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MR. MADIGAN'S FINAL GRANITES REPORT

Boom, Tragedy and Setback to Northern Territory

"NOTHING OF VALUE"

In response to numerous requests, we publish below the full and final report of Mr. C. T. Madigan, lecturer in geology at the Adelaide University, on the Granites goldfield.

Mr. Madigan inspected the field for "The News" and leading newspapers in other States. The report was published on Saturday only in the Street Edition of "The Mail."

(By C. T. MADIGAN, M.A., B.E., F.G.S.)

After spending five days on the field I sent a preliminary report from the Granites, which was published on November 7. In this report I said in effect that there was nothing to be seen to warrant a boom, and that the position was much as Allan Davidson left it in 1900, which would have conveyed to all mining men who know that report, that any valuable ore body had still to be found.

A little work had been done since the prospectors left, but the results of it were most disappointing, and I refrained from giving details of this work, as I hesitated to condemn the whole field on the evidence of a costeen and a small shaft and crosscut, the positions of which might not have been chosen to the best advantage.

Further, I had promised the men on the field that I would draw no invidious distinctions in my report between one lease and another, as the report was to be a general one on the whole field. I should like at this point to record again my appreciation of the very friendly relations which existed between myself and everyone on the field, and my deep regret that I cannot report more favorably.

Hoped for Success

Although entirely without any pecuniary interest in the field myself, yet on account of the importance of a gold find to Australia, and my love of that part of the country, and sympathy with its pioneers, I was most anxious to find the field a success.

As time went on, hope gradually sank to despair, and it was necessary to sound a strong note of warning. At the time, this warning applied only to the Granites, and area some six miles long, in an auriferous belt of over 100 miles.

There was still much more to see, and with such activity on every side, all hope seemed not yet lost, and a bald condemnation would have been premature, unwarranted, and risky.

My investigations extended from the region of Thomson's Rockhole, 44 miles on the Alice Springs side of the Granites, to Tanami, 63 miles north-west of the Granites, and I spent 13 days between those points. Some 40 samples were dollied and panned on the field, and 19 were subsequently assayed at the S.A. School of Mines, assayers for the Mines Department of S.A., as a check on panning.

It was interesting to note that colors were obtained in the field from stone which assayed only a trace. With care, the pan is remarkably efficient. The hope was that owing to the fine nature of the fold, assays would show an improvement on pan results, but the reverse was the case, as the assayers do not use high-powered pocket lenses, nor even rose-colored spectacles, like the man with the pan.

Boom Burst Suddenly

During my tour of the field a number of mining engineers and mining geologists came and went. Their duties were mainly to report on particular properties, and they left disappointed. The boom burst as suddenly as it had come into being, and latest reports indicate that from a population of 120 men, the field has dwindled almost to a state of desertion.

This report therefore comes somewhat as an anti-climax, but a short account of the geology of the area, and some actual assay returns, may still interest a few of the disappointed public.

The Granites lies 375 miles from Alice Springs, the track going north along the telegraph line for 80 miles, and then north-west for some 300 miles. After leaving the telegraph line the track lies between rugged ranges to Coulston Station, 158 miles from Alice Springs, where the ranges end, but scattered hills continue for another 40 miles to Cockatoo Creek.

Here the hills end, and waterless desert continues for another 175 miles to the Granites. This desert is flat and quite devoid of any drainage lines. There are no sandhills. The soil is a red, sandy loam, and the country is green to the horizon in all directions, being quite thickly clothed with spinifex, mallee, and low acacias and hakeas.

There are occasional whitewash gums and bloodwoods, but mulga is very scarce. Odd low hills are scattered about, from 20 to 30 miles apart, none of them rising as much as 100 ft. above the general level. The ground is crowded with ant beds, which are the cause of the roughness of the track, and in places there are anthills up to 20 ft. high.

Wretched Native Soaks

Beyond the Granites there are some saltpan areas, in the direction of Tanami, the north-west, and beyond there, at 40 miles from the Granites, low conglomerate hills and tablelands begin, which become more pronounced to the westward of Tanami, which is 63 miles from the Granites.

The country is a very old peneplain, an area of profound erosion, which has reached base level. There are no permanent waters. The native soaks are wretched affairs in the subsoil, only containing a few gallons of water. There is no artesian water. The underground water level stands at 100 to 150 ft. below the surface, and a plentiful supply could no doubt be obtained by sinking numerous wells. This water, as far as is known from the wells at the Granites and Tanami, is fairly highly mineralised, and is not a good drinking water, that at Tauami being much the better.

An analysis of the Granites well water showed it to contain 0.42 oz. of solids to the gallon, made up of approximately 58 grains of sulphate of soda, 6 grains of sulphate of magnesia, 90 grains of common salt, 14 grains of carbonate of magnesia, and 15 grains of carbonate of lime. This combination of Glauber, Epsom, and common salt, was found to have a most pronounced laxative effect upon all who had to depend on it.

This was probably in part due to the excessive quantities of water one felt compelled to drink during the hot days in that shadeless place. Many newcomers were temporarily prostrated by weakness. There is no mining timber worth mentioning within 100 miles of the Granites.

It was found to be impossible to connect up the geology of the area with the known area of the MacDonnell Ranges, owing to the sparseness of outcrops in the desert. Gaps of 50 miles cannot be bridged geologically. To put the formations at the Granites in their proper place in the recognised Australian series it would be necessary to tackle the problem from the other side, the north or north-west, and to work from the known to the unknown.

Type of Country

The Reynold Ranges in the neighborhood of Coulston Station consist of coarse gneisses, with granite intrusions, belonging to the Arunta Complex, and placed in the Yilgarn series. After leaving the Reynold Range area only a few rises consisting mainly of quartz reefs and highly silicified sediments are met with for the next 130 miles, till the neighborhood of Thomson's Rockhole is reached, 43 miles east of the Granites.

From here to Tanami, 106 miles away to the north-west, all the outcrops show almost identical features, yellow slates, quartz reefs, and granite, together or separately, and almost all outcrops carry some traces of gold.

At Thomson's Rockhole the granite is a medium grained biotite granite, identical with that at the Granites, fresh and free from gneissic structure at both places. Two miles before reaching the Rockhole, an area of soft, weathered, and ferruginous slate is entered. The slate strikes 20 deg. east of north; dips at steep angles to the east, and carries numerous quartz reefs, mainly running with the country, but some crossing it. This country was peeged and prospectors were costeening.

There are no slate outcrops within a mile or so of the rockhole, which is in the granite, a small granite mass 100 yards across and 20 ft. high. At seven miles S. 16 deg. W. of the Granites there is another slate outcrop some miles in extent, and plentifully supplied with quartz reefs. The strike is N.E. Granite was exposed in a trench at the foot of these low rises.

The well 2½ miles south-east of the Granites is in decomposed gneiss. There are no outcrops within several miles of it. At the Granites itself there is a granite hill standing alone in the plain, consisting of piled granite tors, with a base some 200 yards across, and rising to something under 100 ft. To the eastward other low granite knolls are seen.

At 30 chains north-east of the granite hill, which gives its name to the field, a slate ridge commences, and runs north for half a mile, then curves westward to Bunkers Hill, which is due north of the granite hill, and just a mile from it. The ridge then breaks down, but the formation can be traced westward to Twin Hills, 1½ miles further west, and then west, north-west for another three miles, with breaks ending in some higher ground known as The Ivy. The ridge is thus about 5½ miles long.

The rock is everywhere ferruginous slate with quartz reefs, the slate striking along the trend of the ridges, N.-E. near the granite hill, changing rapidly to N. and then W. and dipping very steeply to the east, near the granite hill, in the area where most interest was concentrated and to the north where the ridges run nearly, in other words, towards the outside of the curve. The ridge never rises more than 60 ft. above the plain, has gently sloping sides, and averages about 125 yards across.

Granite has been exposed in costeens at various points along the inside of the curve right up against, and even on the sides of the slate ridge, so that it appeared that granite occupies all the low ground inside the curve of the ridges, and that the ridges mark the contact zone of the granite with the slates, this zone being ramified with quartz veins and reefs, and being thus heavily silicified, has resisted erosion better than the remainder of the country rock or the granite itself.

A heavy limonite gossan is found along the top of the ridges, the limonite often retaining the structure of the slate, and the ridges are composed of a mixture of this slaty limonite, quartz veins, and larger quartz blows of dark quartz. There is a notable absence of chalcedonisation.

Lack of Mineralisation

In costeens it is seen that the quartz veins run with the schistosity of the slate, and also that the slate has in part been replaced in bands up to several feet wide, by haematite. There is a remarkable lack of mineralisation along the contact zone. Quartz and iron oxides are the only minerals introduced in notable quantity. Micaceous haematite is common, and appears to replace slate. Magnetite is plentiful in the quartz.

There were no indications of any other ore minerals, and a complete absence of any signs of sulphides. Sulphides are not expected to exist in the weathered zones, but the quartz should show the cubical cavities once occupied by pyrites if this mineral has ever been present.

No pegmatite dykes and no basic dykes were seen in the whole area, though it must be remembered that the outcrops are in the form of long, narrow, and low ridges in soil covered plains. Very little rock is in reality exposed.

A specimen from the western end of the field showed the mineral bismutite, a basic carbonate of bismuth, as a yellow powder in the pan. This was an isolated specimen stone from the subsoil, which gave a good tail of gold. Samples from the same area did not disclose the mineral. The specific gravity of this substance is about 7, and it is a puzzle when found in the pan.

Prospectors had evidently found it, as one described his difficulties in separating some white mineral from the gold. At the time I had not seen it, and did not discover it till panning a few odd samples after my return. This bismuth was the only metal besides iron and gold, found in all my examination.

The slates show little alteration. At the south end of the ridges they are altered to ferruginous andalusite schist, but in no other place are conspicuous secondary minerals developed. The slates are bright yellow through limonite, near the surface, light purple at greater depth. Some gypsum was noted near the surface.

Tanami Similar

At 20 miles N.-W. of the Granites, on the Tanami road, similar slates appear. At 40 miles a cover of conglomerate is met, at Conglomerate Creek. At Tanami there is a considerable area of these slates, shot through with quartz veins. The country rock at Tanami is exactly similar to that at the Granites, but at Tanami the auriferous quartz veins are said to carry better values. No sampling was done there.

West of Tanami there are extensive conglomerate hills, the conglomerate resting with violent unconformity on the older slates. These slates are placed in the Mosquito Series by Sir Edgeworth David on his new map, and the conglomerates in the Nullagine Series. This is the most reasonable classification, and there is no evidence to the contrary. The conglomerates might possibly belong to the Kamilarol period of glacial deposits.

I did not visit Schist Hills, off the Tanami road, owing chiefly to lack of time, but finally to lack of inclination, as a friend among the "mining experts" who had gone there while I was at Tanami assured me that the country was exactly similar to the western end of the Granites ridges, and useless. The Schist Hills lie in the direction of a westerly continuation of the Granites ridges.

Auriferous Deposits

The gold has been introduced with the quartz in the quartz veins at the contact of granite with slate.

At the Granites, the quartz veins are along the crest of the ridges, and on the inside slopes of the curve, towards the granite. Long and profound erosion amounting to thousands of feet to expose the granite, has produced some rich patches of alluvial gold from very low-grade quartz reefs.

The alluvial gold had all been won on the inside of the curve of ridges. There cannot be said to be any lode formation. The country rock does not carry values apart from the quartz veins, except for the very topmost layers, where alluvial has penetrated.

Specimens of reef quartz from seven miles south of the Granites, and from points all along the Granites ridges themselves, some of which showed colors in the pan, all returned nil results on assay. There was one quartz vein, not separately assayed on account of its small size, in which visible gold could be seen, the single example of visible gold in the whole field. This vein has been sunk on to some 30 ft., at points 25 ft. apart.

At the point examined, in a drive at the bottom of one shaft, this veing showed a maximum thickness of one-quarter of an inch, fading to nothing in hand specimens. A sample over 9 in. including the vein gave an assay return of 5 dwt. to the ton, and the remaining 14 in. of the drive gave 1 dwt. A shaft and drive at 30 ft., off this leader, in the country rock, gave nil returns. A shaft a hundred yards to the south gave 2 dwt. on assay, and further north a long costeen only yielded traces, and a shaft 1 dwt.

The best return of the 19 samples assayed came from the western end of the Granites ridges, from a costeen. Four feet of this costeen yielded 6 dwt., but a shaft 40 ft. deep, sunk on the same veins, gave only 2 dwt. at the bottom.

Conclusions

The assay returns speak for themselves, and tell the whole melancholy tale. Nothing has been found of any value at all.

As to the possibility of the presence of undiscovered but really valuable gold formations in this area, between Thomson's Rockhole and Tanami, the geological evidence is against it. The granite magma itself is unfavorable. Most of the world's big gold deposits are associated with more basic plutonic rocks, such as monzonites and granodiorites, or with volcanic rocks. There are no indications of volcanic phenomena in the area.

The absence of traces of sulphides, and, on the other hand, the presence of oxides, and they of iron only, are distinctly unfavorable indications, as also the general absence of mineralisation of any kind.

The whole boom was a tragedy, and not the least pity of it is that the Northern Territory has received an undeserved setback as far as prospecting is concerned, from which it may take years to recover, though this report only concerns a mere patch of the Territory. To quote from Henry Lawson, "There's gold in them hills yet, if only a man could find it."

Adv. 8-12-32

SIR D. MAWSON OFF TO LONDON

Leading Scientists To View Antarctic Specimens

CLASSIFICATION TASK

To complete reports on specimens obtained during his last trip to the Antarctic, Sir Douglas Mawson, Professor of Mineralogy and Geology at the University of Adelaide, will leave for England by the Strathnaver today. The visit will be made on behalf of the British, Australian and New Zealand Research Expedition, which financed the trip to the Antarctic.

"I am taking with me the film made by Captain Frank Hurley on the 1929-31 expedition for showing in Great Britain and New York," said Sir Douglas Mawson last night. "The funds received from the screening of the picture will be used for the publication of the research results obtained during the expedition.

"The film was shown in Adelaide under the heading of 'The Siege of the South,' and, being an Empire production, it should make an appeal to British audiences, apart from its wonderful scenic and educational features. It will be shown first to the Royal Geographical Society, and then negotiations will be made for theatres to feature it."

Cases Of Specimens

Several cases containing the special specimens which Sir Douglas Mawson is taking with him were piled outside the door of his laboratory at the University last night ready for transhipment. The professor said that among them were pycnagons, commonly known as deep sea spiders. These would be examined and described by Dr. Calman, the world's foremost specialist on these crustacea.

Some of the sea spiders which Sir Douglas Mawson is taking with him are about three feet long, and were obtained at a depth of about 7,000 metres.

Different types of minerals and rocks, Sir Douglas Mawson said, would be examined and described by specialists at Cambridge and other universities, and all reports would be incorporated in a series of volumes, which he was editing. It was expected that more than 50 experts of various nationalities would be engaged on the classification. He would make a brief trip to Europe to interview some of them. When the reports had been prepared most of the specimens would come back to Australia, except for a few duplicates, which might be presented to the institutions making the reports on them.

Mr. C. T. Madigan will be Acting Professor of Geology during Sir Douglas Mawson's absence.

Adv. 8-12-32

Mr. T. E. Barr Smith was born at Woodville 69 years ago today. He is the eldest son of the late Mr. R. Barr Smith, head of the firm of Elder, Smith & Co. He was educated at St. Peter's College, and Trinity College, Cambridge, where he took his B.A. degree. He has for many years been closely identified with the commercial life of the State, and is chairman of directors of Elder, Smith & Co., and on the boards of other important companies, including the Adelaide Steamship Co., the Beltana Pastoral Co., and the Mutooroo Pastoral Co. Mr. Barr Smith is noted for his public benefactions, his latest act of generosity being the presentation of the fine building for the library to the Adelaide University.

Adv. 9-12-32

Mr. H. H. Finlayson left for Oodnadatta yesterday. He will proceed to the aboriginal reserve in the south-western centre, to continue field work on mammals begun last year.