



ALEXANDER ZARCHIN

Inventor of the Sea Water Desalination Process

Born in 1897 in the Ukraine into a family of religious Zionists, Alexander Zarchin received most of his religious and Hebrew education at home. One of the many things which he learned as a child that captured his keen, undiminishable enthusiasm was a *midrash* on Parashat *B'Shal-lach* describing the splitting of Yam Suf. According to the *midrash*, the sea water hardened like glass during the miracle and the Children of Israel drank from it. "Maybe this is how I learned the basic principle of my desalination technique, that frozen sea water isn't salty," mused pragmatic Zarchin on a rare philosophical note during our interview. "Only later as a chemist did I learn that just as any crystal is pure, so is water in its crystallized frozen state."

As a young man, Zarchin pursued industrial chemistry, specializing in the metallurgy of light metals. While a student, he embarked upon his life-long career as an inventor by devising a process to produce light metal from magnesium. Wanting to create something beneficial to *Eretz Yisrael*, he chose magnesium because of its abundance in the Dead Sea area. For having patented this process "LCLA" (an acronym for *L'ma'an Zion Lo Achsheh*, a passage from *Isaiah* 62 meaning "For the sake of Zion I will not

hold my peace"), Zarchin was accused of being a "Palestine lover" conspiring to place a Soviet invention at the disposal of the British Empire and was sentenced to five years in a prison camp. During his term, the research he had been doing on water desalination was kept a Soviet military secret.

After his release, Zarchin was awarded a number of technological prizes and was appointed Lecturer at the Technical Institute of Tashkent, where he also worked as a chemical engineer. In 1948 he made *aliya* to Israel. Since his arrival he has worked on his numerous inventions — which include sea water desalination; petroleum production from bitumen stone; the manufacture and use of basalt for building material; the construction of an artificial lung; and a wind-operated generator — trying to adapt them to Israeli conditions.

Today Zarchin lives with his wife in an austere apartment in the high-rise above the supermarket on Ben Yehuda Street in northern Tel Aviv. The walls of the almost threadbare salon-cum-dining room are filled with *sifrei kodesh*, encyclopedia sets and technical journals (which he still receives from the Soviet Union). The hallway and closed-in porch are packed with plastic-covered inventions, bottles of sample products, raw materials, measures, tools, wheels and models of wind motors. The spare bedroom serves as a utilitarian workshop, where Zarchin also studies Gemara daily.

A short, slow-walking man of 85, Alexander Zarchin pierces through to the definite meaning of what he means to say, focusing his sharp blue eyes beneath the brim of his sports-cap, enunciating in an even, rational tone, securely relying upon his unfaltering memory. With celerity he can immediately find the source of a quote from the Gemara or Torah.

As I had already informed him of the nature of my interview with him, he had

his answer prepared for me before I could ask my first question.

"There are two parts to science — the experimental and the interpretive. I work with the first and throw the second away. Philosophy can't be trusted. I rely only upon the Torah and the *halacha*. Science is a mechanism that can be taken apart and examined, but faith, belief, cannot be. And even at that, the measurements which we use in science are incorrect. Aristotle erred when he claimed that air has no weight, but for centuries science made measurements using this false assumption.

"In the ninetieth Psalm it says, *May'olam ad olam Ata E-I* ("From everlasting to everlasting You are G-d"). This means that we don't know anything about where we come from. The Creator put the universe together in such a way that we cannot understand it. The root of the word *olam* (meaning everlasting or physical or temporal universe) is the same as that of *ne'e-lam* (disappeared). It's often been conjectured that before G-d created our universe, he created other worlds out of

entirely different materials and then destroyed them. This is something which we cannot understand at all. And there is no need to either. Anyone who tries to is a fool. As Rabbi Akiva said, the table testifies for the carpenter, the material for the weaver, the shoe for the shoemaker. . .

*"According to our Sages, all animals are gifted with chochmat lev, natural instinct which understands the secrets of nature without asking questions. How does the spider know how to weave a micron-fine web? How do fish know where to spawn, or birds, where to migrate? How do the birds at the North Pole know to drink water from ice rather than directly from the sea? How do they know that the molecular structure of ice water is the same crystalline form as that of the water in the blood?"* "I don't ask questions. I'm a simple man. I go by what's written in the Talmud, *Tractate Mechilta* — there are three things a man must teach to his son: to learn Torah, to learn a craft and to marry. We must learn halachot and that's all there is to it."

— I.C.