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REPORT ON
AN INLAND TRAVERSE FROM WILKES

10th March to 3rd May 1964

AIMS

1. To determine the highest point of an ice dome 70 miles S.E. of Wilkes.
2. Survey and erect a strain grid across the centre of the dome to determine ice movement.
3. Study gravity and magnetic characteristics of this area.
4. Determine ice thickness by seismic methods.
5. General glaciological and geophysical study of area S.E. of Wilkes.

TRAVERSE PERSONNEL

R. O'LEARY	LEADER
G. HULCOMBE	SEN. DIESEL MECH. & 2/IC.
K. BUDNICK	SURVEYOR
R. WHITWORTH	GEOPHYSICIST
P. MORGAN	GLACIOLOGIST
N. SIMMONS	RADIO TECH. & ASST. GLACIOLOGIST
B. FOGARTY	RADIO OPERATOR & ASST. GEOPHYSICIST
M. JONES	DRIVER/MECHANIC

VEHICLES and SLEDGES

The traverse moved in two trains made up as follows:-

Train One

- 1 - D4 Tractor.
- 1 - Otaco sledge loaded with fuel.
- 1 - Small Norwegian sledge loaded with emergency clothing, LPG and small Polaris toboggan.
- 1 - Large Norwegian sledge carrying fibreglass caravan.
- 1 - Large Norwegian sledge carrying engineers tools and spare parts.
- 1 - Large Norwegian sledge carrying all food other than cold-sensitive foods which were stored inside the caravans.

Train Two

- 1 - D4 Tractor.
- 1 - Large caravan sleeping 4 men
- 1 - Large caravan to house scientific equipment and sleep 2 men.
- 1 - Large Norwegian sledge carrying anemometers mounted at various heights above snow.

Note

Sled runners of scientific caravan contained 400 gallons of ATK.

Other Vehicles

- 1 - Weasel in which all seismic gear was installed.
- 1 - Snotrac used by surveyor.
- 1 - Snotrac used by glaciologist.

Details of estimated and actual fuel consumptions, food and clothing are available in Appendix "A".

As previous year traverse parties had considered it very difficult to haul a traverse train to the plateau as a complete train without hauling single sledges over the steep section to the moraine, it was decided to move the trains to a point above the moraine prior to the actual commencement of the traverse. This was done on Sunday 3th March by Hulcombe, Jones and O.I.C. and contrary to previous reports both trains were hauled to a point 2 miles above the moraine without having to reduce load as expected. Total load was approx. 19 tons.

TUESDAY 10th MARCH

Traverse party moved up to plateau at 1430. Whitworth still at Wilkes testing seismic gear which is still giving trouble. Called at Wilkes at 1900 and found Whitworth would not be ready before the first light tomorrow. Told him to leave at 0400 tomorrow. Everybody settled in to caravans comfortably except Jones whose bunk in the new fibre-glass caravan is too small due to the inward curve of the roof. This could be a problem as it is intended that 4 persons sleep in this caravan for a week at S2.

WEDNESDAY 11th MARCH

All out of bed at 0445. No sign of Whitworth at 0645 so asked Wilkes on 0700 sked. of his whereabouts. Apparently he left at 0600. He finally arrived at 1100 having lost a fan belt 2 miles from Wilkes and returned for a replacement.

Departed at 1215 in fine, clear weather - temp. about +10°F. Morgan and Simmons in Snotrac 5 doing modified leapfrog barometric levelling in conjunction with Budnick and O.I.C. in Snow-trac, 6.

Whitworth and Fogarty doing gravity readings every 352 yards along stakes which were erected every mile by Morgan for snow accumulation measurements.

Made 13.4 miles for the day calling a halt at 1830 as Whitworth and Fogarty had not eaten since 0400. Successful radio sked. using new SSB radio at 1900.

THURSDAY 12th MARCH

All out at 0430 and under way by 0615. Same routine as yesterday on barometric and gravity measurement. Stopped at 1145 for quick bite as thermos were not filled at breakfast.

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Under way again at 1300 with Snotracs rapidly drawing away from the two trains now that the ANGRY9 radios are not being used to synchronise the reading of simultaneous barometric readings in the two Snotracs 1 mile apart. Fluctuating radio conditions caused some delay with the readings during the morning so wathes were used taking a reading every 12 minutes; this gave each vehicle time to move to the next station. Snotracs were out of sight of D4's by 1530 except when the very pronounced mirages around the horizon lift the two trains high in the air.

Snowtracs and Weasel reached S2 at 1815 with temp. down to -10°F . D4's lights appeared on horizon after dark. Lights on one Snowtrac switched to guide them in. Finally arrived at S2 at 2135. Everyone very tired and after re-fuelling of the vehicles was completed all turned in at 2300 without anything more than a cup of cocoa and an Antarctic biscuit.

Mileage for day - approx. 35 miles - a good run considering the work done and the delays with the radio.

FRIDAY 13th MARCH

Heavy whiteout after sunrise at 0530. Visibility down to 50-100 yds. Transferred sufficient food for two weeks to No. 2 train to enable Hulcombe, Budnik, Morgan and Simmons, to go ahead and locate dome centre.

Unable to get away due to complete lack of visibility for most part of day.

Whitworth and Fogarty spent all day firing seismic test shots on known ice depths in the vicinity of S2.

Remainder of party spent day inside S2 trying to clean the tunnels out and tidy the place up in general. The future usefulness of S2 appears limited unless some extensive repairs and alterations are carried out. The floor in the living area has been raised over 4 feet by ice pressure and it is understood that it is rising at the rate of 6 inches per year. (Recommendations for alterations etc. at S2 will be the subject of a separate report.)

SATURDAY 14th MARCH

All out at 0445 to a beautiful, fine clear day. Radio sked. at 0800 on SSB using CW and voice. 5x7 both ways with Wilkes.

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Dome survey party left at 0900 on a bearing of 129T, staking each mile for accumulation and future gravity readings. Tractors had to be preheated with Herman Nelson heaters for the first time this morning with temps. down to -15°F .

Whitworth and Fogarty continued with testing of seismic equipment with O.I.C. and Jones doing one hourly weather observations as a part of Morgan's meteorological programme.

Weather deteriorated at 1200 with winds from 280 degs. blowing heavy drift and reducing visibility to about 100 yards. Much to Whitworth's credit he insisted on continuing with the seismic testing despite the fact the wind had increased to 40-50 knots by 1500. He is determined to have this equipment working correctly before we reach the dome.

Nothing heard on 1800 sked. with dome party. Good sked. with Wilkes at 1900.

SUNDAY 15th MARCH

Weather still mild blizzard all day with wind reaching 50 knots then falling off to about 20 knots at 1600 accompanied by a sharp drop in barometric pressure and a rise in temp. to $+8^{\circ}\text{F}$. from -6°F . Dome party on sked. at 0700. Held up about 5 miles from S2 since 1300 yesterday. Good sked. with Wilkes at 1900. Whitworth continued testing throughout day!

MONDAY 16th MARCH

Still, clear day with temp. around -3°F . most of day. Unable to raise dome party on 0700 sked. but Wilkes loud and clear at 0800. New SSB appears to be working well at least from S2.

Whitworth still having trouble with seismic gear but feels it will only be a few days before he is ready to start actual seismic work at the dome. Assumed Dome party were well and truly on their way by now. If so they should be somewhere close to the position given by Walker (1962).

TUESDAY 17th MARCH

At 0700 sked. found SSB was not working. Checked set and found several wires burnt off terminals in positions

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indicating that there may have been a sudden reversal of polarity. This could have occurred if the D4 battery had been connected incorrectly as at the time the radio batteries were connected to the tractor charger. Nothing definite could be ascertained so the cause remains a mystery.

Endeavoured to maintain skeds. by using the ANGRY 9 at S2 but found that the power cable was missing. Heard Wilkes calling on Sony transistor but no sign of dome survey party.

Jones working in S2 and helping Whitworth and Fogarty with seismic work. O.I.C. taking one hourly weather observations.

WEDNESDAY 18th MARCH

Perfect day with Whitworth and his assistants on the job bright and early to try and get the testing completed by night. Heard Hulcombe calling us on SONY. Apparently they are now 12 miles from S2 and left that point at 0730.

Jones and O.I.C. commenced digging out sledges and D4 in readiness for tomorrow should Whitworth be ready to leave.

Temp. down to -14°F . at 1700 with very little wind.

Whitworth slept the last two nights in S2 as the over-crowding in the small caravan was too much for him. Temp. in S2 with the heater out was -15°F . so it is doubtful which would be the worst! Heater in caravan more bearable now that temps. are dropping. Above zero it is necessary to strip down to a shirt at least with the temp. inside around 70°F .

THURSDAY 19th MARCH

Beautiful, clear morning with temp. during day of -15°F . As Whitworth had completed his tests, decided to move off to dome area. Jones driving tractor and O.I.C. on toboggan looking for tracks and stakes left by survey party. Whitworth and Fogarty following after stowing explosives outside S2. Left S2 at 0815 using magnetic compass to try and pick up stake line. Located faint tracks at S2+6 and waited here for Whitworth - eventually turned up after 2 hours wait. Sent Whitworth on ahead as there was some doubt about the tracks of the weasel.

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Met rest of party at S2+22 where they had been since yesterday. Preliminary survey by Budnick today indicated dome centre could be about three miles from the position shown on the map.

Whitworth and Fogarty arrived ahead of D4 without trouble.

Weather fine - temp. -15°F .

FRIDAY 20th MARCH

White-out all day making it impossible to use survey instruments. Essential to see true horizon in all directions if dome centre is to be proved.

Good sked. at 1900 with Wilkes using ANGRY 9 installed in large caravan.

SATURDAY 21st MARCH

White-out at 0500 but cleared by 0800. Budnick and O.I.C. spent all day proving highest point of dome and it definitely appears to be approx. $3\frac{1}{2}$ miles SOUTH of the original map position given by Walker. Morgan and Simmons covered an area of five miles radius from Walker's dome centre looking for stakes unsuccessfully.

Moved both trains to new dome site during afternoon in heavy white-out conditions. Performance of D4's at this altitude has fallen considerably since leaving Wilkes, especially on ATK and without turbo-chargers. Altitude is about 4800 feet.

Minimum temp. -25°F at 2100.

SUNDAY 22nd MARCH

Weather perfect at 0500 for using theodolites but deteriorated by 0900 with visibility down to 200 yards. Budnick and O.I.C. continued with sun shot throughout day.

Morgan dug a 3 metre glaciological pit for strata studies - very neat etc. but only 15 feet from the door of the large caravan!

Whitworth completed several successful seismic shots on dome centre assisted by Fogarty and Jones.

At 2200 weather had deteriorated to blizzard proportions with winds rising to 40 knots and temp. down to -15°F . During day the temp. was down to -35°F .

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MONDAY 23rd MARCH

Blizzard all day with winds to 50 knots and minimum temp. -7°F . Whitworth and Fogarty carried on seismic testing, mainly from inside seismic weasel, but still under very unpleasant conditions. Caravans and sledges drifted up quickly and it is feared that the drift will alter the height at the actual dome centre.

TUESDAY 24th MARCH

Weather fair with visibility of 900 yards and min. day temp. of -17°F at 1300. Budnick and Morgan commenced setting out strain grid arms on the Folger, Poinsett, Totten and Valley legs. Found conditions not very suitable for accurate work even when the visibility increased to 2000 yards for a short while. Morgan found a flag marker projecting about 12 inches above the snow at a point 1 mile SE of Walker's dome position. If this is a stake placed by Walker in 1962 the snow accumulation would be about 4 feet per annum. This makes the 10 foot long aluminium poles to be used for marking the strain grid much too short as at least 3 feet of the pole will have to be placed in the snow on erection so in less than 2 years the poles in the area south of S2 will be covered.

WEDNESDAY 25th MARCH

Weather suitable for surveying until 1200. During morning several radial stakes from the dome were placed and the angles read but some difficulty was experienced in locating stakes through the theodolite due to the stakes being covered with snow. This required a lot of extra travelling to clean off the stakes to make them visible, to the theodolite.

Diesel mechs. drilled 30 foot hole with Sipre corer for Morgan to obtain cores for return to Melbourne. Whitworth will use same hole for seismic shot at a later date.

Heavy drift during afternoon and night.
Temp. -10°F .

THURSDAY 26th MARCH

Heavy white-out all day preventing any work on strain grid being done. Some seismic work done on dome centre.

FRIDAY 27th MARCH

Fine day and work on the strain grid continued. Some difficulty experienced in sighting stakes over a distance of 2 miles due to rises of up to 24 feet in the snow surface. Again a lot of extra vehicle running was required to place intermediate stakes over the undulations. Becoming quite obvious that the dimensions laid down for this strain grid are quite impractical. Morgan maintains that it is impossible to reduce the dimensions in anyway whatsoever, otherwise the grid will lose accuracy. Cannot agree with this and feel that we could be wasting our time, especially at this time of the year when white-outs are so frequent.

SATURDAY 28th MARCH

Blizzard all day with winds to 40 knots and temp. of -7°F . Heard on radio sked. with Wilkes that several birthdays were being celebrated there, so traverse party settled down to similar enjoyments.

All sledges including the Otaco completely covered by drift and flue of fibreglass caravan blocked with snow which rapidly turned to ice. Heater extinguished and flue cleared.

SUNDAY 29th MARCH

Wind and drift abated during morning but visibility still poor so decided to move trains to a point half way along Totten arm to commence setting out the main and subsidiary arms. The stakes on all arms for 2 miles from the dome have been placed but no final angles read. From a point half way along the Totten the Snotracs will be able to work either way placing the stakes and measuring the angles. Concerned about the petrol consumption as 200 gallons have been used and very little achieved. Having the base in this position should reduce the distances covered.

Two D4's needed to move fuel runner caravan from dome area until firm snow was reached. Left dome in heavy snowstorm at 1700 on a bearing of 215°M and called halt at 4 mile point on Totten leg at 1900 in complete darkness.

Snowtrac 5 had a flat tyre on arrival at the new site. It has been necessary to pump up tyres each morning since leaving Wilkes.

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MONDAY 30th MARCH

All up at 0550 to be greeted by the heaviest white-out so far - visibility down to 10 yards. By 1700 visibility was unlimited so Morgan, Hulcombe, Simmons and O.I.C. commenced survey of the Totten Glacier arm. Positioned four poles on the main and subsidiary arms, the last being done using the Snotrac lights to determine the position of the previous pole. This was done as an experiment as a possible means of overcoming the problem of poor visibility in daylight hours.

TUESDAY 31st MARCH

Similar morning to yesterday, white-out. Whitworth and Fogarty returned to dome centre to carry out further seismic work at 0700. Morgan and Simmons travelled along Totten arm to determine if it was possible to continue the survey - no luck until 1400 when the remainder of the Totten arm poles were placed.

The difficulty in sighting the poles only one mile apart indicated that it will be almost impossible to read the diagonal angles - a distance of 2.7 miles.

Alarmed about petrol consumption - have used 240 gallons since leaving Wilkes with a balance of 280 gallons. Morgan has already covered 300 miles, about half of which was necessary. However the poor visibility caused a lot of extra travel during surveying from the dome.

Temperature dropped -4°F . at 1500 to -33°F . at 1700.

WEDNESDAY 1st APRIL

Temperature at 0700 was -51°F . One consolation was the perfect visibility, but a lot of time was lost in starting the vehicles. Morgan, Budnick, Simmons and O.I.C. left at 0900 to commence the survey of the Valley arm. Although day was perfect for visibility (about 2 miles), the theodolites iced up in the eyepieces as soon as the eye was placed near them. Consequently unable to use the theodolites for more than 3 minutes at a time. Finished all the staking on the Valley arm in temperatures which never rose above -32°F . Budnick suffered frostbite of two fingers on his right hand and O.I.C. frostbitten heels.

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Suggested to Morgan that the dimensions of the strain grid be reduced slightly so that we may have a better chance of reading the quadrilateral angles. He considers this unnecessary because the weather will improve! Do not know where he got his meteorological training but it is obvious that he must have skipped a few lectures.

THURSDAY 2nd APRIL

Very cold again this morning -37°F . at 0800, but very clear again. Budnick and O.I.C. went to the dome to attempt to read the quadrilateral angles. The poles that were within 1 mile of the dome were not visible due to the adhering snow. Cleaned poles and then encountered the problem of iced up eyepieces in the theodolites. Various substances tried to prevent this (glycol, mist-stick) and holding breath whilst actually looking through the eyepiece - none successfully. Furthermore, extreme mirage made any visible stakes jump across the cross-hairs of the theodolite. It appears that the only suitable days are the overcast days and then white-out occupies a large percentage of the horizon.

Hulcombe and Jones serviced and greased Snotracs throughout in temperature of -30°F . Both received minor frost-bite thru' being forced to handle tools with their bare hands.

A lot of time is lost each morning of a fine day. All the small tyres lose at least 10 psi. per day and it is impossible to fit an orthodox car pump hose to these short valves so it is necessary to force the hose only over the valve. In low temps. this is quite a task, especially on 12 tyres per vehicle and without gloves, it takes approx. 2 hours to complete.

FRIDAY 3rd APRIL

Another fine day with the temp. at 0800 -25°F . Budnick and O.I.C. arrived at dome at 0900 to complete astro-fixes and continue reading angles to adjacent poles. Morgan, Hulcombe, and Simmons attempted reading quadrilateral angles on the Totten arm but without success. At 1230 heavy white-out closed in and both parties returned with considerable difficulty to the caravans. This morning was one of the rare occasions when visibility was better than 3000 yards.

SATURDAY 4th APRIL

Heavy drift with winds up to 35 knots and zero visibility all day. Norwegian sledges completely buried in

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first 2 hours of blow.

SUNDAY 5th APRIL

Same type of day as yesterday, although winds moderated slightly.

MONDAY 6th APRIL

Perfect visibility all day but attempts by Morgan, Simmons, Budnick and O.I.C. to read either quadrilateral or short angles were completely frustrated by mirage and refraction. Decided that this nebulous approach should cease and discussed problem with Morgan suggesting that as we had wasted nearly a month trying to get the strain grid set out we should concentrate on those phases of his programme that were not dependent on perfect visibility. He agreed to this and it was decided that we would aim at completing the gravity and magnetic work on all four arms, plus the micro-gravity survey at the dome centre.

Whitworth and Fogarty completed seismic work at dome today.

Considerable amount of radio traffic banked up here because of failure to hear Wilkes over past few days.

TUESDAY 7th APRIL

Blizzard all day with heavy drift over sledges and caravans.

Still unable to raise Wilkes on radio.

WEDNESDAY 8th APRIL

Blizzard again all day but wind velocity dropped slightly around 1700. Successful radio sked. with Wilkes at 1100 and 1900. Also heard sledging party to Haupt Nunatak (Fox, Freeman and Smith) calling Wilkes on 5 megs.

THURSDAY 9th APRIL

Still confined to caravans by weather. Although wind dropped to 30 knots today, visibility was still down to 100 yards.

Temp. over past three days has averaged minus 26 degs. F. and the wind averaged 41 knots.

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FRIDAY 10th APRIL

Weather fine with visibility about two miles. Decided to move train back to dome to enable Whitworth to commence the micro-gravity survey and also to commence the barometric levelling of the main arms in conjunction with the gravity survey of the arms. Took 5 hours for all hands to dig out the sledges, vehicles, etc. Finally left for dome at 1400 when heavy white-out closed in. Found dome with some difficulty as any previous tracks had been obliterated by the recent blizzard. Arrived at 1630. Jones and O.I.C. became ill about 1730 and it was discovered that the heater flue in the small caravan was completely blocked by ice and CO had been forced into living section of caravan. (Fibre-glass). A few whiffs of medical oxygen gave some relief but a severe headache persisted. Cleared ice from flue and tested air with CO detector.

SATURDAY 11th APRIL

Weather extremely cold with a minimum of -59°F . and a maximum of -38°F . Visibility down to 100 yards although wind never rose above 10 knots, consequently again no work.

SUNDAY 12th APRIL

At 0600 weather did not appear too promising but decided to take a risk on it improving so commenced preparation of vehicles to start barometric levelling and gravity readings along Totten arm. A lot of trouble experienced with Snotrac tyres and by the time the vehicles were ready to leave the time was 1400 making it too late to travel the 20 miles of the arm. A pity as today turned out to be a really fine day - the first for nearly a fortnight and it had to be wasted on these damned tyres! With the low temps. of the past few days, ice forms in the valve stems of the tubes so that the valve seats are held open when air is introduced. Finally used Herman Nelson heater to warm tyres and melt ice.

Minimum temp. -36°F .

MONDAY 13th APRIL

Beautiful, clear day - in fact the best day since we left Wilkes. Whitworth, Simmons, Hulcombe and Fogarty left at 0900 on survey (gravity and barometric

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levelling) of Totten arm. Again at least 2 hours were lost in pumping up the tyres.

Some concern about party at 1600 as their lights were not visible and complete darkness had fallen. Fired a parachute flare every $\frac{1}{2}$ hour and they finally answered at 1900 when they were about 3 miles away. Apparently they had some slight trouble with ice in the petrol of one Snotrac and it took some time to clear.

Survey completed on Totten arm. Minimum temp. -28°F .

TUESDAY 14th APRIL

Another fine day similar to yesterday. Same survey party out on Valley arm except Fogarty who has a frost-bitten heel. He is the third to suffer frostbite in this manner - Whitworth and O.I.C. also have the same problem and in each case when wearing thermal boots.

Budnick, Morgan, Jones and O.I.C. commenced experiments to try and determine the cause and amount of re-refraction. As usual trouble was experienced with freezing up of the theodolites, although in this instance the actual vertical angle adjustment refused to function.

Petrol down to three drums, probably just enough to complete the modified programme. Minimum temp. -22°F . with a 15 knot wind which increased the chill factor considerably and made conditions uncomfortable all day. Budnick suffered frostbite of two fingers of the right hand.

WEDNESDAY 15th APRIL

Weather white-out from 0600 to 1000 with ground drift. Cleared at 1000 but considered it too late to commence on Poinsett arm. Whitworth and Simmons working on testing of detonators. White-out closed in again at 1430. Most frustrating day with such a long period, clear yet we were not able to continue with any of the more important work.

THURSDAY 16th APRIL

White-out until 1000 so decided to try to stake Poinsett arm. Left at 1030 but white-out closed in again at 1200 so returned.

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Whitworth and O.I.C. completed final seismic shots in the vicinity of dome. Morgan lost eye piece of Wild theodolite, reducing effective theodolites to one only.

FRIDAY 17th APRIL

Fine day with 2 mile visibility. Survey team off at 0930 to do Poinsett arm. This was quite an achievement considering the preparations required to get two vehicles away in temps. of -35°F .

Despite the fact that a lot of time has been spent confined to the caravans, the morale of the party appears remarkably high. The only "fly in the ointment" is Morgan who is continually in trouble with the rest of the party for his reluctance to pull his weight and do more of the uncomfortable chores such as pumping up tyres, etc. Had a talk to him and informed him that unless he was prepared to alter his attitude, the traverse would be restricted to Buromin work only. This has had the desired effect and the party has been flattered with specially cooked meals since.

Petrol down to 2 drums so imposed restrictions on 110v generator used by Morgan for operating scientific instruments. Normally used 8 gallons per day.

SATURDAY 18th APRIL

Weather reasonable although some white-out during early a.m. Although the survey was completed yesterday, No. 6 Snotrac had to be towed back 3 miles with an alleged petrol blockage caused by ice crystals. Hulcombe and Jones removed tank to find it was empty!

Budnick and Morgan spent day chaining a base line thru' dome centre as a part of the refraction experiments.

Fogarty, Whitworth and O.I.C. working from dome laying out a 4 kilometre cross with 10 metre stations for the micro-gravity survey.

Temp. rose to -5°F . during day indicating that we might have another blow soon.

SUNDAY 19th APRIL

50 knot blizzard blowing at 0600 with extremely heavy snow drift. The day spent in caravans playing chess, studying navigation, eating, and listening to long lectures by Whitworth on the solar system.

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MONDAY 20th APRIL

Weather poor with visibility about 200 yards and a 15 knot wind. Whitworth and O.I.C. continued laying out 10 metre stations for micro-gravity survey throughout day. Temp. maximum -18°F . Both Whitworth and O.I.C. received frost-bite of the ears and nose. No trouble with feet on this occasion, probably because about 5 miles were walked during the day.

TUESDAY 21st APRIL

Fine day so everyone out early to continue micro-gravity survey and chaining of baseline. Budnick, Morgan and Simmons on baseline, Fogarty and O.I.C. marking out gravity stations and Whitworth commenced gravity readings. Jones and Hulcombe on vehicle servicing. Weather deteriorated at 1500 to a complete white-out so all work ceased.

Simmons complained of pain in the lower right abdomen suggesting that there was a possibility of an appendicitis. Checked pulse, temp. etc., as laid down in the ship's doctors book and then discussed with Murray at Wilkes. Murray felt that there was little likelihood of Simmons having anything seriously wrong with him that a day in bed would not cure.

By 2000 weather had reached blizzard proportions.

WEDNESDAY 22nd APRIL

Weather poor with visibility of 200 yards. Whitworth and Budnick were able to do about 3 hours levelling on gravity arms during day.

Petrol down to 48 gallons now so it appears that we will have to leave for S2 soon. Minimum day temp. -36°F .

THURSDAY 23rd APRIL

Fine, clear day. Hulcombe, Simmons and Morgan continued chaining of baseline, Whitworth and Budnick on gravity readings and Fogarty and O.I.C. on survey of gravity arms.

White-out closed in at 1500 forcing suspension of work. Fogarty and O.I.C. dug a pit 8' x 8' x 7' deep and roofed it with a tarpaulin. Pit will be used for housing the BMZ magnetic instrument when local magnetic measurements are done.

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MURTON				ATTENTION		

Frostbite prevalent throughout party now, although none of it is serious.

Minimum day temp. -34°F .

FRIDAY 24th APRIL

Fine but very cold day with the temp. never exceeding -36°F . and a minimum of -45°F . Morgan and assistants completed baseline, but there will not be any opportunity to use it as it is intended to return to Wilkes when the micro-survey and the magnetic measurements are completed. Micro-survey is about 50% completed.

SATURDAY 25th April

Weather poor - temp. at 0800 -48°F . and never went higher than -37°F . Visibility too poor to continue outside work so Whitworth and O.I.C. commenced work on the magnetic instruments in the pit dug on Thursday. Eiderdown suits were worn for the first time and proved ideal in the magnetic pit where the temp. was steady at -41°F .

SUNDAY 26th APRIL

Weather still poor with wind rising to 20 knots during day. Whitworth and O.I.C. did magnetic readings from 0500 to 1800 spending alternate hours in the pit, taking readings. A very long day!

No opportunity during day to do any of the other outstanding work.

Maximum temp. -37°F .

MONDAY 27th APRIL

No improvement in weather with visibility only 100 yards. Only work done was the clearing of the Otaco sledge in readiness to load a Snotrac to save petrol and pumping up tyres on the return trip to Wilkes.

TUESDAY 28th APRIL

Everyone out at 0545 in the hope that the weather may clear although it was drifting heavily up until 1000 when it cleared. Whitworth and Budnick completed micro-survey assisted by Fogarty and O.I.C. This means that only the barometric levelling and the gravity work remains to be

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done on the Folger arm. Minimum temp. -10°F with indications that there will be another blizzard.

WEDNESDAY 29th APRIL

Blizzard all day tapering off towards evening. No work done so everyone spent a boring day in the caravans. Now that the end of the work is so near it is very frustrating to have to sit around doing nothing.

THURSDAY 30th APRIL

Beautiful, fine, warm day with a temp. of -10°F . at 0800. Whitworth and Simmons left at 1130 after a $2\frac{1}{2}$ hour delay in preparing Snotrac tyres. Returned at 1700.

Budnick and Fogarty completed a levelling check of dome centre while rest of party dug out trains in preparation for an early departure tomorrow. Only managed to clear half of the sledges, etc., by dark,

Temps. still high with a minimum of -10°F .

FRIDAY 1st MAY

All up at 0500 to clear rest of train and get under way to return to Wilkes. Everything ready to move by 1000 when the seismic weasel broke a track. Repaired by 1230 and trains moved off at 1310.

Travelled on Folger arm 8 miles doing modified leapfrog barometric levelling from the caravans which were one mile apart. Whitworth and Fogarty did .2 mile baro. readings and a seismic shot at the 8 mile point.

Morgan and Simmons travelled on the original stake line (3 miles to the East of the Folger arm) to check accumulation at the stakes placed on the outward journey.

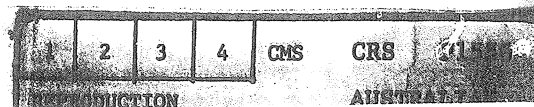
From the 8 mile point of the Folger arm the trains moved to a point opposite on the outward leg and met up with Morgan.

Heavy drift rose at 1700 so stayed at this point overnight. Temp. at 1700 -1°F .

SATURDAY 2nd MAY

Up at 0530 - terrible day with winds up to 30 knots and heavy drift reducing visibility to 100 yards. First train away at 0815 with Snotrac doing a circuitous route to locate stakes. Weasel doing .2 baro. readings and 1 mile

...18



gravity readings. Second train away at 0845.

After 7 miles Weasel broke track so decided to remove equipment from meteorological sledge and load Weasel rather than try to repair it and have it fail again.

Off again in 50 minutes and arrived at S2 at 1500. All remaining ATK and lubricating oil (7 drums ATK and 1 lub.) off-loaded for spring traverse. Left S2 at 1545 in darkness with Snotrac in front to locate the drum line. By 1800 line was lost so stopped for the night. Probably made about 5 route miles from S2 giving an approximate day's total of 17 miles. Minimum temp. during day -5°F. Baro. rose rapidly all day but mainly due to loss of altitude.

SUNDAY 3rd MAY

Left overnight stop at 0830 in fine, clear weather. Apparently our pathfinders of last night had veered off to the left of the drum line as at dusk the line could be seen about 2000 yards away.

Both D4's in 3rd gear on a smooth surface. Morgan and Whitworth leading in Snotrac doing Gravity and snow accumulation work.

Lost drum line again at 1730 and spent 2 hours circling in the Snotrac without success. Star shots taken and new course taken. Eventually arrived at a point several miles North of the Moraine gap so stayed here overnight. Mileage for the day was 40 miles.

A sharp dogleg in the drum line 15 miles from Wilkes was the reason for losing the line at 1530. Will place additional drums along this line at a later stage.

MONDAY 4th MAY

Departed from a point 2½ miles from moraine gap after caravans were scrubbed, de-iced and generally cleaned up, icy surface made movement of sledges transversally across plateau very hazardous. For the Moraine descent all caravans and sledges were connected in one train with a D4 at the rear to prevent side-ways movement. Very successful descent and arrived at station at 1450.

R. O'Leary

O.I.C.

30/6/1964.

1	2	3	4	CMS	CRS	FILE
REPRODUCTION				AUSTRALIAN		

ANALYSIS OF THE AUTUMN TRAVERSE

1964.

Preparation of vehicles, scientific equipment, etc., for the traverse commenced in late January at a stage when the station was still in the throes of settling in after the changeover. The major tasks were:-

- (1) Dismantle and modify the complete suspensions of both Snotracs which were damaged during 1963.
- (2) Carry out extensive repairs to the Robin Nodwell suspension and fit seismic equipment to a new layout.
- (3) Do repairs such as track adjustments, replacement of windows, heaters, etc. on D4's.
- (4) Fit out new fibreglass caravan with batteries, water storage, ATK heater, ventilators and floor.
- (5) Fit out a large caravan to accommodate four men plus a generator and cooking facilities.
- (6) Install ANGRY-9 radios in Snotracs 5 & 6, Nodwell & large caravan. SSB installed in fibreglass caravan.
- (7) Construct food boxes for approx. 1 ton of food and mount on a Norwegian sledge.
- (8) Fit meteorological equipment to a sledge for continuous wind observations.

To this can be added the multitude of small jobs associated with getting a major traverse actually underway. The lack of a carpenter was very evident at all times as the idea of using volunteer labour did not work out on some of the more involved jobs which required considerable skill.

A further load placed on the S.D.M., Hulcombe and his assistants, Hall and Jones was the repair of vehicles used around the station for water and garbage hauling and the 955 tractor used for bulldozing snow. The tracks of this vehicle had to be removed and replaced with a set from a derelict machine.

In mid-February the Nodwell was ready for testing the modifications made to the suspension and during these tests it was found that the oil consumption was about 1 gallon to every 22 miles. Also the vehicle continually tracked to the left, a fault that had been evident in 1963. Rather than waste time on repairs and investigations that might not prove successful it was decided not to use the

.../2

Nodwell, but fit out a Weasel with the seismic equipment. Also the amount of met. equipment that Morgan decided had to be carried in the large sleeping caravan was such that a further caravan was considered necessary. Consequently another large caravan was fitted out with a 110v generator, an anemometer mounted on a 10 meter mast and about 1 ton of equipment.

Logistic planning was often hampered by the vagueness of the aims of the traverse. In December, 1963, at a conference in Melbourne the writer was told that the route was to run from Cape Folger to the dome and then to Cape Poinsett. The traverse was planned accordingly, but the question was raised - how can we run a straight line from Folger to the dome when we do not know the location of the dome exactly? After consultation with Dr. Radok it was decided that the dome should be pin-pointed and a 10 mile strain grid placed across the centre. Planning was altered to suit the amended ideas.

Another obstacle to smooth planning was the demands by Morgan for the services of mechanics to make small brackets, masts, anemometer stands, etc. Subsequently only about 10% of the equipment taken by Morgan was used, the primary reason being the complete lack of a properly planned scientific programme and his immaturity in tackling any unexpected problems in the field. He also refused to rationally discuss his plans with anyone including the writer and adopted the attitude that he alone was the only person who could make any decisions regarding the traverse. It was obvious to other scientists and laymen that many of his plans were unworkable and would end up as utter failures as they did ultimately.

This problem would not have eventuated if some detailed instructions had been laid down by ANARE for Morgan and others concerned with the traverse. Any interference with his plans could have been considered contrary to ANARE policy concerning the relationship between O.I.C. and scientist. Morgan would have been justified in feeling this way had there been any interference. As it was, a young scientist of 24 years of age and the maturity of lesser years had several reluctant expedition members working until 2100 each day to satisfy his impractical whims and the writer was forced to keep these men at work whilst agreeing with their complaints.

As Morgan's programme increased in size from day to day, it was considered necessary to add another member to the traverse. Simmons was informed that he was to go as assistant to Morgan.

.../3

The traverse departed on March 10th., about 3 weeks later than the ETD. This was due to the changeover from the Nodwell to a Weasel for seismic work and the preparation of scientific equipment.

When the amount of work required to get the traverse away in 7 weeks is considered, it is felt that the efforts of people such as Hulcombe, Hall, Jones and Freeman who all worked 7 days a week with a minimum of 12 hours a day to achieve the target date should not pass without record. Also several other members gave considerable time from their routine duties.

The re-location of the dome centre was done in very good time by Budnick who took full advantage of the weather at that stage. Also Whitworth was able to carry out extensive seismic practises in the first three weeks before actually commencing the seismic survey of the dome.

From the commencement of surveying the strain grid, it became obvious that absolutely perfect weather was essential to use a theodolite even over one mile. Several factors affected efficient surveying.

- (i) Refraction.
- (ii) White-out.
- (iii) Undulating surface in several instances.
- (iv) Temperatures less than -10°F . affected the vertical angle mechanisms of the theodolites making them inoperable.
- (v) Theodolite eye-pieces wer continually icing up in temps. below -15°F . Several methods to eliminate this problem were tried without any great success.
- (vi) Stakes were coated with snow almost daily, necessitation many extra miles of travel to clean them. This contributed to petrol becoming short after a few weeks.

Morgan was requested to consider reducing the dimensions of the strain grid proportionately to something more practicable but he considered this impossible. Consequently in view of the nebulous results of the work done on each reasonably fine day and the threatening petrol shortage, he was instructed to modify the strain grid programme and concentrate on the barometric levelling and gravity readings on the strain grid arms, plus the micro-gravity, seismic and magnetic surveys at the dome centre.

.../4

Again this work was hampered somewhat by conditions, but generally only by heavy white-out and blizzards.

Work was completed by April 30th and traverse reached Wilkes on May 4th.

Features of the traverse were:-

- (i) The amount of seismic work done by Whitworth who worked several days in near blizzard conditions to perfect his techniques and also was most dedicated in the work he did for Morgan.
- (ii) The almost 100% reliability of all vehicles, four of which were seriously unserviceable at changeover.
- (iii) Proved conclusively that survey work of this nature is rarely possible at this time of year. (autumn.)
- (iv) Proved that future work in the field should be properly planned in detail by all concerned prior to leaving Aust. and not left solely to the interested scientist to inform the O.I.C. when the traverse is almost ready to leave, of his requirements.

GENERAL :

Suitable days for surveying -- 8
Unsuitable " " " --33
Blizzard over 35 knots --10
Travelling -- 7
Minimum temp. recorded -63°F
" " whilst working -51°F


R. O'Leary
O.I.C.
1/7/1964

AUTUMN TRAVERSE

1964.

AIMS

- (1) Determination of position of local ice cap SE of S2.
- (2) Placement of strain grid from highest point of ice cap along following bearings:
 - (a) 10 degrees
 - (b) 133 degrees
 - (c) 205 degrees
- (3) Placement of strain grid arm from centre of ice cap (same as highest point) to Cape Folger.
- (4) Determination of elevation by barometric levelling.
- (5) Determination of accumulation patterns.
- (6) Investigation of degree of polarization and plane of polarization of snow surfaces.
- (7) Investigations related to the formation, size and shape of sastrugi in its many disguises.
- (8) Gravity surveys to determine :
 - (a) Bedrock profile
 - (b) Horizontal movement
 - (c) Verticle movement
- (9) Seismic determination of ice thickness.

VEHICLES

2	Snotracs
2	D4's
1	Large caravan
1	Small caravan
1	Robin Nodwell
1	Toboggan (large)

PERSONNEL

P. Morgan - Glaciologist
R. Whitworth - Geophysicist
D. Rogers - Radio Operator
K. Budnick - Surveyor
G. Hulcombe - Sen. Diesel Mech. & 2/IC
M. Jones - Driver/Mechanic
R. O'Leary - O.I.C.
N. Simmons - Radio Tech. & Assistant Glaciologist

OUTLINE OF RESPONSIBILITIES AND REQUIREMENTS FOR TRAVERSE
PREPARATIONS

EMERGENCY CLOTHING

All emergency clothing will be carried on a sledge separate from the living caravans. Each traverse member should hand a kitbag with his name painted on it to the Clothing Officer, Neville Woods, who will fill each bag with the prescribed clothing and pack them in large packing cases with nailed lids. Individual "trying on" of boots etc. should be arranged with Neville.

Cases should be marked "EMERGENCY CLOTHING" with the name of each owner marked clearly on oneside of the case.

LIST OF CLOTHING (EMERGENCY) PER MAN

1. pr. Norwegian socks (long)	1 Ventile Suite
1. pr. Army socks	1 Jaeger cap
1. pr. Bedsocks	1 Balaclava
1 pr. Mukluks and 2 inners	1 Scarf
2 pr. Pyjamas Trousers	1 pr. Mitts ltwtgt. outers
1 string singlet	1 pr. Mitts wool trgr. fgr. inner
1 Woollen singlet	1 pr. sunglasses
1 Army pullover	1 Cotton shirt

PERSONAL CLOTHING

Personal clothing should be separated into two kitbags - one acting as a reserve for a change of clothing when the smell becomes too overpowering.

As only a basic issue of clothing was made at Tottenham, additional items will need to be obtained from the Clothing Officer as shown in col. 3.

<u>ITEM</u>	<u>RESERVE BAG</u>	<u>CLOTHING OFFICER</u>
3 pr. Norweg. sox (1 long - 2 short)	1 short pr.	1 long pr.
3 pr. Army sox	1 pr.	
2 pr. Bed sox	1 pr.	2 pr.
Mukluks and inners		Mukluks and inners
Slippers ANARE		
2 pr. Blue pyjamas (suits)	1 suit	
2 pr. Blue pyjama trousers	1 pr.	
4 pr. Short underpants	2 prs.	
2 Long John undersuits	1 suit	
1 String Singlet	1	1
4 Athletic Singlets	2	1
1 Heavy Wool Shirt		

PERSONAL CLOTHING (continued)

<u>ITEM</u>	<u>RESERVE BAG</u>	<u>CLOTHING OFFICER</u>
2 Cotton Shirts	1 shirt	1
2 pr. Trousers	1 pr.	1 pr.
2 pr. Overalls	1 pr.	
3 Pullovers	1	1 Army Khaki
1 ventile Suit		1 Suit
1 Lightweight W/proof Suit		
1 Ski Cap		
1 Jaeger Cap		
1 Balaclava		
1 Scarf		1 Scarf
2 Towels	1	
1 pr. Mittens heavy outer		1 pr.
2 pr. Wool inners trgr. fgr.	1 pr.	2 pr.
2 pr. ANARE ltwtg Mittens outer	1 pr.	1 pr.
2 pr. Wool inners	1 pr.	1 pr.
2 pr. Instrument Gloves	1 pr.	2 pr.
2 Boxes Tissues	1 box	
Toilet Gear (toothpaste, brush, comb, etc.)		
Knife ANARE		
1 Housewife		
2 pr. Sunglasses		1 pr.
1 Eiderdown suit		1 suit

Eiderdown suit should be returned to the Clothing Officer at the end of traverse for PTA for dry-cleaning.

SUGGESTED ADDITIONAL ITEMS

Camera, film, diary, pen and pencils and reading including 6 or 8 novels per man.

DO NOT FORGET CABLE ADDRESSES!

TAKE ENOUGH SMOKING MATERIAL FOR TEN WEEKS INCLUDING MATCHES AND FLINTS.

PREPARATION OF CARAVANS

(1) Large Caravan.

Several modifications are required to this caravan before the stocking of sleeping and cooking equipment can be commenced. John Freeman will be responsible for these modifications and later the stocking assisted by Kieth Budnick.

(2) Small Caravan.

Completion of this caravan other than the mechanical work will be done by Dave Rogers assisted by any of the Met. section who may be off duty. Mechanical work (heater, etc.). Equipment should be stowed after work is complete.

<u>CARAVAN EQUIPMENT</u>		
<u>ITEM</u>	<u>LARGE CARAVAN</u>	<u>SMALL CARAVAN</u>
Sleeping Bags and inners	8	6
Blankets	12	9
Pillows and Covers	4	3
Spring Mattresses	4	3
Pressure Lamps	2	2
Mantles	12	12
2-burner kero store	1	1
Straw whisks	2	2
Dust pan	1	1
Hand Brushes	2	2
Candles	18	18
CO Detector	2	2
CO test tubes	24	24
Large Vacuum Flasks	2	1
Small Vacuum Flasks	2	1
Tea Towels	6	4
Packets Tissue	6	4
Absorbent Paper Rolls	6	4
Saucepans	4	3
Kettles	1	1
Frying Pans	2	1
Metal Plates	6	4
Plastic Plates	6	4
China Cups	12	6
Knives	6	4

CARAVAN EQUIPMENT (continued)

<u>ITEM</u>	<u>LARGE CARAVAN</u>	<u>SMALL CARAVAN</u>
Bread Knife	1	1
Carving Knife	1	1
Teaspoons	6	4
Dessert Spoons	6	4
Toilet Soap (cakes)	10	7
Liquid Detergent	1 galls.	1 gall.
Soap Powder	4 lbs.	3 lbs.
Toilet Paper	15 rolls	10 rolls
Corkscrew	1	1
Tin Opener	2	2
Bottle Opener	2	2
Drinking glasses	8	6
Metal Wash Basins	2	1
Buckets	2	2
Dish Washers	2	2
Milk Jugs	2	2
Jerrican (Kero) 4 galls.	1	1
Funnel for above	1	1
Matches	10 pkts.	6 pkts.
Alarm clock	1	1
Electric Lanterns	3	2
Torches	4	3
String	1 ball	1 ball
Torch Batteries	12	8
Lantern Batteries	6	4
Torch Globes 3-5 v	6	4
Torch Globes 6v	6	4

These are essential items only. If you consider there are other items that should be included please discuss it first -- space is at a premium in each caravan because of the large amount of scientific equipment that has to be carried inside.

EMERGENCY GEAR TO BE CARRIED IN SNO-TRACS & ROBIN NODWELL

EACH VEHICLE

- 4 Sleeping Bags
- 2 Sleeping bag inners
- 1 Polar pyramid or Beche Tent
- 2 inflatable Mattresses
- 1 Primus
- 4 Packets matches
- 2 Saucepans
- 2 Mugs
- 1 Billycan
- 2 Dixies
- 2 12 Manday ration packs
- 1 Jerrican Kerosene (plainly marked)
- 1 quart can metho (plainly marked)
- 1 Funnel for stove
- 4 pkts. Metatabs
- 2 sets cutlery

All emergency gear should be stowed securely in boxes lashed in or on the vehicles. Drivers of each vehicle should obtain equipment from the Field Equipment Officer, Peter Morgan or Gordon Smith who will act as deputy in Peter's absence and during traverse preparations.

VEHICLE DRIVERS AT COMMENCEMENT OF TRAVERSE
AT WILKES

NODWELL	ROY WHITWORTH
D4	MIKE JONES
D4	GEOFF HULCOMBE
SNO-TRAC	KEITH BUDNICK
SNO-TRAC	PETER MORGAN

Drivers will be changed if necessary once the plateau is reached.

FOOD

The Messing Officer will be responsible for the preparation and packing of food assisted by John O'Shea and John Pollard. A suitable Norwegian sledge will be fitted with solid packing cases screwed to the sledge battens and packed with food. Cold sensitive foods should be stored in the caravans.

The following list has been composed from a rather inflexible ration scale. The Messing Officer and Fred Cross should review this list and make any adjustments they consider necessary to give maximum ease of preparation and variety of diet.

Incidentals such as onions, chutney, beer and wines will be calculated and stored separately under another instruction.

Bread-about 40 loaves	Pammican--35 lbs	Butter--120 lbs.
Antarctic Biscuits- 100 lbs	Sugar--120 lbs.	Egg Powder--35 lbs
Milk Powder--70 lbs.	Potato Powder-- 50 lbs	Chocolate--60 lbs
Dehyd.Onion--12 lbs	Coffee Grounds-- 12 lbs	Nescafe--6 lbs
Tea--8 lbs	Vegemite--5 lbs	Rolled Oats--56lbs
Salt--8 lbs	Bonox-- 5 lbs	Packet Soup-- 160 pkts.
Tinned Soup-30 tins	Jam - 25 tins	Honey - 8 tins
Weaties - 1 tin	Plum Puddings-- 40	Canned Fruit-- 60 tins
Dried Apricots - 2 tins	Dates - 28 lbs	Sultanas - 20 lbs.
Mixed Nuts - 10 lbs	S & K Puddings-- 35 tins	Irish Stew-- 35 tins
Saus.& Veg.--35 tins	Tomato Juice-- 15 tins	Orange Juice-- 15 tins
Grapefruit Juice-15 tins	Pineapple Juice-- 15 tins	Bournvita - 9 tins
Table Salt - 12 lbs	Curry Powder-2 tins	Pepper - 1 tin
Baking Powder - 2 tins	Jelly Crystals-- 12 pkts	Tomato Sauce - 12 bots.
Worcestershire Sauce-- 4 bottles	Blancmange - 8 pkts	Tinned Milk. Cond. 12 tins
Custard Powder--1 tin	Biscuits(assort)-- 5 tins	Unsweetened -- 24 tins
Cheese -- 15 lbs	Flour -- 50 lbs	Spaghetti--1 tin
Tinned Peas - 24 tins	Tinned Cauli -- 24 tins	Tinned beans - 24 tins
Dehyd.Carrots -- 1 tin	Suet - 1 tin	Salmon - 9 tins
Tuna - 9 tins	Frozen Fish - 20 lbs	Sardines - 36 tins

Fresh Frozen Meat)	Tinned bacon --	Strasberg Saus.
Lamb	30 tins	-- 15 lbs
Beef		
Steak	Chickens -- 8	Fresh Eggs --
Sausages		1 crat
	Meat Bar - 25 lbs	Peanut Butter -
		6 tins

Amenities such as milk chocolate, nuts, soft drinks, etc., should be stowed in the caravans for easy access if space is available.

	D4-1	D4-2	NODWELL	SNO-TRAC 1	SNO-TRAC 2	POLARIS	HER. NELSON
Wilkes to S2	55	55	55	15	15	-	5
S2 to Fuel Depots and Dome	50	-	-	15	-	-	-
S2 to Dome direct	-	25	25	-	6	-	5
Survey for Dome centre	-	20	10	-	20	5	5
Run Strain gd. across Dome	70	70	140	20	20	5	35
Run strain gd. to S2	20	20	60	10	10	10	30
from Dome	195	190	290	60	71	20	90
	===	===	===	==	==	==	==

Total ATK Wilkes
to Dome and return =385 galls
=9 drums
(to S2 (D4's only))

Total petrol for =240 galls.
same trip =6 drums

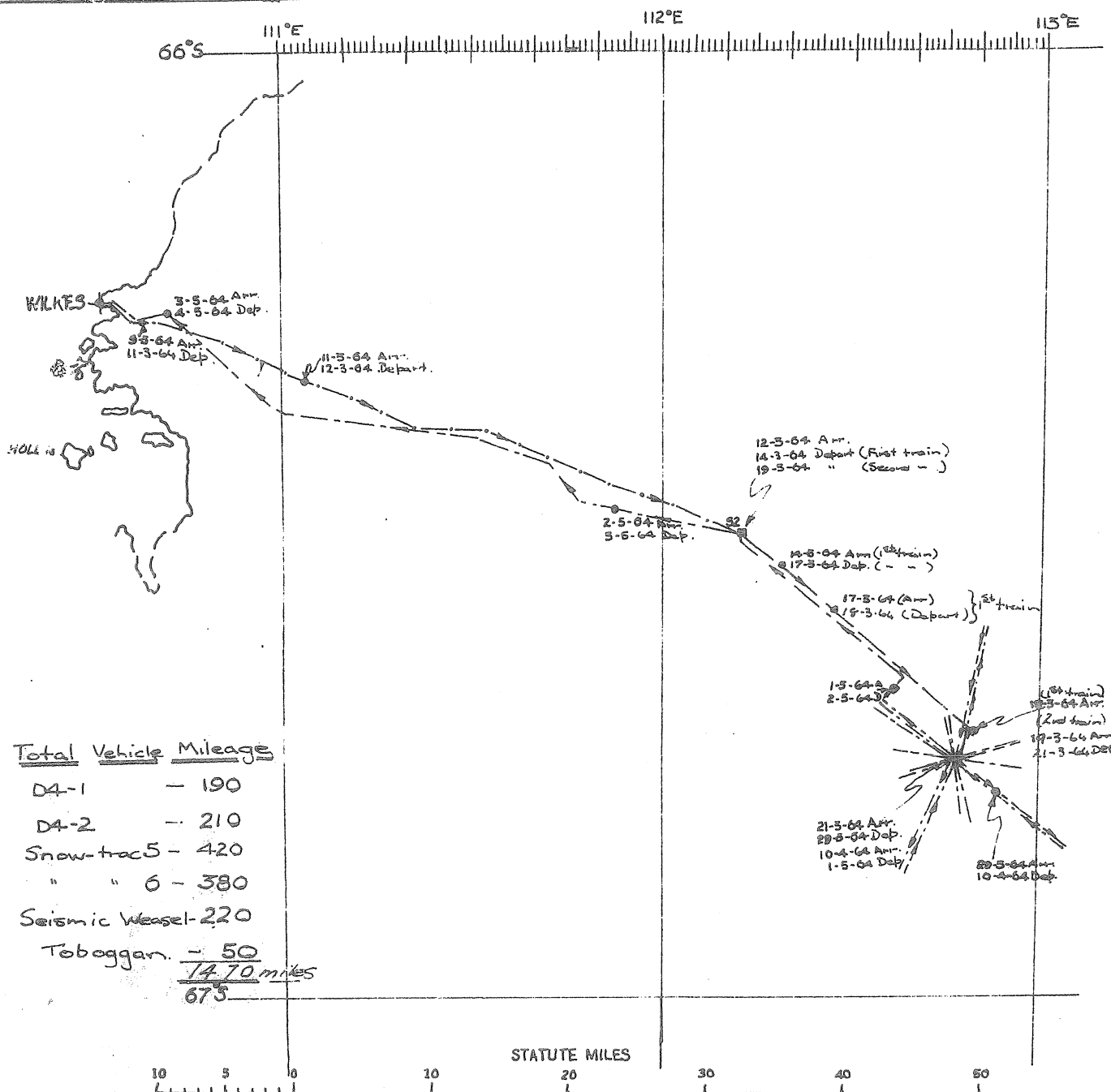
Nodwell 290 gallons

Fuel remaining on sledges on arrival at S2 would be 3 drums ATK and 1 of petrol, 320 galls. of ATK left in the tanker after refilling fuel tanks on the way to the Dome.

S2 to Cape Folger
and Wilkes. ATK--225 galls. Petrol -- 75 galls.
Fuel available
on sledges. ATK--440 " Petrol -- 40 galls. Pick up 1 drum
at S2 & 2 at 30m
post.

FUEL LOADING

- (1) The 500 gallon ATK sledge tanker will be filled and taken to a point south of S2 where it is estimated the first leg of the strain grid to Cape Folger will cross a line due south from S2.
- (2) An Otaco sledge loaded with 39 drums of 25ATK and 14 petrol will be taken to S2 and then 30 miles due East to make two fuel depots for the spring traverse. 5 ATK and 4 petrol will be retained on the sledge for use in the Dome area and return to S2.
- (3) A Norwegian sledge containing 7 ATK and petrol will go direct to the Dome with the survey team.
- (4) The vehicles should leave Wilkes with full tanks and where possible jerricans of spare fuel should be fitted to.
- (5) Lighting kero. and white petrol will be carried on the Polaris sledge. The diesel section will be responsible for all fuel preparations.



Wilkes Autumn Traverse 1964