

*Rafi Mokady – In Memoriam**

To us he was just Rafi, and that embraced everything. No one who knew him is able to analyze the reasons for his being what he was, or to draw a verbal portrait of the person, the colleague, the teacher, the scientist.

Many graduates of the Faculty of Agriculture at Rehovot recall Rafi as coordinator of the Soil Science Laboratory. Throughout the two terms of this course, the Laboratory was their focal point: this was where you were at the core of things, made maximum use of accumulated information, and felt yourself a full-fledged member (albeit a junior one) of the worldwide family of scientists. In this Laboratory Rafi was the moving spirit. Before every class, regardless of how many times the course had been repeated, he would call the assistants together, raise topical problems and discuss them until there was no doubt left regarding the scope and content of the theme. He had the gift of freshness of thought, thanks to which the subject matter was presented in a manner conducive to independent thinking and initiative on the part of the students. Presentation was varied every year, new exercises were added, experiments were reproduced in class, and no significant contribution was overlooked in keeping the course up to date.

Strict with himself, Rafi did not spare his students and drove them to their maximum efforts. He had little use for those who failed to meet his requirements, but on the other hand he encouraged and helped those who met his severe criteria. Many of the present generation of Israel's soil scientists took their first steps in that course and owe him a great debt for his devoted guidance and assistance.

Rafi's Ph.D. thesis dealt with lime-induced chlorosis, a phenomenon of outstanding agricultural importance in Israel's calcareous soils. It was an impressive frontal attack on the problem, characterized by breadth of outlook and scientific curiosity. The study comprised a whole spectrum of aspects, from a severely objective evaluation of field data to an original system for determining oxygen and CO₂ concentration at the root. The areas covered ranged from classical soil subjects to problems in physiology, biochemistry, soil microbiology and root micro-environment.

* From **The Mokady Memorial Issue** of the **Israel Journal of Chemistry**, Vol. 6, No. 3 (1968) pp. vii–xii

With the same strict objectivity, tests failing to produce unambiguous results were rejected, and only data screened through the same fine sieve were used.

Having completed his doctorate, Rafi had doubts regarding his future course, and after some consideration opted for the relatively new field of physical chemistry of the soil. This decision seems to have been motivated by his feeling that the more biological fields of soil science cannot achieve the same degree of unambiguity as their physical counterparts, and that the field of his choice holds a promise of breakthroughs and solutions to topical problems. One such problem, of which Rafi was especially conscious at that time, and which he followed throughout his later career, was water and soil salinity in Israel.

Lacking previous systematic grounding in physical chemistry, he now took up such subjects as general thermodynamics, thermodynamics of irreversible processes, and flow processes. The output of these studies was such that colleagues with whom he had previously had a common scientific language often found themselves left far behind.

At the research institute where he worked he undertook a project on salt migration in unsaturated soil. As he had done earlier as a teacher, he collected promising students, organized them into a unified team, and urged them to progress. Typical of him is the fact that only a fraction of the work carried out on that occasion has been reported: he would not publish material of whose absolute value he had doubts.

After a period of self-training in physical chemistry of the soil, Rafi went to the U.S. on a post-doctoral fellowship, and studied at Purdue University with Dr. P.F. Low. Following two years devoted to comprehensive study of the exact sciences he came back, more accomplished and thorough than before, and took up an appointment at the Technion. A firm handshake for old acquaintances, a brief get-together with new colleagues, a visit to the laboratories, and he was down to work with his usual vigour and efficiency. The beginning was not easy, as proper laboratory equipment and technicians were in short supply, but this did not hamper Rafi who undertook to set up a laboratory for physical chemistry of the soil. His insatiable scientific curiosity, his inexhaustible store of ideas and his enthusiasm fired us all, and we would engage in

* From **The Mokady Memorial Issue** of the **Israel Journal of Chemistry**, Vol. 6, No. 3 (1968) pp. vii–xii

endless discussions on water structure in clay or on the existence of a general potential. Debates and discussions are, however, no substitute for scientific verification; facts must be established and experimental results must have theoretical grounding and rigorous mathematical proof. Here Rafi's supreme virtue – his uncompromising integrity – manifested itself. He approached every problem without prejudice and tackled it at the roots from all possible sides, seeking an unambiguous answer.

With painstaking thoroughness, he collected every publication related even remotely to his fields of interest. He read them all, searched for likely openings for a breakthrough, and then attacked on a wide front. His store of learning was open to all, and he delighted in associating his colleagues with his experiences and discoveries and sharing his knowledge with them.

His main field of research became migration of ions and salts in porous media, as part of the problem of salt leaching and fertilizer distribution in the soil profile and such ramifications as an original approach to radio-isotope migration and a basic study of exchangeable cation capacity. Dissatisfied with the conventional electrical double layer theory which fails to account for important observations and phenomena, he strove for complete reappraisal of the picture and broadening of its base, searching for no less than the secret of water as the source of life.

...Rafi was not only a research scientist; he was a teacher and a good one. He would pose problems from his vast store of knowledge, insert the question marks, and urge his students to seek solutions and delve deep. After years of attending his lectures there was always something new and fresh, and even the elementary material was absorbing. In his capacity as adviser to his students he would act with the same energy and vigour, studying their problems and again and again demonstrating his unique approach: problems are merely symptoms, and it is only by going to the root that they can be overcome.