

# DNA AND NESHAMAH: Locating the Soul in an Age of Molecular Medicine

Robert Pollack

I am a scientist who is about to address a purely religious subject. This is a slightly stressful situation, but one familiar to many Jews. My teacher Rabbi Adin Steinsaltz put it this way in a 1995 article in *Torah u-Maddah*:

Popular science has a huge impact on people because it simplifies things. For example, in Israel we translate. . .the theory of Darwin as *Torat Darwin*. . . .

In our time most Jews live an amphibian kind of existence, like frogs. The same people live consciously in two different realms, or worlds, that of the Western world, and that of Torah. . . .

The problem is the reality of being a member of two contradictory cultures having contradictory claims and assumptions. The real problem is not a function of the truth of these claims, but rather the fact that people accept both of them. Frogs do very well with their amphibian life. But human beings are much less adapted to living in two worlds and belonging to both of them simultaneously.<sup>1</sup>

Where is the soul? Early theologian-scientists—the Aristotelian philosophers of a millennium ago—said that the soul was the “form” of the body, its Platonic

This article was first presented at Yeshiva University on March 19, 2003. An earlier version of this paper was presented to Edah at Lincoln Square Synagogue. Brief portions of this paper are taken from Pollack's books *Signs of Life* (1994), *The Missing Moment* (1999), and *The Faith of Biology, the Biology of Faith* (2000).

ideal. Platonic ideal forms seem to me to be rather tattered after a century and a half of post-Darwin biological science, but the idea intuitively remains, that the soul is somehow the essence of a person.

For example, in his new book on eschatology—that is Greek for the study of the World to Come, *Olam Haba*—the eminent Anglican theologian-scientist John Polkinghorne defines the soul as “the information-bearing pattern carried by the matter of the body.”<sup>2</sup> This formulation invites a simple extrapolation: that the soul of a person is the information in that person’s DNA. Can this be?

First, we need to have a more specifically Jewish notion of the soul. We could go to the Sages, but for a person like me—a scientist for forty years and at sixty-two already two years a *zakayn*—it is easier instead to let the Sages come to us; that is, to turn to the *Siddur*, the Jewish book of daily prayers, codified in Hebrew for the most part a few hundred years ago but including some passages from *Tanakh*—the Hebrew Bible—that are at least a few millennia old.

I prefer the version compiled about two hundred years ago by the AriZal, Rabbi Shneur Zalman of Liadi.<sup>3</sup> A *Chabad* Rabbi who prays with me at Congregation Ramath Orah gave me this *Siddur* a few years ago, in a beautiful edition with English translation. I certainly read it more often than any other book as a consequence of my own religious observance. I love it as well for its density, its intelligence, and its unflinching confrontation with the deepest questions of life and death.

This *Siddur* opens with a set of blessings of Talmudic origin, meant to be said every morning as soon as one is awake, before the beginning of more formal and communal prayer. In today’s Artscroll *Siddur*, two of these blessings, known by their opening lines as *Asher Yatzar* and *Elo-ai Neshamah*, bracket the blessings for having been given Torah. But in the AriZal’s version, as in the earlier Vilna *Siddur* of 1615, these two blessings follow each other without interruption. Together they give us as good a Jewish notion of the soul as we need. In English they go something like this:

Blessed are you, Lord our G-d, King of the universe, who has formed people in wisdom, and created within them numerous orifices and cavities. It is revealed and known before the Throne of your Glory that if but one of them were to be blocked, or one of them were to be opened, it would be impossible to exist even for a short time. Blessed are you Lord, who heals all flesh and performs wonders.

My G-d, the soul which you have given within me is pure. You have created it, You have breathed it into me, and You preserve it within me. You will eventually take it from me, and restore it within me, in Time to Come. So long as the soul is within me, I offer thanks to You, Lord my G-d and G-d of my fathers, Master of all works, Lord of all souls. Blessed are You Lord, who restores souls to dead bodies.<sup>4</sup>

It seems to me both modest and perfectly reasonable to begin each day with thanks for body, life and soul. But a closer look at the two blessings shows a bit of a problem: the soul is not mentioned at all in the first blessing, which is so clear and specific about the body's anatomical vulnerability. This invites an interpretation of both blessings that makes the "soul" of the second blessing into something altogether non-anatomical, and therefore wholly mysterious.

*Olam Haba* (the World to Come) in which the soul once again somehow rejoins some form of the body, must certainly be a World as free of any dependence on a vulnerable wet chemical like DNA, as it is free of death. But then what can one mean to say "You preserve it within me?" Is there a way in which to understand the soul's presence here and now, in this corporeal, mortal world? How can the soul of a living person, the soul I mean when I say these two blessings together, be localized? Is it in "the information-bearing pattern carried by the matter of the body?" Perhaps. In DNA? Perhaps.

This year marks the fiftieth anniversary of the discovery of the structure of DNA, the genetic material. There is something wonderfully mysterious about all DNA, but especially the DNA that sits inside the sperm and egg cells in each of our bodies. It lives on after we die.

We must die, but in our children, a version of that DNA will live on. What is so for each of us, is so for our species, all seven billion humans alive on this planet today. Our species will live only so long as the DNA in some of the egg and sperm cells of some of us combine to make the next generation of people. Beyond that promise, nature offers us no further hope of life, beyond the mortal span each of us has.

What is so for our species, is also so for all other tens of millions of different species alive on the planet today. In each case individuals within a species must die, but the DNA that begins a new individual by the combination of egg with pollen or sperm, will live on. The DNA that succeeds in traveling from the egg and sperm of one generation to the egg and sperm of the next is called the germ

line of the species. We may say with some confidence that the lifetime of a species is the lifetime of its germ line.

So if one wanted to seek souls in physical materials, then the germ line of our species—all the particular versions of DNA containing the instructions for the initial forms and behaviors of each of us and each of our children—would certainly be an interesting starting place. Not surprising that some people treat human DNA this way. But where did this germ line of human DNA come from?

Darwin's explanation of evolution by natural selection answers the question from nature. After almost two centuries it can no longer be called a theory, because no competing theory provides an equally simple and compelling answer to this question. Neither is it *Torat Darwin*, because no scientist expects the current best explanation through science of anything about nature, to have the eternal veracity of Torah. Still it is worth considering for its elegance, and for its utility to us in our attempt to locate the soul.

The Darwinian explanation begins with the observation from nature that germ lines do not live forever. Unexpectedly, species are as mortal as the individuals that make them up. Both fossils and DNA analyses confirm that the germ lines of today's species come from the germ lines of previous, ancestral species, now dead. More, they also agree that any ancestral species emerged from accumulated changes in the DNA of the germ line of even older ancestral species. The process is called speciation—Darwin in his 1859 book *The Origin of Species by Means of Natural Selection*. He said it works in the following way.

When inherited changes—we now know that these must be changes in germ-line DNA—leave some members of a species able to produce fertile offspring amongst themselves, but unable to produce fertile offspring with other members of the same species, then the germ-line DNAs of the smaller and larger subpopulations will begin to diverge from each other by random mutation. Once that happens, each subpopulation's germ line is free to follow its own future of subsequent natural selection, and so we may say each has become the germ line of a new species.

The subsequent survival, change, or death of one new species' germ line need have no further effect for better or worse, on the survival, change, or death of the other new species. Because of their common ancestry, the DNAs of the germ lines of *any* two living species will share some stretches of DNA that were present in their last common ancestor species. The planet today is covered by individuals of species that may look as different as a person and a rose, but trust

me, the DNA of the germ line of a person and the germ line of a rose have an amazing amount in common.

DNA itself, though invisible, is, of all parts of the natural world, certainly unsurpassed in its creativity and power. Common ancestry means that DNA itself, the molecule, has persisted since the beginning of life some 4.5 billion years ago. The mindless sprouting of new germ lines from old from then until now, means that at the deepest chemical level of analysis, all life from its beginnings until now, has been DNA's way of making more DNA. But does this power extend to our souls, or is DNA in that sense nothing more than the golden calf of the day, an object worshipped only by those too impatient to consider their souls?

Let's step back, and consider the germ-line DNA of our species and its most immediate ancestors. The first hallmarks of a future that would include us, are in ancestral mammals that lived at least two hundred million years ago. From that stock, mammals diversified—sometimes slowly, sometimes quickly, especially after the cataclysmic death of the dinosaurs sixty-five million years ago—into a set of about four thousand living species, different enough from each other to be placed in no fewer than fifteen different orders, including our own, the primates. The traits all primate species share define what we can be sure were traits of the first ancestral primate species. Here is how my colleague Monroe Strickberger puts it in his Textbook, *Evolution*, from which I teach each spring:

Primates, the mammalian order that includes humans, are species that have a number of adaptations indicating an arboreal (tree-living) ancestry. . . . These adaptations include:

1. Ability to move the four limbs in various directions.
2. Grasping power of hands and feet.
3. Slip-resistant cutaneous ridges in the ventral pads of these extremities [fingerprints].
4. Retention of the collar bone to support the pectoral girdle in positioning the forelimb.
5. Flexibility of the spine to allow twisting and turning.<sup>5</sup>

There's the most recent DNA-based context for our own species. A tree-living ancestral primate's DNA survives in our germ line through these traits, which we share with all the other primate species that shared this ancestor: gibbons, orangutans, gorillas, and chimps. Our germ-line DNA and those of the great

apes—particularly the African forms—are very similar. The differences in sequence between the germ-line genomes of chimp and human are only a few-fold greater than the differences between the particular genomes of any two unrelated humans, and not much more of a difference separates human and gorilla or chimp and gorilla germ-line sequences.

The last common ancestor of the living hominoid primate species died off no later than ten million years ago, and for much of that time none of the surviving species were particularly human. About eight million years later—two million years ago—the first *Homo* species whose fossils we have found, *Homo habilis*, appeared. *Homo habilis* made tools, was about three feet tall, and had a brain volume of about twenty-three ounces—about half the size of our brains today. In rather short order, a bigger species, *Homo erectus*, appeared in Africa, in time supplanting *Homo habilis*, and spread to parts of Europe and Asia, living from about 1.8 million years ago until about four hundred thousand years ago. By then various strains of *Homo erectus* had grown to about six feet tall and had a brain that reached up to thirty-three ounces, three-quarters of our brain size.

The pace of change was accelerating: about three hundred thousand years ago, even the biggest and brainiest *H. erectus* had died off, and in their place we find the fossils of the first of our own species, archaic *Homo sapiens*. These early humans, with brains at least as large as ours at forty-five to fifty ounces, left a cultural heritage that includes the wonderful grave at Shanidar in Iran, in which an archaic *Homo sapiens* of the Neanderthal type was lovingly buried with flowers. Other Neanderthal burial sites contain the remains of a body folded in a fetal position and painted with red ochre dye, as if death could already be imagined as a form of rebirth, even then.<sup>6</sup>

Anatomically modern *Homo sapiens* first appeared in eastern Africa about a hundred thousand to a hundred-and-twenty-five thousand years ago and began migrating soon thereafter. Europe, Asia, and Africa saw many millennia of joint habitation by archaic and modern humans, but the Neanderthal people of Europe died off about forty thousand years ago, and we have been the lone *Homo* species ever since.

Alone, but not rootless. Each of us carries within, a deep history of primate and hominoid behaviors. Strickberger continues:

In addition to having their highly developed brain, anthropoid primates (monkeys, apes and humans) also undergo a relatively long post-natal growth period accompanied by considerable parental care for a

relatively small number of offspring. The selective value of this trait probably arises from the limited number of offspring that can be successfully born and carried by highly mobile primates, along with the *long-dependent learning period* [my emphasis] needed to cope with many environmental and social variables.

Let me put that into my own words: the germ line of last ancestor common to chimps, gorillas and humans disappeared tens of millions of years ago. But since all three species alive today share a strategy of intensive nurturing of a small number of children, we may safely conclude that this trait is the result of a very large set of DNA stretches within our germ line that have persisted from this ancestral anthropoid germ line.

Now I have come to my first point: this ancestral nurturing behavior, so critical for the strategy of survival used by all hominoid primates from then to now, is also prerequisite to our capacity to enact the commandment of the *Sh'ma*: "*vishinantam l'vanecha/you shall teach them thoroughly to your children.*" Our germ line builds individuals capable of speech, language, abstraction, revelation, ritual and finally the *Sh'ma*.

These capabilities for expression of a Jewish life are all built upon this humbler but central, ancestral germ-line obligation that each generation must teach the next, for the species itself to survive. In this sense, the soul—wherever it may be localized—must be dependent for its existence in part on our DNA-based capacity for teaching and learning; that is, for love and for hope.

Scientists sometimes speak of inherited diseases as "experiments of nature." Not a nice thought, but an accurate one. We can ask nature to help us take the next step in localizing the soul, carrying out our own "thought experiment," of a sort. Consider five different kinds of person. In all five cases we will stipulate that the DNA of the person is OK. Three are alive for an indefinite time to come and so their souls must somehow be available, and two are in a state of transition to death, after which their souls are going to be even harder to locate.

First, the person who is healthy enough to say these two blessings (whether or not they choose to do so). The brain is OK, the mind is OK, and the body is OK.

Second, the person who is in a late stage of ALS, Lou Gehrig's Disease. Portions of the brain have atrophied and as a result there is no communication of brain with body. The mind remains undiminished in its capacity for thought, though totally hampered in all its attempts to communicate through the body. Recent work has given such minds a way to communicate, by presenting

patients—whose eyes may be kept open without discomfort—with a real-time video representation of their own electro-encephalogram waves.

In this situation, some ALS patients learn to modulate their EEG patterns, using a disembodied feedback loop that goes from screen to eye to brain to EEG machine to screen. In time they learn how to think in such a way as to make the waves rise above a line, or fall below it. And that control over a simple digital code of up-or-down is sufficient to enable them, slowly but surely, to remain in communication with any of the rest of us. So we have to say that in such a case, the brain is partially there, the mind is OK, but the body is gone.

Third, the person who is in a late stage of Alzheimer's Disease. Other portions of the brain have atrophied, and as a result there is no memory, no recognition, no communication. My father lived in this state for years. First, I did not know him when he still knew me, which was bad enough; but then he did not know me when I did know him, and that was much worse. Today there are no tools to penetrate this loss of mind. We have to say that in such a case, the brain is partially gone, the body is OK, but the mind is gone.

Fourth, the newborn infant who emerges breathing, but with such severe brain damage that there is no cortical function, that is, no chance for thought or action later in life. Jewish law is quite clear that a person who is breathing on his or her own is alive. This baby will certainly not live for long; but so long as it breathes, it is alive, both according to Halakha, and to civil law. In this case we can be sure that though the body is there—as it is in Alzheimer's Disease—there is neither mind, nor much brain either.

Fifth, the person who has just suffered a massive cerebral stroke, or a severe accident to the head. Lacking signals from the brain to the diaphragm such a person would be dead, but because of the technology of artificial-breathing, he or she may be maintained for some time in a state which can only be described as well as one in which the body is OK, but both the mind and the brain are gone.

Is this person the same as the newborn baby in the fourth case? For the past half-century there has been considerable disagreement, but it is my understanding that today, an acceptable Halakhic interpretation is that artificial breathing in these conditions is not the same as the breath of a living person. According to this interpretation, a person in this condition is considered to be dead by virtue of the absence of brain function, and so the body's organs may be removed for transplantation before the artificial-breathing machine is disconnected.

So, is there a part of the anatomical DNA-based person in which the soul of a living person may be said to reside, based on these five situations? Not really.

In the first case, of a healthy person, it could be in the brain, the body or the mind, or in all three. In the second case, of ALS, it could be in the mind, or in the remaining functional brain, or both. In the third case, of Alzheimer's Disease, it could be in the body or the remaining functional brain, or both.

In the fourth case, of the newborn baby who lacks a cortical brain, the soul can be only in the body. In the fifth case, of the person with a flat EEG maintained on an artificial breathing machine, though the machine is on, only the body is functional. The soul is in question in the fifth case, with some Rabbinic authorities agreeing that it has already been taken, and others seeing no difference between the fourth and fifth examples.

Adding up these five cases, there is no single place left for the soul to reside. A slightly modified conclusion would be, that there is no anatomical localization of a person's soul *within that person* that meets the test of all five of these cases.

Now let's go back to the lessons of evolution, and look again.

Emotionally rich but humane interaction with a loving adult is as important to an infant as food or water. This need is very old, much older than the hominoid ancestors of our species, older even than the ancestor of the mammals, as many hundreds of millions of years old as the time when the last common ancestor of mammals and birds walked the earth. As my colleague Ursula Goodenough put it in her wonderful book, *The Sacred Depths of Nature*,

We nurture our children selflessly. But we also recognize them as our most tangible sources of renewal—for a child, the world is always new.<sup>7</sup>  
 . . . The instinct to engage a mate to help with child-rearing is accompanied by the instinct in children (and in all young mammals and birds) to form strong relationships with their all-important parents. . . . [I]t seems probable that our affection for our parents flows through emotional networks that establish parent-offspring bonds in other mammals.<sup>8</sup>

Nor is the bond between a child and its parent the only universal human emotion of this sort. As Goodenough later writes, "Our sorrow at the death of others is a universal human emotion that transcends cultures. Indeed ape mothers have been observed carrying their dead babies around for several days, suggesting that this form of grieving far antedates our humanness."<sup>9</sup>

This is to say that the germ line of our species carries, and gives to each of us, an inherited, wholly naturalistic, DNA-encoded set of behaviors that include an absolute dependence on other members of our species for emotional and physical support at the beginning and end of life. It's not too much of a reach, to say that that dependence must persist as well throughout one's life, and that therefore we are a species of intrinsically social individuals.

Let us suppose that every one of us does have a soul, and that while we are alive it has a natural location somewhere in this mortal world. We've already established that the soul of any of us is hard to find in any part of our DNA-encoded, experience-modulated minds, bodies or brains. Yet we know that somehow, as Polkinghorne puts it, "whatever the human soul may be, it is surely what expresses and carries the continuity of living personhood."<sup>10</sup> If we simply connect these ideas an unexpected answer emerges, one based on the history of our species. The location of the soul of any one of us need not necessarily be in our minds or bodies or brains. Instead, it could be in the minds, bodies and brains of each of the people whom we have nurtured, and the minds, bodies and brains of those who have nurtured us.

This is a big leap. But stay with me. The argument here is not against Heaven. Whatever aspect of the soul comes to each of us from the Other World, and will return to the Other World at our death, to re-emerge in *Olam Haba*, need not have any material content. But those two prayers do not speak only about death, they speak about those of us alive today, and the souls "within" us now. And I am arguing, simply, that these souls within us need not be individually ours alone.

Look at it this way. I hold in me a set of emotional and narrative memories of a number of people. Some people have impressed themselves deeply on me, and I know I will never forget them. Others once made me laugh or cry, but I can hardly remember why. Above and beyond any other people, my parents, my wife, my daughter and her family live inside of me with sharpness and intensity unrivalled by the memories of anyone else.

From what I have said about our natural origins, it should be clear that the special intensity of these memories is not an accident, but rather that it is the predictable outcome of a strategy for the survival of our species, that has worked for it and for its ancestors as well, for hundreds of millions of years. All that I am saying that might be new, is that this special set of memories and feelings I hold for these people represents an aspect—maybe no more than a reflection, but maybe no less than a portion of the entirety—of each of their souls.

Now let me make that symmetric. I will assume—it is no great immodesty—that a sense and a memory of me is as strong in each of them. In that sense each of them hold an aspect, or a portion, of my soul. And in each case, with full symmetry, it is that portion or aspect of our souls that can, without mystery or miracle, and while restricted entirely to this mortal world, survive death.

In terms of the five persons we've already discussed, this notion clears away all awkward anatomical paradoxes, and restates the problem in a simple and telling way. Each of these people has a soul, but we cannot tell much about that soul until we know more about the people closest to each of them. If they are loved and cared for, then of course their soul is well no matter how ragged their mind, or brain, or body. And if they are abandoned, mocked, written off as if already dead, then their soul must be in the Other World already, even though their body, or their brain, or their mind may still be present.

Is this idea of a distributed, socialized, delocalized, mortal soul in any sense a Jewish notion? It certainly fits the ancient Jewish recognition of a shared ancestry of all people, and the equally unquestioning presumption that the unmeasurable, infinite value of each human life derives not from any aspiration to perfection, but precisely from the inherited differences that allow each of us to look different, and to choose differently, from all others. In this sense, none of us can claim the superiority that would confer complete independence from the rest of us.

The earliest part of the Talmud—the Mishnah—is a record of expectations and laws binding on Jews, codified almost two millennia ago. When I first began to speak on the utility of my own tradition to my science some years ago, Columbia Religion Professor David Weiss-Halivny gave me a reference in *Mishnah Sanhedrin* which has a commentary on the book of Genesis that makes this point with special elegance. The *Mishnah* is giving the reasons why witnesses to capital crimes must be taught that a person's life is at stake in their testimony, and that any person's life is a more serious matter than most anything else. The *Mishnah* then comments:

for this reason one individual Human Being was created. . . to proclaim the greatness of the Holy One the Blessed: for a man strikes many coins from one mold and they all resemble one another, but the supreme King of Kings, the Holy One the Blessed, stamped every human in the stamp of the first human being and yet not one of them is like the

other. Therefore every person is obliged to say: the world was created for my sake.<sup>11</sup>

My notion may also shed a new light on the *Sh'ma*. When you teach, you give yourself to another person in a way that will be remembered through your teaching. In these terms, when you teach effectively, or thoroughly, you give someone a portion of your soul. So perhaps we are instructed “You shall sharply teach your children,” to assure not only that they learn Torah, but also that they carry away an aspect of our souls that may reflect well on us.

And finally, the notion is fully consistent with *Yiskor*, especially when we remember the loss of someone taken at random in an unexpected, unfair, cruel way. After a sudden loss or a disaster, many people will focus at one time of the names of people they do not know. Certainly this is how my family and I observe the difficult day of *Yom HaZikharon*, the day of remembrance of Shoah. Then, and I imagine also at any moment of *Yiskor*, each mourner who is remembering a name of someone—known or unknown—is holding a portion of the soul of the person who has disappeared, even when the obligation to bury the body may never be met.

The notion does, of course, raise certain questions. Let’s consider the four that have come up most frequently:

Doesn’t this idea just beg the question: If our soul is distributed among others, then where is it in them—body, brain, mind, etc.?

Yes, of course it does; that’s the point. The notion restates the question so as to avoid localization in any one part of even any one person, and to substitute for that expectation, a fuller recognition of the essentially distributed nature of one’s humanity.

For persons lucky enough to share the fate of my first example, the symmetry of relationships assures that the distributed soul is not only in others, but in oneself. But surely for the infant born without a cerebral cortex, the soul has little apparent place to be, except in those who love it. In terms of eschatology, I am arguing that *HaShem*, always faithful, will, in *Olam Haba*, return to us both our embodied individualities, and our collective relationships.

What about the soul of an orphan?

Nothing in what I have said links the essential requirements for loving and caring, to any other aspect of DNA-based behavioral biology, except the impulses to love and to care. Parents should love and care for their children, and chil-

dren for their parents, but the soul of a child neglected by living parents is far more at risk than the soul of an orphan adopted by loving strangers.

What happens to the idea of a *Yiddish Neshomeh*, as my grandmother would have put it?

Any notion that mixes DNA and Jews in the same discussion runs the risk of appearing to be an endorsement of the idea that in some way, Jews are a genetically distinct subpopulation of our own, and that therefore we have the capacity to carry each other's souls because we are expressing the DNA-based inheritance of a Jewish variant of a species-wide aspect of human behavior.<sup>12</sup>

By proposing a definition of the soul grounded in an aspect of our species' shared inheritance, I have indeed argued that nature is not consistent with the existence of an inherited, specifically Jewish soul, a *Yiddische Neshomeh*. It exists, but not by DNA-based, genetic inheritance: otherwise, how and when could her mother-in-law have given Ruth the Moabite, the ancestor of King David, her *Yiddische Neshomeh*?

The last line of the "Aleinu," the prayer that ends each service, is very clear about our hope that anyone and everyone can—and some day will—learn the essentials of nurturing another soul in the Jewish manner: "And it is said: 'The Lord shall be King over the entire Earth; on that day the Lord shall be One and his Name One.'"<sup>13</sup>

Observant Jews of centuries past understood that while being born a Jew was precious and important to one's Jewishness, it was not necessary and it certainly was not sufficient for a full Jewish life. The central ideas and actions of a Jew have always had to be taught and learned, never inherited. Nevertheless, until recently many reasonable people could still make the argument, in the absence of evidence to the contrary, that since Jews accept the covenants made with Abraham, Isaac and Jacob, the genomes of Jews must somehow be different from the genomes of all other people, containing unique versions of many genes—that is, that Jews are a biological family.

Until recent advances in DNA diagnosis allowed the question of Jewish genealogy to be asked directly, we based our claim to common ancestry on common laws, habits, language, texts and historical memories. Genes of Ashkenazic Jews are interesting to medical science, because Jews from Ashkenaz descend from a rather small number of families who survived the pogroms of the mid 1600s.

Unlike asking "Are Jews a family?" as historians have traditionally done, geneticists seeking to advise Ashkenazic families are also, in passing, asking,

“Do Jews all share the same versions of one or more genes?”—a question with a testable, precise answer. As no two people except pairs of identical twins have exactly the same version of the human genomic text, this claim could be confirmed or rejected by a search for versions of the human genome shared by all Jews and no other people.

Given the historical context of the Nazi “Experiment,” it is all the more remarkable that Jews all over the world have been flocking to the new technology of DNA-based diagnosis, eager to lend their individual genomes—each a surviving data-point from the terrible experiment in negative selection—to a revisiting of this issue of biological Judaism.

At a recent meeting of the Association of Orthodox Jewish scientists and the Columbia Center for the Study of Science and Religion, it became clear that Jewish curiosity has provided sufficient genetic material to give a perfectly clear negative answer: there is no support in the genomes of today’s Jews for the calumnious and calamitous model of biological Judaism. Though there are many deleterious versions of genes shared within the Ashkenazic community, there are no DNA sequences common to all Jews and absent from all non-Jews. There is nothing in the human genome that makes or diagnoses a person as a Jew.

This is fine with me. In fact, it makes the notion of a “Jewish soul” easier to understand. A Jewish soul is a soul cared for by Jews. No particular version of any gene is involved in this religious choice. This puts our gift at Sinai front and center. It is our unique instruction for making proper use of our innate human capacity for mutual caring and love. Learning the skills required to make the most of these capacities is necessarily a matter of learning *Torah*, as much as it is necessarily not a matter of ones’ parents’ DNA.

What is there about this Jewish way that is special, then?

By accepting *Halakhah* as the product of revelation at Sinai, I happily and wholeheartedly give the Jewish way of caring a unique status. American Jews who do not deny they have Jewish ancestors but who wish themselves otherwise to be exactly like everyone else in America, find this difficult. Jews who eagerly accept the life’s work of caring for others as part of an agenda to assure their grandchildren are Jewish, are more likely to be grateful for the help *Halakhah* provides.

The proposal that one Jew’s *Neshamah* may be located in the feelings other Jews have toward that Jew, is finally not a scientific argument, but a purely religious notion. It makes the obligation to serve others an absolute requirement of a full life as a Jew, not a choice one may take up or not, as if it were a hobby or a career.

The *Rosh Yeshiva* of Har Etzion, *HaRav Amital*, has a sharp teaching on this point, from Rashi on *Parashat Teruma*:

Some people think that a good Jew is one who fully identifies with everything he does and does not perform religious acts as if they had been forced on him. Rashi here teaches us that although the *Mishkan* did require voluntary donations, the sockets—the very basis and foundation of the *Mishkan*—were built not from voluntary contributions but from mandatory taxation. One must inculcate within himself, before anything else, a profound sense of commitment.<sup>14</sup>

To put that another way, we all share, we say, a deep concern for the future of American Jewry; and we all hope, we say, to see continuity here. But continuity of what? As the former chair of the Board that raised the money to build the Kraft Hillel at Columbia University and Barnard College, I have had ample opportunity to measure the religious specificity of the obligation one Jew has to care for another, in this very American context.

To my surprise, I have found that being engaged in Jewish religious obligation is not always what Hillel means when it speaks of Jewish identity. Here, for example, is what the Skirball Director of the Edgar Bronfman Center at NYU and his colleague, the vice president for strategic initiatives of the Andrea and Charles Bronfman Philanthropies, had to say about the Hillel movement, in a recent essay in the *Jewish Week*.

Basic marketing theory suggests that just as it is nearly impossible to build one brand that attracts everyone, Hillel cannot be all things to all people.

We must recognize that there are growing numbers of young Jews eager to explore their identities who are held back only by the negative perceptions they hold about “*the kind of people*” [my emphasis] who populate the Hillel universe. This generation values quality, choice and specificity. Marketers have responded by identifying niche targets and building networks around them. [Linda] Sax’s study [“American Jewish Freshman”] showed that young Jews today are similar in that they are looking to build eclectic niche communities of meaning based on artistic and cultural expression, social justice values or political considera-

tions just as easily and in some cases more than on religious grounds. This is our opportunity, and it can be seized over the next decade.<sup>15</sup>

I am one of those “*kind of people*”; so, I suspect, are many of the other people who contribute to International Hillel. We have work to do here. Niche marketing is not our opportunity, it is our gravest risk. If a Jewish soul requires a community of Jews who care for each other according to Torah—rather than any inherited, DNA-based difference—then by blaming Jewish observance for Hillel’s self-confessed difficulty in reaching some young American Jews, prospective leaders of Hillel like these put every Jewish Neshamah—their own, our children’s, and ours—at risk of a simultaneous, unnecessary, self-inflicted, communal wound.

One last word. About four years ago Columbia University—surely one of the world’s most secular places—gave me the funds to set up the Center for the Study of Science and Religion. In the past year I have brought the CSSR into Columbia’s Earth Institute, where it serves in support of the large agenda of global sustainable development. These career choices of mine have been taken because of—not in spite of—the religious considerations I have just discussed. I do this work because I choose to push this way of seeing our Jewish obligation to each other as a sharing of souls, to its universal limit. There is an idea of universal utility in what I have come to understand out of my own religious experience. It is this: without the capacity to both give and take love, no aspect of your soul can find a proper home in someone else.

King Solomon summarizes the final eschatological point I wish to make:

For love is fierce as death,  
 Passion as mighty as Sheol;  
 It’s darts are darts of fire,  
 A blazing flame.  
 Vast floods cannot quench love,  
 Nor rivers drown it. . . .<sup>16</sup>

I am a scientist, not a poet; and surely no King. This is how I now understand these lines from *Song of Songs*: When the fact of love is elevated to the status of a religious obligation, it becomes a statement about the World to Come. Even then, it need not, nor should not, lose any of its biological, evolutionary, DNA-based specificity. Without the capacity to give love, you cannot leave with any-

one the best aspect of your own soul and so it is likely to wither within you; and without the capacity to receive love, you cannot properly remember anyone else's soul either, and so you deprive them of some hope for the future, as well.

### Notes

1. Steinsaltz, A., 1995. *Torah u Maddah Journal* 5: 156–167.
2. Polkinghorne, J. 2003. *The God of Hope and the End of the World*. Yale Univ. Press, p. 5.
3. Mangel, N., 2001. *Siddur Tehillas Hashem Nusach Ha-Ari Zal*, Otsar Sifrei Lubavitch, Brooklyn.
4. *Ibid*, p. 6.
5. Strickberger, M., 2000. *Evolution*, third edition, Jones and Bartlett, San Francisco, chapter 20.
6. Polkinghorne, J., 2003. *Op. Cit.*, p. 36.
7. Goodenough, U., *The Sacred Depths of Nature*, 2000. Oxford, New York., p. 129
8. *Ibid*, p. 134.
9. *Ibid*, p. 150.
10. Polkinghorne, J., 2003. *Op. Cit.*, p.105
11. Danby Translation, *Mishnah*, Tractate Sanhedrin, Chapter 4, Mishnah 5. p. 388.
12. Pollack, R., 2002 "Genetics and Morality," The Orthodox Forum, Fourteenth conference. To appear in "*Judaism, Science and Moral Responsibility*," ed. David Schatz and Yitzhak Berger, Jason Aronson Publishers, forthcoming.
13. Mangel, N. *op. cit.*, p. 85.
14. Yeshiva Har Etzion virtual Beit Midrash project, <yhe-sichot@etzion.org.il>, February 5, 2003. *Sichot 63–19: Parashat Terumah*.
15. Bachman, A. and R. Bennett, *Expanding Hillel's Reach*, Jewish Week, February 7, 2003, p. 26.
16. *JPS Hebrew-English Tanakh*, 1999. *Song of Songs*, Ch 8, lines 6–7. p. 1743. Jewish Publication Society, Philadelphia.

A vertical bar on the left side of the page, consisting of a red diamond at the top, followed by a yellow-to-white gradient bar.

COPYRIGHT INFORMATION

TITLE: Dna and Neshamah: Locating the Soul in an Age of  
Molecular Medicine

SOURCE: Cross Curr 53 no2 Summ 2003

WN: 0319603652007

The magazine publisher is the copyright holder of this article and it is reproduced with permission. Further reproduction of this article in violation of the copyright is prohibited. To contact the publisher:  
<http://www.aril.org>

Copyright 1982-2003 The H.W. Wilson Company. All rights reserved.