

Jeremy



Editorial

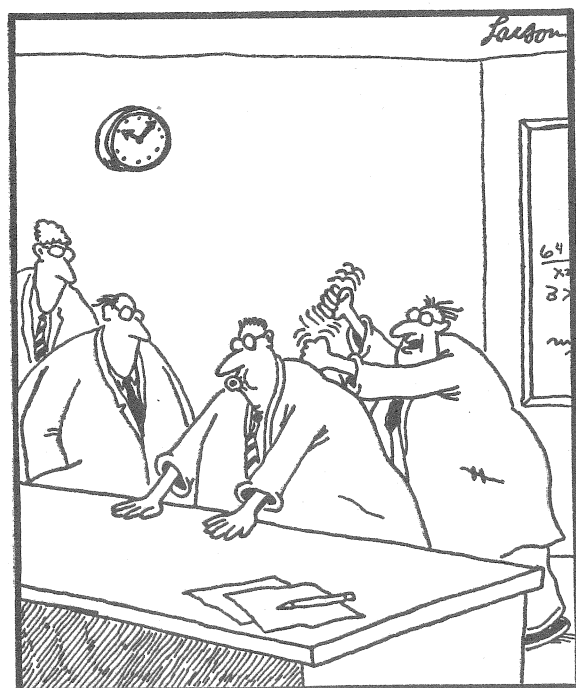
Welcome to the last issue of *Jeremy* for the year. For many, the anticipation must be overwhelming. That momentous (and joyous) occasion, that is, the final physics lecture of your life, will soon arrive. To those lucky students, the editors wish a fond farewell, and good luck. Some students, of course, will be thinking of continuing in Physics. Within these pages are a number of ways that you could spend part of your christmas vacation in preparation for next year; try out a little amateur astronomy, or go on a science camp. Hopefully these articles will make your decisions at the beginning of next year easier.

Happily, contributions to the Kit Kat Quotes Competition have increased enormously. I suspect that Prof. Cram has been paying students to quote him, as I have never seen so many quotes from just one course. The winner of this years competition will receive an entire boxful of Kit Kats. Lots of luck with all your exams. See you next year.

Damien Hogan.

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"And notice, gentlemen, the faster I go, the more Simmons sounds like a motorboat."

Disclaimer

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Furthermore, all expression of opinion are published on the basis that they are not necessarily to be regarded as expressions of the editors unless expressly stated.

The Editors.

W A I L S U N

Into the Afterlife

Sir:

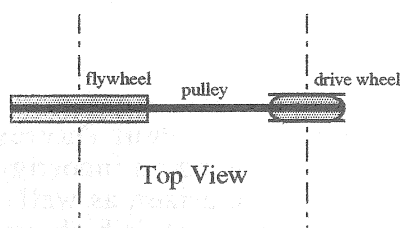
Yes, there is life after thesis submission. You'd be suprised how many of us physicists in the afterlife read *Jeremy*!

I'm writing because there's an minor error in my "last problem" in Physics Forum. I can't see that it makes much difference to the problem, but I thought I should let you know, lest your lecturers spend hours trying to figure it out, instead of setting assignments for you.

The tape deck I experimented with was actually a shelf unit. The smaller wheel is connected to the shaft of the drive motor, while the larger one drives the remaining mechanical tape stuff. I expect the arrangement is supposed to use the large wheel's moment of inertia to

smooth out irregularities in the motor's output, like the flywheel in a car or sewing machine.

The profile is not quite what appeared in *Jeremy*; it is the smaller wheel which bulges in the middle. The flywheel rim is actually flat. I have sketched it below:



The drive wheel has protection against severe slippage but doesn't need it. Somehow the pulley always climbs back to the centre

of the drive wheel's rim, no matter where on the entire arrangement you try and nudge it off; and I still don't know why.

Bodie Senata
Union Street
Meadowbank

Mr. Mega-Bucks

Sir:

Note that Paul Walker said "Lecturers like me... make mega-bucks, wear designer clothes and drive volvos."

Peter Fletcher
Physics III.

(see quotes competition, under student quotes section - ed.)



Figure - Figure

News

▪ Another great party was held recently on the physics roof top. This party (for all physics students) was funded by the first and second years, although almost none of them realize this. Despite the fact that this party was well advertised and provided food and drinks, for a \$3 entry fee, only third year students turned up. On behalf of the third year students who attended I would like to thank the first and second years for their generous funding of this enjoyable event.

▪ Having trouble with an assignment, or an exam question? Then make up an answer, no matter how wild.

As was revealed on last weeks Science Show, with Robyn Williams, at least one academic in the the Dept. of Physics believes that he can levitate by the power of his mind alone. Who is it? (those of you who suspect Dr. Johnston will please impale yourselves on the nearest tripod).

Further investigations by Jeremy have shown that this academic was both a professor, and the head of a Dept.

This unfortunately disposes of my favourite candidate, namely Dr. Paul Walker, but leaves many worthy successors. I suspect that entire Dept. is in fact a front for a witches coven, and that using the power of morphic fields, they intend to spirit away the whole university to Atlantis.

▪ This item has absolutely nothing to do with physics or science in any way whatsoever. No attempt to justify it's inclusion will be made. The item appeared in the Stay in Touch Column on the 17th of October.

"This column has come into possession of the instruction manual which accompanies a new internal phone system being installed at the Park Street headquarters of Australian Consolidated Press. In a section which applies to the

phones of editors and senior executives, we were interested to read the following instruction:

INTERUPTION BY MR PACKER. When Mr Packer calls a busy extension, that extension will hear one beep of warning tone then will automatically be connected to Mr Packer's extension. The other party involved in the original call will receive a busy tone."

▪ Hopefully you are reading this on Thursday, and not Friday afternoon (but I doubt it). Professor Paul Davies of the Dept. of Mathematics and Physics, University of Adeliade, will be giving two seminars on Astrophysics. Paul Davies is known for being an incorrigible science popularizer, as well as a brilliant physicist. Which means that not only has he got something interesting to say, but you will be able to understand what he said. You may even have read some of his books; *God and the New*

Physics or The Cosmic Blueprint.

The first talk takes place at the Stephen Roberts lecture theatre on Thursday, 24th Oct. 8pm, and will discuss how the universe began. This lecture will almost certainly be non-technical.

Then on Friday (LT8 at 2pm) Prof. Davies will give a seminar on gravitational entropy. This talk will cover some of the implications of Stephen Hawkings work on "dissolving" black holes.

▪ This may very well be my last issue of Jeremy. Each year new editors are chosen by the Physoc membership. All positions on the Physics Society are open to election. If you would like to edit this Journal then come along to the Annual General Meeting at the beginning of next year. But be well prepared for student apathy!

I would suggest getting a few of your friends together so that you can share the work load.

Take a journey into the centre of the Earth.

Do you know what it is like at the centre of the earth, or how to move whole continents? You can find out by spending a week at the Physics of the Earth Summer School. The school is run every year by the Australian National University to introduce Physics and Maths students to the science of geophysics. Time is spent in informal lectures, discussion groups and in carrying out field work, all of which you will find very rewarding. Knowledge of earth sciences is *not* expected. The school is open to those students who have

finished at least two years of physics or engineering. For more information see the notices placed in the library or call (06) 249 4620.



Physics Forum

by John Gaunt

Welcome back to physics forum. First we will go to the problem that Bodie posed.

To date we have had two replies, one from Bodie saying that my diagram was wrong and then going on to draw a picture equivalent to my own. The other reply was from Tim Anderson who in the splendid fashion of a computer scientist; drew himself a picture that, whilst changing the problem, made it much easier to solve. However he does offer some useful comments about the problem of the girl with the car problem.

Here is his letter:

To: John Gaunt, Jeremy.

Hi, I have a couple of comments about the problems in your last column. Since I am not a physicist (I quit after first year) - and what is worse, I am a computer scientist - these answers may be considered to be dodgy.

First, about the walk man. I've

noticed that some wheels of this type when viewed side on, look something like the picture below:

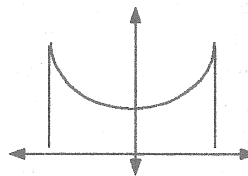


- which due to tension, should pull the band towards the centre as that represents a continuous decrease in tension (and hence potential energy?). But even if it is not designed like that, the centre is still a position of less tension, which the system will try to head to (as in the picture below).



For instance, if we plot tension (or potential energy?) against position, then I think we would get something like this:

When the band is somewhere on the roller (unless it is a l m o s t completely falling off the roller), it will head towards the local minimum, in the middle. Outside this region it would head to the local minimum which is falling off into the most relaxed state.



Now, about your girlfriends shoking problem (sorry, I couldn't resist). I too have this problem, but not as badly, it seems, as your girlfriend. Could

it be that the interior of the car is insulated (electrically speaking) from the exterior, and that your girlfriend manages to build up a static charge (by rubbing her feet against the carpet, or whatever) different to that of the cars exterior, resulting in a shock? Is the car battery invloved? I don't know, and again, I am not a physicist.

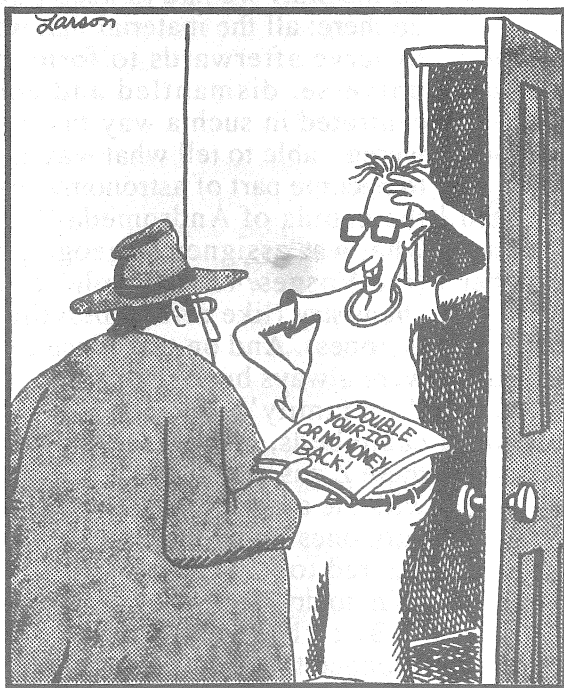
One thing I do know is that some people build up static charges more easily than others. One man I know builds up these charges (how, neither of us know) sufficiently so that can actually dowse for water - there is no mysticism invloved, only physics (he is quite adamant about that). He also has quite a problem trying to get transparencies to stay flat on an overhead projector. (*He sounds like the type of guy that would have a few other problems as well - ed.*)

I can, however offer you a possible way around the problem. I have found that I don't get a shock if I open the car door sufficiently widely that I can get

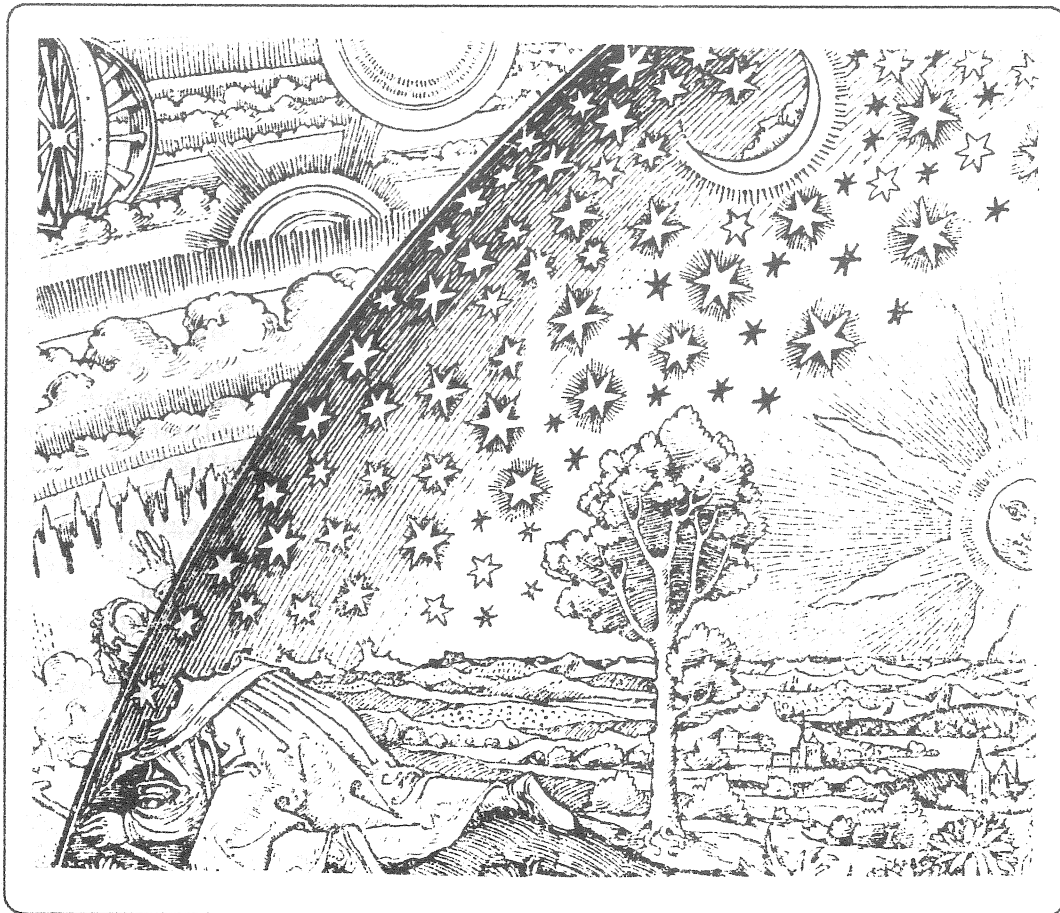
one of my feet to touch the ground whithout approaching either the car frame or the door to closely. Once one of my feet has hit the ground, I can usually

get out quite comfortably (but be careful not to let a hand near the car body before your foot has hit the ground). But even with this procaution I sometimes still get shocked (albeit not so often) - though I have noticed I am being shocked more frequently now (September) than I was a month or two ago.

regards,
Tim Anderson
(Comp.Sci.)



"Well, I dunno. . . . OK, sounds good to me."



At this point in time

by Italo Calvino

Naturally we were all there, old Qfwfq said, where else could we have been? Nobody knew then that there could be space. Or time either: what use did we have for time, packed in there like sardines?

I say "packed like sardines," using a literary image: in reality there wasn't even space to pack us into. Every point of each of us coincided with every point of each of the others in a single point, which is where we all were. In fact, we didn't even bother one another, except for personality differences, because when space doesn't exist, having somebody unpleasant like Mr. Pber^t Pber^d underfoot all the time is the most irritating thing.

How many of us were there? Oh, I was never able to figure that out, not even approximately. To make a count, we would have had to move apart, at least a little, and instead we all occupied the same

point. Contrary to what you might think, it wasn't the sort of situation that encourages sociability; I know for example that in other periods neighbours called on one another; but there, because of the fact that we were all neighbours, nobody even said good morning or good evening to anyone else.

In the end each of us associated only with a limited number of acquaintances. The ones I remember most are Mrs. Ph(i)Nk_o, her friend De XuaeauX, a family of immigrants by the name of Z'zu and Mr. Pber^t Pber^d, whom I just mentioned. There was also a cleaning woman—"maintenance staff" she was called only one for the whole universe, since there was so little room. To tell the truth, she had nothing to do all day long, not even dusting inside one point not even a grain of dust can enter -so she spent all her time gossiping and complaining.

Just with the people I've al-

ready named we would have been overcrowded; but you have to add all the stuff we had to keep piled up there: all the material that was to serve afterwards to form the universe, dismantled and concentrated in such a way that you weren't able to tell what was later to become part of astronomy (like the nebula of Andromeda) from what was assigned to geography (the Vosges, for example) or to chemistry (like certain beryllium isotopes). And on top of that, we were always bumping against the Z'zu family's household goods: camp beds, mattresses, baskets; these Z'zus, if you weren't careful, with the excuse that they were the only ones in the world: they even wanted to hang lines across our point to dry their washing.

But the others also had wronged the Z'zus, to begin with, by calling them "immigrants," on the pretext that, since the others had been *(continued on page 10)*

The Kit Kat Quotes Competition

Ross McPhedran:

"The traditional method used in solving tensor equations is to set them as assignment problems."
 "The mathematics becomes quite tedious, as you will realise when you do your next assignment."
 "You may admire these functions for their ugliness."
 "Thank you for your sufferance."

B. Pailthorpe:

"It's real bad... I'm falling asleep in my own lecture."
 "How can I justify this crap."

A/Prof Peak: "You must be old..."

Prof Davis: "Yeah, old & peculiar."

Bill Tango:

"If you alter the focus on the camera the lines go fuzzy."

Ian Falconer:

"It's Yttrium Aluminium Garnet - i.e Yttrium Aluminium and oxygen with funny numbers underneath."
 "The Biot Savart Law, such an elegant law, but practically... so damned useless."

Dick Hunstead:

"[on the Big Bang] Contrary to popular opinion, I wasn't around back then"

R. A. Milard:(Elec. Eng.)

"Temprature is linearly related to temprature."

Kier Vaughan-Taylor:(Computer Science)

"It's like a one-way piece of string."

John Mulquiney:(Maths tutor)

"...these are related by being seemingly unrelated."

Student Quote:

"Academics get paid megabucks and wear designer clothes." ,said by Micheal Costas 3rd Year Lab. Collected by Dr. Paul Walker.

Prof L.Cram:

"Some people deliberately say things that are stupid in order to win the quotes competition... yes, Dick Collins has been known to do that."

"Eventually the density gets so high that Laurie Peak has to come in and give the lectures."

"At 30 your brains turn into porridge. Of course you don't realise it until you turn 40. At 50..."

"The theory of degenerate gasses would require an entire lecture course. You could read one of Melrose's books... but that's an entire lifetime."

"[allegedly discussing his car] There is nothing inside these things that you can screw anymore."

"If you understand the derivations of all these points and have done well in all your assignments, you should have no worries about the exam being too easy."

Quote of the Year

"No, quantum mechanics is not as funny as solid state physics"
 (Paul Robinson)

A/Prof Peak:

"Let's start at the very beginning...hmmm... that sounds like the 'Sound Of Music'."

Dr. Bailes:

(Co-discoverer of the new planet; at a conference)

Member of audience: "Perhaps it is an artifact."

Dr. Bailes: "Yeah. It could be an alien powerstation."

M.O.A.: "How about a Vagon Constructor Fleet."

Dr. Bailes: "You should be a journalist."

Dr. Fraser:(Applied Maths)

"Look, you can't learn this stuff by eating the assignment sheets."

The winner/winners may collect their prize from room 569 in the new wing.

Cleaning up after the elephant

Christopher Bryant and Micheal Gore from the Australian National University discuss their new Graduate Diploma in Science Communication and the role of science and the scientist in Australian society.

During the last ten years a unique facility has been developed in Australia. In 1980, Australia's first interactive science centre, the Questacon, was established on an experimental basis in Canberra, under the auspices of the Australian National University. Its aim was to stimulate in its visitors a desire to explore natural phenomena, the very basis of scientific inquiry. Questacon attracted a great deal of attention in the early 1980s which eventually resulted in the establishment in 1988 of the National Science and Technology Centre. Coincident with this was the creation of a Graduate Certificate Course in Science Communication, upgraded to a Graduate Diploma in 1991.

Why bother to communicate science?

We live in a society which often ignores science, for people tend to ignore what they do not understand. The community is concerned about the Frankenstein quality of science, concerns that must be understood and addressed by scientists. How scientists work, and the processes of scientific discovery, are mysteries to most people, partly because science has developed into ultra-specialized areas controlled by ultra-specialists. If Australians believe that science is external to their lives, and if such view extends to politicians, to the judiciary, to business people and to industry, it is no wonder that it has taken so long for governments to develop a responsible attitude to science. Science policy should have its

origins in effective communication by scientists.

Science, then, is important to everyone, because of its cultural quality and its capacity to enrich lives, because of its practical applications and because it is used by interested parties as a political weapon. Science becomes even more relevant to the humanities as its techniques are adopted by fine arts, history and linguistics. There is a desperate need for industrialists to become familiar and comfortable with the applications of science in industry. There is the absolute imperative for understanding science in day to day living and for survival on a global scale.

The future of science and technology in Australia depends, of course, upon the value which society places upon them. The 'clever country' can only become a reality if individuals become as involved with science and technology as they are with sport, the arts or politics. For any scientific discovery there are always two options - to use or not to use; to choose between them requires a level of scientific sophistication.

We have always need accomplished science communicators. Today, we need them more than ever because we live in a highly technological society, where a knowledge of science is necessary for effective participation in the political process. We need them to increase the level of scientific literacy in a community which has, at best, a faulty grasp of elementary scientific principles.

Science communicators should be two-way conduits, transmitting

information between the community and the scientist. There is a need both for specialist communicators and for more scientists who are aware of their duty to inform and who are ready to respond to public reaction. Programs such as the new Graduate Diploma in Science Communication mounted, jointly, by the Australian National University and Questacon - The National Science and Technology Centre aim to develop these skills.

The Science Communication Program

Even before the new National Science and Technology Centre was completed in 1988 it had begun to acquire a national flavour by developing travelling programs to reach out to all Australians, no matter whether they lived in the cities or in the country.

The Questacon Science Circus was the first of these programs. It took to the road in April 1985. For the first two years the Questacon Science Circus was staffed by specially selected students from the Australian National University, who has been trained initially as Explainers in the original Questacon. When the Science Circus became part of The National Science and Technology Centre, we decided that, for a truly national program, a Questacon Science Circus Team must be chosen on a national basis.

In 1987, the Australian National University and The National Science and Technology Centre together established a one year Graduate Certificate Program in Science Communication, the first of its kind in Australia and, possibly, the world. The course has, in 1991, been upgraded to a Graduate Diploma, administered jointly by the two institutions. The Australian National University has prime responsibility for the academic aspects of the course, and the Questacon Science Circus, which now receives major sponsorship from Shell Australia, provides the team with a mobile laboratory which travels throughout Australia. The program has a dual purpose: the Team and the

public both use the Questacon Science Circus to gain experience, but in quite different ways.

The basic qualifications for students applying for one of the ten Science Communication Scholarships, (the total package is approximately equivalent to a PhD. scholarship) are that they hold a science degree and demonstrate that they have an engaging personality and that they can communicate in a lively and confident way. Applicants are required to present themselves for audition on videotape; to this extent the course is a scientific equivalent of the National Institute of Dramatic Art.

Scholars' interests in wider aspects of science and science policy are catered for in the program. Past students have become involved in issues such as the philosophy and ethics of science, in policy formulation, in contemporary issues such as in vitro fertilization, the depletion of the ozone layer and the threatened greenhouse effect. These interests share equal emphasis with the task of running the Shell Questacon Science Circus for five months of the year. The remaining time is spent in Canberra at the Australian National University and Questacon - The National Science and Technology Centre.

The Circus, then, is a showplace in which the Scholars develop a wide range of skills, from loading a pantechicon to acting as floor manager during science shows, from fixing exhibits on the run to mastering the techniques of educational radio in the School of the Air. No job is considered too menial and no task is beyond their abilities. In a conventional circus everyone turns their hands to anything, and so it is with the Scholars. Like their more artistic colleagues, they are required to clean up after the scientific elephant! In the process, Scholars acquire the communication skills that equip them to help people to understand science. They hone their abilities for presenting scientific concepts to a diverse public; they undertake challenging personal programs; and they are encouraged to take part in topical debates about science and its impact on our society.

Our object is to let a number of gifted, personable and confident individuals advance their own development within a framework that we have called the Graduate Diploma in Science Communication. The program thus addresses such questions as the type of science a professional

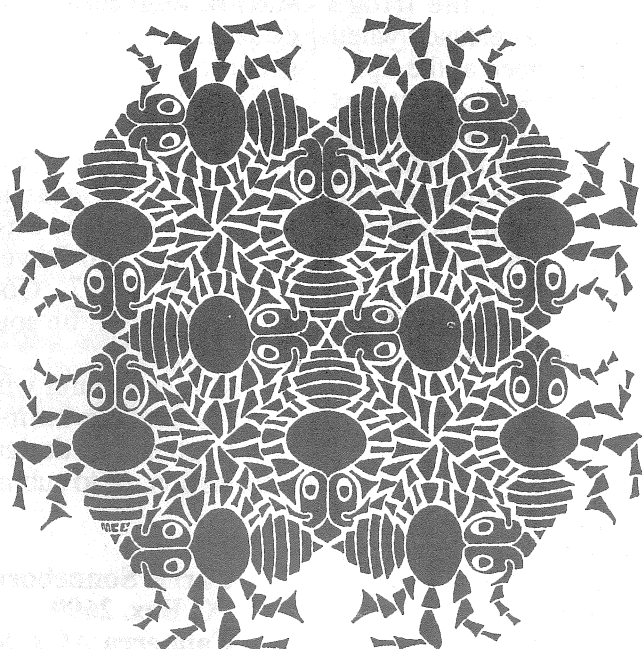
scientist should communicate to the public. Everyday relevance is certainly a key factor, so that one important aim of the Graduate Diploma Course is to demonstrate relevance rather than to sustain the outdated view that science is a series of closed disciplines. This is very important, because science is a normal human activity, inseparable from daily life. Scientific principles are manifest in the making of bread and the brewing of beer; in the planting of trees and the conservation of animals; in the workings of motor cars and in orbiting satellites. It is a common error for people to believe that they know little about science when, in fact, they know a great deal. They just do not recognize their knowledge as science.

Vital Statistics

Since the inception of the program in 1988, almost forty students have completed or are undertaking the course. Ten Scholars are selected each year, from all around Australia, the course extending from the end of January to the end of November. The value of the scholarship is approximately equivalent to a PhD. scholarship. It covers food, accommodation, travel and a separate, personal stipend. Five months of the course are spent on tour with the Shell Questacon Science Circus. This section of the program is not organized on a five days per week, seven hours per day basis! Positions taken up by past Scholars have included Exhibit Coordinators, Science Teachers and Education Officers at a number of institutions, including Questacon, the Australian Museum the Investigator Science Centre, the CSIRO; many enriched by a new outlook, have resumed academic careers.

For further information about the program and how to apply for a scholarship, write to:

The Secretary, Faculty of Science, Australian National University, GPO Box 4, Canberra, ACT 2601, marked attention Professor C. Bryant.



(from page 6) here first, the Z'zus had come later. This was mere unfounded prejudice -that seems obvious to me- because neither before nor after existed, nor any place to immigrate from, but there were those who insisted that the concept of "immigrant" could be understood in the abstract, outside of space and time.

It was what you might call a narrow-minded attitude, our outlook at that time, very petty. The fault of the environment in which we had been reared. An attitude that, basically, has remained in all of us, mind you: it keeps cropping up even today, if two of us meet at the bus stop, in a movie house, at an international dentists' convention and start reminiscing about the old days. We say hello at times somebody recognizes me, at other times I recognize somebody and we promptly start asking about this one and that one (even if each remembers only a few of those remembered by the others), and so we start in again on the old disputes, the slanders, the denigra-

tions. Until somebody mentions Mrs. Ph(i)Nk₀ every conversation finally gets around to her - and then all of a sudden, the pettiness is put aside, and we feel uplifted, filled with a blissful, generous emotion. Mrs. Ph(i)Nk₀, the only one that none of us has forgotten; and that we all regret. Where has she ended up? I have long since stopped looking for her: Mrs. Ph(i)Nk₀ her bosom, her thighs, her orange dressing gown we'll never meet her again, in this system of galaxies or any other...

We got along so well all together, so well that something extraordinary was bound to happen. It was enough for her to say, at a certain moment: "Oh, if I only had some room, How I'd like to make some noodles for you boys!" And in that moment we all thought of the space that her round arms would occupy, moving backward and forward with the rolling pin over the dough, her bosom leaning over the great mound of flour and eggs which cluttered her wide

board while her arms kneaded and kneaded, white and shiny with oil up to the elbows; we thought of the space the flour would occupy, and the wheat for the flour, and the fields to raise the wheat, and the mountains from which the water would flow to irrigate the fields and the grazing lands for the herds of calves that would give their meat for the sauce; of the space it would take for the Sun to arrive with its rays, to ripen the wheat; of the space for the Sun to condense from the clouds of stellar gases and burn; of the quantities of stars and galaxies and galactic masses in flight through space which would be need to hold suspended every galaxy, every nebula, every sun, every planet, and at the same time we thought of it, this space was inevitably being formed, at the same time that Mrs. Ph(i)Nk₀ was uttering those words: "...ah, what noodles boys!"

This one of many science inspired short stories contained in Cosmic Comics, by Italo Calvino.

Green Fridge

Q: What consumes one fifth of all electricity produced, generates greenhouse gases and destroys ozone simultaneously

A: The refrigerator

In NSW the humble domestic refrigerator currently consumes more than one fifth of the electricity produced each year for residential use. The majority of the energy comes from burning coal, oil or gas which is converted into electricity via steam turbines. Each of these fuels produces large quantities of carbon-dioxide - in fact millions of tons per year - increasing the Earth's natural greenhouse warming.

The operation and production of many current models of refrigerators involves the use of CFC's. Chlorofluorocarbons destroy ozone and are also green-

house gases. CFC's are used as both coolant gases and in forming the foams that make up the insulation of the fridge walls.

Until very recently the CFC's within the cooling system were never recovered, the gases eventually leaking out as the fridge grew older or being released when the fridge was dumped at the tip.

Many developing nations are now moving rapidly towards industrialization. Soon the demand for domestic appliances such as refrigerators will be massive. In order to prevent the creation of

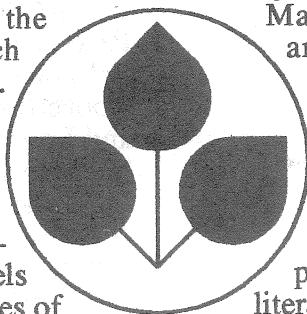
literally hundreds of millions of new inefficient and destructive devices alternative methods of refrigeration must be developed. Alternative gases such as HCFC's and HFC's have been proposed (and patented) by many large chemical companies as the solution to the problem. However whilst these gases are an improve-

ment they still destroy ozone and promote greenhouse warming. The Australian Conservation Foundation (ACF) Green Fridge Quest is an attempt to find a practical solution to the problem.

The Quest calls on students and staff of engineering and science courses to try to design a truly green fridge - one that is energy efficient and ozone and greenhouse friendly. Students with successful designs may end up presenting their ideas at the United Nations Conference on the Environment and Development in Montreal 1992. Commercial partnership will be sought for the final designs.

So ask your lecturer what the alternatives are (e.g ammonia); and how to plan your design. For more information, or to submit, write to:

Carrie Sonneborn
PO Box. 2699
Canberra ACT 2601
(06) 247 2472



Look, up in the sky...

Some of you will have attended the "Astronomy Night" that was held at Macquarie University earlier this month. This annual gathering raises money for the University whilst providing an informal introduction to amateur astronomy.

Those of you who caught the "astronomy bug" might feel that a year is long time to wait for the next meeting. Even if you missed the meeting, the christmas holidays are a good opportunity to do something other than watch "Aliens" for the 40th time. NSW has many astronomical societies just waiting for your call.

There are a number of amateur astronomical societies operating in NSW, Strathfield being the closest to Uni. Each society

generally has regular meetings to which guest speakers or members give talks, in addition to observing

The Astronomical Society of New South Wales is probably closest to Sydney University. The Society holds two meetings per month within the grounds of:

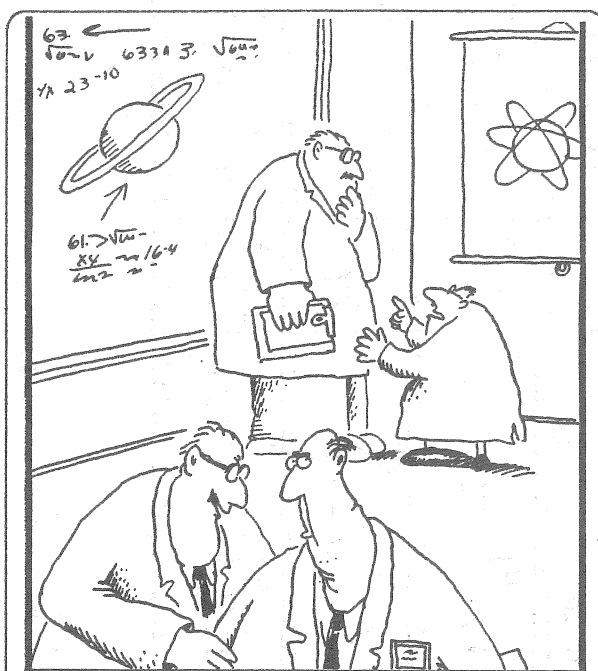
Catholic College of Education
179 Albert Road (West end)
Strathfield. ph 817 4650.

One meeting each month is the "technical meeting". This is an informal night where members are encouraged to participate in discussions, display their latest projects; slide and video evenings and the occasional excursion.

The society has two observing sites, including one between the towns of Ilford and Sofala (at a height of 1000m).

The technical meetings are held on the *third* Friday of each month, which means the next meeting is on the 15th of November.

There is no obligation to join, so don't watch "Aliens" again; try it out.



"There goes Williams again... trying to win support for his Little Bang theory."

sites which members are entitled to use when available.

† Physics Puzzle Page †

Here are some puzzles to get brain working in time for your exams. The first person from each year to bring three correct answers to room 569 will win a fantastic prize. Don't forget to include leap years in number 2.

1. A student rushing to leave at the end of a quantum mechanics lecture diffracts as she passes through the door, her first minima occurring at an angle of 1.48×10^{-42} degrees. Assuming she weighs 60kg and the door is 1.5m wide, at what fraction of the speed of light was she travelling?

2. A 30 year-old astronaut marries a one year-old boy. She escapes in her rocketship, which travels at an average speed of 99.873% the speed of light. How many days later should she return to avoid arrest? (min. age 16 yrs in NSW)

3. Each edge of the cube above has a resistance of 525.6 Ohms. What is the total resistance when current flows from A to B?

The first three digits of each of your answers will combine to form a magic square. Each number 1 to 9 will be included once.

The Psychotic Table of the Elements

Alibi Metals		Fiat Earths		Toxic Wastes								Hallu- cinations		Noble Laureates	
1	S	3	EV	4	La	5	Bx	6	C	7	N	8	L	9	Æ
2	ESTROGEN	11	Zz	12	??	13	Tx	14	Je	15	P	16	Ph	17	Ny
3	AXIUM	18	AMNESIUM	19	Pm	20	An	21	Sc	22	Ho	23	Oh	24	Or
4	VALIUM	25	PARACETAMOL	26	ANOREXIUM	27	F4	28	Y	29	Sc	30	Yp	31	Oregon
5	etc.	32	ADULTIUM	33	NS	34	CB	35	Qs	36	TV	37	La	38	Pg
6	HALF-N-HALF	39	CHUCKLEBERRY	40	INSECTIUM	41	HAIR	42	Qs	43	CB	44	TV	45	Phlogiston
7	HAIR	46	HAIR	47	HAIR	48	HAIR	49	HAIR	50	HAIR	51	HAIR	52	®
8	HAIR	53	HAIR	54	HAIR	55	HAIR	56	HAIR	57	HAIR	58	HAIR	59	TEFLON
9	HAIR	60	HAIR	61	HAIR	62	HAIR	63	HAIR	64	HAIR	65	HAIR	66	Rw
10	HAIR	67	HAIR	68	HAIR	69	HAIR	70	HAIR	71	HAIR	72	HAIR	73	Reagan
11	HAIR	74	HAIR	75	HAIR	76	HAIR	77	HAIR	78	HAIR	79	HAIR	80	Alkaline
12	HAIR	81	HAIR	82	HAIR	83	HAIR	84	HAIR	85	HAIR	86	HAIR	87	Alkaline
13	HAIR	88	HAIR	89	HAIR	90	HAIR	91	HAIR	92	HAIR	93	HAIR	94	Alkaline
14	HAIR	95	HAIR	96	HAIR	97	HAIR	98	HAIR	99	HAIR	100	HAIR	101	Alkaline
15	HAIR	102	HAIR	103	HAIR	104	HAIR	105	HAIR	106	HAIR	107	HAIR	108	Alkaline
16	HAIR	109	HAIR	110	HAIR	111	HAIR	112	HAIR	113	HAIR	114	HAIR	115	Alkaline
17	HAIR	116	HAIR	117	HAIR	118	HAIR	119	HAIR	120	HAIR	121	HAIR	122	Alkaline
18	HAIR	123	HAIR	124	HAIR	125	HAIR	126	HAIR	127	HAIR	128	HAIR	129	Alkaline
19	HAIR	130	HAIR	131	HAIR	132	HAIR	133	HAIR	134	HAIR	135	HAIR	136	Alkaline
20	HAIR	137	HAIR	138	HAIR	139	HAIR	140	HAIR	141	HAIR	142	HAIR	143	Alkaline
21	HAIR	144	HAIR	145	HAIR	146	HAIR	147	HAIR	148	HAIR	149	HAIR	150	Alkaline
22	HAIR	151	HAIR	152	HAIR	153	HAIR	154	HAIR	155	HAIR	156	HAIR	157	Alkaline
23	HAIR	158	HAIR	159	HAIR	160	HAIR	161	HAIR	162	HAIR	163	HAIR	164	Alkaline
24	HAIR	165	HAIR	166	HAIR	167	HAIR	168	HAIR	169	HAIR	170	HAIR	171	Alkaline
25	HAIR	172	HAIR	173	HAIR	174	HAIR	175	HAIR	176	HAIR	177	HAIR	178	Alkaline
26	HAIR	179	HAIR	180	HAIR	181	HAIR	182	HAIR	183	HAIR	184	HAIR	185	Alkaline
27	HAIR	186	HAIR	187	HAIR	188	HAIR	189	HAIR	190	HAIR	191	HAIR	192	Alkaline
28	HAIR	193	HAIR	194	HAIR	195	HAIR	196	HAIR	197	HAIR	198	HAIR	199	Alkaline
29	HAIR	200	HAIR	201	HAIR	202	HAIR	203	HAIR	204	HAIR	205	HAIR	206	Alkaline
30	HAIR	207	HAIR	208	HAIR	209	HAIR	210	HAIR	211	HAIR	212	HAIR	213	Alkaline
31	HAIR	214	HAIR	215	HAIR	216	HAIR	217	HAIR	218	HAIR	219	HAIR	220	Alkaline
32	HAIR	221	HAIR	222	HAIR	223	HAIR	224	HAIR	225	HAIR	226	HAIR	227	Alkaline
33	HAIR	228	HAIR	229	HAIR	230	HAIR	231	HAIR	232	HAIR	233	HAIR	234	Alkaline
34	HAIR	235	HAIR	236	HAIR	237	HAIR	238	HAIR	239	HAIR	240	HAIR	241	Alkaline
35	HAIR	242	HAIR	243	HAIR	244	HAIR	245	HAIR	246	HAIR	247	HAIR	248	Alkaline
36	HAIR	249	HAIR	250	HAIR	251	HAIR	252	HAIR	253	HAIR	254	HAIR	255	Alkaline
37	HAIR	256	HAIR	257	HAIR	258	HAIR	259	HAIR	260	HAIR	261	HAIR	262	Alkaline
38	HAIR	263	HAIR	264	HAIR	265	HAIR	266	HAIR	267	HAIR	268	HAIR	269	Alkaline
39	HAIR	270	HAIR	271	HAIR	272	HAIR	273	HAIR	274	HAIR	275	HAIR	276	Alkaline
40	HAIR	277	HAIR	278	HAIR	279	HAIR	280	HAIR	281	HAIR	282	HAIR	283	Alkaline
41	HAIR	284	HAIR	285	HAIR	286	HAIR	287	HAIR	288	HAIR	289	HAIR	290	Alkaline
42	HAIR	291	HAIR	292	HAIR	293	HAIR	294	HAIR	295	HAIR	296	HAIR	297	Alkaline
43	HAIR	298	HAIR	299	HAIR	300	HAIR	301	HAIR	302	HAIR	303	HAIR	304	Alkaline
44	HAIR	305	HAIR	306	HAIR	307	HAIR	308	HAIR	309	HAIR	310	HAIR	311	Alkaline
45	HAIR	312	HAIR	313	HAIR	314	HAIR	315	HAIR	316	HAIR	317	HAIR	318	Alkaline
46	HAIR	319	HAIR	320	HAIR	321	HAIR	322	HAIR	323	HAIR	324	HAIR	325	Alkaline
47	HAIR	326	HAIR	327	HAIR	328	HAIR	329	HAIR	330	HAIR	331	HAIR	332	Alkaline
48	HAIR	333	HAIR	334	HAIR	335	HAIR	336	HAIR	337	HAIR	338	HAIR	339	Alkaline
49	HAIR	340	HAIR	341	HAIR	342	HAIR	343	HAIR	344	HAIR	345	HAIR	346	Alkaline
50	HAIR	347	HAIR	348	HAIR	349	HAIR	350	HAIR	351	HAIR	352	HAIR	353	Alkaline
51	HAIR	354	HAIR	355	HAIR	356	HAIR	357	HAIR	358	HAIR	359	HAIR	360	Alkaline
52	HAIR	361	HAIR	362	HAIR	363	HAIR	364	HAIR	365	HAIR	366	HAIR	367	Alkaline
53	HAIR	368	HAIR	369	HAIR	370	HAIR	371	HAIR	372	HAIR	373	HAIR	374	Alkaline
54	HAIR	375	HAIR	376	HAIR	377	HAIR	378	HAIR	379	HAIR	380	HAIR	381	Alkaline
55	HAIR	382	HAIR	383	HAIR	384	HAIR	385	HAIR	386	HAIR	387	HAIR	388	Alkaline
56	HAIR	389	HAIR	390	HAIR	391	HAIR	392	HAIR	393	HAIR	394	HAIR	395	Alkaline
57	HAIR	396	HAIR	397	HAIR	398	HAIR	399	HAIR	400	HAIR	401	HAIR	402	Alkaline
58	HAIR	403	HAIR	404	HAIR	405	HAIR	406	HAIR	407	HAIR	408	HAIR	409	Alkaline
59	HAIR	410	HAIR	411	HAIR	412	HAIR	413	HAIR	414	HAIR	415	HAIR	416	Alkaline
60	HAIR	417	HAIR	418	HAIR	419	HAIR	420	HAIR	421	HAIR	422	HAIR	423	Alkaline
61	HAIR	424	HAIR	425	HAIR	426	HAIR	427	HAIR	428	HAIR	429	HAIR	430	Alkaline
62	HAIR	431	HAIR	432	HAIR	433	HAIR	434	HAIR	435	HAIR	436	HAIR	437	Alkaline
63	HAIR	438	HAIR	439	HAIR	440	HAIR	441	HAIR	442	HAIR	443	HAIR	444	Alkaline
64	HAIR	445	HAIR	446	HAIR	447	HAIR	448	HAIR	449	HAIR	450	HAIR	451	Alkaline
65	HAIR	452	HAIR	453	HAIR	454	HAIR	455	HAIR	456	HAIR	457	HAIR	458	Alkaline
66	HAIR	459	HAIR	460	HAIR	461	HAIR	462	HAIR	463	HAIR	464	HAIR	465	Alkaline
67	HAIR	466	HAIR	467	HAIR	468	HAIR	469	HAIR	470	HAIR	471	HAIR	472	Alkaline
68	HAIR	473	HAIR	474	HAIR	475	HAIR	476	HAIR	477	HAIR	478	HAIR	479	Alkaline
69	HAIR	480	HAIR	481	HAIR	482	HAIR	483	HAIR	484	HAIR	485	HAIR	486	Alkaline
70	HAIR	487	HAIR	488	HAIR	489	HAIR	490	HAIR	491	HAIR	492	HAIR	493	Alkaline
71	HAIR	494	HAIR	495	HAIR	496	HAIR	497	HAIR	498	HAIR	499	HAIR	500	Alkaline

MODIFIED AND OBVIOUSLY
REPHRASED BY MIKE CARLTON (Liam.I.)

Scorched
Earths

Radioactinides