REPORT on the RELICS
of the
OVERLAND TELEGRAPH LINE
between
BATCHelor and PINE CREEK

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August, 1983.
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ACKNOWLEDGMENTS

I wish to acknowledge the financial assistance provided by the Northern Territory Government in furthering this project.

I also wish to acknowledge the support of my colleagues of the Northern Territory Division of the Institution of Surveyors, Australia.
INTRODUCTION

The story of the construction of the Overland Telegraph Line, between Darwin and Port Augusta, in the 1870's, has been told many times and will not be repeated here. However Sir Charles Todd must be mentioned, since he was the driving force behind the enterprise, and the Parliamentary Reports were prepared by him.

Todd was appointed as the South Australian Government Astronomer and Superintendent of Telegraphs in 1855, and also as Postmaster General in 1869. By 1870 he had managed the construction of some 500 km of telegraph line, and the experience served as a foundation for the specifications and conditions required for the O.T.L.

In order to know what to look for in relics of the Line, I have had to document what was built initially, and also the upgrading of it in later developments. To this end I have used the South Australian Parliamentary Papers (SAPP), and as as they are interesting and fairly concise, have quoted them at length.

While this report deals with only a small part of the O.T.L. - some 123 km - over half of it is without monuments and without reliable survey data to make up the lack of them. Survey information, consisting of plans and/or surveyors' filed notes of the original work, was meagre. The minimum requirement is a listing of bearings or angles, with distances, as measured on the ground. There is no doubt that the Line was surveyed, but to date, the only really useful plan came from the South Australian Archives and covered the Mt. Osborne to Pine Creek section - the only part to have standing poles. Excepting the Railways roll plans, which will be discussed later, only small scale plans have been uncovered and are of limited use.
The construction of the Palmerston to Pine Creek Railway, from 1884 to 1889, had a considerable effect on the O.T.L. since the two routes tangled for the first 60 km or so. Firstly, the railway survey included some connections to poles, and some detailing of the old mail road together with the habitations at Adelaide River, Bridge Creek, Howley, and Pine Creek: these are shown on the Railway roll plans, scaled a 1" = 4 chains (1 : 3168). Secondly, with the shifting of the Line to the railway, it exposed the now abandoned wooden poles, of the old alignment, to the human element in the destructive forces now facing them.

Plots and co-ordinates have been derived, in the main, from small scale plans, and must therefore be treated with caution.

The old mail coach road was generally evident from Batchelor to Pine Creek. It was less evident, naturally, in areas subject to flooding, and where it was overshadowed by the Railway. However there were long stretches that were usable and pleasantly shaded.

I have used photography to illustrate typical relics, and also to brighten a somewhat dull account of them. The distances referred to in the commentary on the photography are those from the starting point for each section. It looks inland, consecutively, along the direction of construction, unless otherwise stated.

A number of ironwork relics have been found. The most interesting are the devices used to secure the insulators to the wooden poles. I have samples ranging from the simple replacement of the hardwood pin - and iron rod 1" by 10" (.025 by .250 m) - to the bolted bracket.

If I have mentioned King and Herbert overmuch it is because I have, unconsciously, put them in the place of the missing survey data. I believe that their writings will eventually solve the mystery.

Finally, reports like this need survey drafting to complete the presentation. Regretfully, I have not been able to accomplish this.
THE SETTING.

The contract for the construction of the O.T.L., from Port Darwin to about 500 miles inland, was let to the partnership of Darwent & Dalwood of Adelaide. The agreement was signed on 20/7/1870, and bound the contractors to start no later than 15/11/1870, and to complete the Line, "ready for use", by 1/1/1872. Thus the survey and construction under this contract concerns this report.

The South Australian Parliamentary Paper No. 60 of 1871 sets out the specifications and conditions of the contract. Briefly they are:

The Government to supply all wire (in this case No. 6 SWG - 4.88 mm dia) insulators, and insulator pins (hardwood initially). The contractors had to define a track for the Line in as direct a course as possible subject to the approval of the Overseers of Works, who were to point out the general direction to be followed. The Line had to be cleared to fifteen feet on both sides. The poles could be ...

...straight, rough saplings of the best hardwood procurable in the locality accepted by the Overseer, stripped of bark, twenty feet long, nine to ten inches in diameter at the butt, and five or six inches at the top, or square poles, perfectly sound, of the same length, eight inches square at the base, and five inches at the top. The butt of each pole to be charred for five feet up. Number of poles to the mile, twenty, or four chains apart; but where poles of the dimensions before specified but only eighteen feet long are used, not fewer than twenty-five to twenty-seven to the mile must be planted. Sound trees of the requisite girth, situated on the direct line, may be used with the sanction of the Overseer - the contractors to ring and top them. A wrought iron bracket for the insulator pin to be well driven into the tree.
A hole of the proper or exact size to receive the insulator pin to be bored vertically into the centre of the top of the pole to a depth of five inches, and the insulator pin driven into the same depth, and firmly fixed so it cannot be drawn out.

The poles to be planted vertically, in a straight line, to a depth of four feet, the ground being afterwards well rammed.....

Care must be taken to fit the insulator very tightly on to the pin. Should the pin be a little small for the socket, a wedge must be driven to the top of the pin, or a leather collar wrapped around the pin, so as to fit the insulator tightly.'

The line wire to be securely tied with No. 15 tie wire (supplied by the Government), in the manner shown by a pattern to be provided by the Overseer of Works, and strained so as to leave a deflection of three feet in every span of four chains.

Special attention is drawn to the joints, which are to be made in the manner shown by a pattern provided by the Overseer of Works, (the Britannia joint), well soldered with solder consisting of two parts tin and one of lead. The joint to be afterwards washed to remove the acid.

Every angle pole is to be well strutted with an extra pole, sixteen or seventeen feet long.

A length of wire, ten or twelve yards long, is to be stapled to every second pole, as a lightning rod, projecting three inches above the top of the insulator, on the opposite side to that of the line wire, the other end being buried in a horizontal coil at the foot of the pole, four feet in the ground. Care to be taken that the rod does not touch the insulator.
Clause 21, under General Conditions, gave the Overseers of Works, on behalf of the Government, the right to terminate the contract should the progress be unsatisfactory. There were two Overseers appointed: William McMinn and R.C. Burton, who had previous N.T. experience.

McMinn, the principal Overseer, was given detailed instructions.

(15) The relevant clauses were:

In selecting the route for the line, great care should be taken to avoid low lands subject to inundations - where the line would be difficult of access to effect repairs; narrow crossing places over rivers and creeks should be selected, where the wire can be carried over safely. If necessary, masts may be erected on the banks of rivers, vide marginal note in specification.

The route followed is to be roughly marked by blazed trees, mounds, and posts as often as may be necessary. The line as erected being subsequently carefully laid down on a map, on a scale of one mile to the inch.

The Darwent & Dalwood party was led by W.A. Paqaulin, with J. Darwent as second in command. Included were Stephen King Jr., as surveyor, and S.W. Herbert, the youngest member. King, like Burton, had experienced N.T. conditions before, and he was seconded from the Lands Dept. in Adelaide for this reason. (6)

What happened to the contract is well known, and is still somewhat controversial. It is sufficient to say here that it was cancelled by McMinn on 3/5/1871, with the Government party taking over, inter alia, some of the men, including King and Herbert, and presumably also the survey information so far gained. By this date the Line was complete between Southport and Pine Creek.

On 1/1/1873 Todd reported the completion of the construction of the "Adelaide and Port Darwin Line of Telegraph", section by section. Of the Darwent & Dalwood section he said: (17)
I have now only to refer to the section constructed under Messrs. Darwent and Dalwood's contract, from Port Darwin to the King, 225 miles. This being the oldest piece of line (commenced in September 1870), I was more anxious about it, especially as it was in a disabled state during a great part of the previous wet season.

I have had it thoroughly overhauled, every bad pole taken out, and between Port Darwin and the Katherine iron pins have been substituted for the iron-bark pins, which, although soaked in boiling petroleum, were found to attract the white ants and the boring beetle. The result, after examination, is that out of 225 miles of the line it has been necessary, up to the present date, to replace about 150 poles, destroyed by bush fires, white ants, and dry rot, which I think, is sufficient to show that the line was faithfully built.

In a country so abounding with white ants as the Northern Territory, it is not pretended that wooden poles will last as long as elsewhere. Had I thought so, I certainly should not have advised the Government to order 6,000 iron poles, in addition to the 500 previously sent to the Northern Territory (now at Southport), and the 2,500 on the southern portions of the line.

My present idea is, that we should gradually introduce iron poles, planting them alternately with wood where timber is plentiful and near at hand, and consecutively where the timber is inferior and difficult to get.

In the Northern Territory, it will probably be found desirable to have iron and wood alternately from Port Darwin or Southport to Newcastle Waters, unless experience should show that the pine, bloodwood, paperbark, and ironbark poles escape the ravages of the white ants.

At Yam Creek we have put up a substantial three roomed hut, built of cypress pine, and roofed with galvanised iron. It is nearly completed.
It should be noted that Yam Creek was the official name for the Shackle telegraph station. (5) (8)

R.C. Patterson was appointed by the Government, on 13/7/1871, to take charge of the northern construction parties after the failure of the Darwent & Dalwood contract. (16) In his report, dated 30/11/1872, he said:

The line was surveyed to the King, by Mr. McMinn previous to his return to Adelaide....

This should not be taken as meaning the whole survey. It was King who made the measurements - at least to the Katherine. (19)

In 1883 Todd reported on the development of the Line: (18)

...in the Northern Territory, the whole of the poles were of wood, the best local timber obtainable being used. On Bagot's section a large proportion of the poles were of cypress pine, and a short piece of line south of Katherine, in the Northern Territory, was pole with the same description of timber, which is found to be less liable to the attacks of white ants than any other. Elsewhere the poles are mostly gum in the interior, and in the Northern Territory, gum, stringy-bark, and bloodwood. The white ants, especially in the Northern Territory, are terribly destructive, besides which we had bush fires to consider; and in repoling the line, it was decided to use light iron poles (Oppenheimer's patent), except where the local timber was plentiful and durable.

Todd then went on to give a list of section repoled. In part:

Port Darwin to within 20 miles of Southport...375 iron (18 mls)

Thence to Collet's Creek............................wood (35 mls)

Thence to Mt.Todd, alternate wood and iron..1390 iron (124 mls)
The decision to build the Palmerston to Pine Creek railway and to relocate the Line to it is also mentioned:

It is also proposed to shift the line in the Northern Territory to the railway between Palmerston (Port Darwin) and Pine Creek. The original line in this section has been only partially repoled with iron; but along the railway all iron poles will be used, and an extra wire for railway and local traffic is to be supplied...

The improvements on the Pine Creek and Yam Creek stations were:

(18)

Pine Creek. - Temporarily closed (since 1881), but will probably be reopened in two or three years hence, after the completion of Port Darwin and Pine Creek railway; six rooms in all, with several sheds; no paddock; one yard, about half-acre; three galvanised-iron tanks, capacity about 2,000 gallons; one well of good water.

Yam Creek. - One small room for telegraph office and post office; three small rooms and detached kitchen for use of station-master and assistant, one small room for men, also stables and sheds; one paddock, area about 240 acres; one yard, about half-acre; four 400 gallon iron tanks; one well of good water.

The Pine Creek well was described as being 5 x 3 (ft.), 73 (ft.) deep. At Yam Creek (Shackle) the well was circular, 4 (ft.) in diameter, stoned up, and 12 (ft.) deep.

This then completes the setting, the physical evidence to be looked for. However I have not been able to determine whether the unshifted wooden poles in the vicinity of the Railway were sold or simply abandoned. It is an important point in retracing them. I have assumed the latter.
THE PROJECT

The objectives of the project, as I see them, are:

1. Carry out the cadastral and geodetic survey of the route of the Overland Telegraph Line as it stood in 1873.

2. Document the relics of the Line, including the associated road, stations, and appurtenances.

3. Make recommendations for further action.

In responding to these, I have found it convenient to divide the length of the Line under consideration into three sections, the ends being within convenient reach of a 1st order Trig. Station. (29) (30) (31) (32)

Each section is dealt with separately, discussing the survey information (data) available, what was found, progress of the control survey, plans, maps, and co-ordinates presented, and the photography. The recommendations will come under one head.

Section A. 16 km From the S.E. corner of Section 1267, Hd. of Waterhouse, County of Palmerston, to the Adelaide River Railway Station. The starting point is where the O.T.L. "went bush" from previously surveyed land, and is some 10 1/2 km south of Batchelor. It should be noted here that the Line was offset 15 feet (about 4.6 m) into the road reserve, a fact uncovered by survey but not explicitly stated in the instruction to the contractors.

As mentioned before, survey data discovered so far is not very useful. (21) (22) (23) (24) (25) (26) (27)

The Railway roll plans scaled at approximately 1 : 3200, show some plotted connections to the Line and co-ordinates can be derived from these. However, over half the length is not shown at all, thus forcing the use of small scaled plans.
The relics found in this section consisted mainly of the old mail coach road, with a few broken insulators, and some ironwork. Although the wooden poles were not shifted to the railway, none were found; and without data, the sub-surface evidence of them cannot be searched for with any confidence. The fixing of these relics, therefore, must await proper survey data.

As mentioned in the interim report, I have spent five days in the South Australian Archives, in May, to search for this data, and being unsuccessful, engaged a member of the Association of Professional Historians to continue the work. Presently there is no result.

The distances referred to in the commentary on the photography are, without survey, approximate only.

Appendix 1 is a listing of Australian Map Grid (AMG) coords, and 2 is a plot of them, for the O.T.L. As stated before, they are approximate only, and can only be refined by using better data.
Section B. 53 km From the Adelaide River Railway Station to the Mt. Osborne Angle.

The comments on survey data are much the same as for Section A. Other than the small scaled plans mentioned, there are the Railway roll plans. (27) (28) However, as before, these cover less than half of the O.T.L. - 19 km or so between Adelaide River and Brock's Creek, where the Line and the Railway diverge effectively. With a lot of patience and calculations a few angles may be co-ordinated, but again the primary data must be derived from the small scale plans. Appendix 3 shows the plot of the O.T.L. in this section. I am presently working on the co-ordination.

The photography generally covers what was found. As before, there is no definite evidence of the Line, as it stood, except in the Mt. Osborne area. Here the solitary pole was co-ordinated by a direct connection to the Mt. Osborne Trig. Station and is within 200 m of the Fountain Head road. The old coach road was very plain on grades, excepting creek crossings, and in stoned flood areas. The Oppenheimer footplate came from a recently lifted pole of the Railway alignment near Bridge Creek. There are usually two to a pole.

As mentioned in the Introduction, the Railway roll plans show most of the small settlements that attached themselves to the O.T.L., and the attendant road, at convenient places. While the scale of plot is generous, it must be remembered that the primary purpose of the plans was to present railway survey data, and not to particularise buildings, nor, for that matter the O.T.L.

I have not started the control survey as there is no reliable data.

The starting point for the section and the photography is the angle pole position just east of the Adelaide River Railway Station. There is enough survey information to calculate this point within the limits of scale of the roll plans.
Section C 54 km From the Mt. Osborne Angle to Pine Creek.

Survey data being available, the control survey was started by connecting to the Mt. Osborne Trig., and then followed the alignment of the O.T.L. south-easterly toward Pine Creek. (13)

(31)

There was at least one above-ground relic (pole or stump) on each "leg" of the alignment to help define it. After a while it was possible to distinguish, on easy ground, pole holes from pig holes - given the four chains spacings (about 81 m) and the bearings. It was also evident that most of the angles were eased by rounding, that is by offsetting poles near the corner to take up, gradually, the new direction.

The old mail coach road was usually to be found within 50 m of the line, and was evident in most places; and it was sometimes marked by an avenue of trees. Some old logged and stoned crossing of Yam Creek, and of its tributaries, were also evident.

The upper Yam Ck. and Shackle part of the control survey was difficult. The ground was so much overturned by prospecting and alluvial workings that it was hard to decide whether likely holes were due to the pole, pick, or pig. The dolerite ridges, while generally free of prospecting activities, gave very little evidence, considering the advantage of a limited search area.

The location of the Shackle telegraph station, or what was left of it, is doubtful. I have always understood that it was the western-most of the building earthworks of the old townsite situated on the south side of Shackle Creek. However, since completing the control survey here, I found that the Line passed over the middle of the site and would have inhibited the erection of any building with a raised floor. In Kelsey's "The Shackle" a photo shows the Line to be well in front, roadside, of the buildings. Also a well, described in Todd's report of 1883, is some 300 m away thus creating further doubt. However, against this evidence, I have found the butt of a cypress pole some 20 m offset from the Line which would agree with the photo
mentioned above; and as it is a good site and extending it into the ridge would require considerable earthwork, it would be reasonable to offset the Line around it. The events leading up to the building of the station must also be considered: firstly, the gold rush and the setting up of a tent under the Line by the telegraphist, who would have chosen a good place; then the decision to build better quarters — all within a year, at the height of the rush, when most of the land was taken up, would have severely limited the choice of other sites.

The historical accounts of the location of the telegraph station are not precise, and in one instance conflicting with what is now known. Thus Goss: (19)

The Yam Ck. Post Office (generally known as the Shackle) was a small wooden slab building about 115 miles from Palmerston which is now Darwin...

The road, what there was of it, ran along a valley, and the township occupied the rising ground on either side...

On the North Bank (!) on the opposite side of the valley were the Post Office and Hotel...

Goss was an assistant telegraphist at the Shackle for two years, probably between 1880 and 1882.

There are, of course, other remains of building sites along the Line at the Shackle, extending some 700 m. The usual remnants being earth floors, stonework, the everlasting bottle heaps, rusty cans, nails, broken china, and assorted ironwork such as horseshoes, harness frames, and hoopiron. While none of this has been detailed, the control for it has been established.

The old road going south from the Shackle appears to have been no less used than that to Southport. At the West Margaret crossing there are stoned abutments for bridgework in addition to a low level crossing. Generally, on sloping ground, the road can be identified by long channels filled with trees and scrub, and is shown by the photography.
There are some 53 poles and 9 stumps in this section - 5 poles less than in 1980. There are many poles lying on the ground and they will be useful in determining alignments. The poles were of cypress pine (Callitris intratropica) excepting one grey box (Eucalyptus tectifica) and one trimmed ironwood (Erythrophleum chlorostachys). There is no evidence of the stringybark, bloodwood, or the gum mentioned by Todd.

The closest standing pole to Pine Creek is some 6 km away, and the control survey will be required to search for anything closer.

As mentioned elsewhere, one good result of the Railway survey in 1884 was the detailing of the habitations along the route. The roll plans thus show the improvements of the telegraph station at Pine Creek. Refer to Appendix 8.

The plot of the O.T.L. between Mt. Osborne and Pine Creek is shown in Appendix 7.
RECOMMENDATIONS

Firstly: That arrangements be made to draft the survey information so far gained as per field book.

Secondly: That failing any further survey data for the O.T.L. in sections A and B, the old road to be surveyed and subsequently reserved as a historic corridor. Suitable camping places, such as on the Stapleton and at Bridge Creek, having permanent water, to be included.

Thirdly: That the survey of the O.T.L. be continued on from the South Margaret to Pine Creek, as set out in the present brief. I have already said that I will do this, but the time factor may not be agreeable to National Trust.

For those who have to consider these recommendations, I suggest that the very first thing to do is to travel the Line. For the most part the old road can be followed, once it has been pointed out. Start in the north, and note the disruptions as you go. There will be a few fences to cross, and there will be detours. There will be gullies to negotiate, so add a mattock to your 4 by 4. Go slowly and look about. It will probably take two days or so to reach Pine Creek. But camp on the road: continuity is maintained, and some of the granite creeks have permanent water.

Armed with a sense of history, I am sure that the journey will be a worthwhile experience.

A.N. Wilson
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(2) Daly, Mrs. Dominic.
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(3) Gill, Thomas.

(4) Harcus, W.
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(5) Kelsey, D.E.

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(9) Taylor Peter.
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(10) The Royal Colonial Institute.
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(11) Threadgill, Bessie.
SOUTH AUSTRALIAN LAND EXPLORATION 1856 to 1880, S.A. Public Library, Adelaide, 1922.

(12) WILDEY, W.B.
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REFERENCES

SOUTH AUSTRALIAN ARCHIVES

(13) C_55 Scale: 1" = 1 mile (1 : 63360) Shows plots, with bearings and distances, of the O.T.L. between Mt. Osborne and the Edith. Sheets numbered 4, 5, and 6. Very useful, but some differences. Assumed to be dated 1870.

(14) Herbert, S.W. Diary (reminiscenses) 1870-74, ms 166 p. Good source of information, but there are some dislocations. An additional 20 p. deals with prospecting in the N.T. 90% copyright.

(15) SAPP No. 60/1871

(16) SAPP No. 130/1871

(17) SAPP No. 29/1873

(18) SAPP No. 191/1883

PRIVATE MATERIAL

(19) GOSS, Fred. "Life in the Never Never of South Australia in the 70's and 90's. 1956.
REFERENCES

PLANS and MAPS (Surveyor General's Office - N.T. Dept. of Lands)

(20) CP 403  Scale: 1" = 4 miles (1 : 235440) 10 sheets originally but only 6 found. Shows the O.T.L. between Lake Woods and the N.T./S.A. border. Copies.

(21) CP 407  Very small scale. Various plots of the O.T.L.

(22) CP 414  Scale: 1" = 2 miles (1 : 126720) Shows natural features of the Trigonometrical Survey of the N.T. O.T.L. plotted between Section 1267 and Pine Creek.

(23) HD. of WATER HOUSE PLAN DRAWER. Various plans dating from 1869 to recent.

1. Scale: 1" = 20 chains (1 : 15840) Shows survey of Blocks 1 and 2 and a small part of O.T.L. Cancelled, no marks found.

2. Scale: 1" - 1 mile (1 : 63360) Shows connections to the Hd. of Waterhouse boundaries from Mt. Minza to Durand's Hill. Part of O.T.L. shown. Mackay 1874.


7. Scale: 1" = 40 chains (1 : 3168) Shows old mail road crossing of Stapleton Creek. Muntz, 1914.

(24) DP 52. Various scales, 7 plans of the Trigonometrical Survey between Mt. Minza and Gandy's Hill. The O.T.L. is shown on only one, at a scale 1" = 4 miles.
REFERENCES

FIELD BOOKS (Surveyor General's Office - N.T. Dept. of Lands).

(25) Duplicate of field notes of the Trigonometric Survey of the N.T. Shows connections to the O.T.L. at the S.E. corner of Section 1267, and at Pine Creek between Gandy's Hill and Union Hill. Verification base proved the work to be unreliable.

RAILWAY ROLL PLANS (as above)

(26) R7. Scale 1" = 4 chains. (1 : 3168) From Section 1267 to Burrells Creek. (70m 13801/21 to 81m 25231)

(27) R8 Scale as above. From Peters Creek to Burrells Creek 75m 54431 to 81m 25231)

(28) R9 Scale as above. From Burrells Creek to the Howley (81m 25231 to 101m 25231)

TRIG. STATION SUMMARY SHEETS (as above)

(29) N.T.S. 306 (NM/G 25) MINZA.

(30) N.T.S. 307 (NM/G 26) CARR.

(31) N.T.S. 309 (NM/G 28) OSBORNE.

(32) N.T.S. 312 (NM/G 31) GANDYS.
ROUTE OF THE O.T.L. from the S.E. corner of Sect. 1267, N0. of Waterhouse, to the ANGLE POLE position near the Adelaide River Railway Station.

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Railway, Adelaide River Rly. Stn.
INTERIM SURVEY REPORT — SECTION C

Survey Data. (13) (22) (25) (31)
The primary data came from a set of three plans designated as C55 by the South Australian Archives. These were plots, with bearings and distances, extending from just N.W. of Mt. Osborne to the vicinity of the Edith, and therefore covering Pine Creek. It seems that these plans were donated from private papers, rather than being official records, and the annotations suggest that there are others to cover sections A and B. The scale is $1" = 1$ mile (1 : 63360) and there are repetitions of both plot and data. The bearings were magnetic (for that time) and the distances are in miles, chains, and links, starting from the N.W. corner of section 602, Hd. of Cavenagh - about 1 1/2 km south of Southport. (13) Stephen King Jr. was the surveyor, and he used a "compass theodolite". (6)

Other than the above, there were only small scale plans - the best is at $1" = 2$ miles (1: 126720) (22)

Field Work
This was done mostly single handed, using borrowed instruments. However I had to buy a "land" cyclometer, a measuring wheel, for detailing. As with all borrowed or hired equipment time was important, and the survey was done in four stages; firstly, the search for the Line relics (poles or the remains of them) according to data, identification, and the clearing of the survey lines - compass and axe work; secondly, the alignment and angle reading - both vertical and horizontal - by theodolite; thirdly, measuring the distances with electronic distance measuring equipment (EDME); and lastly, the recording of detail - roads, creeks, hills, relics etc. - with the cyclometer, with the creeks being spanned by tape. For the first two operations the equipment was available without much limit, but the last two until the cyclometer was purchased, were time dependent, needing a separate trip.

Generally speaking, the Line would be walked 5 or 6 times, and needless to say, I got to know it very well.
All traverse points were marked by iron spikes, and ringed with stones if they were at hand.

The difficulties experienced in the upper Yam Creek and the Shackle have been mentioned elsewhere. There are some important differences between the old data and the new as fixed by the relics - each "leg" of the Line having at least one. Refer to Appendix (5).

I have replaced the butt of one angle pole with an ironwood post, cut to survey regulations and referenced. However most angle points of the Line were truncated, and it was easy enough to occupy them as traverse stations. While the standing poles were never vertical, they sometimes tilted along the Line causing extra traversing and calculations.

Particular care has been taken to provide both ground and sea-level distances to cover the cadastral and geodetic requirements respectively, the latter being used to calculate co-ordinates on the Australian Map Grid (AMG) and latitudes and longitudes: each convertible to the other.

Closures

The only cadastral plan affording a closure with my survey was OP 1472 (Field Book P.V. MCl 5), unapproved. While the Mt. Osborne Trig. connections showed some misclosures within that plan, my survey has agreed with a closed section of it. Refer to Appendix (6).

Reduced levels, as determined by distances and reciprocal vertical angles, have been used to reduce the slope distances. They were controlled by levelled connections from the Fountain Head road TBM's (Railway photo control), and from the Stuart Highway BM 123 Mile near the Margaret. After 33 stations a distance of some 15.3 km, the misclosure was .069 m. The longest line was 3.6 km, and the shortest 134.6 m.
Progress

The survey was started at what I have termed the Mt. Osborne Angle, a point about 1 1/2 km N.E. of the Mt. Osborne Trig. Station, and is connected to it. The O.T.L. alignment was followed, south and east, to the South Margaret, about 2 km south of the Shackle Gap - some 16 km including connections.

I intend to continue the survey, as the opportunities arise, to the old telegraph station at Pine Creek. It may take a year to accomplish.

As mentioned in the interim report of 4/7/83, I will hold the field notes until this section has been completed. If required, the 40 or so double sheets can be copied. There is a lot of detail to be drafted, such as the old mail coach road, in addition to the cadastral requirements.
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BLACK: O.P. 1472

RED: FROM UNADJ. SURVEY

GREEN: AFTER ADJ. TO OBS

LAT(IA) = 13 30 18.6
n  (21) = 13 34 49.4
2) 27 05 08
MEAN LAT. = 13 32 34

LONG (IA) = 131 29 44.9
n  (21) = 131 31 09.2
Δ LONG = -0° 01' 24.3''
  = -84.3''

Converg. = Sine Mean Lat × Δ Long.
Calc. Position of Angle = -19.7''

Carried Through = 194° 44' 54.4''
+ Converg. = -20''
  = 194° 44' 34.4''

By Obs = 194° 44' 51''

Misclose = -17''
SECTION A

View along the route of the
O.T.L. from Gilberton point
- S.E. corner of sect. 1267

From

THE S.E. CORNER OF SECTION 1267

To

THE ADELAIDE RIVER RAILWAY STATION
1. **0.0 km**  
View along the route of the O.T.L. from the starting point  
- S.E. corner of Sect. 1267

2. **0.1 km**  
Stump of cut ironwood  
(Erythrophleum chlorostachys)  
The original clearing for the O.T.L. in 1870.
3. **1.8 km**
Erosion of the old mail coach road

4. **2.2 km**
Old cart axle, looking easterly from the old road
5. **2.6 km**
Stonework at the start of the Hump.

6. **2.7 km**
To the top of the Hump
7. 2.9 km
The old road built up in the saddle between the two Humps.

8. 3.2 km
Looking back - the reverse view of 7.
9. 3.3 km
Road cutting on the second Hump.

10. 3.9 km
Old road going easterly.
11. 4.4 km
Old road. Although not visible this has been stoned for the crossing of a clay flat.

12 5.1 km
Old road crossing of Stapleton Creek. Note dray or wagon wheel bearing in the foreground.
13.  5.2 km

Cutting through small ridge at old Stapleton Townsite which is just beyond.

14.  5.5 km

From the railway looking south along the route of the O.T.L.
15. 7.0 km
The old road intersecting the railway. The O.T.L. was on the r.h.s.

16. 12.3 km
Old road crossing of Peters Ck.
SECTION B

53 km

From

THE ADELAIDE RIVER RAILWAY STATION

To

MT. OSBORNE ANGLE
1. **0.0 km**
Start of Sect. B: looking S.E. from the Adelaide River Railway Station. Angle pole in this vicinity.

2. **2.2 km**
Old pole in foreground; shifted from the original alignment.
3. 2.6 km
Old and later poles close together.

4. 3.8 km
Stack of small and large oval sectioned Oppenheimers.
      Railway in background.
5. 16 km
A shifted pole. It has now disappeared.

6. 18 km
Railway cottage at Goodilla siding - originally No. 1 Depot.
7. 20 km
Old mail coach road. The railway is some way to the left.

8. 21 km
Old road cutting in very good condition.
9. 25 km
Old crossing of Gunns Ck.
Very good stonework.

10. 29 km
Oppenheimer's footplate for pole shifted to the railway.
11. 30 km
Bridge at the Bridge Creek townsite. Permanent water.

12. 30 km
Bridge Creek townsite. The railway bridge is just to the right.
13. **34 km**
Stonework of the old road crossing a wide clay flat.

14. **36 km**
The Old Howley hostelry "......
crowned by a hugh quartz 'blow'

was on the r.h.s.
15. 49 km
The only pole to be found in the section. Mt. Osborne in the distance. AMG coords. are:
E 766925, N 8507257
Zone 52.

16. 49 km
The old road to the Shackle and to lower Yam Ck. The O.T.L. was on the r.h.s.
SECTION C

54 km

From MT. OSBORNE ANGLE

To PINE CREEK
1. **0.3 km**
   Old road sign: fork in road - left to lower Yam Ck. - right to the Shackle along the O.T.L.

2. **0.3 km**
   The sign reads:
   DARWIN →
   ← KATHERINE
   Made of trolley rail.
3. 3.0 km
Sound pole of cypress pine
(Callitris intratropica)

4. 3.6 km
West branch of Yam Ck. looking west from the south bank.
5. **4.0 km**
Cypress angle pole. Note nail for strut.

6. **4.3 km**
Old mail coach road. Note stock pad.
7. 5.8 km
Ironwood post to anchor bed logs of crossing. Upper Yam Ck.

8. 5.8 km
Ironwood tree (Erythrophleum chlorostachys) "ringed and topped" for a pole. Note insulator bracket hole.
9. **5.9 km**
Ironwood post replacing angle pole stump. O cut into face

10. **5.9 km**
Old bed log of crossing of Yam Ck. It is not ironwood.
12. 6.1 km
Old bed log not in creek: change of course of creek?
13. **6.3 km**
Yam Creek scene.

14. **6.4 km**
Grey box pole (Eucalyptus tectifica). Note hole for insulator bracket.
15. 6.5 km
Old road.

16. 6.6 km
Old road disrupted by mining.
17. **6.7 km**
Old road next to Yam Creek.

18. **7.6 km**
Post and stone work on old road.
19. 7.7 km
A sound pole, but ready to fall.

20. 8.3 km
Pole and stump exposed by washaway. The old road was this side of the stump.
21. **8.4 km**
Bed logs and posts. Note that this is the downstream side.

22. **8.7 km**
Butt of cypress pole offset some 20 m from the alignment at the Shackle.
23. **8.7 km**
Shackle site of the telegraph station? Refer to comments.

24. **9.0 km**
The Shackle well. It still has water.
25.  9.8 km
Cypress pole stump with displaced ironwood pole in the background.

26.  9.8 km
Cypress angle pole. Note insulator pin on top.
27. 9.8 km
Cypress angle pole. Note side bracket for insulator pin.

28. 9.9 km
All that is left of an angle strut
(r.h.s. of photo.)
29. 11.3 km
Cypress pole.

30. 17.8 km
Cypress pole at Depot Creek
31. **26.4 km**  
Erosion of old road near granite creek.

32. **32.2 km**  
Erosion of old road running into a branch of the Douglas River. This is about 1 km long.
33. 32.4 km
Ironwood tree cut for the clearing of the Line in 1870. Note the sliver of wood still unweathered.

34. 32.4 km
Granite rock crossing of a branch of the Douglas. This was mentioned by S.W. Herbert.
35. 33.0 km
Cypress pole with clean uneroded top.
37. 40.3 km
The only strutted angle pole found.

38. 40.3 km
Closeup of 37. Note fallen capping band.
39. 54.0 km
Pine Creek: old floors at the telegraph station site.

40. 54.0 km
Pine Creek: old cistern. Note outlet for pump.