

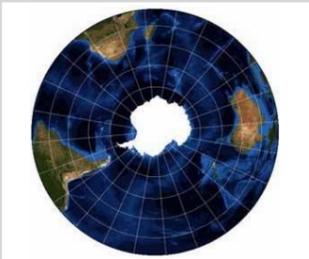
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James Hayes & Ryno Jordaan

ONWARDS, TO THE DAMSEL IN DISTRESS!



Seven kilometers from SANAE IV at the V2K5 waypoint sign at the start of the emergency trip to Neumayer III

THE ANTARCTIC AMBULANCE

Dr. Lowellen Clarke

One last Cat Train - Take 2

The call from SANAP headquarters came at 14h00 on Thursday 29th April. I distinctly remember the time because I was about to launch into that which has become something of a new hobby (read: sport) for me – filling a dental cavity, and I had made an appointment for said time. My victim on this occasion, André Harms, was spared my attentions by the gravity of the situation.

One of our German counterparts at the Neumayer III station, the geophysicist, Tanja, had sustained a fracture-dislocation injury to her left ankle. The orthopaedic powers that be at the Central Hospital in Bremerhaven, Germany, had deemed surgery in the form of open reduction and internal fixation (ORIF) as the treatment of choice. This involves opening the skin and underlying muscles to expose the fractured bone beneath. The broken bone segments are then aligned and secured in position by means of a plate held in place with screws. Unfortunately, Antarctica in late autumn, come early winter is not at all conducive to air travel of any kind, so medical evacuation to Germany for such a procedure was not an option. Surgery had to take place at the excellently equipped Neumayer III base.

Knowing that I have a specialised interest in anaesthesia (this elicited during my stay at Neumayer III in January whilst undergoing treatment for a traumatic amputation of my right middle finger – refer to SANAE 49 February newsletter), my German colleague, Dr Olaf Wetegrove, fully supported by Dr Eberhard Kohlberg, medical officer, department of logistics, of the Alfred Wege-

ner Institute for Polar and Marine Research, had approached SANAP to ask for my assistance in order to compliment his surgical skills. In the spirit of co-operation within the fraternity of the Antarctic treaty, and with the increased chance of success of such a procedure given the presence of two medical professionals, this was approved.

Our 'mission', if we were to accept it (cue "Mission Impossible" soundtrack, take a deep breath, and assimilate): We were to traverse 300km of some of the harshest terrain known to man, in near-winter Antarctic conditions, with plummeting temperatures, the possibility of blizzards, crevasses, vehicle breakdowns, and the added bonus of only a few short hours of daylight! The trip was definitely more dangerous than its summer equivalent. Needless to say, a collective SANAE 49 did not hesitate an instant in accepting this opportunity to help our friends and neighbours, with whom we have developed a fantastic rapport over the last few months. I, on a more personal level, was very keen on returning the favour that had been extended to me in January.

"...medical evacuation to Germany for such a procedure was not an option..."

And so it was that we dropped all other activities with which we were busy, and started preparing for the journey. This was not just an easy matter of packing a few suitcases, starting up the car and driving off, for the following reasons:

For starters, journeys across Antarctica rarely, if ever, take place so deep into the autumn/early winter season – this for reasons

already stated. We were thus not expecting to travel at this time, and were consequently not as 'travel-ready' as we would normally have been during the summer months.

Secondly, on a journey of this magnitude, one needs to be prepared for all eventualities. This involves taking along some specialised equipment, all of which had already been stowed away for the winter. Our sleds and fuel bowsers were in the winter depot. At least one of each had to be exhumed, along with the four-sleeper caboose. This is a rather time-consuming process, and involves extensive periods spent outside. It thereby raises the chance of sustaining a cold-related injury, especially in inclement weather conditions. Two snow-mobiles also had to be mobilised from the hangar.

Permit me to digress at this juncture, but I think it only fitting that I sing the praises of my fellow SANAE 49 team members. To have achieved the above-mentioned preparations in a time-span of four hours, in sub-optimal weather conditions, without injury and to impeccable standards truly stands

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"Are we there yet?"

« The Antarctic ambulance, continued

(from p.1)...as a testament to their professional abilities.

Thirdly, two of our Caterpillar Challenger vehicles were awaiting repair – one with a steering problem, the other with alternator issues. We thus only had two vehicles at our disposal.

Lastly, we had no information as to the urgency of the intended operation – if the fracture had breached the skin and was 'open', or if there was neuro-vascular compromise, surgery would have to be undertaken as soon as possible.

Through communication with Dr Wetegrove at Neumayer, and Dr Kohlberg in Germany, it was established that Tanja's injury had occurred on Tuesday 27th April. There were no indications for an emergency procedure, and the plan was to operate on a semi-elective basis on Monday 3rd or Tuesday 4th of May, once the swelling had subsided. With this information, the emphasis of our preparations focused on thoroughness without haste, and with the safety concerns of those going on the journey first and foremost, as usual. It was decided that a team of four: Andre Harms (team leader, mechanical engineer and German speaking ninja), James Hayes (Space Weather engineer and social diplomat extraordinaire), Marlon Manko (diesel Mechanic and noted Challenger get-away driver) and myself would depart the next morning. We would be driving in convoy in Challengers 1 and 3, two drivers to a vehicle.

The next day, Friday 30th April, after a hearty breakfast, a final shower, and upon completion of the loading of the Challengers with refreshments, clothing and sleeping-bags, the team of four headed off into a fantastically clear Antarctic day. We were in good spirits, and with a relatively light load to pull were expecting a speedier journey to Neumayer III than is customary. However, as so often happens in this part of the world, things were not to run as smoothly as we had hoped. Not 5km from SANAE IV, the first spanner was thrown into the works. The heater in Challenger 1 failed to operate, blowing a few fuses. This carried on despite multiple fuse changes, and some mechanical tampering. André and I had no other choice than to continue without heating in our cabin. We resorted to driving whilst dressed in full cold weather gear inside our down sleeping bags.

The next obstacle (literally) appeared a few kilometres further down the 'road'. The ice was so hard and bumpy, it seemed like we were sitting atop a jack-hammer going along at full throttle! This was due to catastrophic winds we had had the week before which stripped away any covering of snow that

might have softened the track. We were thus limited as to the speed at which we could comfortably travel. The prospect of sitting for at least 24 hours in below freezing cab temperatures whilst being bounced around to such an extent that haematuria from shaken up kidneys was a concern, definitely put a dampener on our moods, but we persevered nonetheless. At least we still enjoyed good weather...for a while.

Approximately half-way through the journey, a blizzard started tearing through the ice plains. Visibility decreased markedly, and we were now utterly dependent on GPS for navigation. Shortly afterward, Challenger 1 developed a fuel leak at her diesel injector sites, which needed mending. Enter the unflappable Messieurs Harms and Manko, and before you could say "major diesel spill", all was back to operational status! At this stage, my thinking was along the lines of "could anything else possibly go wrong?" - of course, in less savoury language. And naturally Fate provided the answer with a resounding "YES" in the form of an anti-freeze leak within the cabin of Challenger 1, courtesy of a faulty clamp on a Webasto pipe. This was once again quickly addressed, albeit it only temporarily – it would need definitive management at the German base.

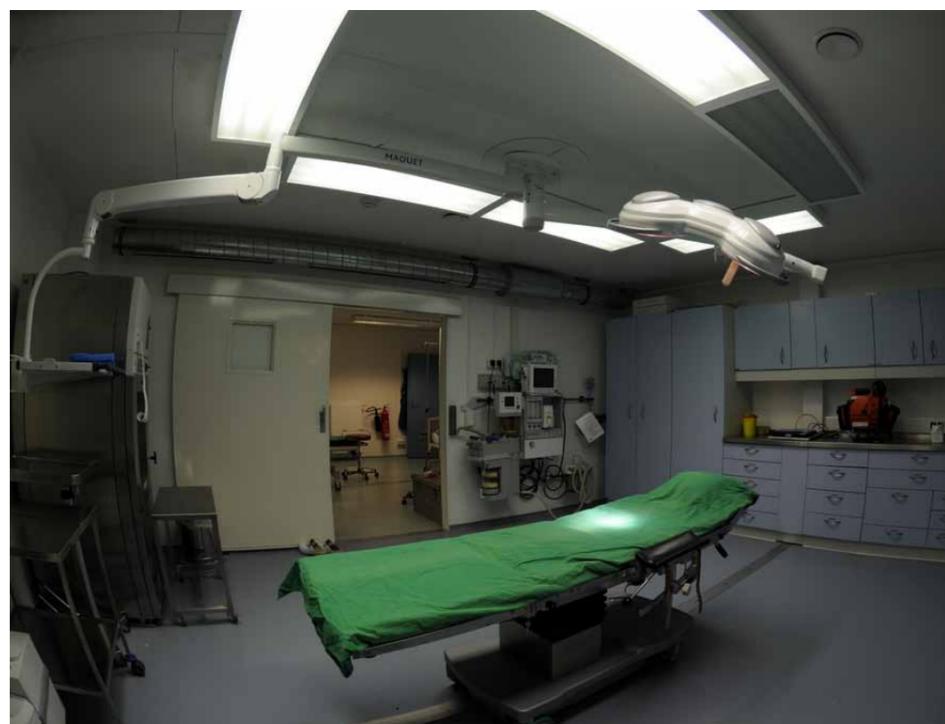
I had by now developed somewhat of a stoic demeanour. Come what may, I would simply accept all that was thrown at us, and forget about fanciful, fleeting conjecture on Fate, Mother Nature, Murphy's Law and the like. At least we were still making progress, and as the saying goes – 'what doesn't kill one can only make one stronger'. This was indeed true of the bond between our band of brothers. We had strengthened our resolve to succeed, and with the conquest of each obstacle, we bolstered our belief in our abilities, in ourselves and above all, in our functioning as a successful team.

There were only two further (relatively minor) incidents en route. The first was a blocked pre-cleaner and air filter in Challenger 3, the result of snow build-up secondary to the blizzard. This was easily fixed by means of emptying them of snow. The second was a threatened homicide by James on Marlon for the incessant playing of Bryan Adams love songs over the radio in their cab. Fortunately, Marlon being 'a lover and not a fighter' (hence said love songs!) did not rise to this bait, and weighing in at about 40kg heavier than James, was easily able to quell any such threatened action!

Finally, on the afternoon of Saturday 1st May, in atrocious weather with poor visibility, and after 30 hours of character-building toil, we limped into Neumayer's parking lot under the guidance of Armin, the German electrician who had ridden out in a Pisten Bully to meet us a few kilometres from our destination. Both Challengers and their drivers were battered, bruised and chilled to the bone, but simultaneously filled with a sense of pride, excitement and elation at what we had accomplished. We eagerly headed indoors to



The recovering patient in an adapted office chair serving as a wheelchair with Paul (left), Dr. Olaf (back) and Dr. Lowellen (right)



The surgery at Neumayer III where the operation was performed

greet and catch up with our German friends, indulged in a hellishly hot sauna, and then attacked a decadent meal before launching ourselves into bed and the welcoming world of sleep.

Sunday 2nd May consisted of the exploration of Neumayer III and the fixing of the Challengers. The first order of the day after a spectacular brunch saw SANAE 49 members getting to know the shovels at Neumayer on a first-named basis! Upon inspection of our sleds and vehicles, we discovered a diesel spill from a leaking nipple attached to the diesel bowser, and an anti-freeze spill from Challenger 1. We had to dig out all the contaminated snow, place it in buckets and transport it into the base for further waste management purposes. This finally out of the way, André and Marlon (with the assistance of Armin and Hinnerk) got down to the business of thawing out and repairing Challenger 1. Meanwhile, James and myself escorted Holger and Sarah to the air chemistry laboratory and the joint magnetometer-seismometer housing facility. We stood in absolute awe of the standard and scope of the scientific equipment. These people do not do anything by half-measures!

Monday 3rd May involved continued Challenger maintenance for André, Marlon and co, and social networking for James. I concerned myself with details regarding the finalisation of, and preparation for, the proposed ORIF. This also involved Dr Olaf who would be chiefly responsible for the actual surgery (his area of expertise being general

and vascular surgery), our support team – Paul (the chef) who was to act as scrub nurse, and Holger (the air chemist) who would act as runner and radiographer, and of course our patient, Tanja.

Due to the small number of members on over-wintering teams, we need to multi-task. Hence each team has some non-medical members who are able to assist their medical professional (James tends to assist me in medical procedures). Because of the lack of a dedicated surgical team who operate together on a daily basis, and also because medical practitioners need to be versatile rather than specialised (in other words, they have the ability to perform most procedures, but have not necessarily experienced the numbers to be slick at performing them). Case in point - neither Dr. Olaf nor myself were experts in the field of orthopaedic surgery, although we both had some experience. For these reasons, procedures in this environment do tend to take longer than they would ordinarily take in a hospital near you... And this was indeed the case here, as I shall divulge.

It was decided amongst the above-mentioned team to perform the procedure under a spinal anaesthetic. This involves the injection of a local anaesthetic into the fluid which surrounds the spinal cord. Consequently the nerves which come off from the spinal cord at that level are numbed for a period of approximately 4 hours. Effectively, the patient is temporarily paralysed from the abdomen

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Refueling normally goes hand in hand with clearing the vehicles of snow build-up



Marlon Manko taking a nap en route in the Challenger's bunk

« The Antarctic ambulance, continued

(from p.2)...downwards, whilst being awake. Although this probably seems terrifying and may be viewed as a form of torture to some people, it has the following advantages over a general anaesthetic: excellent pain relief, less bleeding, the ability to interact with the patient during surgery, good recovery (no grogginess or nausea post-operatively), and safeguarding against the formation of blood clots in the legs to a certain extent. Once stabilised, it also allowed me to assist Dr. Olaf with the ORIF, whilst being able to watch over Tanja and interact with her from within a safe proximity. All equipment was readied that evening, as was an internet link with the Central Hospital in Bremerhaven, Germany, in case we needed additional advice during the ORIF.

Tuesday 4th May rolled on. Surgery had been scheduled for that afternoon so as to link up with the hospital in Bremerhaven. The anaesthetic proceeded as planned. The surgery however, for the reasons stated, proved to be technically difficult, and went on for longer than expected. Consequently the spinal anaesthetic began to wear off before the end of the procedure, and had to be converted to a general anaesthetic. At this point I could no longer assist with surgery, as I had to give my full attention to watching over Tanja as she slept. Fortunately, by this time, surgery had almost been completed, with only a few screws needing placement, followed by wound closure. After approximately 5 hours of theatre time, we had a result which although not perfect, was satisfactory.

We spent a number of days at Neumayer after the operation. This in part because of bad weather conditions, but largely in case a return to theatre was needed due to post-operative complications. Fortunately none arose, and Tanja is currently recovering and rehabilitating well.

These extra days were mostly spent in the forming and consolidating of friendships, playing pool, jamming music, telling stories, watching movies, swapping photos, trying to bribe Paul The Chef to come home with us and that having failed, learning from his culinary sagacity. And of course, we consumed legendary (amounts of) German beer on tap!

There was however one more event of significance – an almost double birthday; Marlon's on 6 May, and Mannie's on the 7th. The result: a midnight rendition of "Happy Birthday", followed by a celebration of titanic proportions! We did however stop short of giving Marlon his traditional snowbath. That would have to wait until our return to SANAE.

Finally, around mid-morning on Friday 7th May, laden with a bunch of extra luxury goodies in the form of yoghurt, ginger ale,

chocolates and German beer as an appreciation of our efforts, we took our leave – for the first time! When we hooked up our sled and caboose to our revamped Challengers, we discovered to our horror that the latter load was an immovable object. There-after followed a few hours of snow-ploughing, road-grading, wrestling and heaving by two Pisten Bully vehicles before the caboose finally tore loose of its icy entrapment. Score : Pisten Bully 1, Challenger 0! After that ordeal we saw fit to first indulge in a spot of lunch before taking our leave a second time – successfully.

Our journey home was mercifully shorter, warmer, smoother and pretty much incident free. Due to snow-drift, we were unfortunately deprived of that magical sight, which when 60km from SANAE IV becomes visible as the last ice rise is crested - there on top of Vesleskarvet, a bright beacon shining, calling us Home. It always brings a lump to my throat, a lilt to my heart, and very nearly a tear to my eye. The effect is then invariably enhanced shortly there-after as a much missed team-mate's voice crackles over the radio - "Cat train, Cat train, this is SANAE..."

I would like to quote from an email sent out by Dr Eberhard Kohlberg which, I think, speaks volumes: "...the joined German- South African medical team finished the operation of our geophysicist with success... We highly appreciated that the colleagues of SANAP promised immediately to give support to our wintering team as fast as possible... It is a great challenge for all to manage this situation under conditions not comparable with a professional hospital, although our stations are well equipped in medical concerns... This operation was an outstanding and unbureaucratic example of international cooperation in the spirit of the Antarctic treaty."

As for me, it was a call to duty; a welcomed and much enjoyed opportunity to once again sink my teeth into some juicy aspects of medicine. It also provided the chance to return a favour for which I shall always be indebted, the chance of an adventure, and the chance to be a part of something fantastic in the spirit of camaraderie, which culminated in a memorable experience and newly formed alliances.

My sincere thanks to our respective organisations for sanctioning this endeavour, to the over-wintering Neumayer XXX team for their warm hospitality and friendship, to Dr Olaf Wetegrove and the unique surgical team of which I was privileged to be a part, to Tanja for her unconditional belief in our skills, to three brothers who ventured with me through an odyssey of almost mythical proportions, and to six more who had to stay behind, but are large as life when it matters. ●



Doc Clarke clearing snow off a challenger - notice the caboose and fuel/cargo sled that was taken on the trip.

CHALLENGER CHALLENGES

André Harms

Some of you may have fully equipped 4x4's, and be under the impression that your massive BF Goodrich T/AKO tyres and modified Old Man Emu shocks will take you just about anywhere - you'll be surprised to know that your beastly 4x4's wouldn't last a minute in the harsh conditions of Antarctica, especially at this time of the year. Actually you probably wouldn't even get it started!

The South African National Antarctic Programme makes use of modified Caterpillar Challengers. These vehicles, originally designed as agricultural work horses, now include a host of modifications to help them survive the Antarctic 'punch'.

These upgrades include starting aids in the form of Webasto cooling system pre-heaters (plus a propane heater as backup), which make sure the engine is nice and toasty before it is fired up. To help with lift-off, 'Ether diesel start' is also injected into the combustion chamber during start-up.

The purpose-built insulated sleeper-cabs have extra room and bunks to make it as comfortable as possible for the team of drivers on the extra long trips across the bumpy, freezing terrain.

Challengers are rather thirsty beasts, especially when heavily loaded, and long-range tanks are installed, so that less refuelling is necessary. Industrial transfer pumps are used to fill up the 800 - 1000 litre tanks in no time from our fuel Polar Diesel tankers. All heater pipes are insulated to ensure that hot water is still hot by the time it gets to the cab heater.

Battery boxes are well insulated to prevent the cold from stagnating the chemical reaction in the batteries. Ice deflectors prevent ice build-up on the suspension, steering systems and track.

Even though these vehicles are 'pimped' to meet the prevailing conditions we still experience problems as the operational conditions verge on the machines' limits. Of all the technical problems encountered on the vehicles during the last trip to Neumayer III, half were directly related to the freezing cold and stormy conditions. The remainder constituted expected faults due to standard wear and tear resulting from the rough ride across the uneven ice.

To my mind (maybe use: In my professional opinion as the Mechanical Engineer), the most prominent issue was that of the broken cab heater – in my cab. As a result of this problem, Lowellen and I had to drive in full cold-weather gear, inside our mummy sleeping bags for several hours. Imagine this: we were little caterpillars driving a Caterpillar. On several occasions we had to swap our frozen juice bottles for liquid juice from the other Challenger, whose occupants grudgingly parted with their refreshments. Once we arrived at our destination, and had a window of good weather, the problem was isolated: strong wind must have forced drift snow into the heater box. This snow froze around the fan in the heater system, thereby

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The German Igloo built outside Neumayer III (Photo taken during the April Auroras: Courtesy Sarah Huber)



Glaring headlights help you to see into the black and white nothingness.

THE POLAR (TEMPERATURE) DISPARITY

Robert Schoeman

Antarctica is a place of extremes – it is by far the coldest and windiest region on the Planet. When comparing temperatures between the Arctic and the Antarctic regions, one will notice a very distinct difference in the extremes of the sub-zero temperatures.

The average temperature in Antarctica (at the Pole) in the winter is around -58.0 °C, and in summer the average temperature is around -25.9°C. The coldest temperature recorded in Antarctica was recorded at Vostok Station (Russian Station) on the 21st July 1983, an incredible -89.6 °C.

The average temperature at the North Pole in winter is around -34.0 °C, and in summer the temperature averages around 0 °C. The coldest temperature measured in the Arctic is -68.0 °C.

Both the North and South Poles are extremely cold due to the fact that they receive much less solar radiation than any other place on the planet. In the summer, the sun is very low on the horizon, and never rises more than 23.5 degrees above the horizon. Due to the tilt of the Earth's axis, the solar radiation travels through a thicker layer of atmosphere at the poles than at the Equator, and much of the radiation is absorbed by the upper atmosphere. Much of the solar radiation is lost due to reflection off the white ice. Both the poles also endure several months of darkness during the winters, which causes the temperatures to plummet.

Regardless of the similarities between the North and the South Poles, there are significant temperature differences, which begs the question: Why is the South Pole so much colder?

The reasons are, in fact, very simple: In short, the distance from the ocean and elevation, are the most significant contributing factors. The following three paragraphs explain:

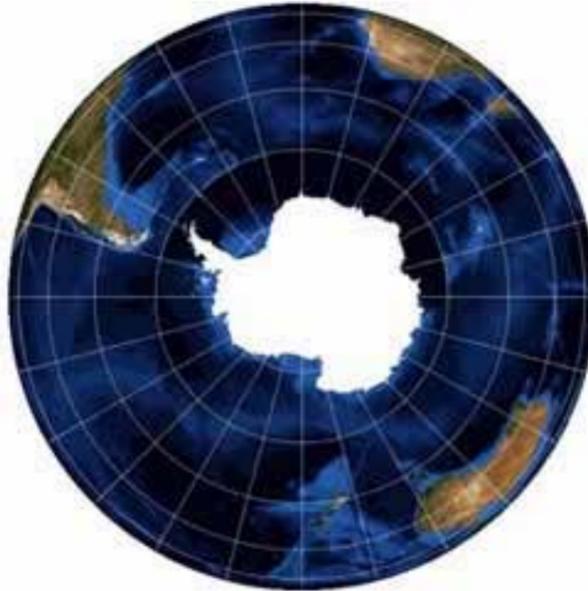
Oceanic thermal convection: Due to the low thermal conductivity of water, the world's oceans store an immense amount of thermal energy, and serve to moderate regional

temperatures. The North Pole is situated on a sheet of floating ice in the Arctic Ocean. The relatively warmer temperatures of the Arctic Ocean warm the cold atmosphere in the winter and draw heat in the summer. The South Pole, and most of inland Antarctica, is far from the surrounding ocean. Also, the surface area of Antarctica doubles in the winter, as the ocean surrounding the continent freezes. These ice sheets further inhibit heat transfer from the ocean to the polar atmosphere.

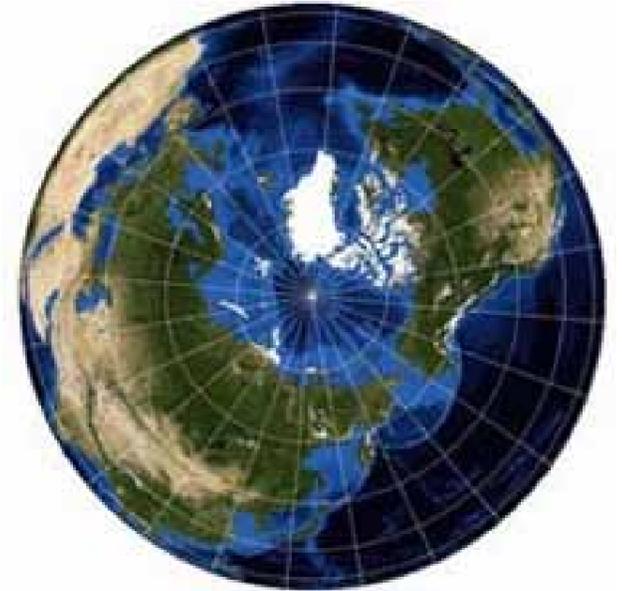
Altitude: Antarctica has a higher average elevation than any other continent on Earth, mostly due to the fact that a thick sheet of ice rests on the continental landmass. As many readers know, atmospheric temperature decreases as altitude increases. Since the South Pole is situated on a massive sheet

of ice that is almost three kilometres thick, and the North Pole is practically at sea level, the difference in altitude contributes to the difference in temperatures.

Reflection and low humidity: Since 98% of Antarctica's area is covered in ice, the continent reflects a great amount of the Sun's radiation, whereas the sea surrounding the North Pole absorbs the radiation more readily. The extremely low temperatures and distance from the ocean at the South Pole contribute to the fact that there is almost no water vapour in the atmosphere. Consequently, the solar radiation that is reflected back into the atmosphere is lost, instead of being absorbed by the water vapour. ●



Azimuthal projection of the Southern Hemisphere (www.icsm.gov.au/mapping)



Azimuthal projection of the Northern Hemisphere (www.icsm.gov.au/mapping)

MEDICAL TRAINING - NEBULIZERS & NEEDLEWORK

Tyrell Sassen

The main function of the support personnel at SANAE IV – that is everyone excluding the scientific engineers and meteorologist – is to keep the base in running order. Without an operational base, life wouldn't be sustainable in Antarctica. For a single team member, the responsibility of keeping things in "running order" goes a bit further: he ensures that those who keep the base in running order, are in running order. This man, Dr Lowellen Clarke, is our doctor. He has stepped forward not only as a medical practitioner, but also as Dentist, team councillor, and as a teacher and guide of sorts, in training rest of us in basic medical interventions.

Before we left from Cape Town, the team was required to complete a basic first aid course, which taught us to stabilise an injured person, while waiting for the assistance of a medical professional. Naturally, even our esteemed doctor cannot

be everywhere at once – as was the case when Lowellen (or 'Doc' as he's more affectionately known) was away at Neumayer III during the first week of this month. He has therefore taken it upon himself to train the rest of us, so that we can address basic emergencies.

So far, we have had two training sessions. These have covered two main areas, namely nebulisers and needles – in other words, how to treat someone who is suffering from an asthma attack, and how to give intramuscular injections and stitch up open wounds.

One of our teammates suffers from chronic asthma. His condition is not severe and can usually be remedied with the use of a standard asthma pump. However, there is the possibility that he could have an asthma attack which requires additional treatment. The team was therefore instructed on

how to set up and use a nebuliser. This is a device that enables a drug to be inhaled as a mist. The nebuliser is filled with the liquid drug and oxygen is pumped through the nebuliser, which carries the drug into the lungs.

It is inevitable that there will be times when our Doctor is separated from part of the team, especially during Cat Trains, where a significant part of the team leaves for an extended period of time. He will either be on the excursion, which means that the team members that remain at the base will be Doctor-less, or he will remain at base, which obviously leads to a Doctor-less Cat Train. In any event, there is always the chance of a team member being injured. In the event that the injury is in the form of a bleeding cut, it has to be treated; with or without the Doc's immediate attention.

Without divulging too many gory details (for those with needle-phobia), Doc taught us how to administer intramuscular injections, as well as stitch up flesh wounds. The paradigm is for every team member to be prepared and ready to aid an injured team member in the Doctor's absence – naturally, as a temporary remedial action to stabilise a situation.

The needlework training had the added benefit of helping to ease pent-up frustration in the team, by allowing us to stab each other's "upper outer quadrants" with what seemed like a fifty-odd centimetre needle. Enough said. This was a lot of fun when you were the one practising (the injector), and a little less enjoyable when you were the 'injectee' - on the receiving end. Thankfully, training went smoothly under the supervision of our committed instructor; the only injuries were inflicted on our pride and eyes, due to a mild-to-serious overexposure to male buttocks. There were cringes and convulsed facial expressions all-round (as illustrated in the bottom slides).

The second part to the needlework class was practiced on something less close to home: oranges. The thick skin and pith is said to be a good analogue for human skin. These juicy, if slightly off-colour, patients managed to remain calm throughout the entire exercise, even with our sometimes overzealous needlework. This was probably due to the anaesthetic that was administered during our previous practice session. Surgeon's knots were practised, deep flesh-wounds were stitched up, and half a dozen or so oranges were saved from near-fatal wounds.

In the end, despite all the cringes and needle-phobia, the team had a good time acquiring skills that could possibly save a life. Who knows, maybe for our next training session, we'll learn how to use that awesome 'bone-saw thingy'. ●



This orange deserved a second chance after it's unfortunate encounter with Mr. Knife.



Nine inch needles, a sadistic smile and a trusting patient is all you need for a good time



Some people do not look normal while concentrating.



COME TO THE DARK SIDE, WE HAVE COOKIES

Roger Van Schie

Some readers might not have enjoyed primary school geography (or might have become rusty on the subject) - we are currently experiencing polar night at SANAE IV. For those that are not familiar with the 24/7 night-time concept, here is a quick explanation; so that unlike us, you are not left in the dark.

There are some inevitable truths in this world: you will grow old, you will have to pay taxes, and the sun will rise in the east and set in the west – day in, day out. Most people believe this due to their everyday experience, but most people also prefer to live in cozy temperate climates, closer to the equator. The fraction of the global population that resides close to the poles, have been familiarized with an entirely different concept of night and day - the sun does not necessarily rise, nor set every day.

Most people understand that daytimes are longer during summer and shorter during winter. This seasonal change in the daytime lengths pivots along the bi-annual equinoxes, where daytime and night-time are equally long. However, as one nears the Poles, the disparity between day and night becomes more pronounced.

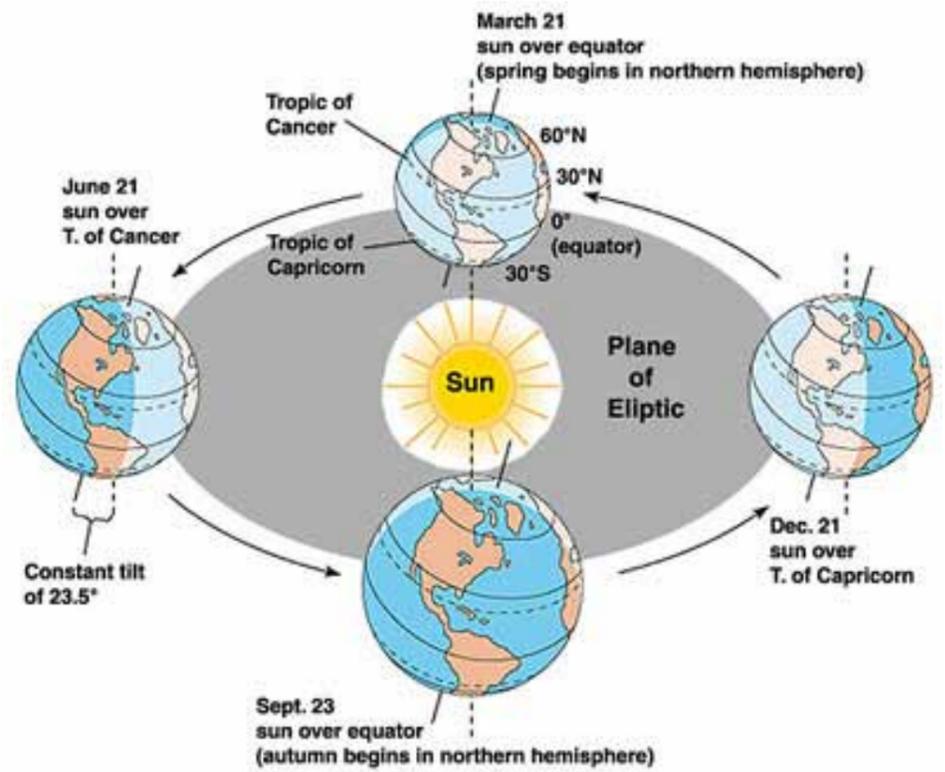
“Why does this happen?”, one might ask. Well kids: “Once upon a time, long long ago, Zeus was playing soccer with some other old Greek god” and “bla bla bla bla” – so on and so forth. The minds of all the brilliant ancient philosophers had the world figured out, as a flat surface under the dominion of countless gods. And surely, there was also a dim-witted reason for the day-night paradox.

In an attempt to stamp out these age-old fallacies, and refresh some of the readers’ minds, we will return to Standard 4 (ahem, Grade 6) Geography:

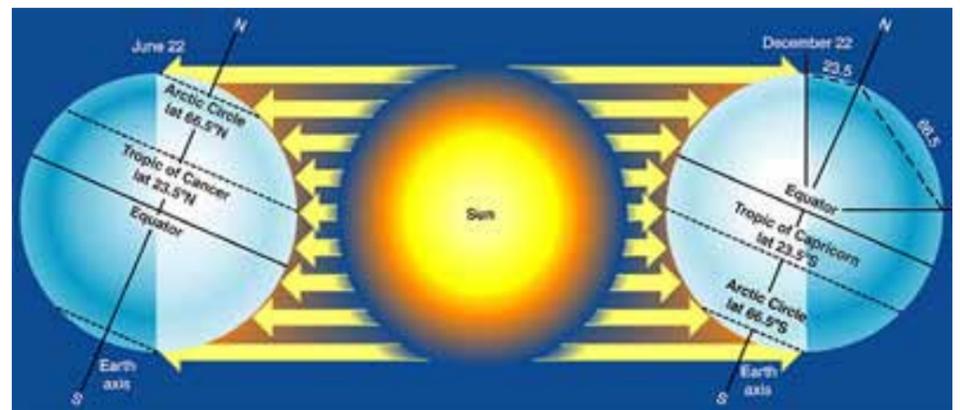
The Earth orbits around the Sun every 365 days, in a plane called the ecliptic plane. Whilst orbiting the Sun, the Earth also rotates around a central axis, every 24 hours. The

catch is that the rotation axis of the Earth is not perpendicular to the ecliptic plane - the Earth’s axis of rotation is slightly tilted. Consequently, either the Northern or the Southern hemisphere will be tilted slightly towards the Sun, whilst the opposite hemisphere is tilted slightly away. Therefore, the hemisphere that is tilted towards the Sun experiences summer, and the other winter. During spring and autumn, the Earth’s rotational axis is almost perpendicular to a line drawn between itself and the Sun. This means that day and night will be the same length, and both hemispheres receive an equal amount of sunlight.

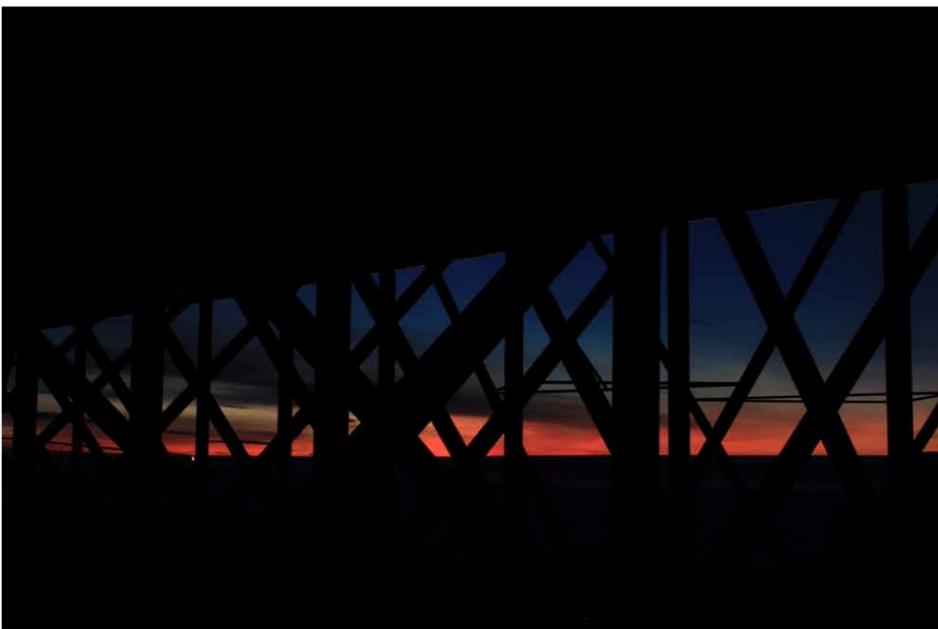
Now that we have explored the winter-summer scenario, we shall discuss the phenomenon of extended day- and night-times in the Polar regions. Since the Earth is tilted, one of the Poles is directed towards the sun (during its respective hemisphere’s summer), and the other Pole is tilted away from the Sun. Consider the accompanying illustration: the sunward facing side of Earth has day, and the side that faces away from the Sun is cast in shadow, and experiences night. Since the planet’s rotational axis is tilted, one of the poles will constantly be exposed to the Sun, even though the Earth is rotating through it’s day and night cycle. This pole will experience constant daylight. Naturally, the opposite pole will be cast in shadow during this entire time, and will experience prolonged night. As the Earth moves to the opposite side of the sun, the Earth’s shadow falls in such a way that the opposite pole is now shrouded in darkness, and the scenario is reversed. ●



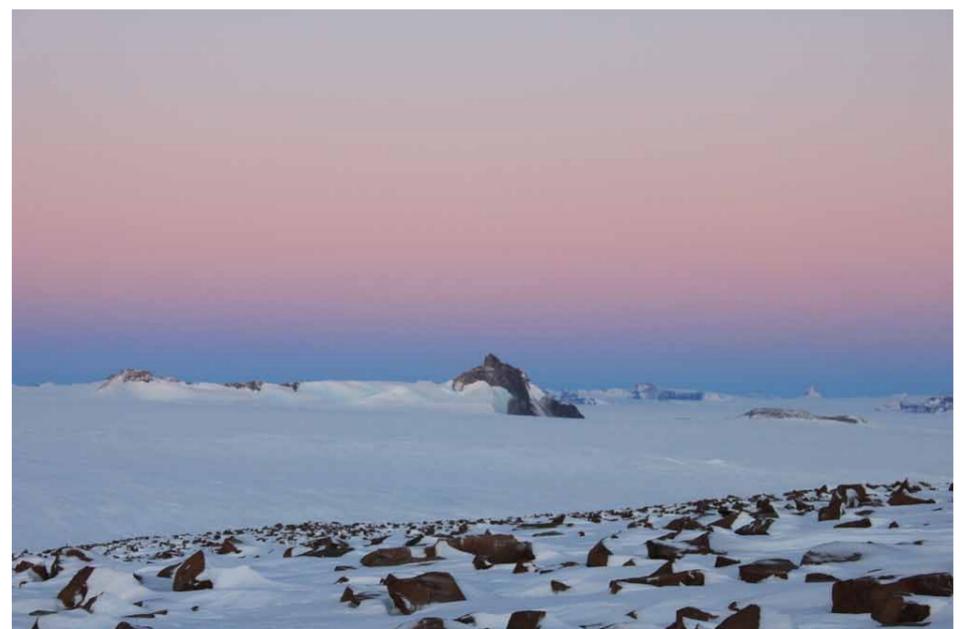
Earth's orbit around the sun (www.hort.purdue.edu)



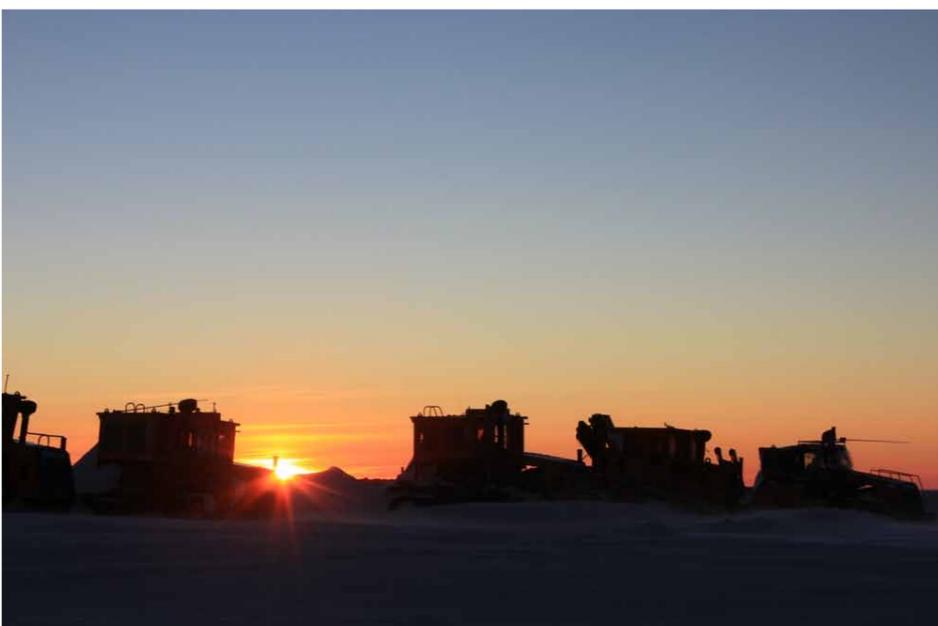
Earth's tilt - the reason for the South Pole being in 24h darkness on the left and constant daylight on the right (www.hort.purdue.edu)



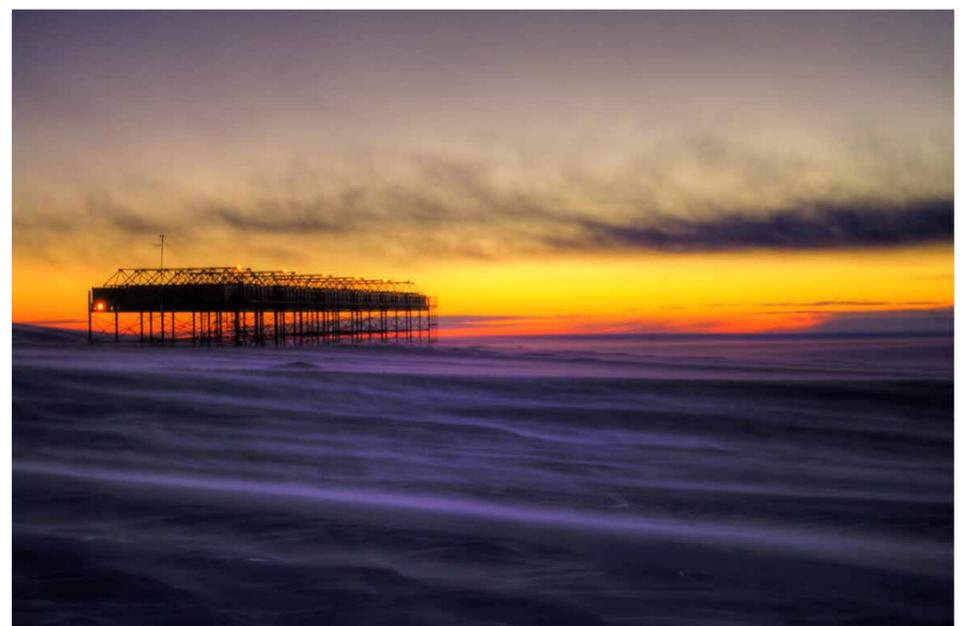
The dawn as we experienced it on the last day



The skies turned a beautiful hue of pink on the last day of sunshine



The last sunset, on 20 May



Although the sun does not rise above the horizon, there is a brief time of twilight around noon every day

« Challenger challenges, continued

(from p.3)...crippling the heater, and causing a fuse to blow every time we attempted to start the heater. We removed the ice, sealed up the box and had more agreeable conditions on the return trip.

The other major problem came from blocked air filters. The vehicles are fitted with cyclone-type pre-filters (to the readers: the 'chimneys' on the Challengers) that filter snow out of the air which is required for combustion. During poor weather conditions such as white-outs, with copious blowing snow, these pre-filters have a tendency to block up, thereby choking the engine. If the conditions are really bad, the actual air filter on the engine can also be blocked. We constantly stopped to clean the snow out of the pre-cleaners, and on one occasion, Marlon and James had to replace their air filters in the middle of a white-out.

When temperatures plummet below -20 degrees Celsius, the alternators struggle to 'get excited' or start charging the batteries. While we were quite unnerved by the issue, it does not present a serious problem on the journey.

Regardless of the difficulties imposed by the terrible weather during our trip to Neumayer III, the Challengers (and the crew) mastered the challenges. ●

SANAE B-DAYS: South Pole Chef, 'Ek sê!

Robert Schoeman

This month heralded the birthday of our "CAT-Man", Marlon Manko. Before delving into details about his "special SANAE birthday present", I would like to point out the fact that this fine specimen of a man is not only a nifty Diesel Mechanic, but very adept and creative in the kitchen, and has been treating us with delicious dishes and desserts from day one. This was our chance to give back, and show our gratitude to the man.

Due to the 42.6 knot wind combined with a -19.3 °C temperature, we thought it wise to postpone Marlon's snowbath. The fact that he happened to be away from SANAE at the time of his birthday (Neumayer trip), was also a contributing factor, and as a result Marlon did not have his snow bath on his birthday. This "SANAE birthday prezzie" was given to Marlon a few days later, in relatively calm weather conditions (-15.0 °C with a 4.2 knot wind). As per SANAE birthday tradition, a XXL-snow-bath had been dug out and awaited the presence of our diesel mech.

Marlon burst out of the base door, in nothing but a cooking apron (very fitting for the man that has been cooking incredible meals this year). The "Naked Chef" provided great entertainment that made his snow bath a very memorable event indeed. Nice one, Marlon!

Marlon's birthday party was spent by having a great dinner, chocolate cake and a great SANAE birthday bash... definitely one to remember.

Happy Birthday, Marlon. The SANAE 49 team wishes you an incredible year and many more happy returns. ●



Chef, making a dash for his snow-bath

IN THE NEXT ISSUE: The ins and outs of a world-class Antarctic base

James Hayes

The South African National Antarctic Program (SANAP) has been involved in Antarctica for exactly fifty years. During this time, overwintering expeditioners have occupied four Antarctic bases, of which three have been decommissioned in the years past.

The current base, namely SANAE IV, was a flagship in terms of Antarctic base construction in its hey-day. After twelve years of occupation, the longevity and functionality of its ground-breaking design can still be appreciated.

So, as a culmination of the knowledge gleaned from half a century of occupation, and the sustained improvements after three previous generations of structural and systems engineering, the SANAE IV base has features which are baseline standards in all modern Antarctic bases.

In the next three issues of the monthly newsletters, readers will be introduced to the major systems that are necessary to sustain a bells-and-whistles Antarctic research station, such as SANAE IV.

As an appetizer, readers can look forward to insightful articles of the following topics: The architectural and structural aspects of the SANAE IV base will be discussed, especially in terms of its ground-breaking design and location. Secondly, the energy systems that sustain the building will be explored. Lastly, the key aspects of Antarctic water and waste management systems will be divulged ●.



View of SANAE IV, facing South.

SANAE TRENDS

Current affairs, statistics, conditions and fads

Temperature Trends

Minimum: -32.6°C
Maximum: -6.2°C
Average: -20.8°C

Wind-speed Trends

Maximum: 110.2 km/h

Day Lengths

1 May 2010: 5 hours 7 minutes
31 May 2010: 0 hours

Quotes of the Month

Tyrell, after Monday morning team meeting:
"Everyone, to the bar!"
(Intending to start cleaning duties in the bar which happened to be a mess after the weekend.)

James to Doc Lowellen, whilst eating the cajun-style fish that Doc had prepared for supper:
James: "Doc, what do you call this chicken?"
Lowellen: "Fish!"

Tyrell, whilst going through left-over food:
"...guys, 'vrot' is relative"

Tyrell, at random:
"Remember shaving!?"

Song of the Month

No Kitty Blues - Grinderman

Movie of the Month

Eurotrip

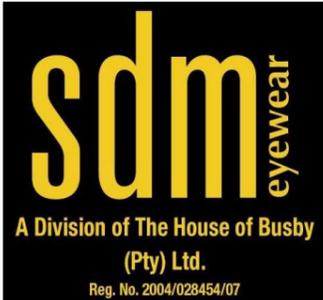
Birthday of the Month

Marlon Manko 6 May 1982

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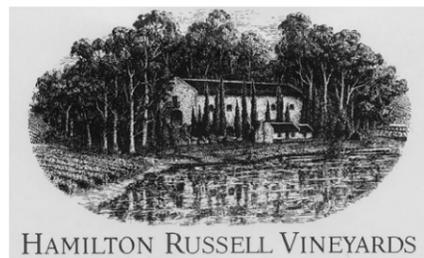
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