

Alan James Wells, M.A., Ph.D., F.G.S., Geologist, 1926-2024

This obituary was compiled by Alan Wells's daughter-in-law, Caroline Wells B.A., F.S.A., April 2024.



During his geological life, three key breakthroughs made by Alan Wells included the discovery of recent dolomite forming in the Persian Gulf, the recognition and mapping of the Zagros Crush Zone between the Eurasian plate and the Arabian plate, and, as a young graduate, identifying the sapphire-bearing strata in the mountains of Ceylon. In addition – and others might rate this more highly - he attained important positions of leadership within Royal Dutch Shell and associated partner companies around the world.

Alan Wells, born 1926, died 31st March 2024, was educated at Stowe School; King's College Cambridge (1948-51), and Durham for a Ph.D. under Professor Kingsley Dunham. Alan joined Shell in The Hague and was a field and exploration geologist, eventually becoming the Head of Geological Research at The Shell Exploration and Production Laboratory.

A family holiday to Wales first sparked Alan's interest in rocks. As a child, the eldest of five children growing up in Shipton-on-Cherwell outside Oxford, his independence of thought was noted.

Leaving school just as the War ended Alan first joined the RAF; after initial flying training he was posted as a meteorologist to Ceylon. Resuming education in 1948 he enjoyed Cambridge, rowed for King's, continued private flying, and as President of the Sedgwick Club in his final year he organised a field trip to the French Alps. His father anonymously donated the cost of the coach. Alan has for years been a benefactor of student fieldwork for the department of Earth Sciences.

After graduating he returned to Ceylon in 1952 to research the source of the local sapphires, locating gem-quality minerals in igneous intrusions in metamorphosed sedimentary rocks high in the mountains south-west of Nuwara Eliya. (Wells 1956). He then began his Ph.D. studies mapping the geology between Scotch Corner and the Dales near Richmond, Yorkshire. (Wells 1955, 1955, 1957). He loved the physical and outdoor experience and the intellectual challenge of fieldwork.

His career with Shell took Alan to Libya for two years, completing a detailed geological map of the Fezzan area in the south. In fact this was the first map of any kind of this area, covering 40,000 sq.km and completed using astronavigation by the dazzling night sky and time signals via short-wave radio transmission from Washington DC. Later mapping and satellite images suggested his maps had been accurate to within 2%. This work was written up in five Shell reports between 1957-1959.

After writing a paper on the different types of sedimentation and their relevance to the petroleum industry (Wells 1960) he then concentrated on carbonate reservoirs, with a study of Devonian limestones in Belgium. He began to challenge an existing adherence to a Bahamian (Jurassic) model of explanation. These ideas took him to Kimberleys of Western Australia, and six weeks in the field amongst Upper Devonian reef complexes such as Windjana Gorge, the Lennard Shelf and Canning Basin being researched by Phillip Playford. It was mid-winter, but perfectly dry weather. The team of two slept under the stars, found dead wood for camp fires and worked their way along river gorges, with all the original reef formations exposed by the erosion of water and wind.

From Australia, straight to the Rocky Mountains in Canada and fieldwork with Shell Canada staff being conducted on horseback, which he found a good slow way to travel to observe the outcrops. The team found spectacular platform margin exposures with many variations of porosity and permeability, leading to key criteria for identifying oil prospects worldwide.

He returned the following year when a helicopter was brought into use to drop the geologists on knife-edge ridge tops.

Between the two Canadian trips Alan joined a Shell team doing research on the Gulf coast of Qatar. With Leslie Illing, his fieldwork took place in the *sabkha* environments on the Qatar coastline. The selected site was a several-miles-wide flat expanse of soft calcium-carbonate mud, sparkling with evaporitic minerals, covered by only the highest spring tides, with minimal annual rainfall but frequent dust-storms. In early April, afternoon temperatures of the mud could be above blood temperatures. Camel skeletons protruded. One day the team were caught out there while golf-ball sized hail stones hammered down leaving ice covered pools. The team dug pits across the *sabka* to collect samples but Alan was recognising similarities in structure with the Rocky Mountains formations he had seen not long before, and utterly different from the prevailing opinion based on Bahamian formations.

The team returned to the Gulf the following year to check the earlier hypothesis. It was confirmed and corroborated in The Hague by geochemical analysis and the sedimentology of cores. The important finding was that mineral dolomite (a double carbonate of calcium and magnesium) was being formed in the evaporitic environment of the *sabkhas*. Alan submitted a short article to Nature and so the first ever discovery of modern dolomite was announced to the world. (Wells 1962) (also Illing and Wells. 1964; Illing et al., 1965).

Now having established a respected reputation as a field geologist and researcher, Alan's Shell career took him back to various countries in the Middle East. His polite and un-abrasive manner, and diplomatic skills were a great asset. Based in Tehran he was Senior Geologist with the Iranian Oil Operating Companies ("The Consortium"). He led a team studying the prospectivity of various groups of carbonate rocks in the Zagros mountains, southwestern Iran, with their associated sedimentological properties and reservoir potential.

Coincidentally, whilst in the Fars Province east of Shiraz, Alan and his Iranian colleague made a contribution to tectonic studies when they identified the exact boundary between the crumpled rocks of the Arabian plate and the older more resistant rocks of the opposing plate. The narrow zone had been named the Crush Zone by geologists in the 1930 who had not understood its significance. Alan kept the name and identified it for hundreds of kilometres in both directions along the northeastern margin the high Zagros. It was reported to the Consortium in 1968 and published in the Geological Magazine (Wells 1969).

After several years in Iran, Alan and his wife Yvonne took a sabbatical year, with travel in eastern Africa, joined by their teenage children Alison and James during the school holidays. Alan re-joined Shell and was based in The Hague, followed by years in Ankara, Turkey, as Exploration Manager.

Another overseas posting was Oman where his position was Exploration Manager of Petroleum Development (Oman). Here he found the first evidence in the Middle East for a Late Palaeozoic glaciation on Gondwana. The oil reservoir was found to be in sandstones associated with the glacial till. Another find was a deep and widespread layer of salt, probably of Cambrian or even older age, potentially sealing and capping lower oil accumulations.

It was after this last posting that Alan returned to the Hague as Head of Geological Research at the Shell Research Laboratory. His years of foreign postings earned him an early retirement from Royal Dutch Shell but he took a position as a consultant in Calgary for Shell Canada where his research project investigated potential on the Atlantic coastline and offshore. As ever, political and economic considerations impacted the oil industry at this time.

The majority of Alan Wells's research was produced as confidential Shell reports, so not cited here. Alan's final publication was a contribution to the *festschrift* for his former Ph.D. supervisor Sir Kingsley Dunham in which he reflected upon "The Dolomite Enigma, Geology in the real world". (Wells 1986).

Alan James Wells had a highly successful career with Shell. He lived a full and rewarding life in other respects. Having learned to fly with RAF, when at Cambridge he and a fellow student borrowed a Gypsy Moth and flew down to Tunisia and back one Easter vacation. Later in life he took up the skill again and enjoyed flying in Canada, including float planes, and over the foothills of the Rocky Mountains. He and Yvonne (1927-2022) loved travel and explored every country that they lived in, getting to know the people and learning the languages. Yvonne was an exceptional linguist, mastering Dutch, Farsi and Turkish. They were both keen on the archaeology, natural history, and arts and crafts of every country that they lived in. In Canada, where they continued to live for six months every year long after retirement, they travelled extensively by VW campervan through the forests and mountains of Western Canada and Alaska, and western America. In the UK they lived in Haslingfield near Cambridge. For the millennium, Alan donated a sundial laid out on the village green. Eventually age and ill health, particularly that of Yvonne, required a move to a care home in York near their daughter Alison. Alan survived his beloved wife Yvonne by eighteen months but died aged 97 on 31st March 2024. He is survived by his daughter Alison Kitchen, his son James Wells, two grandchildren and three great-grandchildren.

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