sun."

19. Maimonides, *The Guide for the Perplexed*, trans. M. Friedländer (New York: Dover, 1956), part 1, ch. 34, pp. 45-46.

20. Rabbi Baruch of Shklov, "Introduction," in *Euclid's Book*, trans. Rabbi Baruch of Shklov (The Hague: Leyb Zusmansh, 1780).

21. Kook, The Lights of Holiness, Hochmat Hakodesh, vol. 1, section 6.