nerdling

Issue #4   August/September 2002

a zine of physics, maths and sci-fi

I received an email the other day from a scientist I worked with for a short period of time. He was talking about the societal association between nerds and social misfits, contrasted with the positive depiction of 'nerdiness' in the genre of science fiction. He concluded with, "But most important for me is that the people I respect most are nerds: my friends and my mentors."

Yeah—and that's what it comes down to. No matter how much, when you look at them across the school playground, the cool people seem to have it made, by the time you get into a uni degree you find that it's the nerds who are doing all the cool stuff. It's the nerds who you phone up when you want interesting discussions, because it's the nerds who are carrying out caving expeditions in Mexico and getting written up by National Geographic, or going down to Antarctica to measure magnetic fluctuations in the atmosphere. The tables are turned, and suddenly it's the nerds that everyone wants to know. Why? Because they're interesting and fun!

And it's the nerds who will be true friends. They're far less interested in judging you by what you wear and who you hang out with, and far more interested in what you're creating or doing or thinking about. They won't even mind too much if you talk about social trends in terms of Star Trek analogies, or if you have to miss an evening at the pub in order to finish some chain mail for a meeting of the Society for Creative Anachronisms.

In this issue of **nerdling** we've got lots of good stuff to satisfy your nerdish yearnings. We go retrospective in *Classic Moments in Old Sci-Fi*, to bring you material that some say should never have been resurrected from the Closed Stack at the library. We tell you how *not* to look to the future on page 14, and show you the results of those who did anyway. They're funny. Plus there's a look at poetry and science, some weird polyhedra stuff, molecules with most excellent names (furfuryl furfurate?! arsole?!!) and the ultimate guide to space travel for students: How to Leave the Planet for Under Five Bucks.

So: nuts to the myth that nerds are misfits (and to the dating agency that says Sarah must be intelligent *yet* beautiful). We know better.

The editor
ubernerdling@yahoo.com.au

Sarah

An intelligent yet beautiful lady, Sarah is now searching for a man to sweep her off her feet. Taut and trim she enjoys

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Cover image: the 'Cosmic Finger of Friendship' in the Keyhole Nebula.
For more pictures and information see the **nerdling** website at au.geocities.com/nerdlingzine.

CONTENTS

The F-Files

- how IFS can take you to nerdvana-

nerdling computer correspondent Chris Foster gets down & dirty
with the F-word: **Fractals**

We've all seen images of fractals: the Mandelbrot set, the associated Julia sets and so on. In fact, pictures of fractals have been bandied about so much that nerdling had occasion to accuse them (in issue 1) of being "clichéd science images". WELL! Having been a follower of the traditional nerd pastime of fractal programming for years now, and having worked my way up to the level of black belt, I was naturally horrified. The time has come to make fractals interesting again!

When most of us think of fractals, we probably think of pretty objects that we can have a look at, but can't really change. In particular, it's usually extremely difficult to predict how a new fractal will look after a change of the parameters – designing a fractal in a particular shape would seem almost impossible. This is where a lovely mathematical theory, IFS theory (for Iterated Function System) comes in.

Designing a fractal set

You might ask, "Why the hell would we want to design a fractal set in the first place?" Firstly, we suggest that it is one of the steps in the 42-fold path to nerdvana. Secondly, it's just plain cool.

Say we have a set in the plane, ▲ for instance, and we want a fractal which looks similar to this set. IFS theory tells us how to design such a fractal. The basic idea is to get a set of functions, call them $\{w_1, \ldots, w_n\}$, which, when combined, map our target set into itself. For our triangle thing above, we could use three functions, each mapping the full triangle into one of the three small filled-in triangles. I've tried to show the action of the first map (see left) by showing where the corners of the larger triangle should end up.

Effect of w_1
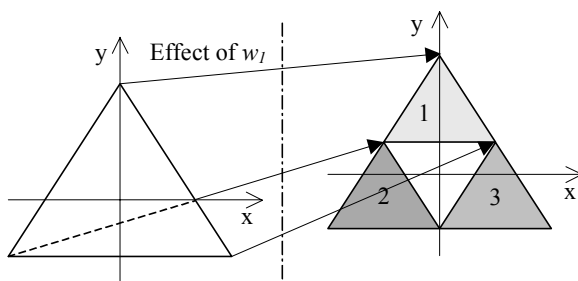
The triangles that the second and third maps produce are also shown, in different shades of gray. Note: In the diagram, the dot-dash line indicates that the space from the initial triangle to the set of three is not connected up. Technically, I should have superimposed the axes on top of each other.

Mathematically, the condition that a "combination" of the functions should map some set, A into itself can be expressed as $A = w_1(A) \cup w_2(A) \cup \cdots \cup w_n(A)$ where by $w_i(A)$ we mean "using w_i on all the points in A".

The theory now tells us that something *really* nice happens: If the functions w_i are all contraction mappings – that is, they map big set into small ones – then there *is* such a set A as above, and what's more, for each set of functions there's only *one* such A! We call A the *Attractor* of the IFS, and here it is for the three mappings outlined above. ➡
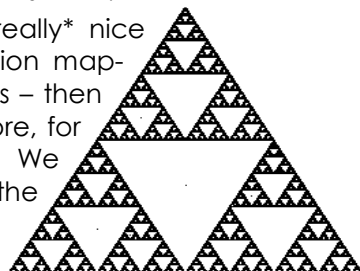
Computing the attractor

OK. The attractor, A exists – it's unique too, but how on earth do we get it? There are actually lots of possible algorithms with some even giving a nice colour picture, but the simplest to explain is random iteration, known as a Monte Carlo method.

The idea is to take an arbitrary starting point, $\mathbf{x}_0$ in the plane, and then choose one of the functions, w_i say, at random. We then apply the function to $\mathbf{x}_0$, to get $\mathbf{x}_1 = w_i(\mathbf{x}_0)$. The process is continued, using a new randomly chosen function for each step (so $\mathbf{x}_{j+1} = w_i(\mathbf{x}_j)$ for i chosen randomly between 1 and n in each step). Amazingly enough, if we plot the sequence of $\mathbf{x}_j$'s in the plane, the process leads to a good approximation for the attractor. Needless to say, unless we're into some bizarre form of masochism, we do all of the calculations above on a computer...
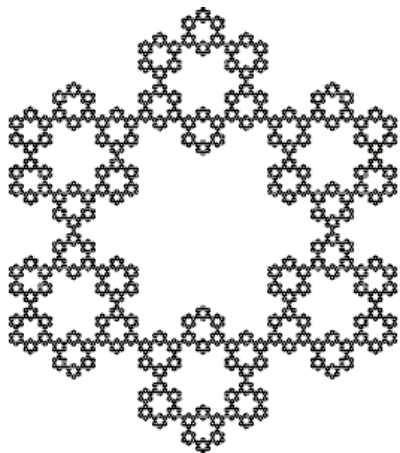
Pictures

The example given above is not much to look at, but it serves well as a simple example. The other pictures here and overleaf (and the fern leaf shown near the title) are however much more interesting, and were made with the same program as above.

[continued overleaf]

5
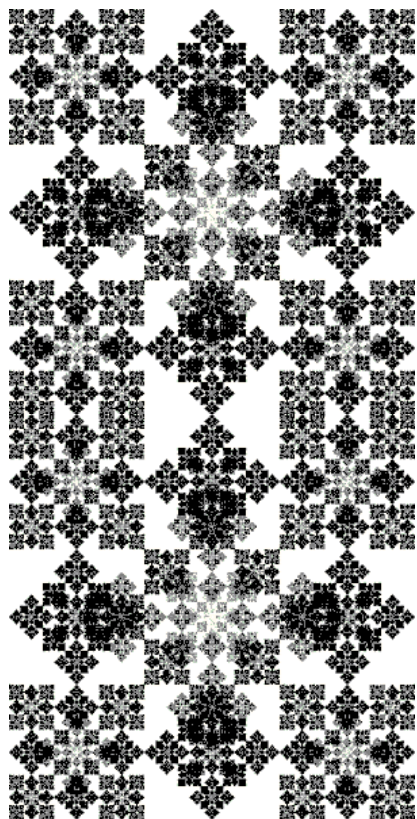
Gimme more!

Well, DIY is the order of the day. For hardcore mathematical detail, I recommend you read at least part of the definitive (and really, really good) book on IFS theory: *Fractals Everywhere*, by Michael Barnsley. If it's not in your university library, then you're not going to the right uni.

If you just want pictures and you're keen, write your own program. People are welcome to use my program too of course – written in C++; it's quite bare bones at the moment (input via text files), but I'm planning on improving it.

Happy IFSing!

[How cool is this ?!—ed.]
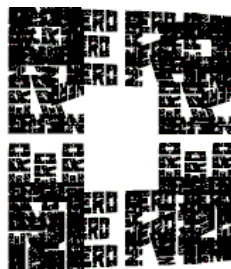
For the program or extra information, email Chris at:
c9907722@studentmail.newcastle.edu.au

Classic Moments In
Old Sci-Fi
Part I

The Brick Moon, written in 1896 by Edward Everett Hale, is a story about some guys who decide to build an artificial satellite. Being smart guys, they realise that it has to withstand the heat generated in passing through the atmosphere, so they build it out of… well, bricks. They launch the Brick Moon into outer space with 37 people on board, who get along famously in this new-found utopia. And when they want to talk to someone back home, they communicate by climbing onto the outside of the sphere and jumping up and down in Morse Code.

A classic sci-fi moment.

Molecules with excellent names

The best we get in physics is a type of bracket known as a *bra*. In chemistry, though, they get *arsoles* and *megaphones* and *dickite*… Should the people who named these molecules be knighted or shot? Read on and decide for yourself…

ARSOLE

...and yes, it is a ring. For more information, see the fantastically titled paper **"Studies on the Chemistry of the Arsoles",** by G. Markl and H. Hauptmann.
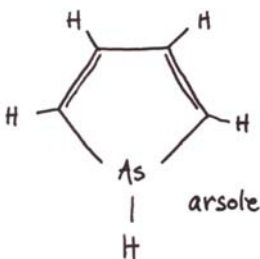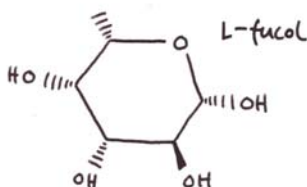
CUMMINGTON-ITE

No comment—except that its official name is magnesium iron silicate hydroxide, and it got its name from the place it was first found: Cummington, Massachusetts.

FURFURYL FURFURATE

O...kay.

FUCOL

A sugar, and apparently it doesn't do very much.

FUCITOL

Chemists talk about this one all the time; I've heard the shouts from the undergrad labs. It turns out to be an alcohol, whose other names are L-fuc-ol or 1-deoxy-D-galactitol. Its common name comes from the sugar fucose, which in turn is derived from a seaweed whose latin name is *Fucus vesiculosis*.

DICKITE

Dickite, $Al_2Si_2O_5(OH)_4$, is a clay-like mineral which is used in ceramics, as paint filler, rubber, plastics and glossy paper. It got its name from the geologist that discovered it around the 1890s, Dr. W. Thomas Dick.

APATITE

No, you don't want to eat it: it's used as a fertiliser and has composition $Ca_5[PO_4]_3(OH,F,Cl)$.

SPAMOL

One for Monty Python fans.

MORONIC ACID

This is an organic acid that is found in *Pistacia* resin. Why it's called *moronic* acid is still unknown.

MEGAPHONE

It gets its name from being a constituent of *Aniba Megaphylla* roots, and a ketone.

SEXITHIOPHENE

This is a 'sexi' molecule - which means it has 6 sub-units, in this case of thiophene rings. Incidentally, the Latin for 5 sub-units is *quinque* (pronounced 'kinky'), so by adding one subunit a quinque molecule becomes sexi. How wonderfully scientific.

Sourced from the excellent collection at www.bris.ac.uk/Depts/Chemistry/MOTM/silly/sillymols.htm. Check it out.

When science and pop culture collide…
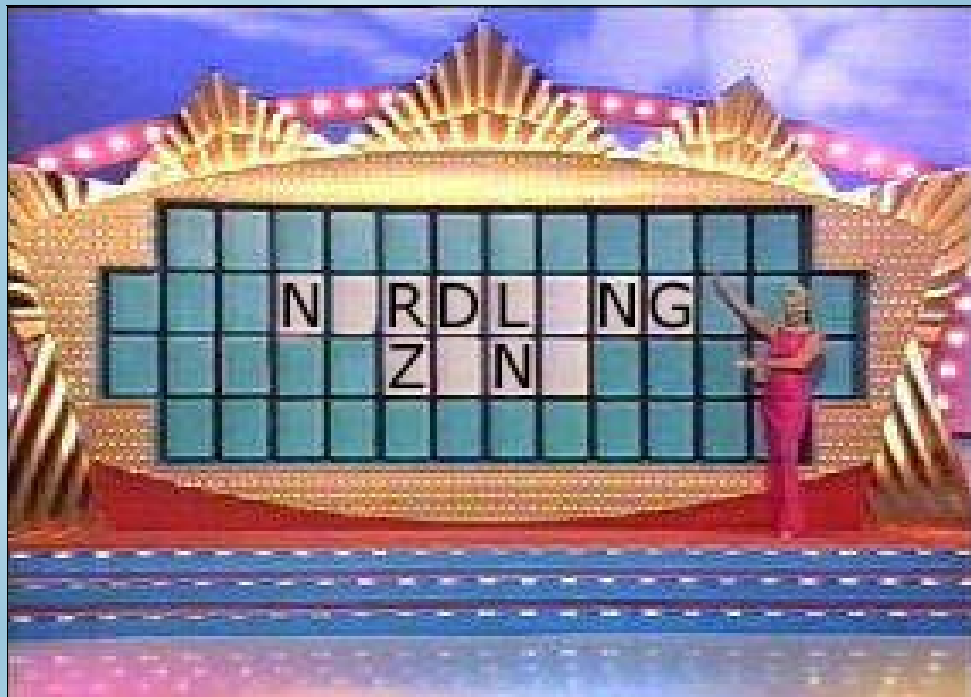
…you know you're reading nerdling.

ᘏ **nerdling zine** ᘒ
subtly infiltrating the contemporary paradigm since early 2002

The Rimmer and Lister Awards
For Good and Bad Pop Science
August/September 2002

A Lister Award to *Newcastle Herald* TV writer Ben Dougherty for summing up the sad state of modern Hollywood sci-fi in this review of a miscellaneous recent release: "...there are also a few allusions to 'terraforming' Mars, but rather than dwell on something potentially interesting like this, we get a load of razor-sharp metal frisbees being hoiked around the joint."

A Rimmer Award to singer Jay Kay from the band **Jamiroquai** for the opening lyrics to his new album: "We're off to the moon… Mars… Jupiter… and the outer galaxies of Alpha Centauri". So: the cat who calls himself the Space Cowboy don't know much about astronomy. He's well funky but.

Textbooks say the darndest things

Does this graph give us any information at all?
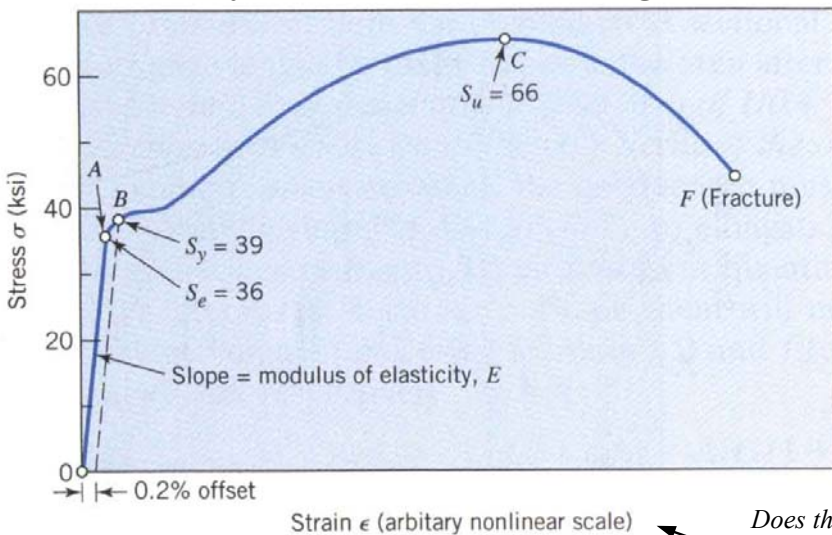
FIGURE 3.1
Engineering stress–strain curve—hot-rolled 1020 steel.

quotes

"Even with an IQ of 6000 it's still brown-trousers time."
— *Holly the Red Dwarf Computer, on solving relativistic equations*

"You still want to be my friends, even though you found out about my nerdish leanings?" — *Lisa Simpson*

"In Heaven, there will be 'cool' clouds and 'nerd' clouds." — *Nun (speaking to the Fonz) in 'Happy Days'*

"You don't have to be Edward Einstein to play football" — *an Australian footballer making a case in point.*

"Apparently, a nuclear-free-zone is a place where there are no nuclei." — *Dr Martin Ebert, medical physicist*

"She was a Bond girl; she couldn't have been in nerdy glasses." — *Denise Richards revealing she's, well, just a pretty face in this quote about her character in the latest James Bond film.*

'...several business places in Melbourne and the suburbs are now connected by means of telephones. The great drawback to the utility of these instruments when first introduced was the difficulty of calling the attention of the person desired to be spoke to. This has been overcome by the attachment of signal bells to the wire.' — *The Victorian Post Office Report, 1878, discussing the difficulty of inventing the telephone before the telephone ring.*
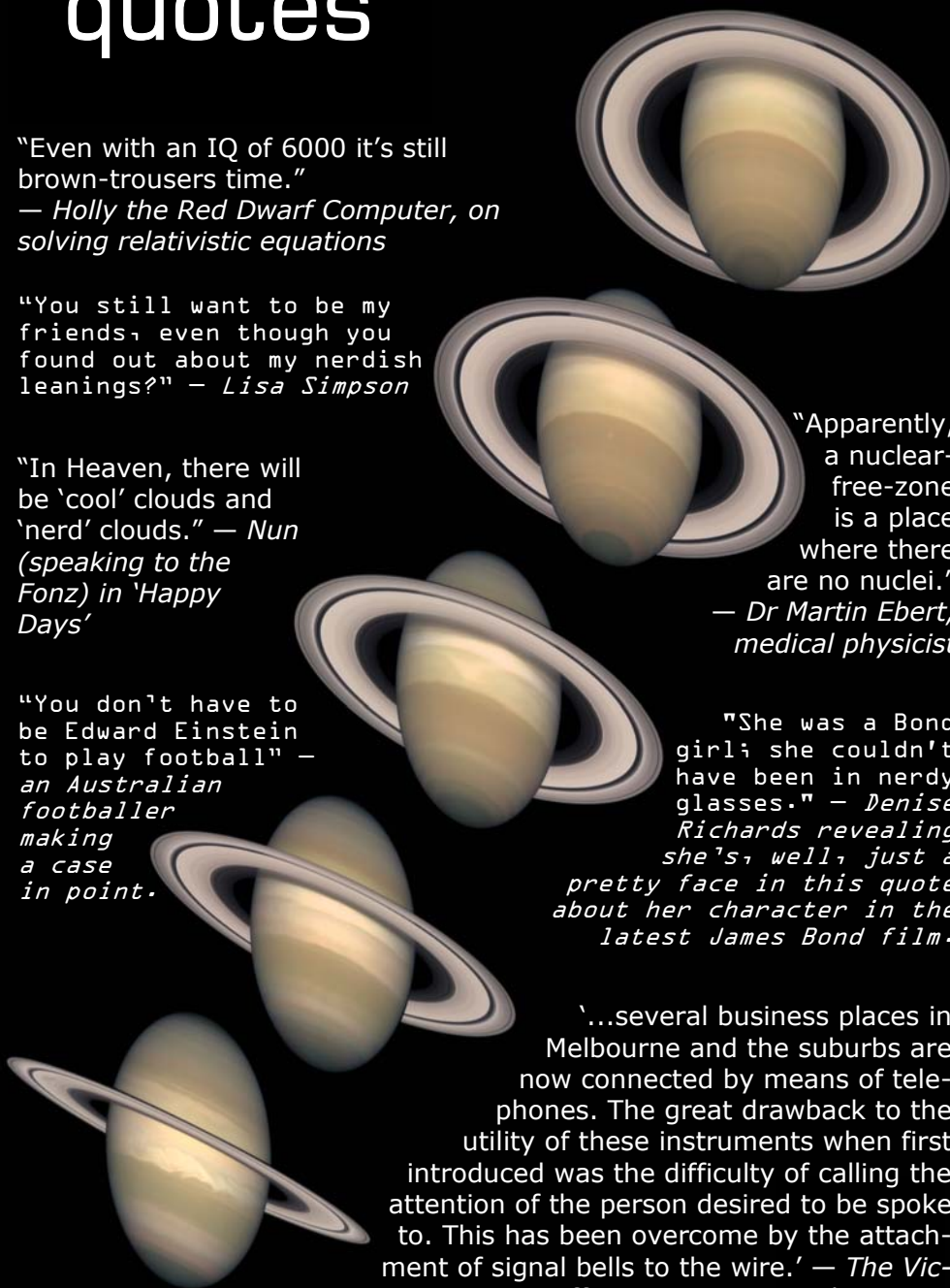
POETRY AND SCIENCE

If you took a poet, John Keats, say, and sat him down to dine
 With a hard-core nerdy scientist like Albert Einstein,
Would they find some things in common to sustain their conversation,
 Or, like matter/antimatter, would they spark a detonation?

There are those who say that poetry and science just don't mix:
 That the scientist shouldn't venture far past humble limericks;
That the poet's lot lies solely with the 'truth' and 'beauty' thing,
 And that words like "quantum coupling" just have *no* poetic ring.

These critics, to defend their views, will smugly sit and smile,
 And say, "Need I go much further than the grim and grisly style
"Of the 'Ballad of E. Rubik', to illustrate my drift?
 "Twixt poetry and dull, dead math there lies a mighty rift."

"And furthermore," they say, "poems should be about emotions –
 "Tragic love-lorn figures crying tears to fill up oceans;
"No-one likes to hear the things that science has to say:
 "That love's just merely chemicals we're obliged to obey."

These critics say that poems and science are mutually exclusive,
 But to others, their arguments are far from being conclusive.
They say the change is subtle from the cliché to the notion
 Of 'poetry in motion' and 'the poetry *of* motion'.

 For wise and famous figures like Plato, Pythagoras,
 Saw only Highest Beauty in numbers, shapes and maths.
And *if* that's not enough to sway the critics, then forsooth,
 'Twas none but Keats himself who said that Beauty equals Truth!

So now, dear reader, o'er to you, for now you must decide,
 Whether, like Jan Owen, you see science as entwined
Inseparably with poetry, or if you disagree there—
 For in the end, the beauty's in the eye of you, the reader.

Do you have a favourite scientific poem, or one that is worse than 'The Ballad of E. Rubik"? Have you written a scientific poem? E-mail nerdling at ubernerdling@yahoo.com.au and gain eternal kudos.

RHEOMODE
Jan Owen

Late afternoon, we lean on the sill
over a city of birds.
The implicate order folds and unfolds
an origami of doves and leaves.

—in this beautiful extract, Jan Owen mentions the implicate order theory of quantum physicist David Bohm, which espouses the idea that beyond the observable world there lies a deeper, implicate order that is undivided and whole. In describing this he used the metaphor of a stream, where the surface waves and ripples are "abstracted from the flowing movement, arising and vanishing in the total process of the flow." [Extracted from Radio National *Poetica* broadcast, 17th August 02]

COSMIC GALL
John Updike

Neutrinos, they are very small.
They have no charge and have no mass
And do not interact at all.
The earth is just a silly ball
To them, through which they simply pass,
Like dustmaids through a drafty hall
Or photons through a sheet of glass.
They snub the most exquisite gas,
Ignore the most substantial wall,
Cold-shoulder steel and sounding brass,
Insult the stallion in his stall,
And scorning barriers of class,
Infiltrate you and me! Like tall
And painless guillotines, they fall
Down through our heads into the grass.
At night, they enter at Nepal
And pierce the lover and his lass
From underneath the bed ~ you call
It wonderful; I call it crass.

HAIKU

A quiet classroom
X-ray bremsstrahlung spectra
The joy of being.

—the simplicity and purity of mathematics and physics lend themselves to the quiet zen of the haiku. The austerity of the haiku lends itself to sarcasm. Oh! such a synergy.

THE BALLAD OF ERNO RUBIK
Ted Russ

Erno Rubik.
Does it Cubic.
Got so much pizzaz-oh ~
Says balls to Picasso!

This would have to be the worst poem I have ever read. The fact that it is about a mathematician is just an unlucky coincidence. It goes on for another eleven ulcer-inducing lines of such

Anon

Big whorls have little whorls
Which feed on their velocity,
And little whorls have lesser whorls
And so on to viscosity.

This is one of a small group of 'instructional' ditties that are quoted over and over in pop science books and textbooks. Of all of them, 'Cosmic Gall' (at left) would have to be one of the best.

FUTUROLOGY:
A LESSON IN HOW **NOT** TO PREDICT THE FUTURE

It's a tantalising prospect, being able to see into the future. So tantalising, in fact, that people's desire to know their futures sustains the entire industry of tarot readings, palm readings and astrology columns. But while these people want to know about love and finances, there's another group that are interested in the technological and societal aspects of the future—and they're none other than scientists.

Futurology is the prediction of the future from reasonable scientific judgements, and it's a very risky business. Most people in fact wouldn't say it's a science at all; more like a vague hand-waving. The evidence certainly points this way—every "scientific" poll conducted by futurologists about the next decade has proved to be wildly off the mark. Just see the quotes on these pages for some classic mistakes.

Nowadays, scientists limit themselves to describing very broad categorisations of human progress, such as astronomer Nikolai Kardashev's method of classifying civilisations. In this system, a Type I civilisation has absolute control over the energy resources of an entire planet; a Type II civilisation directly controls the power of the sun itself; and a Type III civilisation controls the power of an entire galaxy. Currently, humans are at a Type 0 level. Apart from setting rough time periods for the transitions between Types, Kardashev wisely does not try to go into too much more detail.

But when people *do* go into detail when describing the future—and science fiction writers are the obvious offenders—the results are always interesting and often (in hindsight) very funny. Below, **nerdling** has collected a whole lot of examples for your entertainment and enlightenment. Science fiction writers—read and beware.

Mistake 1: Linearity of Thinking

As physicist and author Michio Kaku says, "What makes futurology such a primitive science is that our brains think linearly, while knowledge progresses exponentially. For example, polls of futurologists have shown that they take known technology and simply double or triple it to predict the future." He quotes a poll taken in the 1920s, where futurologists predicted that we would have, within a few decades, huge fleets of blimps taking passengers across the Atlantic.

> "Where ... the ENIAC is equipped with 18,000 vacuum tubes and weighs 30 tons, computers in the future may have only 1,000 vacuum tubes and weigh only 1.5 tons," *Popular Mechanics, 1949.*

Examples of linear thinking, with wildly inaccurate results, are rife in science fiction. Take, for example, Isaac Asimov's 1959 vision of computing in the year 2000: the computer Multivac is powerful enough to solve profound questions on life and human nature, yet is as big as a city, is still using vacuum tubes, and has to be fed information on punched cards.

It's not only writers who fall prey to this trap. Mathematician John von Neumann predicted that in the future computers would become so

monstrous and costly that only large governments would be able to afford them. Even Thomas Watson, chairman of IBM, said in 1943 that "I think there is a world market for maybe five computers."

Mistake 2: Overexuberance

Some futurologists just need to stop and take a chill pill. These guys are the ones who take an idea, get worked up into an excited frenzy like a Labrador with a frisbee, and run with it waaaay too far.

An example is when, in the 1950s, plastics were new on the scene and taking the world by storm. Their uses seemed limitless—so people started forecasting a world where homes of the future would have plastic furniture, rugs, drapes and floors that could be cleaned with a garden hose. An article in Popular Mechanics also forecast plastic plates that would melt in hot water and wash down the drain.

In 1966, Arthur C. Clarke wrote in *Vogue* magazine that houses would fly by 2001. He thought entire communities would head south for the winter or move to new locations for a change of scenery.

Other examples are the people nowadays who predict that soon we will be wearing special 'computer suits', or clothes containing computer chips and data storage modules. When we meet someone, we will shake their hand—and all their relevant personal data will be downloaded via the finger contact into our own suits. Hmmm.

The problem with these predictions is that they totally ignore any sort of social constraints on technology. Are people really going to want the feel of plastic on their legs every time they sit on the couch to watch tele? Is all that molten plastic going to be any good for the environment? Are people really going to get to the stage where the only way we interact is by data download?

"The problem with television is that the people must sit and keep their eyes glued on a screen; the average American family hasn't time for it," *The New York Times,* 1949.

Douglas Adams summed up the situation neatly in *The Hitch-Hikers Guide to the Galaxy*, when Zaphod Beeblebrox is trying to listen to a new-fangled radio, on which you can change the stations just by waving your hands in the air in front of it. Unfortunately, it turns out that every time you blow your nose or point, you lose what you were listening to. Overexuberant futurology is all about this sort of hand-waving.

Mistake 3: Dweeb futurology

A dweeb is a guy who can tell you everything about technology, but wouldn't have the faintest idea about how people interact. When this sort of person writes futuristic sci-fi, it inevitably contains interesting machines and computers, but often no attention at all will be paid to the *people*. This is most glaringly obvious in the treatment of women, if it's a male author. For example, if the story is written in the 1950s, all women of the future are

assumed to still play their traditional 1950s housewife roles. Of course, one or two might emerge as major characters, but these are always exceptions.

Mistake 4: The Lord Kelvin Syndrome

Lord Kelvin, born 1824, is the physicist famous for having his name put to the Kelvin temperature scale. Unfortunately, he's perhaps equally famous for the number of hopelessly pessimistic (and totally wrong) predictions he made about all manner of emerging technologies—such as his blunt statement in 1897 that "radio has no future", or the time he wrote to the Niagara Falls Power Company advising them to "avoid the gigantic mistake of alternating current".

> "Everything that can be invented has been invented." - Charles H. Duell, Commissioner, U.S. Office of Patents, 1899.

> "Inventions have long since reached their limit, and I see no hope for further developments," Roman engineer Julius Sextus Frontinus, A.D. 10.

Lord Kelvin is, unfortunately, just one in a long line of Kelvin-style futurologists. Take, for example, Michelson's famous quote—made just six years before Einstein's revolutionary three papers were published, and quantum mechanics and relativity would change the face of physics—that "the more important fundamental laws and facts of physical science have all been discovered… Our future discoveries must be looked for in the sixth place of decimals." And it's not just modern physicists that have been making these blunders. It goes way back to the Romans, thanks to Julius Sextus Frontinus...

Futurology will always be an interesting field to dabble in, whether you're a writer, a scientist or just a freelance thinker. And past predictions of the future will always be interesting to read, perhaps more for their mistakes than their successes—for through the mistakes, we gain an insight into how we used to think, and how much we've changed.

> People will continue to be stupid well into the future. —internet oracle chihuahuaboy, 2001

NERDLING GOES GEEK!
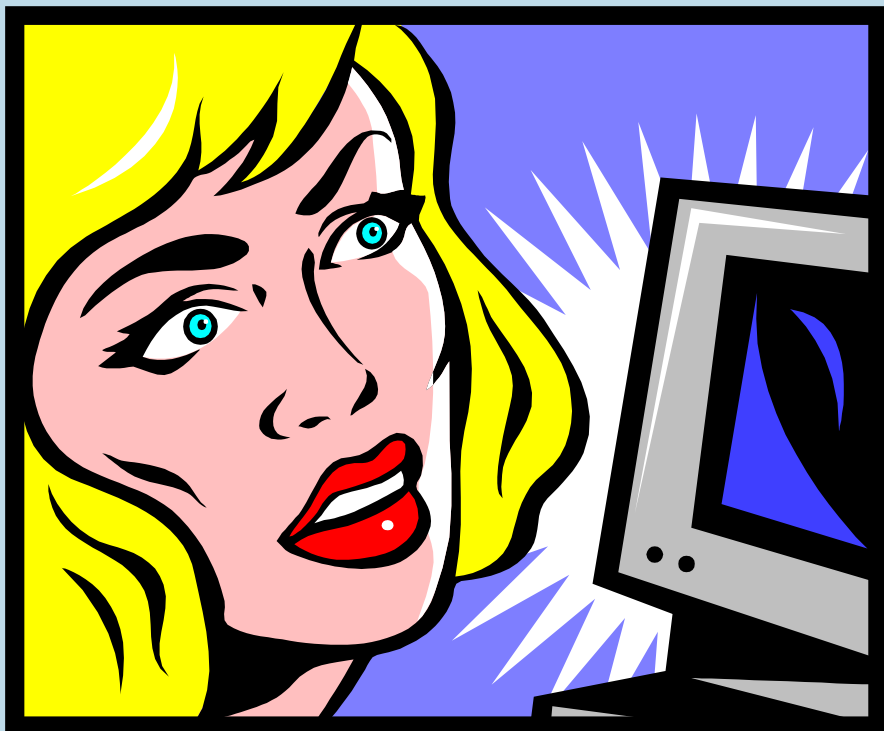
Check out the new *nerdling* website at

>> au.geocities.com/ nerdlingzine <<

...for all issues in
pdf format, nerdling merchandise,
nerd forum, +more!

polyhedra

Or: Otherworldly Messages From the Ghost of Plato

The ghost of Plato has been haunting the **nerdling** offices. Some days he is just a general poltergeist, stealing coffee cups and making adobe acrobat crash and hiding the calculators. But on days of particularly high sunspot activity he becomes more benign and leaves anonymous artwork in our inboxes.

Of course, we're on to him. Right now we're carrying out negotiations with the skeptics' society, who won't let us (yet) take a ouija board into the offices to talk to him. But until then, we've included Plato's otherworldly messages on these pages for you all to see. They all seem to be obsessed about polyhedra. Funny, that.

We'll continue to include them in future issues as they arrive.

icosahedron

The icosahedron is one of the 5 PLATONIC SOLIDS and perhaps the most beautiful

Ancient Greeks associated it with the 'element' water because the roly-poly ball shape suggested the flowing motions thereof.

icosahedron

In nature, some viruses & radiolaria have icosahedral symmetry.

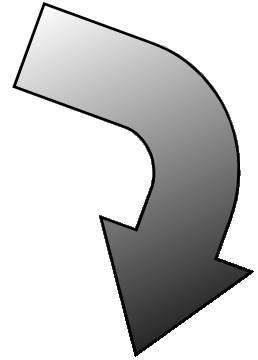Tigers do not. Nevertheless, poet William Blake flipped out over the 'fearful' symmetry of a tiger.

The icosahedron, which has 31 more axes of rotational symmetry than a tiger, would have given Blake an apoplexy.
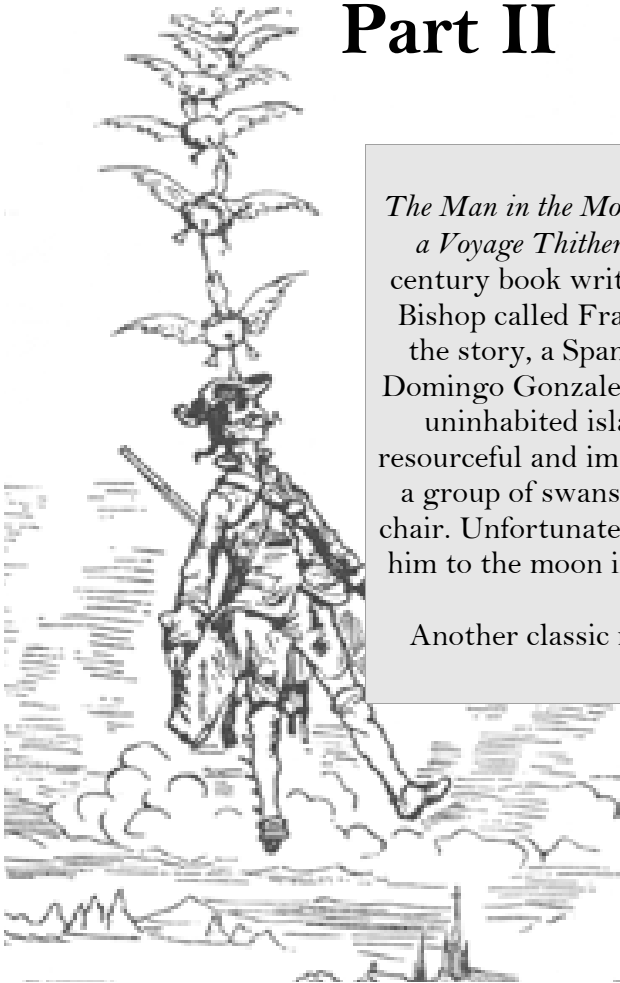
the nerdling t-shirt

coz it's hip to be a square

nerdling zine

turn to the dork side

For ordering details see the **nerdling** website at au.geocities.com/nerdlingzine

Classic Moments In
Old Sci-Fi

Part II

The Man in the Moon, or a Discourse of a Voyage Thither is an early 17th century book written by an English Bishop called Francis Goodwin. In the story, a Spanish sailor named Domingo Gonzales is stranded on an uninhabited island. Being very resourceful and imaginative, he trains a group of swans to carry him in a chair. Unfortunately, the swans carry him to the moon instead of to Spain.

Another classic moment in sci-fi.

HOW TO LEAVE THE PLANET
FOR UNDER FIVE BUCKS

OK, so you wanna be a spaceman—but you're not a South African internet magnate, a Californian financier or a member of a boy band, and that $20 million the Russians are asking for is just a little bit hard to come by. Never fear! With a few household items and some tips from history and sci-fi, you too can explore the final frontier. Read on, fearless travelers, and learn.

Method 1: Be in the right place at the right time.
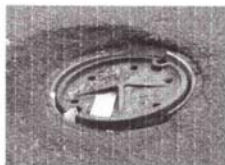
In the summer of 1957, astrophysicist Bob Brownlee put a bomb equivalent to a few hundred tons of dynamite at the bottom of a 500-foot vertical tunnel in the Nevada desert, and sealed the opening with a four-inch thick steel plate weighing several hundred pounds.

After the blast, high-speed cameras caught the giant manhole cover as it began its unscheduled flight into history. Brownlee estimated that the steel plate was traveling at a velocity six times that needed to escape Earth's gravity when it soared into the sky.* Some people believe this manhole cover to be the first ever man-made object in space.

It is immediately obvious to aspiring space travellers that this method could be adapted to human transportation. The logistical difficulty is of course finding a location that has both underground atomic testing, and manhole covers. While the main street in Muraroa Atoll is unfortunately lacking in the latter, experts are keeping an eye on New York's unstable political climate with great hopes.

Method 2: Join a gun club.

In Jules Verne's novel *Round the Moon*, three moustachioed English gentlemen indulge their fantasies of going to the moon by exploiting their mates in the Gun Club—they fire themselves to the moon inside a big cannon-ball. After much planning, it is decided that "the projectile should be of aluminium, with a diameter of 800 inches... that the cannon be a cast-iron Columbiad 900 feet long... [and] that the charge should consist of 400,000 lbs. of gun-cotton." Using the detailed descriptions given in the book, together with a little bit of ingenuity and a good pile of scrap metal, it should be possible for the lunar enthusiast to re-enact the flight of Michel Ardan and his men on a tight budget.

*Info from Feb/March 92 issue of Air & Space (Smithsonian) magazine.
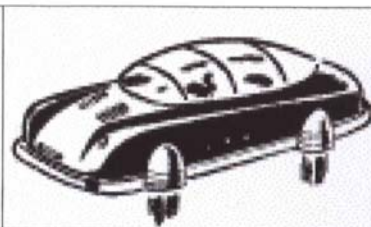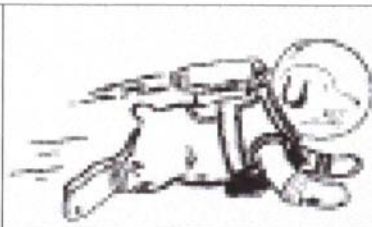
Method 3: Observe nature and learn.

The hero of Cyrano de Bergerac's 1656 novel *Voyage to the Moon* hit upon an idea that is years ahead of what NASA is doing now. He noticed that at dawn, dew was drawn upwards by the sun; so, he tied vials of dew to his waist and launched himself upward by the power of evaporation. He had to break a few bottles to keep from sailing right past the moon, but unfortunately he broke too many and returned to earth. Space travelers should take care to learn from his experiences.

Method 4: Chant the holy names of God.

In the book *Easy Journey to Other Planets*, the founder of the international Hare Krishna society gives us practical and straightforward instructions on how to travel into space. All one must do is direct the air containing your soul to the point between your eyebrows, and out through your skull:

"The spiritual spark, the soul, is floating on air within the body, and inhalation and exhalation are the waves of that air containing the soul. Therefore the *yoga* system is a materialistic art of controlling this air by transferring it from the stomach to the navel, from the chest to the collarbone and from there to the eyeballs and from there to the cerebellum and from there to any desired planet. […] The *yogi* then concentrates the vital force in the middle position, that is between the eyebrows. At this position, the *yogi* can think of the planet into which he wants to enter after leaving the body. For the perfect yogi who has gained success in the method of leaving his body in perfect consciousness, transferring from one planet to another is as easy as an ordinary man's walking to the grocery store."

It's almost *too* easy.

Method 5: If all else fails, follow the advice of Douglas Adams.

How to Leave the Planet:

1. Phone NASA. Their phone number is (731) 483-3111. Explain that it's very important that you get away as soon as possible.

2. If they do not cooperate, phone any friend you may have in the White House – (202) 456-1414 – to have a word on your behalf with the guys at NASA.

3. If you don't have any friends at the White House, phone the Kremlin (ask the overseas operator for 0107-095-295-9051). They don't have any friends there either (at least, none to speak of), but they do seem to have a little influence, so you may as well try.

4. If that also fails, phone the Pope for guidance. His telephone number is 011-39-6-6982, and I gather his switchboard is infallible.

5. If all these attempts fail, flag down a passing flying saucer and explain that it's vitally important you get away before your phone bill arrives.

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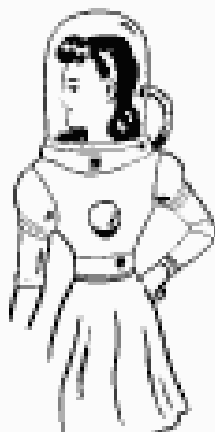
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