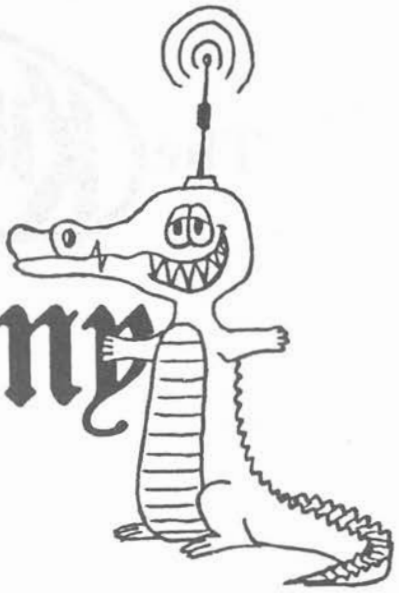
Jeremy



EDITORIAL

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Here we are again, the third edition of Jeremy for the year. Unfortunately the Presidents wishes for another issue will not be met, but she said as long as this issue was a big one, then she would not kill me. As was last issue Jeremy is rather light weight with respect to content. However this issue also includes a couple of more serious articles to stimulate some thought as to what it is we are studying here. Thanks must go to Tania Feletto for the backpage article, Mike Wheatland for his film review, and to all those academics who put their feet in their mouths for the quote section. I take the blame for the rest of this issue.

I must also advertise for the Physoc Jeremy T-shirts. They are what the Physics student around town should be wearing, and they are cheap!! They would make THE ideal Christmas present so get yours now from Elizabeth Hing's office.

Good luck to all of you facing exams, from someone who has been there, done that, and totally failed to retain his sanity through all of it.

Mick Pope.....

Contents

The KitKat Quotes Competition

Kitkat Quote Competition 1992

More of those Kitkat quotes for your entertainment. I have not had many come in this year, are the lecturers not saying dumb things any more???

Laurence Cram: "I make more mistakes than Mr. Perfect." About Don Melrose.

John Davis: "The Doppler Broadening is governed by the ... ah ... doppler broadening."

Bill Tango: "But the fundamental theorem, Gauss' Law becomes Gauss' Law."

Neville Weber (Mathematical Statistics):

"In this type of experiment you measure until they die, or progress, or whatever the appropriate definition of death is." "In the statistics division, we are having alot of trouble convincing the pure and applied mathematicians that in statistics, you sometimes need to write words."

Malcom Quine (Mathematical Statistics):

"So we'll shift each function by kappa t. (Sighs) I could use a nice hot kappa tea right now."

Anonymous editor of Jeremy to Peter Robinson:

"Say something stupid Peter, I need some more quotes for Jeremy."

Foreign Lands:

Prof. J.J. Monaghan (Applied Maths, Monash University):

"People fall in love with complicated, beautiful things." (Talking about Chaos??)

Dr. P. Cally (Applied Maths, Monash University):

On astrophysical plasmas and MHD theory:

"... it is a hairy chested fluid..."

Classic Exam Answers

These are actual excerpts from science exam papers: Who said the educational system is below par? Read and enjoy.

The theory of evolution was greatly objected to because it made man think.

Three kinds of blood vessels are arteries, vanes and caterpillers.

The dodo is a bird that is almost decent by now.

The Earth makes one resolution every 24 hours.

The cuckoo bird does not lay his own eggs.

To collect fumes of sulfur, hold a deacon over a flame in a test tube.

Parallel lines never meet, unless you bend one or both of them.

Geometry teaches us to bisex angles.

A circle is a line which meets its other end without ending.

We believe that the reptiles came from the amphibians by spontaneous generation and study of rocks.

English sparrows and starlings eat the farmers grain and soil his corpse.

By self-pollination, the farmer may get a flock of long-haired sheep.

If conditions are not favorable, bacteria go into a period of adolescence.

Dew is formed on leaves when the sun shines down on them and makes them perspire.

Vegetative propagation is the process by which one individual manufactures another individual by accident.

A super-saturated solution is one that holds more than it can hold.

A triangle which has an angle of 135 degrees is called an obscene triangle.

Blood flows down one leg and up the other.

A person should take a bath once in the summer, and not quite so often in the winter.

Humans are more intelligent than beasts because the human branes have more convulsions.

For dog bite: put the dog away for several days. If he has not recovered, then kill it.

For head colds: use an agonizer to spray the nose until it drops in your throat.

How To Pass Your Exams!!!

Yes, for those poor undergraduate students it is exam time again, and once more you are faced with the associated stress of having to regurgitate the useless information that you have been fed all year. It is rather like going to the pub and having too many beers; you might have enjoyed it at the time, but getting rid of it is terrible and you are left with a headache afterwards. Here are a few tips to help you survive the process, with special emphasis Physics exams.

It was once said by a lecturer in Physics at Monash University, that lectures are the process of passing information "... from the lecturers notes to the students notes without passing through the brain of either." How true.

Studying

Yes, unfortunately it is often helpful to actually study for the exams that you have to sit, but there is a difference between study and learning. Study is something that you do at Uni, learning is something you do in the 'real world' (whatever that may be). Remember that Uni is not the real world (hence you find so many people choosing to stay here for long periods of time). When studying, you should remember these things:

- Physics consists of equations. If you remember the equations then at least the examiner will think that you might actually understand them. If you remember them, there is some chance you might be able to use them. At least you can write them down. Deriving formulae in exams is painful.

- If you have a memory like a politician's sense of humility (small), then you may want to resort to the old trick of mnemonics. For example, the spectral types of stars are OBAFGKM, which can be memorised as 'Oh Boy A Fine Girl Kissed Me'. This was useful for early astronomers, because no one in their right mind would kiss an astronomer so it stuck in their brains.

- Along the same line as above is illustrations, a simple way of explaining something. For example, Einstein once said when explaining radio:

"You see, wire telegraph is a kind of a very, very long cat. You pull his tail in New York and his head is mewing in Los Angeles. Do you understand this? And radio operates exactly the same way: you send signals here, they recieve them there. The only difference is that there is no cat."

Cats are popular in Physics, such as Schrodinger's Cat. Try it.

Siting the Exam

- When actually in the exam you may find that things slip slighty from your memory, that is you forget. For some of you this will be harder because you never actually learnt anything in the first place. Now I can't tell you to cheat, but I can tell you how you can 'jog your memory' in case of sudden brain failure.

- To jog your memory, you need to take something into the exam that will remind you of what it is you have to remember. The answers to the questions would be nice or a list of the formulae, but since I am not allowed to do that (nor have I ever done it myself, I actually used to study for my exams) I must suggest something else. So I tried to think of something else to suggest and here is what I came up with. Nothing.

Bluffing your way through

- The standard question in exams is the proof. Given a set of conditions, prove the given equation. This is really not good if you have only memorised the equation (see above), but that is already a start. Things are a little better if you know the final result to a question, but do not know all the steps in between. The standard trick is to write down your initial equation, write down as many steps as you can, and then when you run into the brick wall of stupidity, write something like:

- "it is obvious from here that the result follows"

- "Reductio Ad Absurdum (reduction to the absurd)"

- "it is trivial to show that...."

and so on.

- always remember to end questions with Q.E.D.

Surviving the Exam Period

- falling asleep during exams is a major risk considering the hours that student keep the night before an exam looking at the material for the first time. I recommend as much caffeine as your body (well bladder) can take. It worked for me. A friend did an exam when he was stoned. To him it was the best exam that he had ever done. He got 12 percent. Think about it.

In conclusion, exams are a necessary evil. Try and be good.

Physics Questionaire

The alternate questionaire for the keen physics student:

1. What year are you doing?

A) First year [ ]

B) Second year [ ]

C) Third year [ ]

D) Honours/grad dip [ ]

2. What made you decide to do physics this year?

A) I am stupid [ ]

B) I did it last year [ ]

C) Someone talked me into it [ ]

D) I ran out of options [ ]

E) I have to [ ]

F) All of the above [ ]

3. What do you enjoy most about physics?

A) It is better than chemistry [ ]

B) It is easier than medicine [ ]

C) I actually enjoy the lectures [ ]

D) The stupid things the lectures say * [ ]

4. What do you enjoy most about lectures?

A) The end [ ]

B) Lecture demonstrations [ ]

C) The subject material [ ]

D) Trying out new paper airplane designs [ ]

5. What do you enjoy most about lab?

A) The end [ ]

B) Pracs that I did in high school [ ]

C) The pracs in general [ ]

D) The wonderfully helpful postgrad demonstrators [ ]

6. Do you think that you will do Physics next year?

A) Maybe [ ]

B) Possibly [ ]

C) I have to [ ]

D) Are you kidding???? [ ]

E) Wild Schrodinger's Cats couldn't drag me away [ ]

If you are NOT thinking of doing Physics (shame on you), please give reasons.

A) I don't like Physics [ ]

B) I'm not interested in Physics [ ]

C) I find Physics too difficult [ ]

D) It is OK, but I prefer other subjects [ ]

E) I like Physics, but have the IQ of a rock [ ]

F) I don't think Physics will get me a job [ ]

G) My friends will think that I am a nerd and I won't be able to find a man/woman who'll be seen with me [ ]

H) Other, please specify

* Send them into Jeremy for the KitKat Quotes Competition.

Please do not think that the author does not like Physics, he loves it (hey get this straight jacket off me!!!!)

DR TONY TURTLE

Movie Review: A Brief History of Time

Free tickets to movies are hard to pass up, even if the film is about a physics nerd. The neon foyer of the Village Cinema held a strange collection of people - all with free tickets - waiting to see the preview of Errol Morris's film about Stephen Hawking. Then and later, I found myself thinking about the attraction the film held for the audience.

Since this was a preview screening, Robin Williams was there to deliver a prepared talk, before the film itself. He predictably eulogised about Mr Hawking, although he felt it necessary to justify his popularity and to assure us that physicists 'in the know' had vouched for the importance and pre-eminance of Hawking's work. (I was reminded of the famous quote - I paraphrase - "there is speculation, then there is wild speculation, and then there is cosmology".) Presumably this was a reply to recent criticism of Hawking or at least to the world view put forward by his book, 'A Brief History of Time'. The infamous conclusion ('the mind of God'), Mr Williams explained with his usual style, is an example of Hawking's sense of humour. Never got a laugh out of it myself. The inevitable joke about the book being a bestseller that is never read was also brought up by Williams.

Now to the film itself. Morris's film is beautifully photographed and very much carries the style of its maker; I was surprised and relieved not to detect the lead hand of Steven Spielberg (the resident wallet). Hollywood has never been good at documentary, but here is a good documentary, from Hollywood. The biographical part of the film is its strength, relying on interviews with family and co-workers. Hawking's mother is particularly memorable, as are the anecdotes from Hawking's undergraduate years at Cambridge. The story of his acceptance of and then victory over his debilitating condition is a moving one, best conveyed by the quiet strength of his mother's words in the film. Hawking himself is not interviewed but provides commentary in his neutral, computer voice. (I kept thinking: they could give him any voice, so why not Richard Burton's?) The decision not to interview Stephen Hawking was an inspired one: a very clear picture of his character and his life is given by the interviewees.

Descriptions of the physics are provided via animations and film sequences, but take up only a small part of the film. These are well presented but not as interesting as the biography and no real attempt is made to explain; this is not a criticism, since I think the film is better for this. It is very unfamiliar to sit in a movie theatre and hear physics (a friend who went to another screening said that he thought the film would have been better suited to television). Biography at the cinema is a bit more familiar and entertaining. The audience's response seemed to support this view.

Errol Morris's film about Stephen Hawking is an interesting, biographical picture of a popular figure and leading physicist. The title is somewhat misleading because it is not about the book so much as Stephen Hawking's life. And it is better for that.

Michael Wheatland

God and Science: are they incompatible?

Science traditionally has not always had the highest regard for any being that might be called God. From the times of Newton and his laws, physicists have sought to understand the universe in such a way that there is no need for a personal being in the created order. Johannes Kepler, who worked for more than 20 years on his planetary laws of motion, once said "My goal is to show the celestial machine is not a divine being but like a clock."

An admirable task, for there were some who thought that angels pushed the planets along in their paths, and for them the universe was a place where God did things in a less than subtle way. If Johannes thought that God was the one who wound up the 'celestial clock', it is not for me to speculate. It was an analogy also used in what was called 'arguement from design', where the orderedness of creation was used to infer Gods' existance. For those who have read the book of Romans, they will see that this is a perfectly biblical thing to do, to appreciate God's creative nature from nature itself, but is that enough to discover who this God is?

The great man of science, Albert Einstein, had a nebulous concept of God. When refuting Quantum Theory he said, "God does not play dice." His remarks about God reflect a deep respect for nature rather than knowledge of a personal being. Einstein sent a telegram to a Jewish newspaper saying "I believe in Spinoza's God who revels himself in the harmony of all that exists, but not a God who concerns himself with the fate and action of men." Why should he not believe in a personal God, and indeed if he does not believe, does that mean that God does not exist?

The man he spoke of, Baruch Spinoza, was the Jewish lensmaker and philosopher who reasoned that God and the material world were indistinguishable. Human minds were part of God's mind, and the better you understood the universe, the closer you came to God. This 17th century writing foreshadowed modern cosmology, and the names of Paul Davies and Stephen Hawking come to mind. While Paul Davies may be fence sitter, Stephen Hwaking is more like the 18th century mathematician-philosopher Pierre Simon Laplace. When asked by Napoleon where was God in his theories, he simply replied "I have no need of that hypothesis." Was he correct in stating this, or is it the standard arrogance of the scientific mind? Laplace was a Newtonian to the extreme, in that he felt that an equation could be written down to desribe everything with precise accuracy. We know now that his basis, Newton's theory has been somewhat disrupted by Relativity, Quantum Theory and Chaos. But the question remains, can the scientist exclude God from the big picture? Think of the painter painting the room in which he is in, does he ever paint himself, thus painting himself, painting himself...? Can the cosmologist think of the universe in which he is sitting?

The church has never been too kind to the scientific mind, and any challenge to the authority of the church has generally led to the perpetrator being branded a heretic. Copernicus, when he proposed that the Earth revolved around the Sun kept it to himself until close to his death to avoid being burnt at the stake, which was the lot of 'heretics' at that stage in history. Giordano Bruno was not so lucky. Galilieo had to recant his views on the solar

system or face certain death. The track record is not good, but there are two points to make. One is that a view held by the church may not always reflect the God which it represents, for does the Bible say that the earth is flat or that it is at the centre of the universe. Even the poorest scholar can see that it does not, yet these are views that the church has held in the past and persecuted physicists for rightly showing these views to be wrong. Then there is the case more to do with genetics and so on, where the moral issues become greater. Does the scientist have the right to make decisions over the genetic makeup of the human species, or is that purely the ground of a God that created?

There is a new view these days called "scientism", which seems to think that science is the panacea for all woes and that "how" and "why" questions are now blurred because since science has relieved the need to seek some great cosmic purpose, there is no "why". Thus science claiming through its' understanding of the way the universe works that there is no God, then the questions of every day are just "how" questions, and science can deal with any of the moral issues that we face. Thus, by understanding all of the "how's, we can then formulate a "why" which encapsulates all of these. This is the new religion of science. To them, "cosmic purpose" is an invention of the theologian, and thus is something that holds science back. In the words of Peter Atkins in his New Scientist article (8 Aug 1992) "Religion claims total understanding, but fails to deliver anything but sweet words; science claims cautious progress, and is able to deliver success at every stage." There are three things wrong with this.

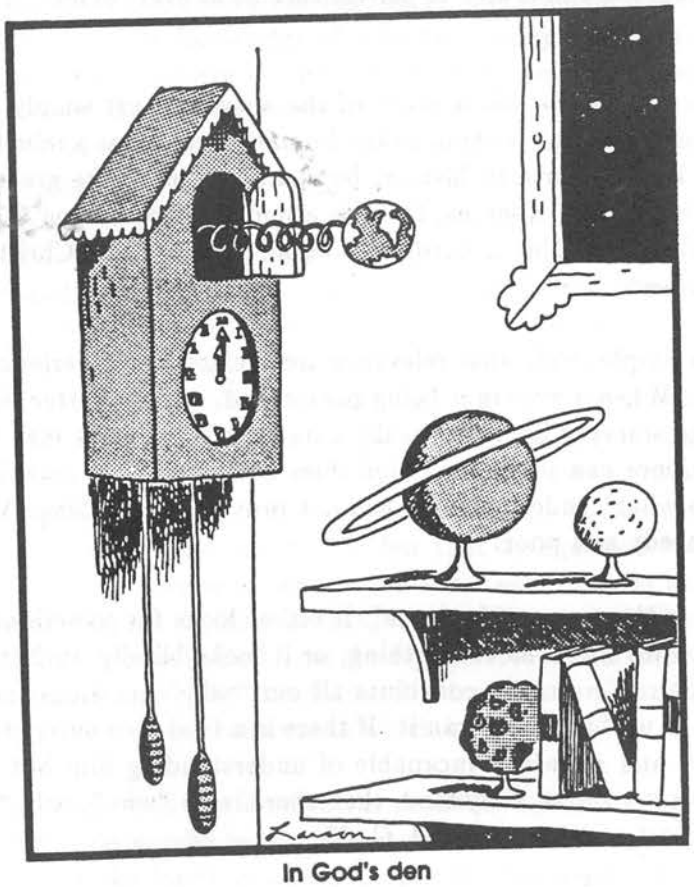
The Christian faith is one where some of the answers must simply be taken on faith or admitted to not being known. It explains the human situation as a rebellion against God and that God reveals Himself through history, but leaves some of the great questions of "why" unanswered. In the book of Romans, there is a quote "who are you O man to talk back to the God that made you?" This is hardly giving all the answers. Christianity gives purpose but not all the answers.

Secondly, on a simple level, what relevance are the great discoveries of science on a day to day personal level. When a woman is being pack raped, does it matter that elctrons repel one another? Does the starving Somalian really care that black holes may be the power source for quasars? If science can prove that God does not exist, then mankind is liberated from something, but to what? Indeed science has not proven such a thing. Where is the comfort of science to the needy and poor?

Thirdly, what is the success of science? It either looks for something that it supposes is already there and thus has achieved nothing, or it looks blindly until it finds something. It tells us "how", but can we really convolute all our "why" questions into "how" questions? Science does not tell us "why", nor can it. If there is a God then surely that God must reveal his nature himself, and science is incapable of understanding him but only what has been done by him. If we can throw away God, then there is no "why", only "how". The question then remains, does science do away with God?

The answer must in the end be no. This answer lies in the claims of the Bible versus the claims of science. The evolution vs creation debate is an old one, but unnecessary. The

main point of the beginning to Genesis is to show how order arose out of chaos, and thus since evolution is exactly that sort of process, the two accounts agree. The difference is in ideology, did God intiate the process or was it random, "why" is there life? The "how" is not under major dispute for the generalities, although the specifics are still open to conjecture. The Bible claims that the human situation is a result of a rebellion against God. Can science dispute this? It can neither support nor contest such a claim, for human behaviour and emotions have not been reduced to mere chemical reactions. This question must be debated theologically or philosophically. Why society is the way it is cannot be formularised for it is a "why" question, although there are "how" aspects. Thus, claims by Christianity must be dealt with on its own ground. No all pervading theory of what is out there is sufficient to discover the answers of "why", lest we be painting ourselves into the room.



In God's den

Annual Progress Report 1992

I began my PhD studies on January 11 of this year under the supervision of Dr. I.M.A. Dorque. The intial stages of my PhD have been occupied by preliminary reading on what the hell it is that my PhD is about (something or other to do with physics), and learning how to play X-Trek, Mud's, send email and read news. My thesis is divided into two sections: finding something to look at, and then look at it and try and write enough papers on it to graduate. I hope to do this in the three and a half years that I get money from the government, but I try to suck up to my supervisor and head of school often enough so that if I run out of time I will still be able to scrounge money from somewhere.

This year I have found some difficulty in adapting to my enviroment, having done no work in the past four years and knowing nothing about physics apart from the fact that most of my lecturers in the past have been nerds and I don't want to end up like that. However, I have actually done the following this year;

- examined some theory of something or other to do with plasmas and gave a talk on it (see below)

- attempted to relax some of the assumptions in the above treatment, but didn't get anything to work

- intiated research on something else other than the above, that is, begun a comprehensive literature survey (soon to be started), on the subject.

1992 Publications

I.M.A. Dorque, A. Einstein, "Really very hot gases in physics", Proc. ASA, resubmitted September 1992.

It is a little premature to construct a detailed timetable for the completion of my canditature since I don't know what I am doing anyway at this stage, but since I have to write this report to keep everyone happy, I will lie about the following that I hope to get around to doing at some stage;

- completion of the background literature survey (well start it really)

- defining the problem and particular areas of interest, and then outlining various ways of modeling, both analytically and numerically

- involvement with the data reduction of observations of this phenomenon

- presenting of paper of initial work to any conference stupid enough to accept me (if I can scum the money to go from somewhere)

Miscellaneous activities related to my canditature over the past year include.

Talks

- many Journal Club talks (well one or two)

- various in-departmental talks

- some conference in Canberra

Conference attendance

- some conference somewhere south (in Canberra I think, I was either drunk or sleeping, even in my own talk)

Assessed Lecture Courses

- some fourth year subjects (slept in the lectures I did go to)

Teaching

- tutoring some poor idiots who paided me heaps to confuse the hell out of them

A. Einstein

Einstein discovers that time is actually money.

HEAD OF SCHOOL
PROFESSOR L.E. CRUM

SCHOOL OF PHYSICS, A28
THE UNIVERSITY OF SYDNEY
NSW 2006, AUSTRALIA

School of Physics

9 October 1992

MEMORANDUM TO:
ALL RESEARCH STUDENTS

ATTENTION

It has come to my attention of late that the majority of the research students within the school actually do nothing with their time within the school. This will not be tolerated!

Students seem to spend most of their time in the tea room engaged in idle chit chat, that is anything that is not related to their studies, and also spend far too much time on the computer. I must state that email is strictly for the use of those of us who are old enough to remember when there was no such thing, and is not for the idle gossip of students. Whilst space travel is a relevant interest to physicists, playing space invaders or X-trek does not count as research into extra-terrestrial life or space travel. The net news service is permissible, as long as students limit themselves to groups which are relevent to their studies. Thus sci.physics is ok, alt.sex.bondage. hampster.gaffer-tape is not!

If this situation continues, I will have to take extreme action, and confiscate students brains until they put them to a better use.

Yours threateningly,

L.E. Crum

L.E Crum

Are You A Mathematician Or A Physicist?

Here is a simple test to find out whether *you* are a mathematician or a physicist.

You are in a country cabin in which there is an unlighted stove, a box of matches, a tap with running cold water, and an empty pot. How would you get a pot of hot water? Doubtless you will answer 'I will fill the pot with cold water, light the stove, and then put the pot on until the water gets hot.' To this I reply 'Good; so far the mathematician and the physicist are in complete agreement. Now the next problem separates the cases.'

In this problem you are in a country cabin in which there is an unlighted stove, a box of matches, a tap with cold running water, and a pot filled with cold water. How would you get a pot of hot water? Most people would reply, 'I would light the stove and put the pot of cold water on it.' I reply: 'Then you are a physicist! The mathematician would pour out the water, reducing the case to the preceding problem, which has already been solved.'

We could go a step further and consider the case of a pot of cold water already on a lighted stove. How do we get a pot of hot water? The physicist just waits for the water to get hot; the mathematician turns off the stove, dumps out the water, reducing the case to the first problem (or he might just turn off the stove, reducing the case to the second problem).

A still more dramatic version goes as follows: A house is on fire. We have available a hydrant and a disconnected hose. How does one put out the fire? Obviously, by first connecting the hose to the hydrant and then squirting the building. Now, suppose you have a hydrant, a disconnected hose and a house not on fire. How do you put out the fire? The mathematician first sets fire to the house, reducing the problem to the preceding case.

(Raymond Smullyan-'What Is The Name of This Book?')

120
+ 60
80