

PROFESSOR LISA HELLER-KALLAI ON THE OCCASION OF HER SIXTY-FIFTH BIRTHDAY



Professor Lisa Heller-Kallai was born in Vienna, Austria, in 1926. As a child, when the Nazis took over Austria, she escaped to Czechoslovakia and a year later, when Czechoslovakia was occupied by the Nazis, she escaped to England. There she received her elementary and secondary education. She studied chemistry in Oxford and received her BSc degree in Chemistry in 1948. In the period 1948–1953 she held a research appointment at Birkbeck College, University of London, where she was working in the field of X-ray crystallography. She received her PhD degree from the University of London in 1951. In 1953 she immigrated to Israel. She first worked at the 'Israel Standards Institute' in Tel-Aviv and from 1955 until 1967 was employed at the 'Israel Geological Survey' in Jerusalem. From that year Lisa has been a member of the Academic Staff of the Institute of Earth Sciences at the Hebrew University of Jerusalem. At this Institute she has been deeply involved in the building and development of courses for undergraduate and graduate students, on chemical-geology, crystallography and mineralogy and on physical methods for the study of rocks and minerals (optics and microscopy, thermal analysis and spectroscopy). Her principal course has been on the physical chemistry of clay minerals, the major subject of her research work. She has been lecturing, conducting seminars and supervising research of undergraduate and graduate students. In 1971 she became a Professor of Geology at the Institute of Earth Sciences.

In the course of her career Lisa has been working in collaboration with several distinguished clay scientists from different centers in USA, UK and France. She has been invited to visit many universities and scientific institutions for lecturing and consulting. She has also been invited to present Plenary and Key-note Lectures in several National and International Clay Conferences.

Lisa has been involved in many scientific subjects. Although her first scientific contribution was to organic chemistry, most other contributions deal with the chemistry, mineralogy or geology of silicates. In London, during the period 1948–1953 she collaborated with Prof. H. F. W. Taylor in the investigation of crystallography of cement minerals and together they published the monograph 'Crystallographic data for the calcium silicates'. In Tel-Aviv, in the period 1954–1955 she collaborated with Dr. M. Ben-Yair (ex-Chairman of the Israel Group for Thermal Analysis) in the study of the interactions between Portland cement and sea water (Mediterranean and Dead Sea) or sodium chloride and sulfate solutions. During the time she was at the Israel Geological Survey, she dedicated much of her time to mapping and studying the clays of Israel and mainly those of Makhtesh Ramon (in collaboration with Prof. Y. K. Ben-Tor, Dr. W. Bodenheimer, Dr. S. Gross and Dr. L. Slatkin) and of Sinai (with Dr. Y. Nathan). She was a pioneer in applying X-ray diffraction techniques for the study of minerals in Israel. In the late seventies she studied (in collaboration with Prof. Z. Aizenshtat and Dr. B. Spiro) the deposition and diagenesis of oil shales in Israel.

Lisa's most important contributions have been the field of physical chemistry of clay minerals, mainly in surface chemistry. In these studies she has elaborated spectroscopic and thermal analysis methods. The few studies which are mentioned here, were chosen to demonstrate her original ideas and significant achievements. In 1962 Lisa collaborated with scientists from the Macaulay Institute, Aberdeen, in studying the thermal dehydroxylation and rehydroxylation of several clay minerals. In the seventies Lisa was a pioneer in the study of Mössbauer spectra of several micas and clay minerals and of organic materials from natural sedimentary environments and by using this technique for the study of oxidation-reduction reactions of structural Fe in clay minerals. At the same time she also studied the thermal reactions of clays with alkali halides and other salts and demonstrated how ions of these salts interact with clay OH groups. Recently she has studied the thermal reactions between calcite and kaolinite together with Dr. R. C. Mackenzie. She also collaborated with Dr. R. Prost in the study of disorder induced by de-intercalation of DMSO from kaolinite. In the last few years her research has been devoted to the thermal evolution of different gases from natural clay minerals by the EGA technique (together with Dr. I. Miloslavski and Prof. Z. Aizenshtat). In these important geochemical studies she identified the evolution of unexpected gases from natural clays from various sources, and followed reactions of these volatiles with calcite.

My collaboration with Lisa in the study of organo-clay complexes and of clay organic interactions started in 1960, while I was a PhD student. We continue this collaboration even today. Until now we have studied the adsorption of aliphatic and aromatic amines by montmorillonite saturated with different exchangeable cations and demonstrated the effect of surface acidity on the adsorption mechanism. We have also studied the adsorption of fatty acids by different clay minerals and of several other compounds and the effect of aromaticity on the organo-clay complex. The collaboration with Lisa has been a good schooling for me and I am grateful to her for teaching me how one should not be overwhelmed by one's own ideas read the latest literature, listen to other people and be open to new ideas. I also learned from her to treat the experimental results and their analysis with great caution. Her ability to write articles very concisely has always been a quality that I have envied.

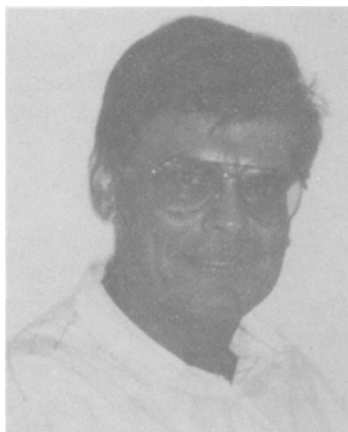
In 1965, together with Prof. Y. Ben-Tor, Dr. W. Bodenheimer, Dr. M. Gal and Dr. M. Ben-Yair, she founded the Israel Society for Clay Research, and in 1966 she was one of the organizers of the International Clay Conference in Jerusalem. She was the Editor of the Proceedings of two International Clay Conferences, the one in Jerusalem, 1966 (two volumes) and the one in Tokyo, 1969 (two volumes). For many years she has represented Israel in the activities of AIPEA (International Association for the Study of Clays) and in the period 1981–1985 served as the President of this association. In 1980 she was one of the founders of the Israel Group of Thermal Analysis and since then has been an active member of the Group. She was a member of the Organizing Committee of the 9th ICTA Congress in Jerusalem in 1988. For her scientific contributions and for her contribution to scientific life in Israel, she was honoured in 1991, during a special evening organized by the Israel Clay Society in collaboration with the Israel Group for Thermal Analysis, with a Plaque of the Israel Clay Society.

In all her travels, Lisa is accompanied by her husband, Zechariah Kallai, who himself is a professor of biblical archeology at the Hebrew University. Thus, Zechariah has facilitated the introduction and friendship of many clay scientists from different countries. Lisa also accompanies her husband in all his travels in Israel and outside the country. Over the years, Zechariah, in his own way became expert in clay and pottery science and Lisa became expert in archeology. She even did some chemical-petrological research on Early Bronze Egyptian pottery from Canaan. The Kallais' interests are multitudinous. They both have a rich knowledge of literature and Jewish philosophy and are interested in music and theater. When the Kallai family organizes a party, the conversation of participants concentrates on many different subjects, but hardly ever on scientific subjects.

On the occasion of her sixty-fifth birthday, the Editorial Board of the Journal of Thermal Analysis has decided to dedicate a special issue in recognition of her distinguished contribution to thermal analysis of clay minerals and sediments. I am grateful to the authors who contributed papers for this special col-

lection. Although the papers were invited, each nevertheless was reviewed by two specialists. I am grateful to all the referees for their thorough reviews, and especially to those who were kind enough to review more than one paper. I am also grateful to Mr. Leslie Weisenbaum, the Secretary of the Department of Inorganic Chemistry of the Hebrew University, who carried out most of the secretarial work connected with this special issue.

We wish Prof. Heller-Kallai continued success in her endeavours and very many more years of activity in the thermal analysis of clay minerals.



Shmuel Yariv

Guest Editor of this Special Issue

Department of Inorganic and Analytical
Chemistry, The Hebrew University,
Jerusalem, Israel