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Obituary

Jack Zussman 1924–2024

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On 30th August 2024 we said goodbye to a giant of the mineralogical world, Professor Jack Zussman – he reached the wonderful milestone of his 100th birthday and was blessed by good health throughout his long life. Those who knew him describe Jack as genial, unassuming, unflappable and, above all, generous with his time for everybody he met. Despite his stature as a mineralogist, he never seemed happier than enabling others to succeed.

Jack was born in 1924 in East London and was educated at the Cooper's Company School in Bow. At the outbreak of WWII, the School was evacuated to Frome in Somerset where Jack stayed until being called up in 1943. He served in the Navy and was posted as a radar mechanic to the Destroyer HMS Caeser in 1944 which undertook operations off Norway and support for winter Arctic Convoys to Murmansk – leading to Jack being awarded a 'very tardy' Arctic Star in 2013, and the Soviet Medal of Ushakov. Jack was a lifelong supporter of Tottenham Hotspur football club and the young Jack frequented the terraces at White Hart Lane.

Taking up a place at Cambridge in 1946, Jack obtained a Physics MA and joined the Cavendish Laboratory then run by Nobel Laureate, Lawrence Bragg; Francis Crick and James Watson were also contemporaries. Using X-ray diffraction, his PhD concentrated on the structure of organic compounds, including nucleotides; his first publication in 1951 was on the amino acid, hydroxyproline. He obtained a PhD in 1952 and in the same year was appointed to a lectureship in mineralogy and crystallography in the Geology Department at Manchester University, there undertaking pioneering work on the determination of mineral structures. His first mineral structure publication came in 1953, on serpentine, with a further 12 papers focused on that group of minerals, along with amphiboles and pyroxenes. In 1962 Jack was appointed to a Readership in Oxford University but by 1967 he was back in Manchester as Professor of Geology, and Head of Department, holding these posts until his retirement in 1989. Jack worked with colleagues at Manchester, continuing to develop and deploy X-ray Diffraction techniques and electron microscopy in mineral-structure determinations, with a focus on amphiboles, pyroxenes and sheet silicates, and with special emphasis on asbestiform amphiboles. He presided over a department with an international reputation for crystallography and experimental petrology.



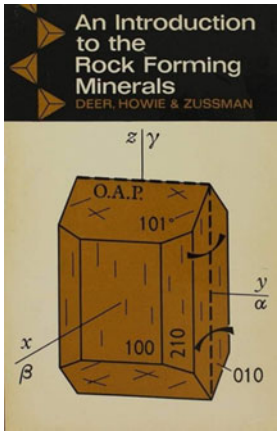
All geoscientists and the wider scientific community will always associate Jack with the seminal, standard reference works on the rock forming minerals. Co-authored with Alex (W.A.) Deer and Bob (R.A.) Howie, an extraordinarily rigorous account

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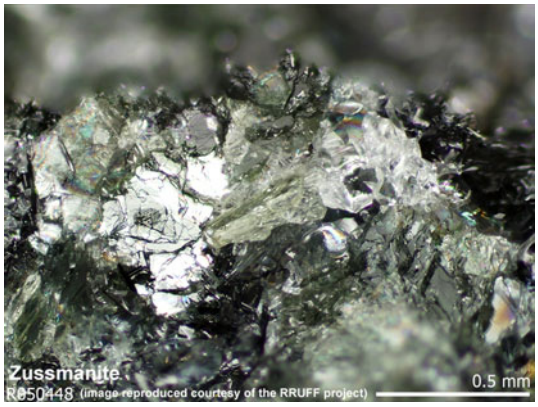
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of the structure, chemistry and optical properties of the minerals was published in five volumes between 1962 and 1963, covering Ortho- and Ring Silicates, Chain Silicates, Sheet Silicates, Framework Silicates and Non-silicates. These volumes were the first 'in depth' compilations of the structure of minerals, collated at a time when gathering information was a real challenge. Few, if any, mineralogical investigations at the time would not have leant on these books for information, and they are still very relevant today. The latest editions comprise a massive 11 volumes and include editorial and author contributions by J.F.W. Bowles, L.L.Y. Chang, M.E. Fleet, D.J. Vaughan, W.S. Wise and M.J. Wilson.



Every student of mineralogy will be familiar with the condensed version of these volumes, *An Introduction to the Rock Forming Minerals*, colloquially and affectionately known as DHZ. The first edition was published in 1966 providing a bible of mineralogy for geoscience students and researchers. An expanded edition of DHZ appeared in 1992, and, as the result of developing analytical techniques, a revised third edition was produced by the Mineralogical Society in 2013. So far, more than 3500 copies of this version have been sold all around the world.



In recognition of his work on the DHZ series, mineralogist Professor Stuart Agrell named a newly described blueschist-facies phyllosilicate mineral after Jack – *Zussmanite*, formula $K(Fe,Mg,Mn)_{13}(Si,Al)_{18}O_{42}(OH)_{14}$. Agrell found two other rare new mineral species (inosilicates) at the same location in California and named them Deerite and Howieite. In the period after the initial publication of the Zussmanite paper, Jack and a colleague published a revision of the crystal structure!



As rocks started to return from the moon in 1969, Jack was a Principal Investigator in a group based at Manchester which was selected by NASA to examine lunar samples. A 'soil' sample collected by Neil Armstrong was displayed in Manchester Museum three months after being lifted from the Sea of Tranquillity. The group published on the petrology of the basaltic rocks brought back by Apollo 11, 12 and 14, as well as focusing on the opaque lunar minerals and olivine in the Apollo 12 basalts from the Ocean of Storms.

During the 1970s and 80s, Jack increasingly focused his energy on running the Geology Department at Manchester and was also Dean of the Faculty Science (1980–1982). As part of the national Earth Sciences Review in 1988, Jack presided over a major expansion of the Department, making several key appointments that transformed it to a wider and very successful Earth Sciences unit.

Jack was President of the Mineralogical Society of Great Britain and Ireland from 1980–1982, received Honorary awards from the Mineralogical Society of Poland in 1979 and a Doctorate in Geology from the University of Athens in 1992. He served on committees of the Royal Society, the British Council, the British Crystallographic Association, Commonwealth Scholarships and was Chair of the NERC Geological Sciences Research Grants Committee.

After his formal retirement, Jack continued to frequent the Department of Earth Sciences at Manchester and worked quietly and tirelessly on the revisions of DHZ and those 'Rock Forming Minerals' volumes. Over the years he worked vigorously for the Jewish Community of South Manchester, being Chairman of the Reform Menorah Synagogue, developing education programmes, working on interfaith committees and twice receiving the great honour of by being asked to be a Chatan Torah at Simchat Torah. Jack was very proud of his expanding family, he married Judy in 1960 and has three children (David, Susie and Sarah), eight grandchildren and two great grandchildren.

Mineral science has lost the last of the DHZ triumvirate but Jack Zussman has left an indelible mark on the field of mineralogy.

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