

WHAT HAS SPACE GOT TO DO WITH CHEMISTRY ?

THIS ARTICLE WAS WRITTEN BY IAN THOMAS FOLLOWING ATTENDANCE BY FOUR MEMBERS OF THE HEALTH, SAFETY & ENVIRONMENT GROUP OF RACI, AT A PRESENTATION BY COLONEL PAMELA S MELROY OF USAF AND NASA, TWICE DEPUTY SPACE SHUTTLE COMMANDER

Once again, we Chemists prove to be a versatile bunch. On 7th July 2005, the fateful day of the first London bombings when we were all again, reminded of how vulnerable we are and how 'sinful' some believe western society is, a fortunate four of us went to MacRobertson's Girls High School in Melbourne.

There, we were the esteemed guests of the Systems Engineering Society (courtesy of Barry Drew and Neil Pringle) to witness one of the best talks we have ever had the pleasure to be at. Perry Vlahos of ABC Radio had put in a word for the meeting over the radio a few evenings prior and sent the attendance nearly up to the heavens.

We must have looked like Chemists as we arrived because Neil immediately said "*we would like to help him on the door wouldn't we*" ... making sure that every attendee had a name tag and that no others would be admitted unless they could show that they had pre-booked.

So Joe Allan (formerly of Dow Chemical), my wife Joan and I pretended to be tame systems engineers and acted as if we knew it all. This got hard as naturally, everyone tried to rush the lecture theatre doors and had to be politely asked to adjourn for tea and coffee upstairs while the auditorium was being prepared. What for ... we wondered but we complied and even moved our tables so that you just about had to climb over us to get in.

All this and very few cups of tea or coffee later ... we were in. There were many already in despite our best intentions and in moments, almost no seats left. But at least by having helped, we were given seats right at the front ... but for what

Colonel Pamela Melroy, USAF and NASA twice deputy commander of space shuttle missions to the International Space Station. Yes ... she not he ... and what a brilliant evening was in store for us. Anna Scotnicki (now the late Anna who was formerly with Swinburne University and Chisholm TAFE) arrived shortly after the start and squeezed in among the 150 others and we were all spellbound.

Explanations of how astronauts were selected, how they trained and what it was like to go 'up' there culminating in an excellent set of still and movie shots of life on the way up, up there, in the shuttle, in the Space Station and even space walking.

As if this was not all too much for us to take in at once ... then it was question time and yours truly remained completely silent ... to allow all those other much better questions which flowed so freely from all quarters, from Mums, Dads, School Teachers and even most importantly, from Students and Children.

The punch-line came when Pamela said

"Now guess all of you, why I am here talking to you like this .. what is my real purpose ?"

"It is because of those of you here who are aged between 5 and 25, or have children or grandchildren who are in that age range, we need you ... in 20 years time we will be going to

Mars and we need many new astronauts ... Sorry about you older folks but that too, includes me - I will be going on the next shuttle mission after the impending one (which is currently up there under Commander Eileen Collins) as its commander and as well, I hope to be able to participate in a number of the lunar missions which will be conducted over about the next ten years - then I too will be too old !"

Pamela, you are never too old ... you are a credit to us all and your talking was as inspiring to us seniors as it would have been to anyone. The Mars mission is planned as a two-year trip ... six month journey, 12 months there and six months back.

During question time, right near the end when I still resisted the temptation to ask -

"Some earlier astronauts reported seeing alien things out there ... if you did, would you be sworn to secrecy ... and by the way, did you see any ?"

Instead, we had a much better question - a school teacher bursting to tell of her frustration when faced with a myriad of questions from her students asked

"What exactly do you do on a day-to-day basis ... how do you actually do all those more mundane things in space ?"

Pamela replied that when she is with audiences of children, that is always the first question. With audiences of grown-ups like you she said, it is nearly always the last but it still has to come out - so I'm all ready for you.

Pamela then tastefully but factually, explained how most of our daily functions happen 'up there' and how important it is to get past things like the difficulty in sleeping at all, and of course the inevitable starting-off bout of constipation. Reporting to the Commander with

"Yes sir or Yes Ma'am, all systems are indeed go"

has a very different meaning in these early stages of a mission and is absolutely as important as anything else.

It seems that 'pooopies' are all placed into a compartment under slight suction via a flexible pipe for which each individual has a personalised and colour-coded end-attachment ... no, not one size fits all but one type for boys and another for girls. The whole is then wrapped in zip bag after zip bag and then deep frozen ... so there are never any odours or any contamination.

There must of course, be curtains across the toilet bit of the cabin which is only the size of a mini-van in total. Showering must be by vacuum sponge or something like it ... no free roaming particles or droplets are permitted and anyone playing with them, must clean-up completely ... think about it.

Food and drink is all taken by squeezing into the mouth out of tubes. Sleeping is by hanging around in a zipped-up sleeping bag.

But better still was the very last question. *"You described the very complex and tortuous training you go through to prepare you for things going wrong ... did anything like this happen to you"*

"Oh yes, we had a real doozy. During a space walk, the equipment handling arm broke and for an intense period of about an hour longer than scheduled, the two walkers had to work much harder to get everything to where it should go and to anchor everything so that it

wouldn't be lost. Pulse rates soared and the suits when they were taken off afterwards were upended and liquid perspiration poured out"

So for me and I am sure for all of us, this whole evening was a real "doozy"

But there was more for a select few of this 150 strong throng, continuing on at a trendy Beacon Cove restaurant (Campari Bistro) was on. So we four from RACI having helped out at the beginning politely didn't ask if we could continue on too. The evening was organised as mentioned, by the Systems Engineering Society ... but the Space Association of Australia and the Royal Aeronautical Society were also involved - gave votes of thanks and were to attend at the restaurant ... sorry no, but there are simply too many going on already - definitely no room for gatecrashers !

Ah well, never mind, and the queue to talk to Pamela at the front by now was so long that there was little chance of meeting her. So what ... a second request and a reminder of the help we had been ... ah well, go and talk to him over there. We went and stood close to 'him' and waited not to intrude and 'he' turned out to be Systems chairperson, Barry Drew whom I knew well and hadn't seen for ages. After much catching up, we pointed out that there was a reason for our presence and we had a question for you Barry No you don't said Barry, you are all very welcome !

So those of us whose minds were already blown, joined in - with Pamela being ushered to sit at different places around the big table out in the open air near the wharf so as to meet us all .. but with young Joe following at every move and being guess where, when the group photos with our guest were taken.

Some of us never did put our saved-up questions, some took Pamela's autograph others exchanged business cards. Some with their wives between two gentlemen (Joe Allen and the President of the Space Association) at the other end of the table watched while being themselves between two ladies at this end of the table one of whom was our Anna (Scotnicki) and the other, Mika Schroeder who had a German accent a deep voice and sung 'Falling in love again' & 'Lili Marlene' for us, in German.

Now to the pre-eminent question ... Space is now moving into the realm of engineering as well as continuing to be very much in the realm of science. Those of us who have had the pleasure of attending at one of Dr Christopher Fluke's super-computer AstroTour nights at Swinburne University (courtesy of past Victorian RACI president Ian Jones), know this.

Space is chemistry ... we are chemistry ... we are all star dust

And by the way, Dr Duncan Steel of Ball Solutions Group, Canberra and Vice Chair of the International Spaceguard Foundation whom some of you will know from the conference Risk 2004 (after dinner speaker on the Near-Earth collision-course Asteroid Monitoring Program), also sends his regards. This great man when recently asked to assist me in working out the upward acceleration and terminal velocity of hydrogen in the atmosphere, replied "*But I am a mere physicist*". The answers when finally calculated using bouyancy theory, are 131 m/s/s and 17m/s.