

## **Avdat runoff-farm 1984-1985**

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It was a hot and dry summer day in the Negev desert in 1984. Beer-Sheva bus station was busy and the air filled with all kinds of noises and odors. Soldiers waited at bus gates, talked, smoked, spat sunflower shells on the ground, drank softdrinks, or ate falafel. As soon as a bus approached, soldiers travelling to their army bases and residents of Negev villages pushed to open doors of the luggage compartments beneath the buses to stow their luggage and boarded then. The bus floors were quickly covered with army bags which didn't fit into the compartments and forced passengers to stumble to their seats. Smokers sat in the back near open windows. Strangers travelling together started talking about their lives which was a regular custom in these days.

“Ask the driver to stop at the farm”, I was told at the ticket counter when asking for a ticket to an experimental farm located at the foothills of the ancient Nabatean city of Avdat. It was the first time I travelled to the Negev highlands located about an hour bus-drive southwards from Beer-Sheva. Drought adapted shrubs were scattered in the landscape at low densities. Bedouin tents were visible here and there. Goats, sheep and dromedars were roaming in the desert with their Bedouin herders. The bus passed three Kibbutzim and the Jacob Blaustein Institute for Desert Research of the Ben-Gurion University on the way until it reached the scenic Zin valley. Driving around its head, the bus finally entered the valley of Avdat, passed the official bus stop at the Nabatean city and came to a halt after 500 meters. The driver turned his head towards me, said “The farm!” and opened the front door. I thanked him, stepped out and was immediately immersed into hot air under a blazing sun. The bus continued to Mitzpe Ramon with a roaring engine until it was not audible anymore. There was no wind. It became totally silent.



Cave ruins and acropolis of the temple of Oboda I at the ancient Nabatean city of Avdat (1<sup>st</sup> century BCE – 7<sup>th</sup> century CE)

There are many people who perceive deserts as inhospitable, boring, and dusty places where humans have no business. Over the years I got the impression that a significant number of them are afraid of this silence. Away from the hustle in cities and economic frenzy, people are intensively confronted with their own selves under this condition. Who am I? What do I want? What is my future? These are challenging questions one cannot escape in deserts, provided one is open to them.

I perceived my first experience with desert silence at Avdat as impressingly peaceful and wondered how my future at this unfamiliar place might look like. Action Reconciliation and Peace Service, a German organization devoted to learning lessons from the Nazi past, sent me there to explore whether I could work for Professor Michael Evenari who founded the experimental farm in the late 1950s. Born 1904 in Metz as Walter Schwarz, he visited schools in Berlin and Marburg, studied botany at the University of Frankfurt, worked as a scientific assistant at the University of Prague and almost completed his “Habilitation” (i.e. German university teaching license) at the University of Darmstadt. The rector expelled him from this position on April 1st, 1933, the day when Nazis started boycotting Jewish businesses in Germany. He continued his studies in Palestine, fought as a soldier in the Jewish brigade of the British Army during World-War II, became a professor of plant ecology at the Hebrew University of Jerusalem, and helped to develop its Mt. Scopus campus as a Vice-President and Dean of its Faculty of Natural Sciences. He became world-famous for agro-ecological studies in ancient Nabatean runoff-farms he and colleagues reconstructed in the 1950s. Professor Evenari belonged to the friendship circle of Action Reconciliation and Peace Service in Israel and always had volunteers from this organization on his farms since the late 1960s when diplomatic relations between Israel and Germany were established.



Avdat farmhouse, a terrace cultivated with almond and peach trees on the left, and two ancient terrace walls in the forefront

I saw a dirt-road to a hill with a small wooden barrack and a stone house after my eyes got used to the strong sunlight. That must be the farm, I said to myself. Dogs started barking when I started walking towards it. Another volunteer from my organization appeared, calmed them down and welcomed me. The plan was that I replace him after his service if Professor Evenari accepted me as a volunteer. It was not difficult to convince him. After three years of agricultural work in three kibbutzim, two moshavim and two German farms, I was in good physical shape at the age of 21. My grandfather Friedrich Langensiepen was a protestant priest, a member of the Nazi resistant movement “Confessing Church“, and close companion of Paul Schneider who was tortured and murdered by Nazis in the Buchenwald concentration camp. My childhood and youth were shaped by countless stories our family told about this terrifying time. I was therefore sufficiently sensitized for discussions about the Nazi past.



An ancient runoff farm in the Negev highlands which diverted floodwater from an adjacent dryland river into its terraces and harvested rainwater from hills on the right

Runoff agriculture relies on infrequent rainfalls during winter months which are “harvested” from hillslopes using conduits and terraces which had been carefully arranged and dimensioned based on hydrological principles. Early runoff farmers were ingenious in designing them more than 2000 years ago without the tools and knowledge we have today. In Avdat farm, several conduits transported water from two watersheds to different sections of a terrace system where it was ponded to a maximum height of 30 cm using spillover weirs to control the amount of water allocated to each terrace. There were about two rains per year when enough water could be harvested. Plants hence received an equivalent of about 600 mm of rain per year. Soils were fertile and needed to be tilled as soon as possible after each rain to prevent capillary water loss through evaporation into the atmosphere. The terraces were mainly cultivated with perennial trees such as pistachios, almonds, peaches, olives, and carob which could withstand years with absent rainfall.

Grapes were cultivated for wine production in ancient times. Dryland adapted crops such as chickpeas, durum wheat or millet were grown in smaller areas in years with sufficient rainfall. Runoff farmers had several options for designing their farms, such as selecting suitable catchment areas, dimensioning water harvesting sections, and sizing terraces. Any mistake was punished relentlessly. Terraces and conduits were eroded when greedy farmers dimensioned the water harvesting areas too large. Trees and crops wilted if they were dimensioned too small. Some ancient farms had division boxes which partitioned harvested rainwater to different terraces. Management was important too. Conduits and terrace walls had to be checked before and after each rain and repaired, if necessary. Tree and crop selection had to fit to the hydrological conditions of the farm. Knowledge about plant adaptive responses to drought was an advantage. Wrong choices led to yield reductions or losses.

Further details about the history and practices of runoff-farming cannot be given here for space reasons. The point I want to make is that ancient runoff-farmers had no other choice than to live with nature if they wanted to harvest trees and crops. The fact that some of their farms were operated for 2000 years by different cultures of the Negev proves that they understood and respected nature's limits and principles well. Experiencing agricultural practices in the North and South, I am flabbergasted how little we care today. Why?



A conduit for collecting runoff water from the hill-slope on the left and transporting the harvested rain to a farm terrace



A terrace filling with harvested rainwater

A typical day in Avdat started at early dawn with hee-haws from a donkey owned by Abdallah, a Bedouin from the region who guarded our farm at night. If we didn't wake up immediately, we woke up a little later from a constant pounding noise. Abdallah had roasted green coffee beans in a tank ammunition shell on a small wood-fire in the meantime and pounded them to powder using a metal rod. That was the time we really had to get up. We were about four volunteers for most of the time. We smelled a mix of dew, bonfire, coffee, and desert herbs when exiting our rooms in a wooden barrack, exchanged a few words with Abdallah, took his gun, went to the stone house to store it and then into the kitchen for having coffee as well. Professor Evenari had his room next to an adjacent library with a large wooden table which served as a meeting place and occasional microscoping or root-counting laboratory.

David, our farm manager from Dimona, met us in the kitchen and discussed daily work tasks with us which included standard runoff-farm operations and scientific studies on plant-water relations. We worked from 6 to about 8 am when breakfast was served by our cook. The kitchen was occasionally crowded with guests from the ecology department of the Hebrew-University who carried out desert-ecological studies in the vicinity of the farm, or from the University of Bayreuth which operated a large lysimeter experiment on grapevines within the framework of a collaborative research center on flux control in biological systems. Main work was carried out between 9 am and 2 pm, except when daily cycles of plant responses to their physical environment were measured from pre-dawn till night. We ate a light meal after work, relaxed for about an hour and then met around 4 pm in the library when Professor Evenari was on the farm and gave seminars about any imaginable field of science and humanities. One time we discussed how an ideal society could be constructed, another about the ecology of desert shrubs, or the history of the Nabateans, Israelites, Romans and Byzantines, or the Israel-Arab conflicts, approaches of measuring leaf gas-exchange which were partially invented on the farm, or the relation between Jewish and Christian religions, or Bedouin culture and so forth and so on. Adolf Hitler's "Mein Kampf" was standing in the library and we were introduced to it by Professor Evenari. He wrote his memories "Und die Wüste trage Frucht" (in German!) during this time and provided glimpses into his life (English translation available: "The awakening desert"). Scientists from around the globe, practitioners from the South studying water harvesting methods, foreign politicians, students, development workers, tourists, international television, pilgrims, religious communities of any sort, and hikers visited the farm to meet Prof. Evenari and discuss what they were concerned about. Avdat was a kind of "academic inn", to phrase it in the words of Leopold Kohr, in which all kinds of people could meet in an inviting intellectual atmosphere, openly discuss in mutual appreciation and deepen their understanding about a very wide range of topics. After 33 years of studying and working at several universities, I think that we need to institutionalize such inns as additional breeding grounds for creative, integrative thinking that is required for solving the burning problems of our times.

The seminars usually lasted from 4 till 6 pm after which dinner was served and discussions continued. We retreated then, lit a bonfire, conversed, watched the stars, milk-way and shooting stars, undisturbed from light pollution, and gradually became tired and quiet. Prof. Evenari played recorder in his room. Abdallah came. Crickets were chirping. Snakes were occasionally chasing mice in the attic of our wooden barrack when we fell into deep sleeps until another day began...