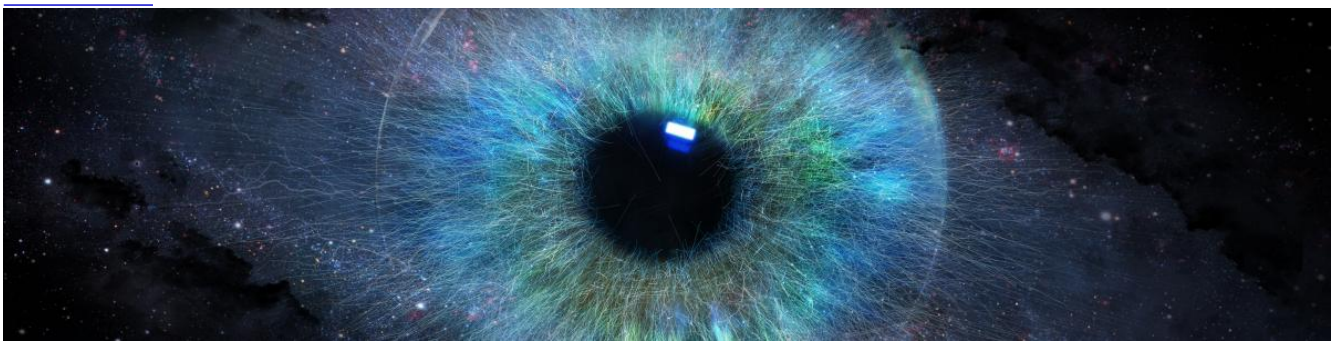
Observations of an Observant Ophthalmologist

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In 1969, a very precise and intelligent law student approached me in a rather confused state of mind. He had just studied the proofs for the existence of God as presented by Maimonides in the Guide for the Perplexed. These proofs were disappointing to him, as they said little to his practical twentieth-century Western mind. Did I read them, he asked. Yes, I answered, but they also said little that resonated with my way of thinking. At least all but one (the proof from design) lacked the punch that one expects from such “proofs.”

Both of us were young and saw ourselves as scientific, accepting only what was clearly proven to us. My confession allowed him to ask, rather sheepishly, that if I found the proofs generally so meaningless, why was I an observant and practicing Jew.

My answer surprised even me: ”I believe because I just completed as part of my ophthalmology residency training a full time six-month course in the anatomy, physiology and pathology of the eye”. He eyed me at first with a skeptical tilt, but I explained.

The eye is one of the most beautiful creations that I know. It is a wonder and a marvel, dwarfing even our most sophisticated human inventions. You would probably agree with the above, but with the in-depth study that I had just completed, I found that this sensory organ was indeed most awe-inspiring. I saw that every part of its anatomy and function were nothing short of astounding—and this even though we know but few of its inner secrets.

Basics: the eye is a one-inch sphere that is bombarded with electromagnetic light rays from a radiant object. The cornea and lens focus the image, which is then projected on the retina where it is converted into an electrical signal and this electrical wave is transmitted a few inches to the occiput, the rear of the brain. We then “see” an object in all its beauty, with the color, perspective, depth, relationship to other sights and a lot more. Other parts of a brain then incorporate this into our past memories and give this electromagnetic signal a full world of relationships.

Sounds easy! Well it is not.

Every step in the process, and there are many steps, screams loudly of the work of a Creator. Please follow closely as we explore just a small sample of some of the wonders of the eye and see how they attest to the glory of the Almighty Creator.

First, the external anatomy: the eye is protected on five sides by a bony pocket in the skull. These bones are in turn surrounded in many areas by air-filled sinus cavities. Further, the eye sits in a cushioning bed of soft fat, a shock absorber. A bony protruding front rim protects the front of the eye from large projectiles.

The front surface of the eye is indeed exposed, but the complicated eyelid protects it. You take this lid for granted. Do not, for even small lid problems can cause major ocular problems. The lid has multiple muscles and tendons as well as a full moistening and draining lacrimal system. In the lids are several types of glands that secrete the many components of the tears. Brushes on the lids, the lashes, function to avoid excess light and foreign bodies. The tear drainage systems with its glands, drainage, nerves, arteries, even the chemistry of the tears are all a shocking wonder.

In addition, the tears are not just a layer of water. Several sets of glands produce a highly complex thin layer. In this later are found antibodies and electrolytes. One can indeed spend a lifetime just studying the chemistry of the tears.
Do not think that the tears afford just an added bit of comfort. Not at all. Very many people are actually blinded by tear deficiencies.

And I can go on and on. The eye muscles, the miracle of the cornea, the very complex fluids inside the eye, the amazing lens, the miraculous retina, optic nerve and the visual components of the brain. The six muscles around each eye that are in constant coordination with each other. The biochemical, immunologic, and regenerating systems, the color and depth perception abilities, dark adaptation and so very much more. The sub-cellular components, the enzymes, proteins and nucleic acids, the electrical systems and the anti-microbial systems.

Each of these components has been researched ad infinitim. Book after book is available on every micro component of the eye. Moreover, every day I read of a new discovery, a new enzyme, new cellular components, and new genetic controls.

Ma rabu maasekha Hashem. How awesome are your creations, God.

There are those who peer into deepest space to see the glories of creation. But I find that we do not need a Hubbell Telescope to see God's creation, rather, a microscope will do just fine. There is a whole world in each of us that can serve as witness to Creation. *Lo Bashamayim Hi*, it is not in heaven.

But wait, what silliness is this? How many science teachers have we had who did everything that they could, either openly or by innuendo, to convince us that religion, or more specifically, that the whole God concept is primitive nonsense? How many times have we read that the concept of Intelligent Design is just plain wrong, that the theory of evolution can prove it all, and I mean all of it. How many of us get cold sweats when we read a Times article "proving" that our most basic religious concepts are silly? How many high school and college students fall into obsessive doubt, even depression, when they study evolution and learn that the Torah is wrong in describing Creation, that the whole thing is but a myth?

Yes, the study of evolution, both macro and micro, anatomic and physiologic, cellular and sub cellular can argue quite convincingly that it all just came about by itself. No God, no Creator, all just spontaneous development over fourteen billion years.

Nevertheless, the message that I am conveying is that if one looks through the microscope, studies and observes, one becomes overwhelmed and convinced that the Proof from Design is indeed correct. There was a Creator. Many scholarly books have been written, some by evolutionary scientists, that stress that science "proves" that there is a God. We should not be on the defensive. Science is really the clergyman's best ally.

However, you complain, "science is just not Jewish." After all, we know all about dinosaurs and evolution, a non-geocentric universe, and concept after concept that disagrees with our talmudic and rabbinic literature.
I say,"NO." Science is not religious or irreligious, not Jewish, not Buddhist, no. Science describes. And from careful observation, it allows for accurate prediction. It can measure the speed of an electron, what effect penicillin has on a bacterium, or how my anatomy compares to that of a monkey. But as far as the *why* of nature, science has no way of knowing if God guided the evolution and development of the universe over the billions of years, or if human's evolution was spontaneous, by random chance. It is for you and me to look at the world, to study in depth both the astronomical universe and the sub-microscopic particle and after unprejudiced thought to decide if we think that this all just came about. And for me, with the bits of knowledge that I have, particularly from my ophthalmic studies, the answer is heavily on the side of a planned and guided Creation.

In traditional Jewish circles one often hears adherents complaining that many of our modern findings contradict the science of the Torah, of the Talmud, and of the rabbis of the past, some of them who were outstanding scientists in their times. But I say that if you believe these sages who had no microscopes and no telescopes, no spectrophotometers and no cyclotrons, if you believe that if they were here today and had our knowledge, that they would still accept that the sun circles the earth, and that the world is less than 6,000 years old, then you insult these intellectuals to the core. No, I think that if Hazal were here today they would rejoice over our new knowledge of the Almighty's handiwork. They would of course correct what they wrote in error about Nature.

Maimonides writes: "And what is the way that one comes to love and to be in awe of Him? At the time that the individual studies His amazing creations and His large creatures he will at once apprehend from them His wisdom, which is unappraisable and endless—immediately he loves and extols and praises and craves a great craving to know the great Almighty (MT HYT 2:2).

Imagine if our sages of old, if Maimonides, the talmudic rabbis, even the rabbis of the last century, could experience our world today. How very appreciative they would be of today's scientific discoveries. They would write and modify their philosophies utilizing our new knowledge.

As we know, national prophecy ceased before the second Temple was destroyed. But I wonder if it really did; I wonder if the exponential growth of the knowledge of nature that has come about in the past decades is not in fact a new form of prophecy. Are these recent discoveries of the last years really God's prophesying to us an additional canon, a canon of His blueprints, a canon that aids us to more love and revere Him?

Go to an operating room, witness an ophthalmic surgery; you would be stunned to see what man hath wrought. Instruments, chemicals, computers—all were unknown but a few years ago yet today are our basic surgical tools. To me these are not just human discoveries and inventions; to me these speak of

the presence of God in an ascending spiral toward His showing us His being, if not essence.

We can now do angiograms of the eye's finest vessels, and we can open the eye and correct these vessels. We can use a concentrated light beam, a laser to repair retinal problems without opening the eye. We can even thread a catheter in from an artery in the groin and guide it into the finest brain vessels and when in the desired vessel, we can cause a clot or we can expand the vessel—all without ever opening the skull. Indeed a few years ago, I was involved in such a case and I must say that I never felt God's presence as I did during the course of that patient's cure.

Yes, humans have done wonders, but it is Almighty God that has guided them, given them the abilities and aided them in seeing the presence of the Creator.

Open up the books of science if you really want to see *Ma'aseh Bereshith*.