

THE SURVEYS OF THE LAND BOUNDARIES OF QUEENSLAND

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Queensland was separated from New South Wales and erected into a separate Colony by Letters Patent bearing date June 6, 1859, and proclaimed in New South Wales' "Government Gazette" of December 1, 1859, by Sir William Denison, Governor.

The boundary was described as follows:—

"So much of the said Colony of New South Wales as lies to the northward of a line commencing on the sea coast at Point Danger, in latitude about 28°8' S, and following the range thence which divides the waters of the Tweed, Richmond and Clarence Rivers from those of the Logan and Brisbane Rivers, westerly to the Great Dividing Range, between the waters falling to the east coast and those of the River Murray; following the Great Dividing Range southerly to the range dividing the waters of Tenterfield Creek from those of the main head of the Dumaresq River; following that range westerly to the Dumaresq River and following that river (which is locally known as the Severn) downwards to its confluence with the Macintyre River; thence following the Macintyre River, which, lower down, becomes the Barwon, downward to the 29th parallel of south latitude, and following that parallel westerly to the 141st meridian of east longitude, which is the boundary of South Australia, together with all and every adjacent islands, their members and appurtenances in the Pacific Ocean. . . ."

This description left some doubt as to what constituted the western boundary, north of the 26th parallel. This was rectified when the Governor of Queensland, in a despatch to the Secretary of State, dated Brisbane, January 18, 1863, stated that "Queensland has undertaken the Provisional Charge under Her Majesty's Letters Patent dated March 13, 1862, of the entire north-eastern corner of the Australian Continent, including the shores of the Gulf of Carpentaria up to the 138th meridian of east longitude."

Marking the Boundaries.

The boundaries of the State having been fixed thus by proclamation, it became necessary to define the boundary on the ground. Surveyor F. E. Roberts was instructed to place the necessary marks on the ground and to brand reference trees for identification along the McPherson Range, etc.

On July 4, 1865, Surveyor Roberts forwarded six plans to the Surveyor-General of Queensland. In December of the same year he reported that he had completed the survey of McPherson's Range and intended to proceed with the survey of the Main Range towards Maryland. The difficulty experienced at that time was in keeping up a constant supply of rations.

In September, 1866, Surveyor Roberts had completed his section of the work, and the boundary of the State was marked from Point Danger to the junction of Tenterfield Creek with the Dumaresq River. The length of Mr. Roberts' survey was 215 miles.

The actual length of the Dumaresq-Macintyre River boundary was 280 miles, but no notes are available as to the method followed in marking it.

Interstate Negotiations

Nearly 10 years elapsed from the commencement of the survey by Mr. Roberts before negotiations were begun by the two States for the marking of the 29th parallel of south latitude. This was begun in August, 1875, by the Governor of New South Wales inviting the co-operation of the Queensland Government in running the whole of the boundary line not yet determined by actual survey or by physical features.

It was considered extremely desirable that the position of the 29th parallel of latitude should be settled without delay, owing to the fact that the boundaries of the runs on both sides of the border westward to the Paroo River could not be correctly adjusted until the parallel was defined. An Executive Minute of the Queensland Government (No. 41 of 1875) authorised the Lands Department to proceed with the necessary action.

In May, 1876, the Surveyor-General of New South Wales recommenced the establishment of latitudes by observation with the zenith telescope, at convenient stations, about 50 miles apart more or less, as the

physical features of the country suited. He then proposed to run trial lines between the points so fixed and from these lines to mark the true one, which is, in reality, a curve upon the earth's surface.

Taking everything into consideration, the Surveyor-General of New South Wales confidently recommended this method as the less costly one, being also of opinion that it would prove as accurate as any other short of employing an 18 in. alt. azimuth and laying off chords and tangents, a labour that would occupy several years, while the instrument alone would cost £400. He suggested further that a Queensland surveyor should be employed to run the lines between the latitude stations, having equal authority with the New South Wales surveyor, by whom also his work would be open to inspection. He also expressed the opinion that the work was not of sufficient importance to warrant the employment of a double set of officers. He anticipated that a period of at least a year would elapse before anything could be undertaken owing to the delay in getting special instruments from Europe, and reported that the large transit circle for the Sydney Observatory had not at that time arrived and time would have to be allowed to observe a large number of stars before the work could commence. He proposed adopting the existing line so far as improvements had been made on the ground, and to make the initial point from which to start the astronomical work west of them and then to continue onwards without further regard to existing interests.

Survey of the 29th Parallel

On June 19, 1879, Surveyor Watson (the Queensland representative) reported having joined the New South Wales survey party and added: "Preliminary observations are being carefully made with a view to fixing the observatory on the 29th parallel. Our men are now engaged in procuring material for the observatory; meanwhile, the zenith telescope and transit instruments have been erected on substantial wooden blocks which serve for preliminary determinations of the latitude 29° S. and the true meridian."

With reference to the marking of the boundary—owing to the absence of suitable material and the delay involved in burning clay, charcoal, etc.—Mr. Watson recommended on July 3, 1879, the use of gas pipe in

10 ft. lengths, galvanised iron, if procurable, similar in material to that used for metal telegraph poles. These could be procured at Adelaide and shipped to Bourke on the Darling. They would be used at the end of the five-mile lengths, so as to prove permanent marks from which the intervening miles would, at all times, be readily found.

In his report, Mr. Watson made the following further suggestions: "In regard to the conclusive marking of mile trees, that as we shall commence from a fixed point of longitude—accurately determined—it would be advisable to mark every minute of longitude, i.e., the actual geographical position."

On the following day, July 4, 1879, Mr. Watson reported that suitable stone had been obtained for the observatory pillars and also that meridional and latitudinal lines had been cleared, at the ends of which lights were fixed as reference marks for all observations. These were prime verticals with the transit instrument for latitude, zenith pairs with the zenith telescope for latitude, stellar transits with the transit instrument for time and longitude and azimuth pairs with the transit instrument for the direction of the true meridian.

Sharing the Work

Mr. Conder, chief of the New South Wales party, proposed personally to conduct the observations to determine the longitude of the zero point and the direction of the meridian through this point; the remainder of the work allocated to the same party was left under the supervision of Mr. John Cameron.

Under date July 7, 1879, Mr. Watson, after setting out in detail the methods adopted for the various observations, states: "It is anticipated that, by the above-mentioned systems, the 29th parallel will be determined within a fraction of a second, and it is intended when marking the boundary, to fix lamps on stages at long distances asunder and regulate whatever error may have imperceptibly accrued from solar rays whilst running the line."

Mr. Watson further says: "I understand that the New South Wales observer will, during the progress of the survey, constantly take observations to ensure the maintenance of direction from the true meridian considering as ultimate the mean latitude obtained on the Warrego. Observatory No. 1 is erected at the

nearest convenient point to latitude 29° , and, as it is impossible to fix it beforehand on the precise parallel, it has been considered the most advantageous in practice to erect Observatory No. 1 on the same site as the temporary observatory to save time and labour and to utilise the work already done, i.e., some 48 seconds south of the parallel. From Observatory No. 1 lines will be run easterly and westerly, computed to cut the 29th parallel at distances of about 10 miles, and from the mean of observations, the sites of Observatories Nos. 2 and 3 will be determined from computations. At Observatories Nos. 2 and 3 the latitude will again be observed, and from a mean of the aggregate results the 29th parallel will forthwith be determined as ultimate."

Points of Observation

In Mr. Watson's report, under date August 5, 1879, it is stated that the east and west lines were being run and that Mr. Conder had taken additional latitude observations at a large sandhill some three miles northwest from Observatory No. 1, the object being to avail of every diversity of geological formation, either sandhill, stony ridge or open plain, as a test upon the gravitation that may act upon the plumbob.

The report continues: ". . . Work has been retarded by the late heavy rains, which rendered travelling almost impossible. After the necessary observations at Observatories Nos. 2 and 3 are completed, the observations for longitude will be taken at Observatory No. 1, for which purpose an inverted cone in stone and cement has been erected for the instrument to rest upon. . . . This part of the district having been visited by very heavy rains, it is hoped the present retardations, in consequence, will be far more than compensated for by the fall of water along the projected route of survey. So soon as the Cuttaburra is fordable it is intended to examine the country, and, should it be found practicable to preserve the surface water, it is proposed to employ men to sink tanks for that purpose, provided that the soil is retentive of moisture. If successful, this will moderate the expense of carrying water that otherwise would be inevitable."

"Every Care Taken"

On September 1 Mr. Watson reported: "Mr. Conder commenced, on the 30th, to observe for longitude.

Every precaution has been taken to ensure the best possible results, the transit instrument being fixed in the true meridian on solid stonework in cement, its stability being continually tested by azimuth observations, and the astronomical clock rated with the utmost scrutiny to locate time. In view of this, the general method adopted can scarcely fail of success. Insulated wires containing the galvanic current connect the astronomical clock pendulum with the electric telegraph. Mr. Conder, when observing, holds a key, and as each star crosses the wires of the instrument, the pressure of the key in his hand denotes the instant, which is forthwith communicated by the current to the Sydney Observatory."

Boats Used In Floods

By an entry dated September 30, Mr. Watson reported as follows: "For a few days, pending the values of the latitude being determined, the recommendation of the Surveyor-General of New South Wales was acted on and some attention was devoted to the burning of clay as material for marking the line, but the result proves clay for such a purpose to be an utter failure. Upon the values of the latitude having been determined, the first chord was forthwith set off at right angles from the meridian passing through Observatory No. 1. Mr. Cameron and I turned the angle upwards of thirty times, working by lamps after sunset and being on the ground before dawn of day to avoid any refraction. As the road passes through this chord, it has been distinctly marked with wooden mile posts, and at each end with a stone pier, having an iron bolt at the precise end of the chord. The floods seriously impede us. We have, however, constructed boats, but the numerous channels occasion much delay."

In his report for October, Mr. Watson states: "The progress throughout October may be estimated at fifteen miles, but this distance affords no criterion of any average rate of progress, as the Warrego and Irrara being both in high flood, occasioned unforeseen delay, all the equipment and plant having to be boated across in small loads. The marking of the line has been done by stone piers at the end of each chord. Gidya posts have been fixed at every intervening mile and marked as directed; between these pegs 18 in. long and 4 in. x 4 in. are driven in the ground. Being now under

the necessity of forming advanced camps in waterless country, it has been requisite to take the steps for carrying water along the line; two men are accordingly appointed to this work, one from each party."

An extract from Mr. Watson's report, dated December 3, reads: "We are now engaged upon a waterless tract of country between the Cuttaburra and Lake Wonbah. Owing to bad country for horses, much time has been lost through their straying, but we trust to get over it in about a fortnight—the water-carts and advanced camps were kept moving on."

"Severe Privations"

Mr. Watson reported, under date December 31, 1879, that the survey of the New South Wales border had extended to the tenth chord from the Warrego. The country over which the survey had been extended had been a dry, waterless patch, involving severe privations. Through the long distances from water it became necessary to despatch all the horses 25 miles ahead to form a temporary camp, under the care of men specially detached to keep them together, whilst the water-carts worked with relays of horses between the advanced camps. The whole camp was then within the Paroo watershed, and for the next six chords their difficulties would not prove so serious."

In his report dated January 22, 1880, Mr. Watson said: "The experiences of the present summer manifest the desirability of suspending field work during December, January, and February. The extreme heat, notwithstanding the precaution of erecting sheds, proves so destructive to the working plant; the distance of carting water becomes out of the usual limit, while sickness, in the form of dysentery, fever and blight, has already much hindered us, and it is therefore proposed to reserve my office work for the hot months. It has become necessary already to procure a blacksmith from Bourke to regulate all the wheel tyres, some 20 in number, in order that the work may be continued."

"Experimental Chains"

In his report of January 31, 1880, Mr. Watson said: "I may here observe that the joint instructions provide that the chaining shall be done with steel tapes, but during the past two months, Mr. Cameron has

chained ahead with experimental chains made of piano wire and crinoline steel and measured over the ground before it has been shovelled down, but the steel tape used by me subsequently has checked the work and the experiment upon comparison has proved highly satisfactory and an economy of time.

Under date February 3, Mr. Watson stated: "I do not believe there will be the least use in attempting to extend the survey any distance westwards from the Paroo until the back country has been visited by rain, the country now being almost devoid of water, outside the main river courses."

Paroo In Flood

A month later Mr. Watson reported as follows: "During the month of February, the boundary survey of the Queensland-New South Wales border has been extended to the Paroo River, where operations are now hindered by the river being in high flood. Considerable time has been lost during the month through the straying of horses, a very usual occurrence at the setting in of rain. It is very difficult to foresee and guard against all the contingencies likely to arise through a period of wet weather similar to last month. At the end of February the work was 10 miles east of Hungerford. Our preceding main camp (to which all the horses were accustomed) was some thirteen miles, making the whole stage to Hungerford 23 miles. As all the camp, plant, etc., was already transported half-way—and water carried there for the camp—my purpose was that the horses should remain at the previous camp and work the camp forward from that convenient distance (as at that time Hungerford was bare of grass) to the next convenient stage, when they would all be removed to Hungerford, near to which a camp would be found for the horses to run upon. I understood that Mr. Cameron acquiesced in the proposal, and I instructed the Queensland horsedriver accordingly. However, Mr. Cameron sent all the horses to the Currawinya paddock, only insecurely fenced (Currawinya Homestead is north-east of Hungerford) and took four horses for the camp from which they strayed and retarded operations for some days. All the Queensland horses were removed to Currawinya, whether the Queensland officer liked it or not. The consequence was, half of these strayed away and were recovered

with great difficulty and a week's loss of time of one of the Queensland men. Other consequences have followed. Not having one of the horses at my disposal, my assistants were compelled to leave all their effects surrounded by water. My own equipment was damaged to some extent. I have had occasion, by last mail, to acquaint you of Mr. Cameron's intentions of leaving a portion of the instruments behind him until his return from the South Australian border. If this proposal is carried out there will be no further check upon the latitude, as it is intended to leave the zenith telescope here. If the plumb-bob was unduly influenced by the formation at Barrington, there will (by abandoning the zenith telescope) be no means of ascertaining any actual error and Queensland may lose a strip of metaliferous country without knowing anything about it."

An entry dated March 31, 1880 reads: "The border between the two colonies has been cleared and chained to a point 12 miles west of the Paroo. The flooded state of the river at the earlier part of the month necessitated the construction of boats. Latitude observations with the zenith telescope, 28 pairs of stars being used, were reduced, and a copy of the results forwarded with the report shows the value of the line representing the parallel as $29^{\circ}00'00''.16$ S." ($\frac{1}{4}$ chain about).

On April 14, 1880, John Cameron, leader of the New South Wales party, wrote to G. C. Watson, the Queensland representative, as follows: "In reply to yours of the 12th, I think it would greatly lessen the difficulty by withdrawing, say, four of your hands, including the cook . . . etc., etc. We have only nine draft horses fit for water-carting and removing camp. At the least we require twelve horses for water-carting and three for removing camp. I have had to take one of the tanks off the water-waggon, not having sufficient power to draw it. Foster not being able to draw more than 200 gallons at a time, the water is nearly all used up before it gets into camp. . . ."

To this letter Watson replied, under date April 17, 1880, that he had been instructed that ". . . so soon as the Paroo waters cease to be available for the work with the horses and water appliances, I am instructed to withdraw from the survey. As the further survey of the line will depend upon the water supply provided at increased expenditure, an additional team having

been already engaged by you, I feel unable, under my instructions, to continue my party on the line, consuming water, and must therefore withdraw, as I have no authority to join you in incurring that additional expense." (Note: the expense was being divided between New South Wales and Queensland.)

Queensland Party Withdraws

Mr. Watson's report, dated at Hungerford, April 14, 1880, to the Surveyor-General, stated that he had withdrawn the Queensland party from the Border survey.

A further report in April, 1880, stated that the Queensland party accompanied the Boundary Survey as far as 99M.40C. west from the Warrego and 22M. west of the Paroo. Before leaving the locality, Watson reported that he had surveyed the town of Hungerford.

On June 21, 1880, the Surveyor-General of New South Wales wrote as follows: "In reference to the recent communications relative to the withdrawal by your government from the survey of the boundary line between Queensland and New South Wales, I have the honour to inform you that the Secretary for Lands has been pleased to approve of the survey being continued by this colony alone, as far as the South Australian boundary; provided that your government will adopt our measurements. The same facilities for enquiry and testing the accuracy thereof remaining open to your department."

This was agreed to by the Queensland Government.

At South Australian Border

On reaching the South Australian border, John Cameron submitted his report, a copy of which was forwarded to the Surveyor-General, Brisbane. This reads as follows: "January 17, 1881. I have the honour to transmit the following report of the colony boundary between New South Wales and Queensland:—

- (1) On the 15th September, 1879, I commenced by turning the angle from the meridian line to vanes erected on the Warrego, took 78 angles, built three concrete obelisks, one on the east bank of the Warrego, one five miles west, and one five miles east.

- (2) Had great difficulty in crossing creeks with the whole came, the Irrara, Cuttaburra and Warrego being flooded, Irrara being one mile wide and Warrego 20 chains wide. I had to construct two boats, one of planks and another of canvas and frame, the latter being the most useful; ferried eight tons with this boat in one afternoon, including instruments.
- (3) Dense gidya and mulga scrub between Warrego and Hungerford and had to cart water 25 miles on this stage.
- (4) Erected latitude stations at the following sites: At 54 miles, 76 miles, 156 miles, 210 miles and at 268 miles; built two brick obelisks at Hungerford, one at 76 miles and one at 76 miles 65 chains.
- (5) On the completion of the latitude observations at Hungerford, Mr. Hely (officer of Customs) kindly lent me a boat and which, after a couple of days spent in repairs, enabled us to cross the Paroo. The men were obliged to cut the line waist-deep in water for over a mile.
- (6) At the 85 mile post I—and a blackfellow—went ahead to look for water between the Paroo and the Bulloo, but after three days' exploring we found none within 25 miles of the line.
- (7) At the 100 mile post Mr. G. C. Watson had instructions from his department to withdraw his party owing to the waterless country ahead and expense for extra equipage.
- (8) I was determined to carry the work out at all hazards and engaged an extra team of six horses and bought two extra horses for my own camp, making a total of 14 horses carting water.
- (9) At the 108 mile post I started again with a blackfellow to explore westward to Wanpah Creek. After traversing 190 miles we only found a little electro-plated water on the clay pans left by the recent shower. As this would evaporate with the sun, I sent two men ahead to drain it into small tanks. At the 140 mile post I was obliged to go ahead with all the horses by a compass bearing to Bulloo Downs (90 miles), the nearest known water. I took four men, dray, tank and buggy to make a

track to the water, if we found any. At Bulloo Downs we were informed that there was no water except at Booka-Booka, 18 miles north of a point on the line 188 miles from the Warrego. On our way back, found a little muddy water at the 156 post. At this point one of the hands (Lindsay) got seriously ill with scurvy, and had to be carried on a stretcher. I had to send a conveyance with him to Yancannia, 150 miles, being the nearest point to the Wilcannia Hospital. Immediately after his departure, the assistant, Mr. C. V. Brown, and the chainman, Bryant, were laid up; four others, including myself, just able to move about. I was obliged to chain, run the line, observe at night, help to cart water and remove camp on account of being so short-handed. I sent to Wilcannia and Bulloo Downs for medicine to cure the scurvy. On the return of the waggon that brought Lindsay to Yancannia I had to send it to Depot Glen with the chainman, Bryant, about 80 miles. I engaged two fresh hands and continued the line west from Wanpah Creek, knowing that there was no water between that creek and the South Australian border.

- (10) The lessees contiguous to the line had to remove their stock to Cooper's Creek for sustenance and water.
- (11) At the 235 mile post we nearly lost all our horses in one night, owing to the teamster and blackfellow being unable to find the waterhole. They brought the horses back to camp, after having traversed 90 miles. Having 100 gallons of water in camp, I divided 50 gallons among the 32 horses with a little oatmeal, which enabled them to travel to "Warri Warri" Creek. I travelled 50 miles on my private horse before I found this water, and then only a little by digging in the sand. I was obliged to give the horses a week's spell to recruit their strength and also cart water to the camp, 22 miles, with the strongest of the horses.
- (12) When at the 250 mile post I sent one of the assistants, Mr. B. C. Boys, for mail and beef to Fort Grey, and to get information re water,

etc. In the dark, he (Boys) crossed the track leading to Fort Grey and meandered about the Lower Cooper Creek flats for three days and nights without food or water until his horse died. Boys then carried his saddle and mail bag and went east and struck a cattle track about 18 miles south of the station. When he got to the station, Mr. Crozier kindly attended to him and loaned him horses to return to camp with beef and mail.

- (13) From this (250 mile post) point to the end we had it very dry, the only water being at Fort Grey, and no grass for a radius of eight miles from the lake (this is Pinaroo Lake).
- (14) I intended to erect a stone obelisk at the intersection with the South Australian boundary, On account of there being no stone in the neighbourhood, I was obliged to erect a post 8 ft. high with large mound.
- (15) On the completion of the boundary, we could not follow our line back to Barrington, as there was a stage of 134 miles without water, and we were obliged to go via Bulloo Downs and Thar-gomindah, and even by this route there were stages of sixty miles without water.
- (16) I think the principal cause of scurvy was bad water. For four months we were obliged to drink water that the horses would not drink, which we purified with gypsum, when we could get it.
- (17) Latitude stations were erected at an average of 50 miles. The greatest apparent error appeared at stations 5—Brindingabba Dam, 2", and at 268 miles, 2.35"; the others were less than one second.
- (18) The time occupied for the 287M.60C. being September 15, 1879, to September 30, 1880—12 months and 15 days.

(Signed) John Cameron, Geodetic Surveyor.

A report on the marking of the 29th parallel from Barrington easterly to the Macintyre is not available, but copies of plans, signed by John Cameron, were supplied to Queensland. Cameron's signature is dated January 31st, 1882. This part of the survey was car-

ried out in a manner similar to the survey westerly from Barrington to the South Australian border, i.e., it was marked by chords 5 miles in length; posts at every mile, 4 ft. 6 in. to 5 ft., marked N.S.W

Q

(mileage); pegs 18 in. in ground at every 20 chains. Chords were produced with the Dolland transit. The relation of the magnetic meridian to the true north was recorded in many places.

The original plan shows that a large post (one ton weight) marked the position of the boundary on the west bank of the Macintyre. On the north side of this post were the letters QL; on the south side N.S.W. J. Cameron, and on the west side LAT

29.

Gregory's Marked Trees

Two of Gregory's trees marked A and B were located nearby and connected by traverse to the border survey (see M.51.99A).

South Australian Boundaries

The boundaries of South Australia were fixed by Letters Patent dated February 19, 1836; the description reads: ". . . on the north by the 26th degree of south latitude . . . on the east by the 141st degree of east longitude . . ." Queensland, being contiguous, is interested in part of these lines, but no official reports of the work can be traced among the records. Copies of the plans, however, are available.

Information in the Survey Office, Brisbane, points to the conclusion that the 141st meridian was run from the boundary pier (which was in the vicinity of the Murray River) as far north as the 26th parallel, the position of which was determined from the latitude of the boundary pier by measurement. The measured distance to this point (called Haddon Corner) was 552.089 miles. The section from the 29th parallel to Cooper's Creek was done by Mr. W. M. Barron; the plan is dated January 2, 1880, and endorsed by Mr. G. W. Goyder, then Surveyor-General of South Australia, on August 12, 1881.

From Cooper's Creek to Haddon Corner was run by Mr. Augustus Poeppel. His instructions were dated

June 4, 1879, and the plan is dated May 19, 1881. It also is endorsed by Mr. Goyder on August 12, 1881.

From Haddon Corner the 26th parallel was run westerly by mile chords, a distance of 186 miles 49 chains to the calculated intersection with the 138th meridian. This work was likewise done by Mr. Poeppel. Apparently mile chords were run, and, at every ten miles meridian observations taken, and the next chord laid off on its proper bearing.

To the Gulf of Carpentaria

From the point thus fixed as the intersection of the 138th meridian, the latter was run north to the Gulf of Carpentaria by Messrs. Poeppel and J. Carruthers in 1885 and 1886. The latitude was marked on every tenth mile post.

The first available report from the survey is dated September 30, 1885, from Kilgours Well, in Lat. $19^{\circ}8'$ and signed Jno. Carruthers, and reads as follows: "I have the honour to report that I have run the line to the 481st mile and have taken the party to Kilgours Well, about seven miles north-east of the line. The country passed over this month up to the 471 mile is chiefly undulating. Mitchell grass downs with occasional belts of gidya and Landsborough pines. From the 471st to the 480th miles (between which we crossed the Gregory River), the country is very rough and stony with abrupt spurs running from the tableland and covered with spinifex, gum trees and bloodwood. From the 480th mile the country again breaks into undulating Mitchell grass tableland and will extend for ten or twelve miles north, after which we will enter broken stony ridgy country, intersected by numerous creeks and watercourses covered with spinifex and desert gums. It is my intention to stay at Kilgour's Well for a short time in order to spell the camels, cut mile posts and pickets and to attend generally to the mending and rearrangement of camp equipage. It will be necessary to examine the ranges north of this. They are supposed to be terribly rough and stony and extend between 60 and 70 miles north to the Nicholson River. The camels are a little lame in consequence of the stony nature of the country already passed over and require a short rest, as they are still showing symptoms of skin disease and require regular attention at least once a week to thoroughly eradicate

the disease. Unfortunately, I could not get the dressing ordered from Burketown, consequently I am sending a man this month for it.

“Kilgour’s Well has just been sunk by the Kilgours Coy. of Queensland, who have only now commenced to form the station and is the nearest known water for 50 miles. It happens to be conveniently situated for working the line to the north. Mr. Kilgour has kindly volunteered to find horses and will accompany me as far as possible in search of water and feed for the camels. We have on several occasions seen native fires on the ranges, and have no doubt we shall find water at suitable intervals along the line. Our greatest difficulty will be to find food for the camels, as only spinifex and stunted box or gum seem to grow on this stony land. All the members of the party are in good health and spirits.”

Under date, November 4, 1885, Carruthers again reports: “I have completed the line as far as the 504 mile post. From the open grassed downs mentioned in my last report we have passed into rough rocky hilly country or broken spurs, the gullies being very abrupt and rocky. From the 481st to the 491st mile is open grassed undulating country with a few scattered Landsborough pines and bushes. From the 491st to the 504th mile is chiefly broken rocky spurs and ridges, covered with spinifex and desert gum, box forest, with a few scattered bloodwood trees and bushes. The trees average from 30 to 40 feet in height, but are more or less eaten by white ants, whose nests are to be seen in considerable numbers all through the forests. After completing the month’s work, Mr. Wells and I took two camels and started from the 504 mile post in search of water. Bearing due north at 506 miles, we crossed some small alluvial flats, nicely grassed, the soil being a rich brown porous loam. At 507 miles we came to a small creek running east. Altering our course from north to east, we followed up this creek, and at two miles came to its junction with a large creek running from the north-west. Following this creek on a general bearing of 75° east, we came to a native camp and found a soakage hole, which has been scraped in the sand by the natives (and about two miles from the junction). Following the creek two miles further east, we came to very rough, rocky gullies and spurs and were obliged

to return to the junction. We then followed the large creek north-west towards bold rocky cliffs; at two miles found a small waterhole, and at two and a half miles at foot of cliffs found a magnificent reservoir of permanent water supplied by springs running from a deep rift in the range. The cliffs, which are actually a range, slope gradually to the northward, rise abruptly about 140 feet from the watershed presenting a precipitous face of rock on the south side, the bold outline of which can be traced for a considerable distance east and west. On examination of the rift from above, I found, about mid-way, a spring from which a small stream of clear water flows from rock to rock until it reaches the reservoir below. It then flows seven or eight chains down the channel, when it disappears among rocks and sand. The rift is an opening for creeks from the north and west, and is about 20 feet wide at the top, narrowing down to about half that width at the bottom, with perpendicular rocks on either side. The reservoir covers about two acres of ground and is fringed with large paper bark trees and numerous shrubs and bushes, and, with the spring and other waterholes, is teeming with a variety of fish. Its length is six chains and greatest width four chains, and is in part 30 feet deep. The natives seem to be aware of our presence, as all their camps have the appearance of being lately abandoned. Signal fires are frequently seen about our line, but the natives themselves will not venture near us. Am sending Mr. Wells with the mail; he will also bring out the rations from Kilgour's camp. During Mr. Wells' absence, I shall be able to run the line another seven or eight miles and sketch in the country on both sides of the line as far as possible and will endeavour to find a place to cross the range with the camels. Once across on the north of this rocky barrier, we could then reach the water in the spring from the north side of the rift. I expect the camels back here about the 12th instant (November), when I will again take six of the camels and push on as far as possible with the line. All the members of the party are in good health."

Carruthers' next report is dated December 3, 1885. He says: "I have completed the line to the 517 mile, but regret to state that on account of the miserable condition of the camels and the rough nature of the country, it will be impossible to do more until they are

better. I am taking the party to the depot at Rocklands Station, where there is plenty of feed for the camels. I intend to work round from there to the Nicholson River via Burketown. On November 23 I started with Mr. Wells, two men and four camels and traversed the line (as nearly as possible) to the Nicholson, but after travelling about 30 miles over terribly rough country, we were obliged to return, the camels being unable to go any further through want of food. From the appearance of the country, I should say that there must be over 50 miles of wretched stony country from the 517 mile yet to do. I have to state that one of the camels died from poverty on November 19 and two others have been poisoned by a weed. Several of the other camels are in a very weak condition, and they will require at least a month's spell to get into working condition again. After they have sufficiently recovered, I will make easy stages round to the Nicholson. This will give them every opportunity of improving their condition, when I trust to be able to start work again about March next. Before leaving Rocklands, I will connect the junction of the James and Lorne Rivers with the survey and trust to be able to finish the line to the Gulf by August next."

No further reports are available, but the plan shows that a large post was marked on the shores of the Gulf 50 links above the high water mark.

