



# SANAE 49 NEWSLETTER

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## IN THIS ISSUE



SANAE sled-dogs .....1



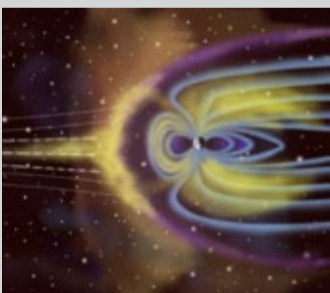
The Real Antarctic Doctor ..... 2



Birthdays .....2



Skidoos .....6



Cosmic Rays .....6

### EDITORS:

James Hayes & Ryno Jordaan

### GUEST EDITOR:

Dr Lowellen Clarke

## THE END IS NIGH...



Playful puppies? Think again...

## WET-NOSES IN ANTARCTICA

James Hayes

*"A very hard and willing worker, always anxious to get going. Very restless, continually standing up when the team is resting; punishment will not stop him doing this. Affectionate, intelligent and inquisitive, well worth trying as a leader. A cowardly fighter, waits on the outskirts to seize any handy part of the (one) getting the worst of it. Killed in fight, Feb '60"*

Right...just off the bat, let me reassure you that all ten of us are still alive and well. This is not our doctor's report, nor an extract from our team-leader's diary. There have been no fights to the death for S49, probably due to the non-violent manner in which we settle our differences by means of brutal bare-knuckle foosball matches.

This character profile was filed for Lewis. Lewis was a "rather highly strung but not nervous" individual that over-wintered at the Australian Davis Station between 1958 and 1960. At least, that's what it says in the 1961 Husky register for this particular Antarctic station.

The corridors and links of SANAE IV are decorated with photos and trivia from the past – a theme which keeps recurring in the photos, is that of the old-school Antarctic adventurer's trusty canine companion. When South Africa first occupied the Norway Station during the summer take-over of 1959/1960, ten huskies were 'inherited' from the Norwegians. In early 1967, an additional ten dogs were obtained from the Belgium/

Netherlands base, *Roi Baudoin*. It was only in 1977 that dog-sleds were replaced by mechanized forms of transport at SANAE – after that, dogs sleds were used exclusively for recreational purposes.

During early years of Antarctic exploration and occupation, these dogs formed an integral part of the day to day operations. Over-wintering expeditioners were reliant on their sled dogs and formed special bonds with them. Although us 'modern teams' share a common thread with our predecessors who also braved the Antarctic winter, the lore and culture of using sled dogs is completely lacking from our experience.

The 1991 Madrid protocol, which was instituted as an environmental protection amendment to the Antarctic Treaty, called for the removal of all alien species (excluding humans) from Antarctica. There were growing concerns that sled dogs were malignant to the environment and that they were spreading serious diseases such as Canine Distemper Virus to resident seal populations. Consequently, sled dogs were removed from Antarctica in the years that followed.

It is only apt to explore this topic, and to acknowledge the incredible role that these dogs played at the previous SANAE bases. Being no expert on the subject, I've turned to the tales of expeditioners of yonder years,

and to the documents and Antarctic annals of times long past. As a modern SANAEan, I concede that I cannot begin to fathom the depth of relationship and interaction between man and beast as it was experienced in those days. Despite the common ground between our team and those of the

» continued, p. 3



An Antarctic research expeditioner with sled dog pups (Image courtesy of the National Archives of Australia).

# THE ANTARCTIC DOCTOR MAKES A COME-BACK

Lowellen Clarke

As doctor to a team of (mostly) young, (certainly all) healthy and vibrant men, I fully appreciate, and rather enjoy, the relative deficiency of medically related work I have happened to experience this year at SANAE IV. Indeed, other than the traumatic amputation of one of my fingers, a trip to the German base, Neumayer III, in order to assist in the surgical correction of an ankle fracture (see SANAE 49 newsletters for February and May respectively), some dental work, and the odd muscular tweak, I really have not had to strain myself.

And just as everything in paradise was going swimmingly, along came October...

First up to challenge my medical proficiency was Tyrell, who decided to slip whilst walking on the ice outside and used his outstretched arm as a braking device. In the process, he injured his wrist.

He is one tough bugger, is our Ty! He walked around for a week before he approached me with a wrist which was still painful. On palpation, it was a bit swollen and most definitely tender over the ulnar aspect, which meant that I had to fire up the old X-ray machine and play paparazzi. This was the easy part. Next I had to spend in the order of 15 minutes with both Tyrell and Roger in a dungeon-like darkroom developing X-rays. At times like these, I find that there is always a concern in the back of my mind about hands starting to wander... Thankfully, we all emerged into the light with no awkward silences and two sets of acceptable X-rays.

The adjacent oblique wrist X-ray shows that Tyrell had sustained a fracture to the styloid process of his right ulna. Fortunately this is a fracture which is amenable to conservative management, and much to Tyrell's relief, there was no need to bring out the drill, plates, wires and screws; immobilisation in a plaster cast should do the trick. By the

time of publication of this article, 6 weeks of immobilisation would have elapsed. At this juncture, repeat X-rays will be indicated in order to evaluate the extent of recovery, and thus the course which further management is to take.

The second casualty of the month was André. He slipped at the bottom of the BC link stairs whilst going for a casual Saturday stroll in a T-shirt, short pants and 'slip'-slops (as one does when one has been in Antarctica for nearly a year!). Unfortunately, the landing zone was littered with bits of genuine Vesles dolerite, which proved to be a tad harder (and sharper) than "The Beard's" upper arm. The result: one rather impressive C-shaped laceration approximately ten centimetres long.

I've read that a drop of blood can attract sharks from miles away, but trust me when I say that they do not have a patch on S49! Within minutes, the entire operating theatre was crammed to capacity with the whole team wanting to see the extent of the damage. This was fortunately not severe. The proximal five centimetres of the wound was deep enough to warrant sutures, much to the glee of the entertainment-starved bunch of savages who masquerade as my team mates. The whole scene was reminiscent of a Roman amphitheatre filled to capacity, with a crowd baying for blood! Only the addition of cameras and a vidcam laid testimony to the fact that this was indeed modern times.

Not at all fazed by the media attention, I, with the aid of my trusty aide, James, set to suturing the wound. Amidst various "oohs" and "aahs" from the gallery, I decided to embrace the moment and follow up on my teaching session on suturing technique given earlier in the year (see S49 May newsletter). After tying three sutures, I adopted a "see one, do one, teach one" approach and asked James if he would like to attempt the



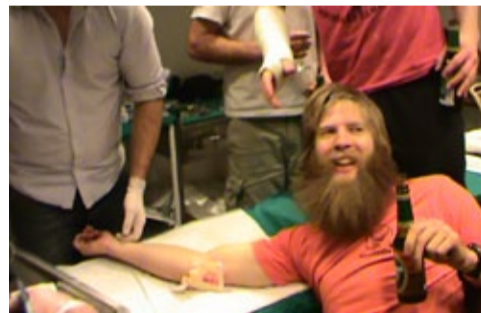
Clockwise, from top: Repairing Mr. Tea in three easy steps



rest of the wound closure. This of course was akin to throwing fresh meat to the SANAE hounds. A satisfied sigh swept through the spectators, and of course our 'guinea pig' (aka esteemed team leader) complied graciously. Needless to say, James, with his penchant for performing in the limelight, did not disappoint.

Currently, all sutures have been removed and André's wound is almost completely healed.

As a rather (thankfully) medically sedate year draws to a close, we accept that although some of us have had to endure difficult therapeutic circumstances, it will not have gone unrewarded, for as the saying goes: "bones heal and chicks dig scars". And we will most definitely have an interesting tale or two to tell in the future...●



The Beard, the Doc, the lovely assistant, and the peanut gallery.



Medical training level two: "But Doc, the oranges never pulled faces!"

## SANAE BRRRTHDAYS

André Harms

As the year draws to an end, we have worked our way into the tail-enders of the batting line-up for snow baths. With Roger's on the 1st of October, only two birthdays are left, and they incidentally fall on the same day – seriously, what are the odds of that? Anyhow, we'll get to the double-birthday-combo in our next issue.

As with Rob's birthday a month before, Mother Nature interfered by sending a rather nasty spell of weather; and the rest of us being gracious enough not to send Roger out at the risk of him losing his important bits (or anything really) to frostbite, the snowbath was responsibly postponed. Luckily conditions in the base were optimal for

the second birthday tradition: soon there was a storm raging not just outside, but also in the Sastrugi Inn, our local watering hole. Again it was an award-winning party and fun was had by all, but we'll leave the details up to your imaginations.

A couple of days later the wind abated to a pleasant 2,7 knots, which made the rather fresh dry-bulb temperature of -24,1°C more bearable. So Roger's hardcore-ness was put to the test with this year's all-time coldest snowbath...he made Bear Grills look like a member of the Backstreet Boys.

Congrats, Roger! ●



Meteorologist's report: -24.1°C; Doctor's report: "Everything is still intact...he'll live."

## « Wet-noses in Antarctica, continued

from p1...earlier expeditioners, there is an element of severity and a hint of the "Wild West" in their tales that I will never regale from personal experience. These stories might be difficult to stomach for 21st century animal lovers, but they reflect a part of history that exemplifies not only the persistence and character of the men that braved this continent, but also that of their dogs.

Consequently, I will play the role of SANAE storyteller-slash-bard as I attempt to string together facts from the past. I hope to amalgamate these snippets of first-hand memories to reflect the mind-blowing tales of man and beast set in an epic wrestle against Mother Nature. As much as these stories elucidate memorable times, they also indicate how far we've come and that some issues are best left in the past.

The two key sources I share from are the diary of Dr Peter Sutcliffe, who over-wintered as a SANAE 9 team member, and the 1961 Mawson Station Dog Report from the same era, as compiled by GDP Smith and archived in the National Archives of Australia. I believe these sources will suffice in bringing colour to the grey memories, that they will divulge details on a lifestyle that few of us could imagine being part of.

A lot has changed over the years. These days, we commit to half-hour skidoo (snowmobile) training sessions once we arrive at the base, and Bob's your uncle: you're good to go. There are no hassles with training your dogs, keeping them warm, breaking up fights, feeding them or remembering their names. When a snow-mobile breaks, no one sheds a tear (fair enough, it's not crystal clear what Marlon gets up to in his long hours of repairing and servicing vehicles in the hangar). In general, we haven't harboured any particular sentiments towards the vehicles, apart from general stewardship for governmental property and a partiality towards the fast ones. Teams of today have their inanimate metal steeds and mechanical crew, and travel across this inhospitable

country occurs with little afterthought for the means of transport.

Despite the relative comfort and ease of our modern vehicles, the memoirs of past expeditioners reveal that the presence of sled dogs had major ramifications on many aspects of their lifestyles. This is appropriately expressed in the concluding paragraph of the Mawson Dog Report of 1961, which was compiled as an information and training guide for future Australian over-winterers:

*"Remember, it is the hardest and most uncomfortable means of Antarctic travel. However, if you love dogs, if you want adventure and interesting work, if you are prepared to become a dog fanatic, in fact if you are prepared to look, think, and even smell like a dog, then you will find it the most rewarding and memorable year you have ever spent."*

As any dog-owner can imagine, sled dogs required special attention and care. They could not merely be treated as vehicles; it clearly wasn't as simple as parking a snow mobile, leaving it exposed to the fury of the elements, and starting it again once it was needed.

Without delving too much into the details of pedigree, it suffices to mention that sled dogs were generally Alaskan Malamutes, Siberian Huskies, or crosses between breeds with similar traits. They were hard-working creatures that were bred to endure the harshest of conditions. Because these dogs were highly intelligent, active and often rapacious canines, they had to be mastered through training, and put to work.

Like wolves, these canines are prone to establishing hierarchical pecking orders. They fight incessantly, and require constant stimulation to keep them pacified. As 'work dogs', their predilection to being active meant that they were easily agitated from boredom. As stated by Dr Sutcliffe regarding the temperament and character of these creatures:

*"The dogs were very friendly to humans and I don't know of anyone ever been bitten, except when I got my hand in the way trying to stop two dogs fighting. The dogs were mostly very ferocious towards each other*

*and had to be kept chained out of reach of each other to prevent fighting. No dogs ever 'escaped'. I remember one black husky, Kero, getting loose one day; he ran off for a while and then returned to his pole and lay down. One day, three dogs got loose when we were on a sled trip, but they also returned after a while.*

*The dogs loved going on sled trips and would all start jumping and barking as soon as one started setting up the traces on a sled - much the same as a domesticated dog performs when it sees you preparing to take it for a walk."*

His diary extracts constantly reflect similar memories – for example, Saturday 20 December:

*"... While Schalk and Barry tied up the dogs, I put up the tent. In the field, in order to tie up the dogs, a long chain is anchored at its two ends and centre, and then the dogs are chained at intervals along this chain on shorter chains, so that they are just out of reach of each other."*

Having a dozen or more dogs at the SANAE base meant that there had to be provisions made for dog-food. Consider this, as an indicator on how times have changed: Dogs were fed 3kg of whale or seal meat every second day. During the winter, they would receive helpings of whale blubber on alternate days. Seals were shot mostly during the summer, and buried at the base (for later 'processing'). Whale meat and blubber were shipped from South Africa, compliments of the then-booming whaling station in Durban.

The '61 Mawson report provides further (and quite amusing) insights on the ins and outs of feeding the dogs – nowadays, any person with an appreciation for the phrase "environmental conservation" would be left gawking at such a blasé recital of these charming stories:

*"All pups were weaned at about four weeks. They were fed powdered milk and warm water at first, twice a day. Gradually, as they grew, other ingredients were added: Egg-powder, vitamin capsules, and Bonox. Chopped seal meat was given soon after weaning and whole pieces as soon as they could handle it. At this stage they were only given milk mash once every two days. Pups were usually allowed to run loose until the age of five months. On no account should they be tethered before four months. During this time, plenty of freedom and exercise is necessary to promote growth and strength, so they should be left free until public opinion becomes overwhelmingly opposed to the idea (caused by chewing of gloves, socks, etc., fouling of camp area and eating of snow petrels)."*

Later in Mawson report, on feeding the dogs:

*"... This was only given when seals were unavailable. In these circumstances Emperor Penguins were also used for dog food, possessing as they do a large quantity of good red meat (also excellent for human consumption). However, for biological reasons, penguins should only be used as a last resort."*

The Mawson report provided a comprehensive guide to sealing, for new

expeditioners. The facts followed the trend of activities at most bases during this era:

*"At the beginning of our year we had a good stock-pile of seals both from the party's efforts and through the good offices of the DUKW crews who provided transport for an intensive seal hunt..."*

*"... All meat carried was boneless and as far as possible cut into cubes to facilitate packing. A chain saw was provided this year for cutting up seal meat, but it could not cope with the frozen carcasses in winter. It was much slower than the axe."*

As the year of 1969 wore on, the chronology of Dr Sutcliffe's diary entries provide a myriad keen insights on the lives of both the expeditioners and the dogs at SANAE:

Monday 12 May:

*"Today the wind dropped a bit to 30knots and the visibility improved slightly. This afternoon we also received some sad news when Piet King and Dries came in and told us that five of the dogs were dead. Three others were very weak and were brought into the base to recover. The only conclusion that we could come to was that they died of exposure."*

Saturday, 21 June:

*"While outside, I went to see the dogs and noticed that Elsa did not jump up to meet me as usual. On going to her to see what the trouble was, I discovered that she had given birth to two pups. It was really amazing to see the way in which she looked after them, keeping them covered and yet not allowing them to lie directly on the snow surface. I called Alph and we took her into the passage where she later gave birth to two more pups."*

Thursday 14 August:

*"Early this morning ... I went to talk to the dogs. I really felt sorry for them lying outside in the extremely cold conditions (-48 degrees Celcius and 15knots wind). A huskie's life is not an easy one!"*

*This afternoon, while Clive was away, I fed all the dogs that slept inside the base. This entails feeding the six so-called Hyenas (the dogs that were young pups when we arrived at the beginning of the year), Bamsy, who is still inside recovering from the time 5 of the dogs died in a storm, and also Dino and Elsa with their four pups each."*

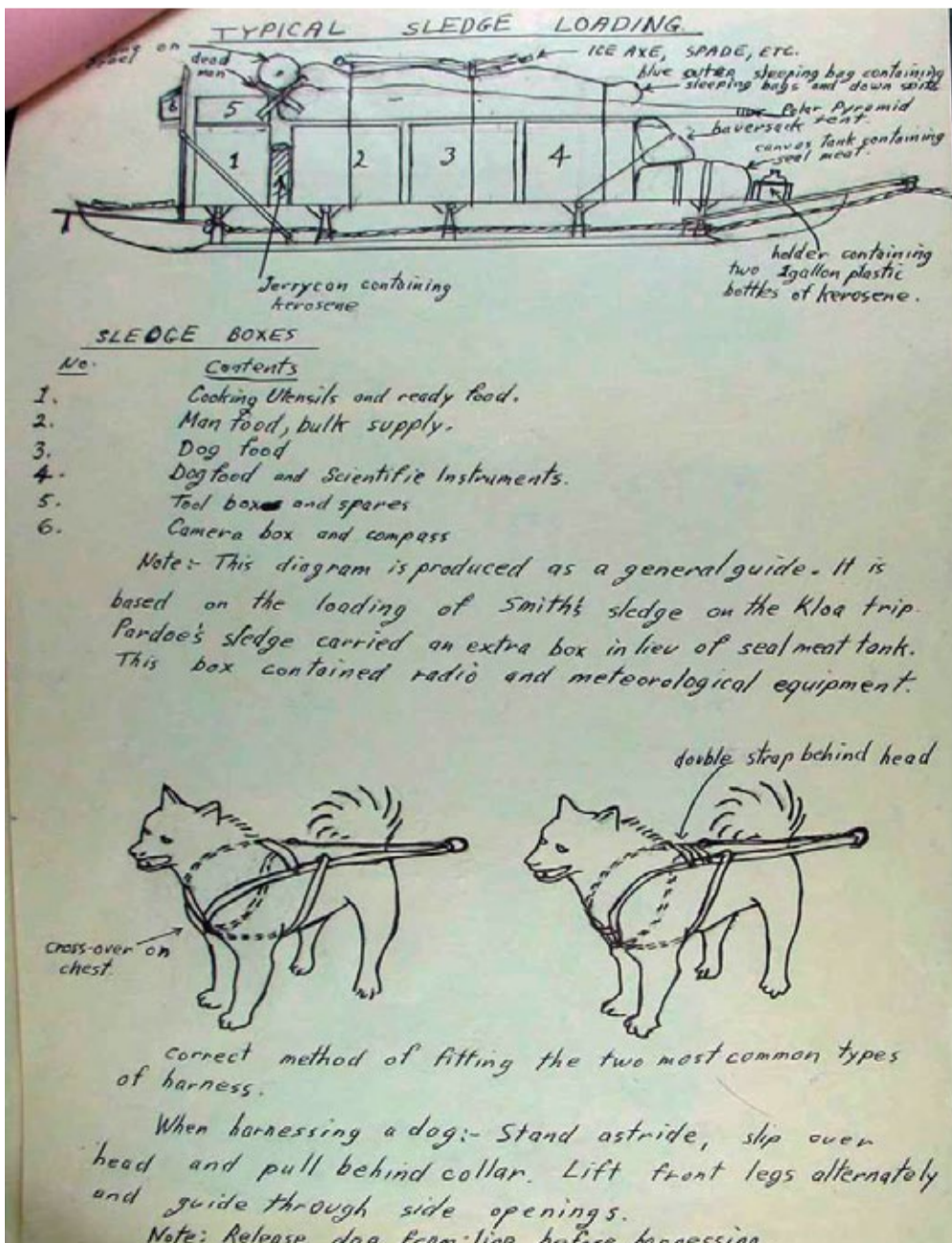
Monday 18 August:

*"This evening Clive took Elsa and her four pups from the passage outside the dry lab, where they have been since they were born, and put them with Dino and her four pups in the South garage. It was like a mad house for about half an hour. The pups ran around smelling, pawing, biting pulling and barking at their new lodgers. Clive, Gordon, Alph & myself sat watching them and had a really good laugh."*

Monday 27 October:

*"This afternoon Clive, King and myself fetched the whale meat and blubber off the meat stallation and pushed it near the dogs. We decided that it is now warm enough not to have to put the whale meat in the diesel shack to defrost. It will make it much easier to feed the dogs. We also shifted all the dogs over to the new poles. While moving the dogs, we discovered that the hyenas no longer seem to be so scared of the older dogs. In fact, Chuck started a fight with \*Losserson\* and also*

» continued, p. 4



An instruction on loading sleds and harnessing dogs, from the '61 Mawson Dog Report (courtesy National Archives of Australia)



Whale-meat for the dogs was packed into blocks and shipped to SANAE from the Durban whaling station.

## « Wet-noses in Antarctica, continued

from p3... growled and showed his fangs to Jonno." Wednesday 29 October:

"This afternoon we \*impounded\* the dogs and went out on the dogsled for a short trip. There were lots of fights again - \*Losserson\* really got himself badly chewed up. The Hyenas are not frightened of the older dogs any more either. When two huskies have each other in their jaws, the hardest hits with one's fist will not make them separate - the only answer is a short, heavy leather whip like the one Clive has made for himself."

Having appreciably strong wills of their own, sled dogs had to be directed and corrected constantly, in order to perform their function. The following insight from the Mawson report is a classic example in this regard:

"In Antarctica, where trees and lamp-posts don't exist, anything which projects even slightly above the surface has an irresistible fascination for the dogs. The driver should be prepared to whip the team away from such distractions."

Words weren't minced by the author of the 1961 manual. His commentary on commands and instructions reveals how intel-

ligent these dogs are, and how intuitive the interaction between the trainer and the dogs was: "The usual commands were carried on from last year, namely:

- Sit
- Mush (Start or run faster).
- Illi, illi, illi (Right turn).
- Eeeeyuk (Left turn).
- Whoa (Halt)

I found, that by giving them 'Mush' from a sitting position, the dogs didn't start off together and, with heavy loads it was hard to start the sledge moving. I introduced the order 'Right-ho boys' upon which, all dogs stood up ready to pull. This was followed by 'Mush'. All dogs pulled off together. Another command was given to dogs who crossed to the wrong side of the centre trace. This was 'Over' and was taught by flicking the whip and saying 'Over'. Soon it was only necessary to call to the offender, e.g. 'Over, Flash' and he would jump back. Apart from profanity, the only other command was 'Hi yi yi' to encourage them to greater efforts."

As flagrantly gruesome as the following story might sound, it reflects a fair deal not only on the resilience of these crea-



Ready to go (Image courtesy of Dr. Peter Sutcliffe).

## SANAE WORKHORSES

Marlon Manko

For travelling short distances around the base we tend to use our trusty snowmobiles, or as I came to know them, "Ski-doo's". At first sight most people will think that these are motorcycles which have been adapted for snow use; there are definitely a few similarities. For example they do not have roofs, they have two handlebars and can accommodate one or two people, but that's about as far it goes.

I am not going to bore you with technical detail, but there are two rather unique aspects to their power transfer. The first is their clutch system, which differs from a normal motorcycle or car. Perhaps you are thinking that this is most likely in the form of an automatic clutch, but this is incorrect. It is in fact a centrifugal clutch system. The other major difference is that there is not a direct power transfer from the engine to the transmission by means of a shaft. Rather, in a snowmobile, power transfer is made possible through a belt system.

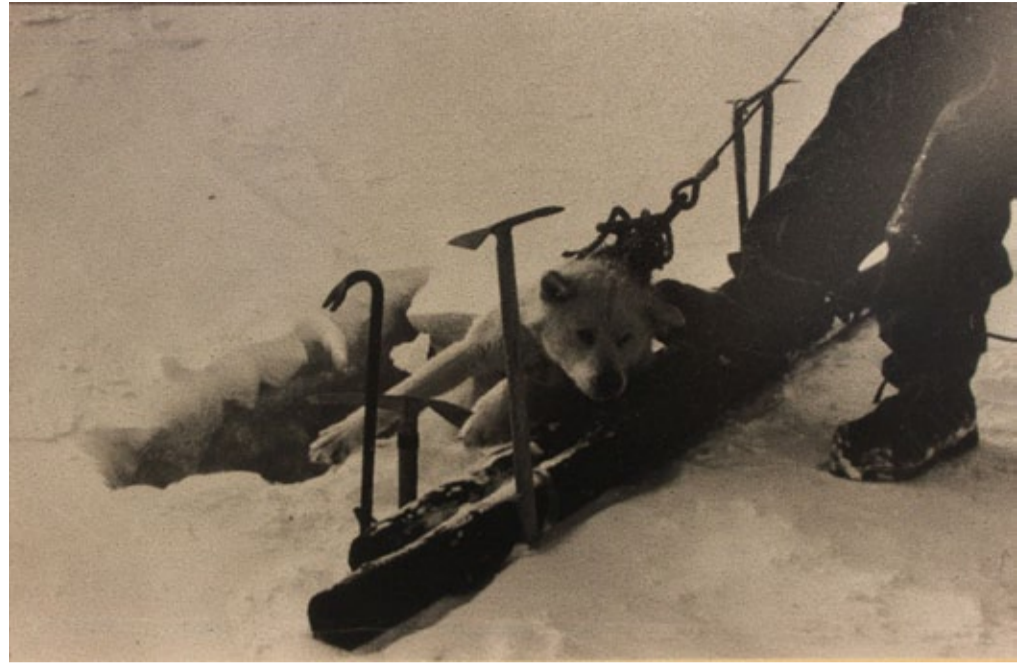
Here at SANAE our cavalry is made up of four different types of snowmobiles. They include the BRP Alpine 2, Yamaha VK 540 (2), Polaris LX indy and BRP Skandic 550 wide track. They range in age from in excess of 14 years to only 5 years old. Believe it or not, when there is work to be done, the old workhorses don't stand back for one moment. There is many a time when the more senior machine outdoes his peers in the working environment. Although the newer generations of snowmobile tend to be faster than the older ones, this does not necessarily hold true in the power department, where the

"oldies" often outperform the newer kids on the block. If only this were the same for aging humans!

When I was busy preparing them for the summer season, I do admit that I was fairly impressed with the condition of (especially) the older machines, given their age. I was anticipating severe abnormalities, but they appeared to have the expected normal wear and tear for their age. However, in more than one case I felt sorry for some of the machines. This is because of the abuse that they had suffered at the hands of their operators. Unfortunately some people happen to have a destructive and disrespectful nature, and this was clearly seen just by looking at some of the machines. These same people also don't always realise the danger of a machine of this kind - they just see it as a toy to be used for fun and games.

To have the opportunity to be able to fix this type of machinery is really a great learning experience. It was not always just a simple case of removing a part and replacing it with a new one. There was many a time that I had to look for a problem that was not as apparent as it seemed. The highlight came when I resurrected the two Polaris. When I started with them they were not operational, and when I finally got them up and running it was a really good feeling. Between them there were a number of problems like: non-starting - in part due to charging problems and burnt out starters, but also carburettor flooding, broken rear suspension springs, missing wheels on the undercarriage, burnt wires, brake problems,

» continued, p. 5



After falling 45metres down a crevasse, Viking was rescued by Andy Paterson.

tures, but also on the interaction between the over-wintering crew and their dogs.

Friday 10 October:

"This evening, we found out just how tough a husky is. When still small, Viking's front left leg was broken and mended again, but skew. Alph decided that he would now break it again and set it straight in plaster of Paris. But with Alph's medical knowledge, Clive's advise, Phil's strength and Barry's weight, it was not possible to break the dog's leg. Also, the amount of ether used to keep the dog out for an hour would probably be enough to keep two people out for 4 hours."

SANAE records indicate that young dogs were teamed up with older dogs to be trained. Although details are vague, it is known that Viking got a trace wrapped around his front leg during his first time on a sled team, and it was in this episode that the leg was broken. Records also indicate that at some stage, Viking's leg was mended with metal plates. However, due to this 'lucky leg' he became a pet dog and was never used for sledding. In 1971, Viking fell in a crevasse, and was rescued by Andy Paterson who found him 45metres down where he had landed on an ice bridge. In the summer

of 1972, Viking returned to South Africa with Mr Paterson. The SPCA later awarded Andy Paterson with the Silver Federation Medal for his bravery in saving Viking from the crevasse.

At the end of the day, the joys, pains and complexities of having wet-nose companions in Antarctica brought with it a flavour of life that us envious contemporaries will never know. Admittedly, some of the quips and quotes throughout this article can be interpreted from a 'modern' standpoint as brutal pragmatism that is tantamount to Machiavellian exploitation of Antarctic fauna; the abolishment of the presence of sled-dogs in Antarctica has certainly led to improved conservational practices, but laid to rest aspects of a phenomenal lifestyle that characterized Antarctic exploration and occupation for several decades. Our respect and thanks to the men, women and canines who endured those times and paved the way to what SANAE is today. Special thanks to Dr Sutcliffe for his personal input and his generosity and effort in sharing his memories with us. ●



Biker Boys: *NOBODY* will ever be as cool as these guys.



Antarctic Racers: If I were a betting man, my money would be on Etienne & Ryno on the skidoo (more of this in next month's edition)

# « SANAE Workhorses, continued

from p4...a worn power belt and a broken pull start cord. Hence my jubilation and sense of triumph when I took them for their first test drives!

The Yamahas were a breeze to work on. Between the two I just had some ignition problems and one carburettor needed some attention. The rest of the time that I spent on the Yamahas was on small cosmetic treatments.

The newest members of our cavalry, the Skandic 550 WT's, didn't need a lot of work. The problems I encountered were as follows: flat batteries, spark plug changes, a power belt change and one clutch problem.

The Alpine 2's were not in a bad shape considering their age. I had some charging problems to deal with, spark plug changes, top up of gear oil, a front shock change, gearbox seal changes and the repair of normal wear and tear.

All of the machines spent the winter inside the hangar. This was not only to protect them from the elements, but also to have a warm and comfortable environment in which to affect repairs. Since we have reintroduced them to the outdoors, they have not given us any real trouble as yet. In fact, the only problems we have encountered have mostly been fuel related. For example, a fuel priming pump misbehaving for a moment on the Alpine 2, or running out of fuel with the refuelling point in sight! That all said, I hope for a brilliant summer season. ●

| Model             | Engine make | Engine type           | Type of track     | Ski type   | Transmission |
|-------------------|-------------|-----------------------|-------------------|------------|--------------|
| Scandic 550       | Rotax       | 2-stroke air cooled   | Wide single track | Twin ski   | 2 speed      |
| Polaris LX Indy   | Rotax       | 2-stroke water cooled | Single track      | Twin ski   | 2 speed      |
| Yamaha VK 540 (2) | Yamaha      | 2-stroke air cooled   | Single track      | Twin ski   | 2 speed      |
| Alpine 2          | Rotax       | 2-stroke air cooled   | Double track      | Single ski | 2 speed      |



Scandic 550: The Luxury Sedan.



Yamaha VK 540 (2): The cross-country champ.



Polaris LX Indy: The Speedster.



Alpine 2: Ugly as hell, but never fails you.

# SANAE SCIENCE

Etienne Kruger

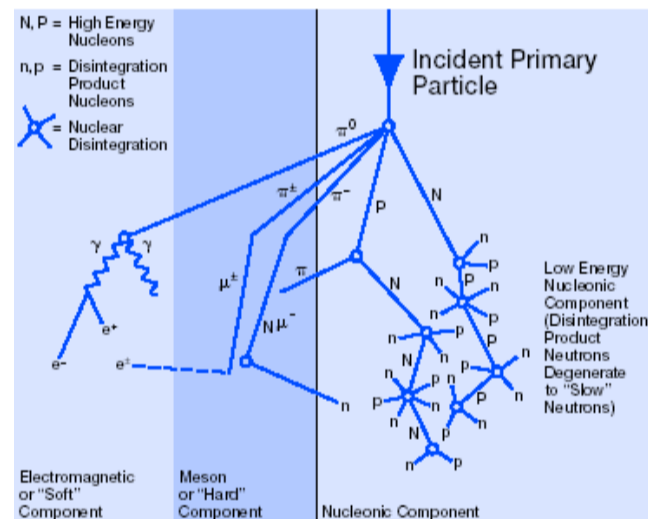
**This month**, we will be focusing on the neutron monitors installed at SANAE-IV and administrated under the Cosmic Ray programme of the North-West University. Cosmic rays are high energy particles that originate from many sources in the universe. Because of the high energies associated with these particles they are affected by the magnetic fields that stretch throughout our solar system and the rest of the universe. Our main area of focus is our own heliosphere, which consists of the bubble "blown" into space by the solar wind originating from our own life-giving star, the sun.

Cosmic rays have energies orders of magnitude higher than particles from even the most powerful man-made particle accelerators. Even though they don't generally reach the surface of the Earth due to collisions with atoms in our atmosphere, we can still quantify the levels of cosmic ray particles reaching our planet by measuring the secondary emissions of these collisions. At SANAE IV we specifically measure the resulting high-energy neutrons using two neutron monitors. The first is located in the hangar, and is elevated high above the floor so it is not in the way. The second is actually a scaled down design called a neutron moderated detector and is located in its own dedicated room because it is very sensitive to changes in metal objects in close proximity to it. These monitors consist of tubes filled with a specific gas (boron-tri-

fluoride) at a very low pressure. High voltage electronic equipment interface to these tubes, and measure a small electric pulse for every incident high energy particle. The recording systems can then give us a count representing the relative number of particles that strike the tube during any given time period.

Cosmic rays are affected by magnetic fields, and therefore cannot easily penetrate the magnetic field that surrounds Earth. Because the magnetic field is directed into the crust of the earth close to the poles, particles require less energy to penetrate the magnetic field at the poles than closer to the equator. We call this minimum energy the cutoff rigidity of a specific location on the surface of Earth. Neutron monitors in Antarctica are very important to scientists because of their low cutoff rigidity compared to the monitors located closer to the equator. The North-West University has neutron monitors at SANAE-IV in Antarctica, Hermanus and Potchefstroom in South Africa, and Tsumeb in Namibia.

The data gathered by the North-West University is intensively used by scientists all around the world to do research on the magnetic fields present in the heliosphere, the solar cycle and other events related to the Sun. In the long run, cosmic rays can help us better understand the complex relationship between Earth and the rest of the universe. ●



Cosmic rays entering the earth's atmosphere cause a reaction resulting in high energy neutrons that can be measured on the surface.

For more information visit:

[http://www.puk.ac.za/fakulteite/natuur/nm\\_data/index.html](http://www.puk.ac.za/fakulteite/natuur/nm_data/index.html)

<http://en.wikipedia.org/wiki/Heliosphere>

[http://en.wikipedia.org/wiki/Neutron\\_monitor](http://en.wikipedia.org/wiki/Neutron_monitor)

[http://en.wikipedia.org/wiki/Cosmic\\_ray](http://en.wikipedia.org/wiki/Cosmic_ray)



Tubes of the neutron monitor located in the hangar at SANAE-IV.

# SANAE TRENDS

## Current affairs, statistics, conditions and fads

### Temperature Trends

Minimum: -31,3 °C (7 October 2010)  
 Maximum: -10,5 °C (18 October 2010)  
 Average: -19,8 °C

### Wind-speed Trends

Maximum: 106.2 km/h (20 October 2010)

### Day Lengths

1 October 2010: 13 hours 30 minutes  
 30 October 2010: 18 hours 55 minutes

### Quotes of the Month

Rob referring to the massive tear in Etienne's jeans while standing outside having a Windhoek Lager:  
 "Hey, now Etienne has a lager and a draft"

Johan, in the morning after Doc woke up:  
 "Doc, you look like ... what's that chick from the Bible again? ... Medusa."

### Song of the Month

Soko - I'll kill her

### Movie of the Month

Inception

### Birthday of the Month

Roger van Schie - 1 October 1982

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