From Innamincka to Lake Eyre – Premier's trip, 1961

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Department for Energy and Mining

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Biography: Professor Helmut (Heli) Wopfner
Born in 1924 in Austria, Wopfner served in the German air force as a pilot during World War II. After the war he studied geology at the University of Innsbruck, Austria, completing a PhD thesis. In 1955 he married botanist Dr Inge Wagner and in 1956 they left Europe when Wopfner joined Geosurveys of Australia on a four-year contract to undertake oil exploration work on behalf of Santos. Using ground and air reconnaissance, Wopfner and Dr Rudi Brunnschweiler produced the first structural contour map of the entire Santos licence area in South Australia and Queensland. Published in 1958 in the *AAPG Bulletin*, the map led to the partnership between Santos and the American independent, Delhi Tailor Oil Corporation. In 1960 Wopfner joined the Geological Survey of South Australia and undertook many arduous field trips, often with Inge and their children, into the desert to explore the geology of northeastern South Australia and the Northern Territory. In 1962 he was promoted to Senior Geologist in charge of the newly created Petroleum Geology Section where he was instrumental in ensuring that Delhi–Santos followed up gas shows in Gidgealpa 1 with a second well, Gidgealpa 2, which discovered the Cooper Basin hydrocarbon province. In 1973 Wopfner resigned to join the University of Cologne, Germany, as Professor of Applied Geology where he focused on the economic potential, the tectono-sedimentary facies and the paleoclimatic development of Permo-Triassic depositional sequences of Gondwana and Gondwana-derived terranes. Prior to leaving Australia, Wopfner was elected a Distinguished Member of the Petroleum Exploration Society of Australia and in 1973 was awarded the Sir Joseph Verco Medal of the Royal Society of South Australia. In 2001, on his 75th birthday, *Contributions to geology and palaeontology of Gondwana in honour of Helmut Wopfner* was published. Although well into his 90s, Wopfner continues to document the history of the early days of the petroleum sector in South Australia through the Department for Energy and Mining's Report Book series. Sadly Inge passed away in 2016 and her descriptions of field trips have been included in some of the reports. More information and selected publications are given on the Petroleum website.

WARNING: *Aboriginal readers are warned that this report may contain images of deceased persons.*

Cover photo: A well-vegetated sandy hummock on the flood plain near Kanowana ruins. (Photo 418114)

FIGURES

From Innamincka to Lake Eyre – Premier's trip, 1961

Heli Wopfner

1960, the first year of my employment by the South Australia Department of Mines, had been dominated by special assignments and regional reconnaissance (Wopfner 2020), but towards the end of the year I was finally attached to the Regional Mapping Section of the Geological Survey of South Australia. Thus, in May 1961, I was mapping on the Cordillo 1:250 000 mapsheet, assisted by Dr Bryan Forbes. We were trying to fill in the gaps which had not been covered during the structural mapping and drilling campaign of Santos in 1957.

We set up camp at Providence Dam, about 60 km north of Cordillo Downs homestead, but before starting with the actual mapping we went across into Queensland to visit the well site Buckabie 1, drilled by Phillips Petroleum Ltd about 60 km northeast of Quilpie. I had been invited to visit that important location by Dr Joe Tanner, exploration manager of Phillips Petroleum Ltd. I met several of my old American acquaintances from the Innamincka/Betoota operation which assured us free access to information on the drilling results of the well.

Back in the Cordillo area we commenced our job on the southeastern limb of the Cordillo Downs anticline, south of Mount Howie (Fig. 1). 1957 we had relayed on the aerial observations provided by Rudi Brunnschweiler and me from reconnaissance flights in the Sokol aircraft. During this visit to Mount Howie I found a current bedded sandstone full of shale pebbles of reworked Winton Formation, above a channel-like unconformity at the top of the underlying Late Cretaceous Winton Formation. Apparently, it was older than Tertiary thus I called it Mount Howie Sandstone (Wopfner 1993). Further south, on Nilpie Nilpie Creek we came across natural springs which issued from a thick cover of a laterite formation and supported a permanent waterhole (Wopfner 1961). We were investigating the thick laterite deposits which rested unconformably on the east-dipping Cordillo Silcrete at Haddon Downs when we received a new order from Domex-Adelaide, the Flying Doctor code for the Department of Mines.

We were to go to Innamincka and negotiate a passage from there to the Birdsville Track, crossing the Strzelecki Desert and that maze of flood-out channels of Cooper's Creek south of Sturt's Stony Desert. The Premier of South Australia, Sir Thomas Playford wanted to cross that unpopulated desert country during parliamentary holidays to find out if it would be feasible to carry out a seismic survey to connect seismic information in the Innamincka area with the results of the departmental seismic survey along the Birdsville Track (Wopfner 2020).

The task was not quite as arduous as the crossing of the Kallakoopah the year before, but it certainly wouldn't be a weekend picnic. I requested John Rattus to be sent up in the jeep truck as a support vehicle, bringing the necessary aerial photographs required for navigation through the unpopulated desert and flood-out country between Innamincka and the Birdsville Track. Then, we parked our caravan in the woolshed as suggested by Roger Beckwith, the manager of Cordillo Downs, and proceeded to Innamincka, taking our swags and normal bush-gear with us.

Three days later John Rattus arrived with the Jeep truck fully equipped for a tough and long haul, including sufficient petrol for the truck and our Land Rover. A year ago, John and I had pioneered the path from the Birdsville Track to Oodnadatta, crossing the treacherous salt swamps of the Kallakoopah at the northern end of Lake Eyre. John, a native of Lithuania who came to Australia with his parents as post-war refugees was the ideal companion for such jobs (Fig. 2). Not only was he a competent driver and mechanic but also an experienced bush man and a reliable mate. He always kept his calm no matter how difficult the situation might get and never lost his dry humour.

Figure 1. Map showing camp stops and locations of interest. (Plan 205358-001)

There was a good track from Innamincka Station to the Gidgealpa waterhole, about 61 km southwest of the station. Ron Absalom, the Innamincka manager suggested to follow the northwest channel of the Cooper to Cuttapirie waterhole and then work our way in a southwesterly direction via the Kanowana ruins to the Birdsville Track.

The track to Gidgealpa waterhole was one of these smooth sand tracks which are a joy to travel on in the bush. At the gate of the Innamincka horse paddock I found a perfect Nardoo grinding stone consisting of silcrete and a fitting top-stone nearby. The southern side of Gidgealpa waterhole is edged by an ancient dune, consisting of hard, clay-indurated sand. I drove onto it to gain an overview of the maze of channels ahead. When we stopped to survey the scene, I found several human skulls at surface level revealing an Aboriginal burial place exposed by wind erosion. We even found an almost completely exposed skeleton which was later investigated and documented by Dr Graeme Pretty of the South Australian Museum. Leaving the skeleton undisturbed we continued on our way.

Figure 2. John Rattus in the 1-ton Jeep truck during the 1961 reconnaissance trip.
(Photo 418113)

From Gidgealpa waterhole most of the waters of Cooper's Creek flow northwest, forming a complex channel-system with interspersed sand dunes to Cuttapirie Corner, where the northwest trending drainage changes into a southerly direction before the watershed between the flood area of the Cooper and that of the Diamantina/Warburton is reached. The gradients of these drainage areas are incredibly low, usually around 3 cm/km or even less.

We camped less than halfway to Cuttapirie Corner and proceeded there the next day. The waterhole at the corner was dry due to the drought conditions, so we did not linger and tried to find a way towards the southwest. The country is a mixture of floodplain with intermittent shallow channels, clay pans, and low sand dunes. We headed across some low dunes in a westerly direction when we came across an abandoned rabbiters camp (professional rabbit shooters). The camp and a freezer unit which they had left behind was an abominable sight and stank to high heavens. You could smell the place before you could even see it and after having seen it, I would never eat a rabbit unless I had shot it myself. We followed their track to the ruins of the Kanowana station where we made an early camp. I decided to cook us a juicy pot roast but when it came to thicken the gravy, I found we had only self-raising flour, which is not very suitable to thicken gravy with. However, rice flour is, so using a couple of silcrete grinding stones, John ground a handful of rice grains to flour which was exactly what we needed to make a nice gravy.

We left the track at Kanowana and travelled southwest across flood out country with sandy hummocks (Fig. 3) and some linear sand hills until we reached the Birdsville Track somewhere south of Mungerannie.

Figure 3. A well-vegetated sandy hummock on the flood plain near Kanowana ruins.
(Photo 418114)

1961 was the third time that the Premier, Sir Thomas Playford, undertook an adventurous bush trip during parliamentary holidays. The first one was his visit to the drilling site of Innamincka 1 and the second was to Birdsville for the crossing of the Simpson Desert via the Kallakoopah in 1960. This year the Premier had decided to follow Cooper's Creek from Innamincka to Lake Eyre South. As this was long before the resurrection of the settlement at the original site of the old town, his trip had to start at Innamincka Station.

Lee Parkin, the Deputy Director of Mines, and I had driven to Innamincka to welcome Sir Thomas Playford's party. The party included the Minister of Mines, Sir Lyell McEwin; the Under-Secretary, Mr. G.F. Seaman; the manager of Delhi-Taylor Oil Corp. in Adelaide, Charles Easley; and Warren Bonython from ICI Australia Ltd. The Premier's party arrived at Innamincka air strip on the TAA-Channel Service DC3. We were waiting for them with a Land Rover station wagon and two normal Land Rovers, equipped for long range desert travel.

Before we set off for the crossing, I wanted to show the party the exposures of the Early Tertiary Eyre Formation at the type locality on the north bank of the Cooper, 4 km east of Innamincka homestead. The site is marked on the Innamincka 1:250,000 geological map by the Geological Survey of South Australia (1975). To get there we had to cross some rather nasty run-off gullies and the Premier opined: "These outcrops should be good, to justify the rough trip."
When we got there, I showed them the lower part of the type section and the unconformable contact with the underlying Cenomanian Winton Formation (Fig. 4), including an eye-catching erosional scour, filled with well-rounded pebbles (Fig. 5). The Premier wasn't particularly impressed by "Heli's bloody pebbles" until I pointed out that the same Cretaceous formation and the unconformity with the Tertiary is present 94.5 m beneath the surface of Madigan Gulf, Lake Eyre (Ludbrook 1963), and that the pebbles of black, silicified wood, had derived from trees which had grown in late Jurassic river sands around Tibooburra.

Figure 4. The lower part of the type section of the Early Tertiary Eyre Formation on the north bank of Cooper's Creek, resting unconformably on Cenomanian Winton Formation, east of Innamincka homestead. (Photo 418115)

Figure 5. Erosional scour at Cenomanian/Tertiary unconformity filled with well-rounded pebbles. The black pebbles are of silicified fossil wood, derived from the Late Jurassic sandstone around Tibooburra in northwest New South Wales. (Photo 418116)

After that interlude we left Innamincka air strip shortly after noon on 1/7/1961 and proceeded via Gidgealpa waterhole to a pleasant bean tree flat on the central Gidgealpa flood out, northwest of the waterhole. Next day, on the way to Cuttapirie Corner, Sir Lyell spotted the nest of a wedge-tailed eagle (*Aquila audax*) on top of a coolabah tree (*Eucalyptus coolabah*). Using the bonnet of the Land Rover as a stepping-stone he climbed the tree to investigate the contents of the nest (Fig. 6). When he saw me taking a picture of him, he cried out in a mock-threatening voice: “Don’t you ever dare to show that picture to my wife!”
Well, I had no intentions to do so. Shortly thereafter we came across a firm claypan with a few bean trees (*Lysiphyllum gilvum*), an inviting spot to camp for the night. Next morning, we proceeded via Cuttapirie Corner, the rabbiters camp, Parachirrina Waterhole and Kanowana overflow to Cooyeenina Waterhole for camp and then, following the rabbiters track north, to the dry “Salt Lake” to Kalladeina artesian bore. A reasonable track lead from there to Mirra Mitta artesian bore on the Birdsville track, where our seismic party, working on the continuous reflection line across the Great Artesian Basin (GAB), had established its camp. The Premier and his party stopped briefly at the camp to be informed about the latest development, but then pushed on south for a camp at Cooper’s Crossing.

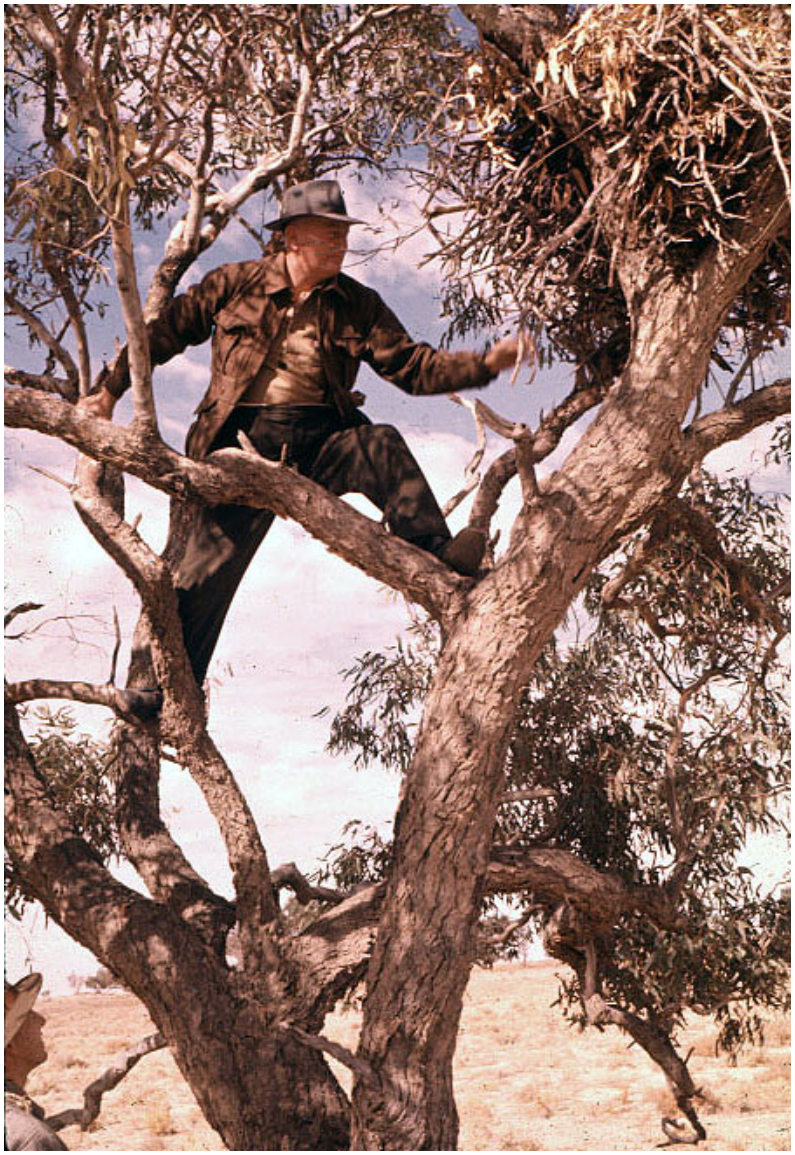

Figure 6. The Minister of Mines inspecting the nest of a wedge tailed eagle (*Aquila audax*) on a coolabah tree, a few kilometres northwest of Gidgealpa waterhole. (Photo 418117)

It was the 4th of July, the eve of the Premier's birthday. This time, Warren Bonython came prepared and after dinner, which I had prepared, he produced a birthday cake which he had brought from Adelaide. It was certainly more attractive and decorative then the cake I had baked, buried in the camp oven the year before (Wopfner 2010). During the ongoing birthday celebrations I think Sir Lyell suggested that we have a birthday shoot, the targets being hats and other head covers being tossed into the air. He was also the first one to throw his hat which I holed with a shot from the 22 rifle. He then wanted to throw the Premier's hat, but he refused, arguing that it was too large and too easy a target. Instead, Lee Parkin had to throw his Basque beret which I also adorned with a bullet hole. Now the Premier was urged again, but he did not succumb and threw an empty tin of Heinz soup which I hit also at the first go. Nobody else wanted to have a go at it after that. The party decided that I was too good a marksman to risk more hats.

The last locality on our itinerary was Madigan Gulf of Lake Eyre, where the Department was drilling several core holes into the sediments below the salt crust to investigate the composition of the brines beneath the crust (Johns 1963; Ludbrook 1963). Lake Eyre bore 20, situated 32 km north from the southern shore of the gulf (Fig. 7) was the deepest of all these holes and had just been completed. It bottomed in Cenomanian Winton Formation at 300 m. According to Ludbrook (op. cit.) it had transected 217.6 m of Winton Formation, 24.3 m of Eocene Sands, 13.4 m of ferruginous clay and 38 m of dolomites and dolomitic marls of the Miocene Etadunna Formation.

Figure 7. Departmental drilling rig at the site of Lake Eyre Bore 20 on Madigan Gulf, Lake Eyre. (Photo 418118)

The drilling rig had been placed on the surface of the lake, consisting of a solid crust of halite, about 25 cm to 30 cm thick (Fig. 8) on which several miniature salt domes penetrated the surface (Fig. 9). It was that very surface on which three years later the last world speed-record for wheel-driven motor cars was established by Sir Donald Campbell.

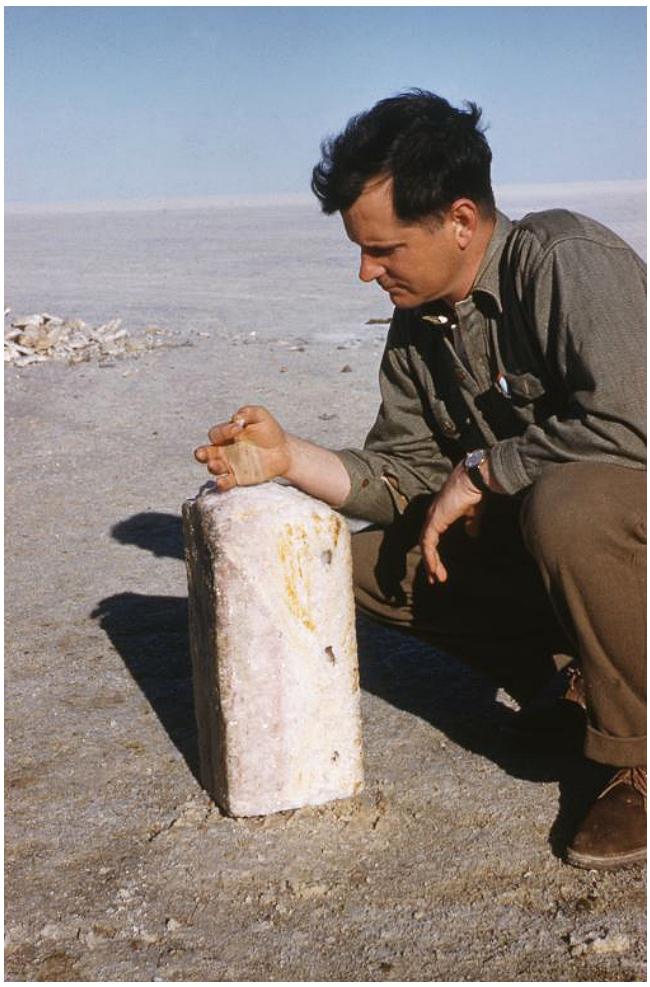

Figure 8. **Charles Easley, Managing Director of Delhi Australia Petroleum Ltd, takes a scrutinising look at a block of halite, cut from the salt crust near the drill site of the well.** (Photo 418119)

Figure 9. **Sir Lyell McEwin at a small, dome-shaped protuberance of the salt crust on Madigan Gulf.** (Photo 418120)

Most of the rivers, like the Warburton or the Macumba, which bring in large volumes of waters when they are in flood, enter the lake at its northern end, whence the water flows south to the lowest point at Madigan Gulf, following the broad, shallow channel of the Warburton Groove (Fig. 10). Cooper's Creek which, like the Warburton, originates in the monsoonal region of the Great Dividing Range in northeast Queensland, deviates around the large structure of the Mount Gason Anticline and therefore enters Lake Eyre about halfway down its eastern shore.

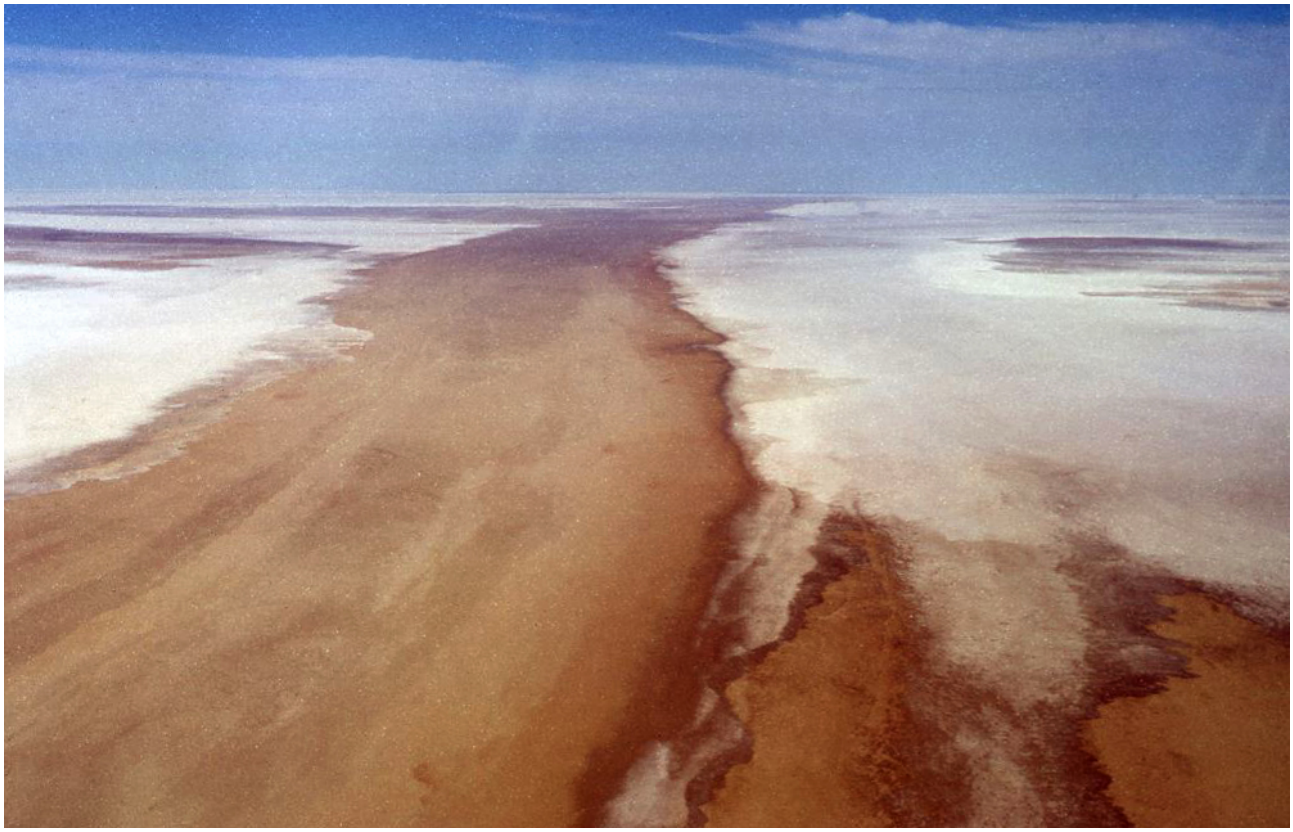

Figure 10. Warburton Groove, which is not covered by halite, looking south towards Madigan Gulf, seen from a position above the mouth of the Warburton River.
(Photo 418121)

The salt crust does not extend to the shores of Madigan Gulf, which has no halite cover, but is separated by Kunoth Shoal – a several kilometres-wide slush zone of polygonal compression ridges of halite and salt-mud (Fig. 11). To bring the drilling rig onto the salt crust a temporary causeway of wooden planks had to be constructed.

We did not spend much time on the lake and started our return to Leigh Creek. On the way back from Marree to Leigh Creek, Sir Lyell told me to detour to Farina. We stopped at one of the few cottages which had survived droughts and other disasters and were cordially welcomed by an elderly gentleman, obviously an old friend of Sir Lyell. After being introduced I was informed that I was to taste some of the best Scotch whiskies ever produced. When I suggested that I was on duty and couldn't partake on strong liquors Sir Lyell's reaction was swift and unambiguous: "Rubbish Heli, if I say so it's alright!"

From Leigh Creek the party returned on the regular DC3 service to Adelaide. On its arrival at the city airport either the Premier or the Minister told the press about the birthday shoot, prompting the article in *The Advertiser* (Fig. 12).

Lee Parkin and I were still on the road driving the Land Rovers back home.

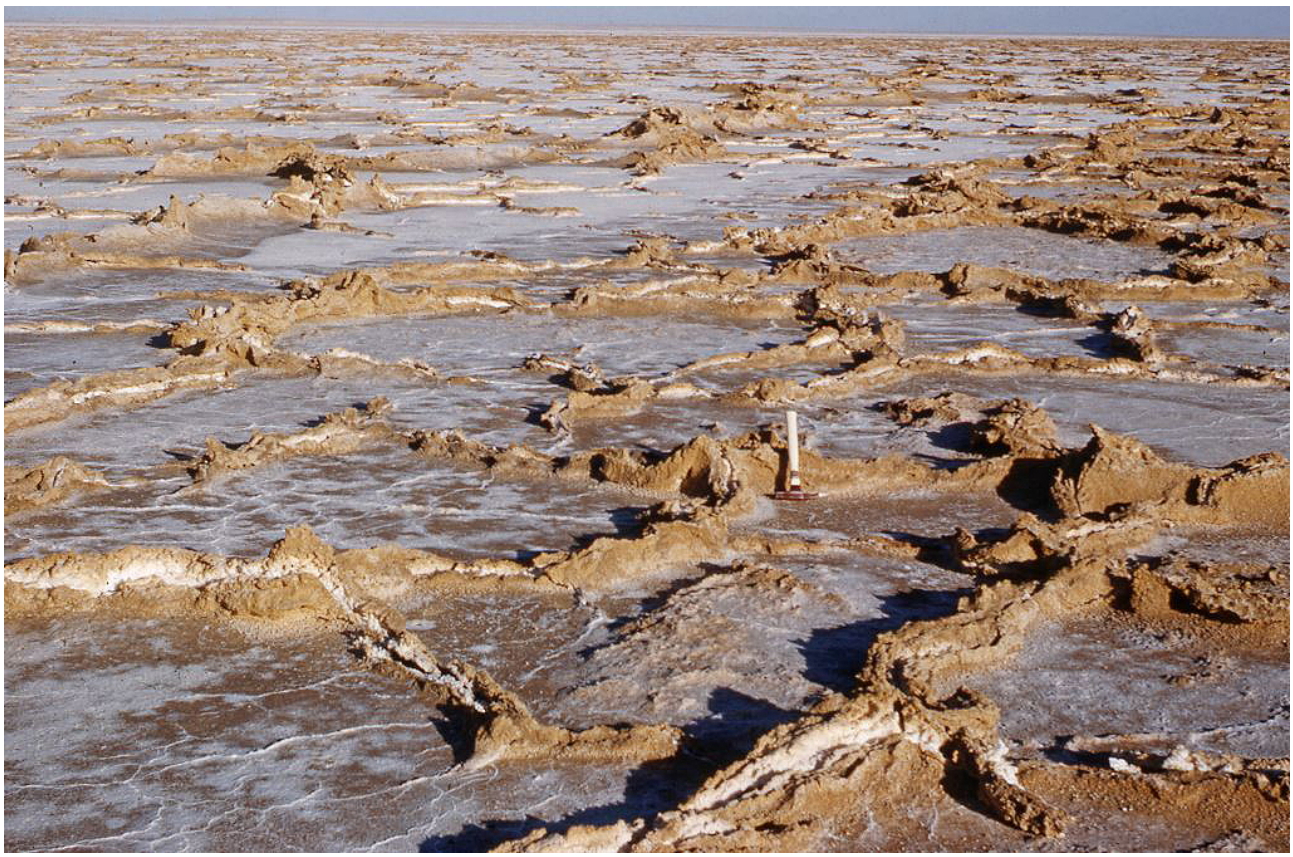

Figure 11. Kunoth Shoal, a slush zone consisting of thin, polygonal salt floats with upturned edges and salt mud. It intervenes between the salt crust and the shore of Madigan Gulf. (Photo 418122)

Mines Minister Has Hole In His Hat

The Premier (Sir Thomas Playford) returned yesterday with a cold and the Minister of Mines (Sir Lyell McEwin) with a bullet-hole through his hat after a week's inspection tour of Mines Department operations in the north-east of the State.

The hat was holed during a "birthday shoot" to mark the Premier's 65th birthday on Wednesday. Sir Lyell McEwin, who is a crack rifle shot, demonstrated the correct method of throwing a hat to produce a moving target.

It was neatly holed by Dr. H. Wopner, a Mines Department geologist.

The party, which included the Under-Treasurer (Mr. G. F. Seaman), the Deputy Director of Mines (Mr. L. W. Parkin) and representatives of the Delhi Taylor Petroleum Company, travelled by four-wheel-drive vehicles from Innamincka along Cooper's Creek to south of Lake Eyre. They returned by air from Leigh Creek yesterday afternoon.

The idea was to find a route for seismic teams to continue their survey.

Sir Lyell McEwin said the survey teams were working down the Birdsville Track at the rate of six holes a day, or 55 miles a week.

Two portable drilling plants were being used to drill shallow holes for explosive charges which provided a shock pattern which was graphed.

By this means a picture of the sub-surface geology was being prepared to help the search for oil.

The Premier will go to Burra today to address an LCL rally.

Figure 12. Article in *The Advertiser* on the return of the party to Adelaide airport.

References

Ludbrook NH 1962. Investigation of Lake Eyre, part 2: Subsurface stratigraphy. *Report of Investigations* 24:71–104. Geological Survey of South Australia, Adelaide. <https://sarigbasis.pir.sa.gov.au/WebtopEw/ws/samref/sarig1/wci/Record?r=0&m=1&w=catno=2033210>

Geological Survey of South Australia 1975. Innamincka. 1:250,000. Department of Mines, South Australia. <https://sarigbasis.pir.sa.gov.au/WebtopEw/ws/plans/sarig1/image/DDD/200471-030>

Wopfner H 1961. The occurrence of a shallow groundwater horizon and its natural outlets in north-easternmost South Australia. *Transactions Royal Society of South Australia* 85:13–18.

Wopfner H 1963. Post-Winton sediments of probably Upper Cretaceous age in the central Great Artesian Basin. *Transactions Royal Society of South Australia* 86:247–253.

Wopfner H 2010. Premier Playford's trip across the Kallakoopah region of the Simpson Desert 50 years ago. *MESA Journal* 58:26–29. Department of Primary Industries and Resources South Australia, Adelaide. <https://sarigbasis.pir.sa.gov.au/WebtopEw/ws/samref/sarig1/image/DDD/MESAJ058029-029.pdf>