The Discovery and History of the Dalgaranga Meteorite Crater, Western Australia: Supplement - Images of the Nininger and Kelly Expedition, 1959.

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SUPPLEMENTARY PAPERS
Australian Journal of Earth Sciences (2013) 60,
http://dx.doi.org/10.1080/08120099.2013.815274


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PHOTOS FROM THE ALLAN O. KELLY COLLECTION - CARLSBAD CITY LIBRARY, CALIFORNIA

The following seven photos are from the Australian leg of the Nininger and Kelly expedition in 1959. They all relate to their survey of Dalgaranga crater. Figure numbers are the catalogue numbers from the Kelly Collection and show the caption text given by Kelly for each photo.

Many of the following photos have a bright spot or bar in the lower right of the image. These are from the original scanned documents in the Carlsbad City Library archive. Versions of these photos without the bars are not available.

“Harvey H. and Addie D. Nininger”
Figure 10001: Termite nest at Dalgaranga Crater looks like meteorite

Figure 10003: Meteorite in place Dalgaranga Crater W.A.
Figure 10077: Near Dalgaranga Crater (featuring H.H. Nininger)

Figure 10131: Aborigine camp W. Australia (near Leonora, WA)
Figure 10160: Chunks of Laterite thrown out of Dalgaranga Crater

Figure 10235: Dalgaranga Meteorite Crater.
February 8, 1959:

We were up early and off by 6:20 a.m. to the next town for breakfast. We had decided we would eat out and sleep in hotels while we could because camping might get a little tiresome before the month was out.

We began to get into the wheat country, the road paralleling the railroad, and about every 10 miles we passed a big wheat bin. The Australians do not use elevators but build long wooden bins to hold the wheat. The bins are V-shaped in cross-section so that the wheat will gravitate to the bottom as the bin is emptied, and some appear to be 400 or 500 feet long. Usually there are two of these bins. One is open to receive the new crop of wheat and the other has a roof for long-time storage.

The wheat country is the home of a beautiful parrot, a bird about the size of a pigeon with a rose-colored breast, pearl gray back, and some rose and white under the wings. We saw them by the hundreds around the open wheat bins, sometimes literally covering the bins. Like all parrots they are quite at home hanging by their beaks or upside down by their feet. Many were resting on the telephone wires along the railroad and about as many were upside down hanging by one foot, as were sitting upright. I asked a small boy what they called these parrots and he said "gahlah". After having him repeat the word several times, I asked him why, and he
answered, "because that's what they say—'gahlah-gahlah-gahlah'".

Sure enough, when I listened, that is what they did say.

In the afternoon we came out into more open country not far from the coast where huge sand dunes had grown into hills. A thick brush vegetation on these sand hills has produced a surface soil sufficient to grow good wheat. A little beyond we passed by the big Yarra Yarra lakes at Carnamah and on north to a town called Minganew, where we turned eastward on a dirt road across to Morawa and thence 79 miles more to Yalgoo. During the day we counted four new kinds of parrots and were much surprised to find these large birds in semi-desert country where water is very scarce. Most of the birds are seen around windmills and watering troughs. We saw big black parrots—birds at least two feet long, half of which is tail. When they fly and spread the tail a large patch of deep crimson appears on the underside. We saw two other varieties of rose-breasted parrots as well as a white parrot with a sulphur-colored head and breast.

We reached Yalgoo about 5:00 p.m. and got rooms at the Railroad hotel. Yalgoo is the central town in a large county or Road District, and was once a thriving gold-mining area. Most of the mines are now abandoned and Yalgoo has gone back to a population of about 25 people, three times that many dogs, and some roosters. In the middle of the night the dingoes came to see about the roosters and all the dogs rushed forth to do battle with much barking and minor squabbling among themselves. This went on intermittently until near morning when the roosters came to life and began to crow. It reminded me of old-times at home on the farm, and when a few burros joined the sunrise chorus with some choice braying, the sounds were those of a little Arizona mining town, which made the Niningers feel right at home.
Yalgoo was laid out with a 100-foot-wide main street that stretched up the slope from the railroad station. In later years the railroad was moved a bit and now the station is a half-mile from the hotel, the store a little beyond, and the garage just beyond that, with a half-dozen houses lining the rest of the street. Old walls and piles of brick rubble indicate the glory that was once Yalgoo.

The hotel had the inevitable saloon in front and a long hall extending to the back with a kitchen and dining room on one side and the bedrooms on the other, each bedroom having a door out onto a long porch. The hotel owner invited us to move our bedding out onto wire cots that lined the porch from end to end. Dr. Nininger and I took advantage of this offer, but Mrs. Nininger, being a lady, stayed inside and suffered the 100-degree temperature all night.

February 9, 1959:

By 6:15 a.m. we were under way, headed for Mr. Ross's sheep ranch, called Dalgaranga Station, about 60 miles north and east of Yalgoo. The road was rough and full of pot holes and corrugations, but the farther we went the better the road became apparently because of little traffic. Much of it was as smooth and hard as pavement and straight for miles. We saw our first wild kangaroos just a few miles out of town, and then three emus, the huge flightless birds of Australia, crossed the road.

We continued on over endless straight road through scrub bush about 12 feet high. We could never see more than about 50 yards into the bush. Arrived at last at Dalgaranga Station where we were met by Mrs. Ross and two friendly sheep dogs. She had no idea we were coming, but she was very hospitable and invited us in for a round of ice-cold beer.

Delgaranga Station is an old one and has seen years of great

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prosperity when wool was high. The house is old but large and well made, and filled with expensive furniture of vintage 1880. It was very dark inside, the curtains being drawn to keep out the heat, but after a few minutes were able to see each other and to enjoy the coolness of a well insulated room. Mrs. Ross said she had come here as a bride 30 years before when her husband had bought the station lease. The station contains 264,000 acres and was named after the peak we could see to the northeast, Dalgaranger Peak, a mountain that appeared to be at least 1,000 feet higher than the surrounding plain. She told us that a spring on the side of this mountain was the only natural flowing water for 100 miles in any direction. Just a few hundred yards to the rear of the house and other outbuildings, a large granite dome stood above the plain. On top, she said, was a lake of several acres which had been dammed off by a low wall which we could see from where we stood. This was their main water supply when rainfall was sufficient, but they had a "dug well" in the yard which produced discolored, brackish water, and the inevitable rainwater tanks which are seen around every house in interior Australia.

Dr. Nininger told Mrs. Ross of our hope to visit the Dalgaranga meteorite crater and inquired about the road getting there. She said she had never been there and could not direct us to it, but that if we wanted to drive out into the bush she could direct us to where her husband and the "blackfellow" were working on a windmill. They could show us the way. So, after getting directions from one windmill, to the next windmill, to the next windmill, and right and left turns, we started out.

We went around the big granite dome and took off into the bush. The bush is 15 feet high, so you can't see out of it to keep landmarks in view. My directions were mixed, even when I was at the
station and could see Dalgaranger Peak and the granite dome, so when we got into the bush and couldn't see these landmarks, I was completely lost.

After about 10 miles of driving we came to a windmill where we thought Mr. Ross should be but there was no sign of him nor his tracks; so we went back the way we had come for more directions. Mrs. Ross said we had not gone far enough, that there was one more windmill to go and the reason we had not seen tracks was that the men had probably taken a shortcut. She gave us more directions for finding the shortcut and told us to look for fresh tracks turning that way before taking it. "You never know about men. They may not go where they say they are going". She said.

We started out again, found the cut-off and the tracks and, in a remarkably short time, the windmill; Mr. Ross and the boy were eating lunch under a scrub acacia. Mr. Ross was a tall thin man of about 60 years whose hair had once been red. He wore a large "ten-gallon" hat with a wide brim to protect his tender skin, and kept his shirt collar turned up to protect against the bush flies. When he learned that we wanted to visit the crater, he said he had only been there twice, a long time ago, but that the boy could show us where it was. They would lead the way and we could follow. Mr. Ross said it was about 14 miles from where we were but it seemed nearer 20; most of it a straight road along a fence line.

We finally reached a group of big granite boulders where the boy stopped his truck and told us we would have to walk the rest of the way. We walked about 1,000 feet through scrub brush growing in desert pavement when we suddenly came to a hole in the ground. This was the Dalgaranga Meteorite crater which had been reported in scientific literature some 25 years before by the curator of the museum in Perth. He had not seen the crater himself but had assayed
the samples of iron brought in and reported what the discoverer said about its size and depth. It was reported as 75 yards in diameter and about 40 feet deep. It actually measured 75 feet in diameter and was 10 feet deep. Dr. Nininger was the first scientist to visit this crater and we were probably about the fourth or fifth white party to see it.

We looked for meteorites for about 30 minutes but didn't find any. Then Mr. Ross and the aborigine went home and we brought the Volkswagon out through the bush to the rim of the crater where we made camp. We hunted for meteorites all the rest of the afternoon and I found six, the biggest about an inch across. Mrs. Nininger found two or three and Dr. Nininger found several small ones. He had a horse-shoe magnet bolted onto the end of an aluminum tube so that he could rake around in the soil and pick up anything that might cling to the magnet. About half of the ground-surface around the crater was covered with small rusty-colored stones averaging about one-half inch in diameter. They are rough and sculptured in many cases and look almost exactly like the small iron meteorites which are among them. This makes the meteorites extremely hard to find and much time was spent in examining things that turned out to be stones instead of meteorites. It was very hot, over 100 degrees we guessed, and the bush flies were something awful. We stuffed handkerchiefs under our hats to cover our ears and the backs of our necks, but the flies were in our eyes behind our glasses and a constant annoyance.

We had a watermelon break about mid-afternoon and then back to hunting until dark. Mrs. Nininger got some supper out of the cans and all hands turned in for the night—but not before making a semi-scientific meteorite count did we drop off to dreamland. Dr. Nininger is a dedicated scientist who never stops work from dawn until dark,
except to eat, and that he can do six times a day.

February 10, 1959:

We were up early and Dr. Nininger started to search for meteorites with his big magnet. He didn't have much luck so he tried out the mine detector he had brought along from the States. We couldn't make it work. It was supposed to squeal when the plate was held a few inches above a piece of iron, but we couldn't get a sound out of it even on the biggest pieces of meteorite we had found.

I tried the hand magnet for awhile but decided I could find more by looking. Mrs. Nininger and I each had a little magnet on a string so that we could test likely looking objects without bending over. This was a great help and I collected a few small bits by dragging the magnet behind me.

During the morning I took pictures and we measured the crater with a string. There was a good-sized tree growing right in the center of the crater making it impossible to stretch the string tight. I climbed the tree and cut or broke enough branches out so that we could stretch the string and get an accurate measure of the depth and diameter of the crater.

The Dalgaranga crater is in perfectly flat ground in a granite formation with about three feet of laterite on the surface. The explosion upon impact threw up a rim of laterite boulders about five feet high on one side and perhaps four on the other side, and sloping down and outwardly from the rim about 15 yards at maximum points. The debris is not evenly distributed about the crater. Apparently the meteorite came in at an angle of about 45 degrees from the south-southeast and much of the force of the explosion was back in that direction for it cleared that section of the rim of all loose rock debris and hurled most of it a considerable distance out into the bush, most of it from 80 to 100 yards. Another streamer of fragments
was thrown in the opposite direction, to the northwest, some as much as 200 yards and one chunk of laterite about 8 inches in diameter was 185 yards from the crater rim. There were other smaller streamers of rock debris but the main bulk of the material thrown out was close to the rim on the northeast and southwest sides. (See Fig.______) I made a complete circle around the crater at a distance of about 80 yards where the largest chunks of laterite were to be found (about 18 inches in diameter) in the hope of finding a large meteorite but had no luck. I did find many pieces of flint that had been flaked by the aborigine. It occurred to me that perhaps the natives had traded artifacts with their gods, putting down a flint where they had picked up a piece of iron meteorite. This, I thought, might account for the small amount of irons as compared to the size of the crater. To test my theory I made a search far out beyond the last piece of laterite ejectamenta and found no sign of either flint stones or flaked flints. Flint does not occur naturally in granite country so the natives must have carried them there and besides, only man can flake a hard stone like flint. No doubt the natives saw this fall, for it would have been visible at a great distance even in daylight. They soon found the sharp little iron meteorites and carried most of them away, not forgetting to leave an exchange gift for the fiery god who came out of the sky.

Judging by the lack of weathering and erosion in the crater walls and in the laterite and granite brought out of the crater, I doubt that this event occurred more than a few hundred years ago. Laterite, being a loosely cemented conglomeration of small pellets, it is not a stone that can be expected to withstand decomposition yet many of the chunks of laterite were quite fresh in appearance and even a stone 16 inches in diameter which I turned over, was only buried about three inches. The desert floor about the crater is extremely flat and quite
hard, with a pebble surface in many places between the trees. Tires of autos scarcely make an imprint and any rain that falls must stand there until it soaks into the ground, so that there is not much chance for sediment to accumulate around such stones. The flints were lying on the surface as if they had been put there a few days or a few years before. Wind is not an effective force in this area either, the bush being fairly thick and averaging about fifteen feet tall the flat surface is not much affected and there is no sign of a strong prevailing wind that might show in the direction of tree growth.

The trees in this area are mostly acacia (mulga) of one variety or another and do not grow to any size nor great age, probably because of the high salt content of the subsoils. One of the largest trees about was in the crater basin and it showed no sign of great age as compared to old knarled and half dead trees nearby. I would say that it was a tree in middle life and I doubt that the oldest of these trees is more than a hundred years. This tree proves nothing about the age of the crater except that it is probably more than a hundred years old.

It was very hot and so dry that our bodies craved water continually with the result that we drank most of our water before noon. Seeing that we could not stay longer, we broke camp at 1:15 p.m. and started back to the station. We had two compasses, so were able to establish directions at the crater relative to which way the debris was thrown out, but we were just as completely lost when we started for the station as if we had had none. We had no idea in what direction the station was, and when we came to a fork in the road we didn't know which road to take. There was a windmill at the fork so I climbed the tower to look for Mt. Dalgaranger. I could see it far in the distance but still had no idea whether the station was to the right or left of it. We had been at the station during the middle of the day and hence the sun
had been overhead, giving no clue as to which was east or west. If we had seen Mt. Dalgaranger from the station early in the morning or evening, we would have known whether it was east, west, north, or south of the station.

We took the left fork, driving through the bush for what seemed hours, always along fences, for they build the road when they build the fence. We came to other windmills which looked strange but didn't dare go back because we were nearly out of gas. Finally the engine did stop and I turned on the spare tank which meant that we had 35 miles left in the Volkswagon. Only a few miles beyond we made a turn and looming ahead was the big granite rock by the station. Rarely have I seen a more welcome sight!

We were soon back at Dalgaranga Station and Mrs. Ross had us in for another round of beer. We had taken the wrong road at the fork, but had got onto another shortcut which brought us back safely.

We borrowed some gasoline from Mrs. Ross (we were to pay for it to her account in Yalgoo) and headed back for that metropolis. On the way we had a race with a pair of emus which were standing at the edge of a clearing about 150 yards from the road. They started to move and I drove off the road a little way daring them to race. Sure enough, they took the dare. Instead of disappearing into the bush, they started a 200-yard dash to cross in front of us. I slowed down just enough so that they could make it at full speed. They passed only about 50 feet in front of the car doing above 40 miles an hour. Their mouths were open, their necks stretched out, and their tails were bobbing up and down as they took 10-foot strides in their flight.

On our way out to find Mr. Ross the day before we had had a similar experience with another emu. This one had been drinking at a water trough when we arrived. He started to run along a fence leading away from the water trough; we were on one side of the fence,
the emu on the other. At any point he could have turned away from
the fence and into the bush but he was determined to cross in front
of us. The road was smooth and straight and I kept increasing the
speed until we were doing about 30 miles an hour, the emu just ahead
of us about 20 feet. We had gone about a half-mile when I decided
to get a picture. Dr. Nininger held the steering wheel while I tried
to hold the camera out the window. Just then the emu tried to jump
through the fence but rebounded off the wire about 40 feet, so that
he was to the side of the car where I got two good pictures. Determined
as ever he headed back for the fence, but I slowed down taking pity
on the poor stupid creature. With no competition his judgment got
the better of his instinct and he turned away into the bush.

Many years ago Roy Chapman Andrews told of his experiences in
his explorations of Outer Mongolia. They had chased the wild asses
and antelopes on the dry lakes of that country in their Dodge touring
cars and the animals had raced them for miles in order to outrun and
pass ahead of them. He thought that probably all wild animals which
protect themselves by fleeing have this instinct to outrun and cross
in front of their enemies. In my younger days, I had occasion to try
out this theory several times on horses, chasing them in a Model-T
Ford. In the spring of the year when the grass is green and the
horses are feeling good, the whole herd will try to outrun your car
and pass across in front of it. The old mares and geldings will trail
behind but the colts and young horses will run 35 miles an hour quite
easily and do better than 40 if pressed hard.

The Australian method of sheep raising, as we were told about it
at the Dalgaranga Station, is quite simple. No extra labor is required
except at shearing time. The land is divided up into large pastures,
and at the corners where four pastures come together a well is dug
and a windmill and large tank erected. Four watering troughs are set
up, one in each pasture. Around the trough and in the corner of each
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pasture, a wire corral is built with a gate in one corner. When the owner wishes to "muster" the sheep in any given pasture, he simply shuts off the water in the trough until all of the thirsty sheep are in the corral bleating for water. This may take a day or two, but they all eventually come in. This is probably the only practical way to gather 200 or 300 sheep from a 20,000-acre pasture, when you consider that a man on horseback can only see a few hundred yards through the bush at most.

The only natural enemies the sheep have are dingoes, the native wild dog, and domestic dogs turned sheep killers. Every sheepman carries a rifle in his car and all dogs found in his pasture are shot unless accompanied by their master. To keep the wild dogs down the government employs hunters who do nothing but hunt and trap wild dogs. They are called "doggers" and their method of hunting is by jeep, motorcycle, and shotgun. The dogger puts a light motorcycle in the back of his Land Rover and takes off across the open desert or through the bush until he finds a good hunting ground. There he parks the jeep and starts after the dingoes on the motorcycle armed with a shot gun loaded with buckshot.

In this region we had our first look at the government rabbit proof fence. It is well built wire netting fence about five feet high and extending below ground surface six inches to a foot to keep the rabbits from digging under. This particular section of the fence is an east and west fence to keep the rabbits from migrating down into the grain farming country from the north. It joins the main north and south fence at a point about 100 miles north of Sandstone. These rabbit fences are an important feature shown on every road map for they extend for hundreds of miles across the country, actually fencing the rabbits off in a huge pasture that includes the whole northwest corner of Australia. We saw a crew of government repair men on the Dalgaranga
Station who were fixing a small section of fence that had washed out in a creek bed. Dalgaranga Station is on the headwaters of one of the small coastal rivers.

We reached Yalgoo about 5:00 p.m. and put up at the same hotel for another night of barking, braying, and crowing.

February 12, 1959:

We took off this morning for Mt. Magnet, Sandstone, Agnew and all points east. The road was dirt and badly corrugated but we had heard that Mt. Magnet was a big town with all facilities. The Volkswagon people in Perth had told us that we could get parts there and have our Combe serviced. When we arrived we found one old garage, a few stores and a court house. The main street was three blocks long and 100 feet wide. It began abruptly and ended abruptly in the desert. From either end of this street the tourist can see 20 miles without the view being interrupted by a house. The one touch of modernization was a curbed parkway down the center of the street with newly planted grass and some tiny wisps of trees.

The garage man had no speedometer cable that would fit a Volkswagon so we filled our gas tank and headed for Sandstone. The cable had broken for no apparent reason just before we reached Yalgoo so we were without speedometer until we reached Kalgoorlie, a distance of about 450 miles.

A little way out of Yalgoo we had passed out of the laterite and had come into a greenstone and quartz formation. Little quartz buttes were scattered all over the landscape, most of the surface rock weathered and split into angular chunks two or three inches on a side. The flats of desert pavement in between these buttes were covered with small blue-black stones that looked as if they had been varnished. The astonishing thing was the uniformity of their size and the steady change to larger and larger sizes. At first they were all half-inch size,
then an inch, two inches, and finally whole fields or flats covered with these black stones averaging about three inches in diameter. Then they suddenly ceased altogether and we entered a country of low bluffs and cut banks of red decomposed granite and pyrophyllite, the latter being an advanced stage of decomposition in granite similar to a very smooth clay. This part of the country is the same rolling topography as described earlier except that the slopes are longer and more gentle. We had been gaining altitude all the way to Sandstone but so gradually it was hardly noticeable.

Sandstone is an old mining town with the regulation 1890 hotel, bar and gas pump, and tumbled-down garage with a few old junked cars. Also a road maintenance station, general store, and a few homes for those who must live in this dreary place.

Like most of these mining towns, Sandstone is on top of a mountain, better described as the highest part of a plain. From the hotel we looked down a long slope to the north that gave one the impression of looking into eternity--so vast, so far away from everywhere, and so uninhabited. There was not a sign of smoke from a farmhouse; just the blue of the brush-covered land fading softly into the blue of the sky. The air was very clear and we must have been looking at least 100 miles to the horizon. The town of Sandstone would do well to import a few of the sandstone cliffs from Dr. Nininger's home town of Sedona, Arizona, to place on that horizon. As far as I could see there was not a smidgein of sandstone in sight. My notes read, "Sandstone is sans sandstone".

We continued on toward Agnew, stopping about 5:30 at a sheep station to get water. We were met by barking sheep dogs and presently the owner came out from somewhere, dressed only in a pair of kakhi shorts. He kindly filled our water bags from one of his five big rainwater tanks. We asked him how many sheep he had and he replied that he was
running about 600 head on 303,000 acres, that being all he had fenced at the time. He said that was too many and that he intended to cut down to about 500 head. We had seen a few very wild sheep run across the road. Since they don't herd their sheep but only muster them twice a year for shearing, these sheep become almost as wild as the wild game.

I asked our host about the average rainfall and he said it was about 16 inches but that they had just had a series of dry years. Ground water, he said, was only six to eight feet down, but when one went much deeper it became salt water. It was in this area that we began noticing how the trees only lived to a certain age and he confirmed our guess as to the reason: When the trees reach a certain size the roots get down to salt water and they die. The dead trees are only about 15 feet high and the younger trees appear as healthy as any tree could be, with bright, lush foliage.

We camped that night in the middle of the road and about 50 yards from a windmill and trough, hoping to see wild game in the early morning at the water. It turned out that the only wild game was mosquitoes, so we built a big fire of mulga wood and threw on green weeds to make a smoke. It was effective while the green weeds lasted, but that wasn't long. I made my bed (cot) in the road in front of the car, that being the place most free from stickers which might get into bare feet. There wasn't much danger from passing cars; we had passed only two cars all day, not counting those parked in Sandstone and Mt. Magnet. It had been threatening to storm as we went to bed and later in the night we heard thunder and toward morning big drops began to fall. So, like the characters of Biblical record, "We arose while it was yet night and departed from that place".

February 13, 1959:

The early start was profitable, however, for we saw 30 kangaroos
and three emus in the first hour. We reached Agnew quite early (85 miles from Sandstone) and found it just like its neighbor. We stopped at the hotel for gas and while I was hunting up the manager to pump the gas, Dr. Nininger went into the pub to see what he could find out about local tektite collectors. The gas station consisted of about 50 barrels of petrol, some full, some empty, standing in the yard. The manager broke open a new one and thrust a gas pump in the bunghole, pumped a five-gallon can full and then poured that in my tank. When this was accomplished I went around to the pub to find Dr. Nininger.

He was busy drinking beer with a couple of customers and the bartender, trying to get some scientific information about australites. It should be said here that Dr. Nininger is definitely not a drinking man; he hates beer. But in the interest of science, he drank literally quarts of the stuff. The two Aussies had either started early or late the night before, because they were in no condition to give out accurate information. Dr. Nininger got me into the conversation and while they weren't looking he set the half-empty glass behind something and sneaked out the door. The gentlemen bought me a beer and then I had to return the favor, so it was some time before we got on the road again.

We kept close watch for kangaroos as we drove, because the dirt road had narrowed down to just one track and the bush on either side was quite thick. The kangaroos sleep in the shade of a bush during the middle of the day and if they chance to be asleep under one by the side of the road as you approach, they may dash in front of your car.

About 10 miles east of Agnew we crossed the Depot Range, according to our map. Actually, what we did was to go around the end of a ridge about 150 feet high and 10 miles long. It is hard to get adjusted to these Australian "mountain ranges".

At Agnew we turned southeast and headed for Leonora, 83 miles away
with no gas stations between. We saw five emus in a group but could not get them to race, so decided they must not race on Thursday. We also saw seven wedge-tailed eagles eating a kangaroo someone had run over, two rabbits, a fox, and a dingo. The rabbits were certainly scarce; these were the first we had seen. But kangaroos are more plentiful than rabbits would be along our country roads at home.

Leonora turned out to be quite a nice little town, more buildings than we had seen in any town since leaving the coastal area and quite apparently a trading center for the mining industry. Just before entering the town we came upon the largest aborigine camp we had yet seen. Scattered over a few acres of ground along the roadway were about 20 rude shelters, most of them constructed of old burlap sacks and bits of canvas thrown over bushes to provide a shade in the heat of the day and some shelter from the dew at nightfall. One old blackfellow sitting under a bush had most of his upper body painted with white spots but he quickly put on his shirt when he saw that we were going to stop.

Dr. Nininger had found that nearly all of the natives knew about tektites (they call them meteorites) and have collected them for many years. He began to circulate about the camp showing them a few tektites he carried in his pocket and asking if they had any for sale. He finally found one man who sold him two. Others said that they knew where many could be found but the sites were far away, several days travel. Some said that in years gone by they had collected many, hoping to sell them to the museums or white collectors, but that the demand had ceased long ago and that they had lost or thrown away what they had had.

One fierce-looking old man came up to the car and begged for money so I gave him a shilling for the privilege of taking his picture.
He had a dirty rag tied around his head to keep the hair out of his eyes and a tattered shirt and pants about the same color as his skin. A few specks of white paint remained on his face and chest from a recent paint job that had mostly worn away, and he had the usual ring of flies around his eyes and at the corners of his mouth. The aborigines never fight the flies away but allow them to sit and drink the moisture from their eyes and mouth. Extra flies, waiting their turn, sit on their hosts' backs in considerable swarms.

The Australian aborigines are a very primitive-looking people, many of them with very heavy, gorilla-like features, but they do not impress one as a fierce or aggressive people. They never crowd around your car to see what you may have inside nor do they give the impression that they might steal something if left unwatched. This is generally true in all parts of Australia and New Zealand where honesty is well above the world average. The foreign sections of the big cities are probably not much better than the under-privileged sections of most big cities, but the native population has, by and large, a better-than-average record for honesty.

We saw a good many half-castes in the country towns and learned that they are a product of pioneer days when there was no laws against the inter-marriage of white and black races. Many of these half-castes have apparently married other half-castes and the genetic result is often a person whose skin, eyes, and hair are a uniform shade of brown best described as a milk-chocolate color. In talking with a number of Australians about this peculiar coloration, I was told that the brown or cinnamon-colored hair is a characteristic of the pure-blooded aborigine, not just the half-caste. Later, around Alice Springs, I saw many natives who, though very black of skin, had quite brown hair.

We ate lunch in Leonora in a little cafe where we had "stike and iggs" (steak and eggs). We asked for water but none was available,
probably because Leonora is in a very dry desert country and entirely surrounded by dry salt lakes. Any ground water produced would no doubt be salty. "Lolly water" (a soft drink of any kind) and beer are always available, and sometimes milk.

A few miles south of Leonora we crossed over Lake Raeside, an ephemeral body of water that consisted of a salt flat about two miles wide and 115 miles long. There are a number of these string lakes in this vicinity which are thought to be the remains of an ancient river system that has been cut into short lengths by encroaching sand dunes. I saw no physical evidence to bear this out but we crossed at right angles and so had little chance to see much of the shoreline.

We continued for 65 miles across a flat salt desert country to the old mining town of Menzies, which, like all the other gold-mining towns in Australia, is located on a greenstone intrusion a few hundred feet above the surrounding country. Menzies is truly a ghost town. Perhaps a dozen old buildings stand along a wide main street, many of them with the windows out and the roofs fallen in. One I remember well had four Greek half-columns in the front wall and a formal Greek doorway and roofline. With the roof fallen in and the back wall knocked out, it looked for all the world like an ancient Greek temple. It was probably the bank of Menzies in its heyday.

According to our map it was 82 miles from Menzies to Kalgoorlie, but night overtook us before we could reach the city so we camped out near a place called Broad Arrow, which was a one-building station on the railroad.

During the last hour before reaching Broad Arrow we had been climbing quite steadily, a long straight road that seemed to rise in steps, each one a little higher and steeper than the last. The eucalyptus forest was increasing in height and density too and it was quite
obvious that the rainfall here was considerably greater than on the lower plains. The larger trees were about 75 feet tall and scattered out, tending to grow in little clumps with open spaces between covered with a gray brush two to three feet tall.

We drove off the road about 100 yards and camped near some beautiful salmon-bark gums, a eucalyptus with a salmon-colored, satin-smooth bark which, in the younger trees, sometimes changes to a rich olive green on the shady side of the tree. This tree sheds its bark in long streamers which hang from the main trunk in strips as much as 10 feet in length and add considerable picturesqueness to an already beautiful tree. A chill evening wind was blowing the streamers as we made camp and rustled firewood for the evening meal. There was no lack of wood here in this forest of Magos, the native name for these trees.

The elevation must have been close to 2,000 feet at this camp for we traveled downhill for many miles the next morning before reaching Kalgoorlie which is 1,250 feet high. We put on all the clothing we had and went to bed early but could not sleep because of the cold. Dr. Mininger got up about 3:00 a.m. and gave all of his bedding to Mrs. Mininger to keep her warm. He built up the fire and I got up, too, after another hour; it seemed like a good time to look at Jupiter's moons with my Questar telescope. The seeing was really wonderful and we could count five moons quite easily.

February 14, 1959:

After an early breakfast we got away from camp about 7:30, driving 25 miles down to Kalgoorlie. We found the Palace Hotel without much trouble at the main intersection in town and also some very welcome mail at the desk. I received two letters from Mrs. Kelly, one from Honolulu and the other after she had reached home, so knew that she was safe and sound.
Plan View of Dalgranga Crater showing the irregular distribution of rock debris and the direction of meteorite approach. Arrows indicate chunks of laterite thrown to a considerable distance away from rim.
CROSS SECTIONS THROUGH DALGRANGA CRATER AT A-B AND C-D
The Joint Honorary Secretaries,
Royal Society of Western Australia
(Inc.),
Western Australian Museum,
Beaufort Street,
PERTH.

Dear Sirs,

I wish to draw the attention of the Society to the desirability of protecting the Dalgaranga Meteorite crater. This unusual feature is probably the only thing of its kind in the southern half of Western Australia. The Wolf Creek crater of the East Kimberley might be insensitive to vandalism by virtue of its size but such is not true of the small Dalgaranga crater.

When I visited it recently I was prepared to see a certain amount of devastation because I know that excavations had been made in the floor of the crater in search of meteoric material at the instigation of H. H. Nininger of Arizona. However, I had not realized that the man concerned should have thought it necessary to destroy all trees in the crater and throw the branches around the edge as a fire-risk to the surrounding mulga. His prospecting area pegs (possibly of bluff value only), his tins and broken bottles did not improve the site.

The excavations, though small, affect a sizable fraction of the crater floor which is scarcely a chain in diameter (in Dr. Simpson's hearsay account of this crater - "The Mineralogical Magazine" volume 25, 1938, pp. 157-158 - for "yards" read "feet"). A few excavations of this kind would effectively destroy such evidence as remains of the history of infilling of the crater. The inclined bedding of the fill is observable in the excavations and it is possible that, for example, radio-carbon evidence of age might be obtained through plant matter in the fill.

It appears to me that an area of an acre or so about the crater should be reserved, or at the very least made a temporary reserve until such time as competent observers have made a thorough examination of the crater and placed their results on record. To site but one point which should be cleared up: Dr. Simpson concluded that the meteorite travelled from S.E. to N.W.; I think this is a very debatable conclusion and Dr. Nininger evidently thought so too because he directed excavations in almost the exactly opposite direction in the crater.

To reach the site, I recommend the route via Mt. Magnet, Boogardie Station, Mt. Farmer Station and the Dalgaranga Out-camp which is in the vicinity of current beryl- and tantalite-mining activity. From the Out-camp a vehicle track runs about 3 miles north-easterly right to the lip of the crater in lateritised granite. The route from Yalgoo via Dalgaranga Homestead to the Out-camp was also travelled by me recently but this is not a route to be used following rain.

Yours faithfully,
The Joint Honorary Secretaries,
Royal Society of Western Australia
(Inc.),
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Yours faithfully,

W. H. Cleverly
HEAD. DEPARTMENT OF GEOLOGY.

P.S. Would you please return Kodachromes after perusal.