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Gift horses

Some years ago I had the pleasurable experience of living in Brazil. The majority of the population were under 21 and had an infectious, anything-is-possible approach to life, famously expressed in football, music and dancing. The Brazilians were then building what is still the largest hydroelectric scheme in the world (10,000 MW) and had discovered oil. Young people saw themselves creating the future and wanted to do real things like engineering, medicine and architecture. During a recent visit I found attitudes had not changed, the economy had grown significantly, the prestigious new business school in Rio was being led by an electrical engineer and the girls in Ipanema were alive and well.

A similar challenge and opportunity faces all young people today and it is paradoxical that UK engineers feel so misunderstood and unheeded when the opportunities in engineering have rarely been better. Whether one is tackling the Government's targets for renewable energy or simply craving a civilised lifestyle, the future is in engineering. How else will we succeed with combined heat and power systems in the home without mechanical, electrical, electronic, control and computing engineers? How will we harness wind power without civil, mechanical, electronic

and electrical engineers? What new designs of turbine and generator are needed to utilise the biomass fuels? What about solar energy, photo voltaics, nuclear fission, nuclear fusion and wave power? What about the ICT revolution and its impact on home entertainment, education, jobs and culture? **and**, how will we progress any of these unless we work in collaboration with the many other engineering institutions and profes-



sions that deliver them? These are not merely opportunities they are gifts. If we do not accept them, someone else will!

"It is paradoxical that UK engineers feel so misunderstood and unheeded..."

"... if we do not accept them someone else will..."

We are trying. Your Regional Branch has this year successfully hosted a Faraday Lecture on technologies which reduce domestic waste and encourage easy living, delivered an EMPEI pres-

tige lecture on how young Ellen McArthur (from East Midlands!) circumnavigated the globe single-handed in a boat put together with an enormous range of engineering technologies and skills. It has organised a conference on sustainable issues, is representing the profession

on the Regional Energy Task Group, seeking closer collaboration with industry through the IEE Business Partnership

initiative and engaging with the other institutions through EMPEI. As a Branch and on its Committee we need young blood to help us. Please contact me or any committee member if you feel you have something to offer.

Dain Phoenix

Chairman, East Midlands Branch, IEE



The EMPEI Prestige Lecture reported on the technology behind Ellen MacArthur's triumph

Don't forget the Branch AGM & Chairman's address:

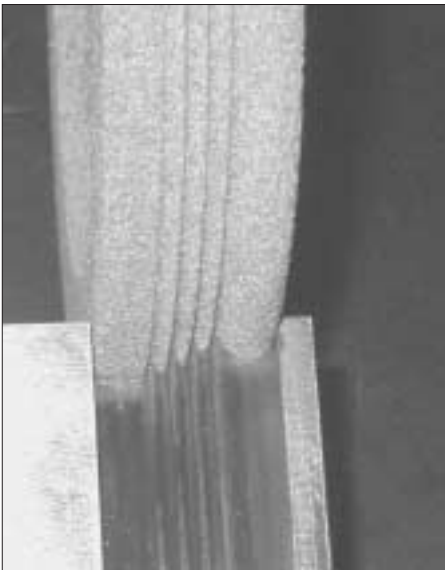
Tuesday 14 May 2002

See programme for details

Good News in Manufacturing

Amid many gloomy reports about UK manufacturing, engineers who attended the Open Day at the Rolls-Royce Manufacturing UTC at Nottingham University had good reason to return to their works with a spring in their step.

Derek Toller, Head of Manufacturing Technology at Rolls-Royce, told the visitors about the University Technology Centre concept which has now been used by Rolls for 10 years with 19 Centres now in operation. Two of these, the Manufacturing Technology UTC and the Transmissions Systems UTC, are located in the School of Mechanical, Materials, Manufacturing Engineering and Management (4M) of the University of Nottingham.



A Viper grinding blade root test piece and the profiled wheel

Although the Manufacturing Technology UTC is the newest of them, the Rolls-Royce experience of the concept has convinced it that an opportunity exists to involve other companies to gain mutual benefits and significantly enhance the world position of manufacturing research in the UK. The continuing trend towards *buy* rather than *make in-house* heightens the importance of co-operation with partners and the supply chain and for the need to be excellent at "what we do". The Universities, as centres of excellence, offer this expertise in research into fundamental processes and systems, with the opportunity to be much more responsive than industrial development and production departments.

Professor Nabil Gindy, Director of the Manufacturing Technology UTC, covered the wide range of manufacturing



Triaxial braiding a test A-pillar preform for the Aston Martin Vanquish

research interests in the M4 School, its links with other universities and to organisations such as PERA. He referred to the newly established Innovative Manufacturing Research Centre at Nottingham. Professor Ian Pashby complemented this presentation with a description of the range of undergraduate, taught full-time and IGDS postgraduate courses available. These presentations showed the range of potential industrial involvement ranging from the offer of a vacation placement to an undergraduate, through sponsorship and scholarships to major long-term research contracts.

The meeting then split into groups for a whistle-stop tour of a selection of manufacturing research projects in the School.

The range included fixture performance in Viper (Very Impressive Performance Extreme Removal) grinding, super-plastic deformation modelling, laser drilling, performance of machine-tools with unconventional kinematics, characterisation of tool cutting anomalies, photometry in robot drilling, manipulation of textiles and the control of impregnation in composites, the performance of hot and cold material spraying processes and human interactions in virtual factories. If you failed to respond to the "whistle" at each stop, the risk of becoming lost and then assimilated into the nearest project team seemed quite high!

The poster-session lunch with researchers gave a chance to explore interesting details. My impression was of



Purchasing manager, designer and project manager in a virtual enterprise

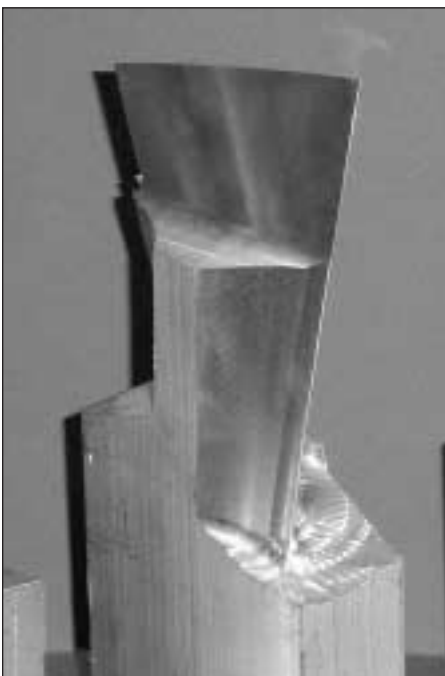
Good News in Manufacturing - continued

the wide range of skills available and how these and the instrumentation, experimental design methodology and mathematical techniques were applied across the research.

In the afternoon, Rolls-Royce expanded on how their experience with UTCs had solved what had initially seemed major problems in areas such as intellectual property rights and management of projects. They now wished to encourage other enterprises to share in these solutions and, by extending the University Technology Centre idea to a University Technology Partnership, to enhance manufacturing capability for all. Furthermore, there are particular incentives for collaboration in connection with European Sixth Framework bids. The visitors, representing major manufacturers in the UK, responded positively to these idea and a series of individual meeting is likely to follow.

The Rolls-Royce Manufacturing Technology UTC plans to repeat the day for machine tool manufacturers and for suppliers. In any event, if your company or institution is interested in involvement, then you are invited to contact nabil.gindy@nottingham.ac.uk or derek.toller@rolls-royce.com

John Prentice



Test piece from Variax non-conventional kinematics machining centre

Young Engineers and Scientists of Derbyshire Rise to the Challenge



The KS4 winners were from Kirk Hallam CTC seen here with their vehicle and awards

On Friday 8 February the University of Derby hosted 29 teams from Derbyshire schools which had come to compete in the twenty-fifth *YESD Design Challenge*.

The competition is intended to give children in secondary education an idea of the excitement and challenge of solving an engineering design and make problem, working as a team and to a deadline.

The students work on a problem in teams of three and, this year, there were 19 teams from Key Stage 3 (11 to 13 year olds) and 10 teams from Key Stage 4 (GCSE years). These teams were the cream of entrants, with some schools

having held heats to get the maximum entry of three teams per age range.

This year's task was to design a vehicle and mechanism to drop a ball bearing onto a target or, in the case of Key Stage 4 students, to drop two balls, one on each of two targets. Figure 1 from the competition handbook gives an impression of what faced the young engineers.

The value of planning, done in school, before the competition was evident as materials were "bought" from the stores and work commenced. The frustrations and joys of testing and developing a

continued on page 5

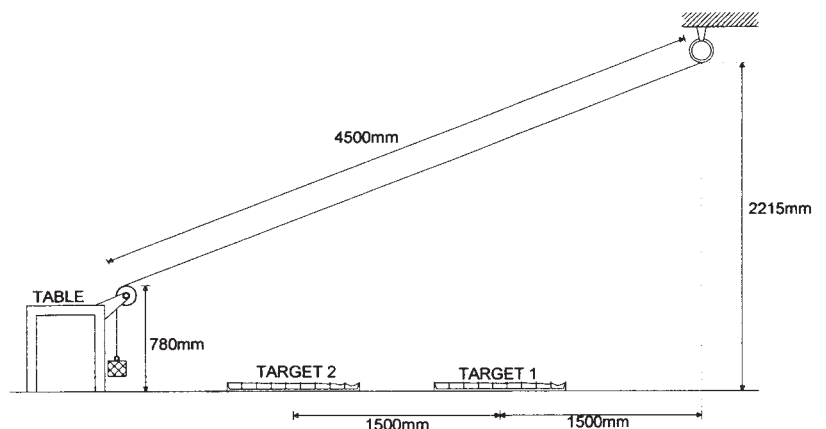


Figure 1. - Side View of Cable and Target Positions

Stereotypical truth?

A man in a hot air balloon realised he was lost. He reduced altitude and spotted a man outside a pub below. He descended a little more and shouted to him, "Excuse me, can you help me? I promised a friend I would meet him an hour ago, but I have no idea where I am". The man below shouted back, "Well, you're in a hot air balloon floating approximately 30 feet above the ground. You're between 40 and 41 degrees North latitude and 59 and 60 degrees West longitude."

"Ummm", said the balloonist, "you must be an engineer". "I am", replied the man below. "How did you know that?" "Well", answered the balloonist, "everything you've told me is technically correct, but I have no idea what to make of this information, and the fact is I'm still lost. You've been absolutely no help whatsoever". "You must work in Sales", the man below replied. "I do", replied the balloonist, "How did you know that?" "Well", replied the man "you don't know where you are or where you're going. You made a promise for which you had no idea how to keep, and you expect me to solve your problem. You are in exactly the same position now that you were in before, yet now, somehow, it's my fault!" Meanwhile, all the creatives looked out the window of the pub and sadly shook their heads.

from Esther Prentice



The Mayor of Derby speaks at the East Midlands Faraday Dinner

Smart Living @ home with Technology – The 2001/2002 Faraday Lecture



Audience members respond to "control signals" Olbo is in the background

Who stole the show? Olbo a small voice activated robotic dog that walked, danced and sat to command. You should have heard the "ahs" from the audience when he was told off as part of his training.

Over 1600 pupils, staff, members, guests and members of the public came to the Derby Assembly Rooms for the Faraday Lecture in January. Although the lectures are written for 14 to 16 year olds they interest and entertain a much wider age range as was evident at this year's lecture "Smart Living @ home with technology".

Do you want to see who's stealing the chocolate from your fridge while you are out of the house? Through the young engineers presenting this year's Faraday lecture we explored the home of tomorrow. We saw a robotic vacuum cleaner, talked to Tom who was the human face of the computer that managed all the technology in our smart home and learnt about the different ways of controlling all the technology. Most of the smart devices, miniature cameras, touch screens on fridge doors, movement sensors to control lights and many more are available today. What the lecture showed was how these could be integrated to manage and monitor the home even when we are at work or on holiday.

A more serious point addressed was the ability to support and monitor those who live alone, particularly the elderly. They could have reminders to switch off the cooker if they forget or to take their tablets, detected if the bottle has not been

moved, or to automatically send an alarm if they don't get up in the morning. The monitoring has the potential for being supportive without being too intrusive.

Pupils had clear views when asked if their future homes would be like the smart home. "I don't know" said one "it might cost too much.", "It could make me lazy" said another "I don't want that". They all agreed however, that they liked the idea of technology working for them.

The pressures on the young presenters are enormous, they had to learn 35 pages of script and developed the skills to bring the lecture to life, which they did so well. The pressure was even greater for two of the presenters, Clair Williams and Nick Barker who were on their home patch and had their families and work colleagues present for the evening lecture.

The dinner after the evening lecture brought together; the presenters, the Mayor of Derby, IEE members, guests from industry, education and link organisations. It was an enjoyable end to a successful day.

Tickets were not issued for the lecture, instead bookings were taken by an internet/email system. On the whole this worked well and it certainly cut down on administration and postage. However, there are some things that could be improved, so please let us know if you have any thoughts for improvements.

*Alan Wright
Regional Organiser, Faraday Lecture*

Calling All Younger Members

Are you under 30? We are seeking you to help expand our present Younger Members Committee and looking for people who can help from all over the East Midlands. As the East Midlands is a large area, we need different people from all over the area to help organise different activities. This will help provide technical support and professional development in all aspects of engineering life for younger members.

It doesn't matter if you are a student, or even at work. If you are interested, you can come and observe our meetings. They are once a month in the Toby Carvery, Wollaton, Nottingham.

Further information from the Hon. Sec. Alan McPherson by e-mail on eastmidlands_yms@iee.org or 0115 8756158

YESD Rise to Challenge *from p3.*

design were clear from the students' faces.

The teachers who came were not allowed to rest either. They were given the task of designing and making a vehicle to travel **up** the runway using falling weights as a source of energy. (For the record both teachers' teams produced designs which "showed great promise")

Awards went to Derby Grammar School, Kirk Hallam CTC and Merrill College.

The event is sponsored by the University of Derby, who also awarded a prize for innovation, and more than a dozen local companies. If your company would like to be involved, or you could assist personally with organising and running the competition in coming years, then you are invited to contact Mike Lynch, the secretary of the YESD organising committee at irenemik@onetel.net.uk

John Prentice



Teachers getting ravelled up!



THE INSTITUTION
OF ELECTRICAL
ENGINEERS

East Midlands Branch
Leicester District

POWER SECTION
CHAIRMAN: Nigel Parlor MBA AMIEE
East Midlands Electricity

Tuesday, 07th May 2002
at 7.00pm (tea at 6.30pm)

Embedded generation - Destined for Growth?

Prof. Nick Jenkins
UMIST

Synopsis

At present less than 10% of the UK electricity demand is supplied by embedded generation. This lecture examines the drivers for capacity, describes current developments in technology and considers the connection issues to the electricity grid.

VENUE:
**Charles Wilson building, Leicester
University**

(See web site below for detailed map)

Visitors Welcome

please advise intention to attend to <peterholmes@iee.org>

Visit the East Midlands Centre Web Site on:
<http://ion.le.ac.uk/iee>



Derby Grammar, winners in the KS3 section

Another East Midlands "Record" Event

Once again the East Midlands Prestige Lecture attracted nearly 1000 ticket applications (we believe this is the record number for any IEE-sponsored event anywhere in the UK in 2001) - with some 100 people having to be turned away. IEE members and guests joined colleagues from nine other institutions on December 5th 2001 to hear Merfyn Owen CEng MRINA (Owen Clarke Design Partnership) describe the Kingfisher yacht in which Derbyshire, 25 year old, Ellen MacArthur became the first woman to sail single-handed around the world, coming a close second in last winter's Vendée Globe Race.

Merfyn inspired his audience ("Brilliant" - an IEE member's wife) with the story of the UK design process. The key principles were to focus on safety and reliability, to build a "slightly less powerful" boat but with a high power/weight ratio, with no untried radical options. "Alone 1000 miles from land is not the place to pioneer". Kingfisher's distinctive cambered deck, for example, is there to give stability if inverted!

Tank and wind-tunnel testing at Southampton University's Wolfson Unit combined with Wolfson's world-leading sailing performance prediction software led to an optimum hull form rather narrower than conventional for the class. Design features such as the twin hydraulic-powered tilting dagger boards



Ellen MacArthur onboard Kingfisher (and out of the wild weather)

and special ultra-lite cameras to keep the world there with Ellen on the boat illustrated the combination of professional expertise involved. Building and fitting-out the carbon-fibre hull in New Zealand enabled Ellen's 'trial run', through the southern oceans and round Cape Horn to the start-point in France, to test Kingfisher and herself in some of the worst waters in the world.

Merfyn emphasised a key to success was 'team management' with a "no blame" philosophy. At a special Schools afternoon event Merfyn explained how he became a yacht designer and Chartered Engineer and started his own business which now employs six people. His mother is still waiting for him to get a "proper job".

The Annual Prestige Lecture is produced by the East Midlands PEI on behalf of the

sponsoring institutions and the Campaign to Promote Engineering, with financial support this year from Kingfisher plc. Robin Smith FIEE organised this year's highly successful event.

Hans Butler, MIEE - for East Midlands PEI PR Committee (with acknowledgments to Robin Smith)

EMPEI "the united voice of the engineering profession in the East Midlands"

**Technical and General Interest
Visit to**

Royal Mail Sorting Office

Padge Road, Beeston

**Tuesday 21 May 2002 registration at
6.15 p.m.**

What happens after you've posted your letter to Aunt Betsy?

How is tiered mail delivery organised?

What new technology is used?

Is Postman Pat real and who feeds his black & white cat?

Come and see, enjoy and earn some of your "posty's" secrets.

Places will be limited & will be allocated on a 'first come, first served' basis.

There will be no charge for attendance on this visit

To book please contact Nigel Parlor by:

Email: nigel.parlor@eme.co.uk or

"Royal Mail", Nigel Parlor, East Midlands Electricity, Herald Way, Pegasus Business Park, East Midlands Airport, Castle Donington, DE74 2TU.

With the following information:

Name

Company/Affiliation

Email/Postal address

Daytime telephone.



from left: Hans Butler, Merfyn Owen CEng MRINA, David Rhodes [Chair E M Branch, IEE], John Parry [Chair Prestige Lecture Committee], Robin Smith [Lecture Organiser]

Branch Organisation

The list of officers of Districts etc. given below is an update of that given in *East Midlands Focus 13*:

Junior Vice-chair: (*elected in February but details omitted from AGM and Programme through error by Hon Sec - sorry*)

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Derbys/Notts: have opted for a rotating convener for the present. Their contact person is:

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Leicestershire Chair:

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Snippets

Honorary Branch Membership

You are automatically a member of the Branch corresponding to your home postcode. You can be an Honorary Member of one or more other Branches by contacting Norman Wake at Michael Faraday House, Stevenage. e-mail: NWake@iee.org.uk.

As an Honorary Member you should receive the annual programme, flyers for events and the Newsletter. This should be especially useful to students or members working away from home on long-term contracts.

Branch Publicity Mailings

Headquarters is now providing Branch Committees with data on membership on a monthly basis. If your e-mail address is registered with the IEE and you have not declined information from the Institution by e-mail then you should have been sent an individual invitation to the Branch Annual Dinner.

We are very anxious not to burden our members with what they may see as junk mail or spam, but e-mail is a very cheap way of distributing attractive, potentially full-colour, information to you. The guidelines we have adopted are simple:

E-mails will give a very short description of an event and have a link to a web page giving the full details (typically as a poster you can print and display to interest your colleagues in the office)

No more than two e-mails will come from the East Midlands Branch each month

Each e-mail will say how you can stop further ones being sent.

Please write to the editor with your thoughts on e-mailing publicity.

We would also like to use conventional mail to remind members who have recently attended our events of forthcoming activities which might interest them. This will require capturing more than just a signature in the attendance book at a meeting but we hope that it will help encourage members to attend the local events which are generally presented to a very high standard.

A double loss

With sadness we report the deaths of two members of the Branch who have been active contributors to its activities over the years.

Tony Claridge worked for many years in the nuclear industry. He was a man with very many interests, editing the local newsletter for the Institute of Advanced Motorists, participated in IEE Retired Members events and recently completed a comprehensive series of articles on the

mysteries of all aspects of electromagnetics for a model engineering journal.

Philip Jordan was a manufacturing engineer who worked for much of his career in the machine tool industry. He was a past chairman of the IEE East Midlands Centre and devoted a lot of his energies to encouraging young people to seek careers in engineering.

We give thanks for their lives and remember their families at this time.

John Prentice

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*For other Branch Committee members,
membership advisors etc. see page 7
and the Programme booklet*

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February 2002 (rev A1)

Contributions from members of meeting/visit reviews, letters to the Editor, Bee in my Bonnet and Brain Power for subsequent issues will be much appreciated.

The copy date for *East Midlands Focus 15* is Monday 29 April 2002, publication with *IEE Review* in June 2002.

The opinions in this Newsletter are those of the authors and not necessarily policy of the Institution.

Web Links

Visit the Branch Website at:

<http://ion.le.ac.uk/iee>

for the latest details of Branch Events and

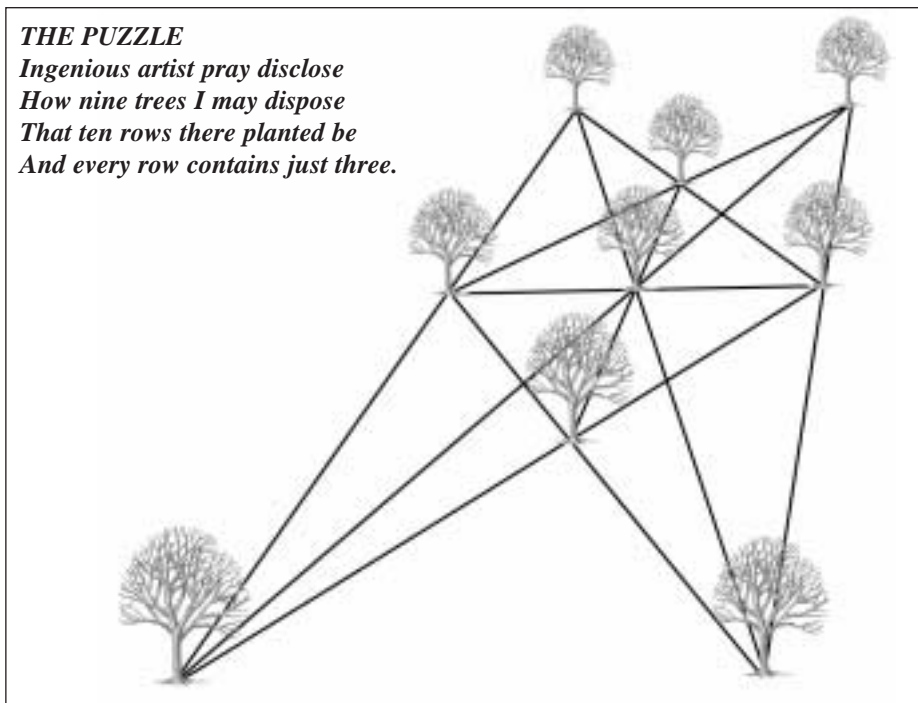
<http://local.iee.org/eastmidlands/yms>

for further information on Younger Members activities.

Brainpower 13 - solution

THE PUZZLE

*Ingenious artist pray disclose
How nine trees I may dispose
That ten rows there planted be
And every row contains just three.*



Brainpower 13 was supplied by Tony Claridge, notice of whose recent death appears elsewhere in this issue. Tony, in not supplying a solution, generously told me that I should have no difficulty in solving the problem in 10 minutes. This opinion proved far from true and it is to Elizabeth Dunford, a mathematician friend, to whom I am indebted for the

solution. I have contributed some graphics to her diagram and it is reproduced above.

Her solution is particularly valuable as I have, most unusually, received no letters from you dear readers. On this occasion it seems to be Mathematicians 1, Engineers Nil!

Brainpower 14

Perhaps the difficulty with the trees was that the problem was too geometrical. The problem for this issue is numerical and above all requires you to exercise your powers of inference. Even when solved, the clear presentation of the solution is non-trivial.

After evensong in a small church the vicar remarks to the sexton that the product of the ages, in whole years, of the three members of the congregation is 2450, and the sum of their ages is exactly twice the age of the sexton. He suggests that the sexton could try to work out the ages of each of the three worshippers.

A few days later the sexton berates the vicar "You have not told me enough information to solve the puzzle". The vicar looks at him and sarcastically asks "You do know your own age I suppose?"

and without waiting for an answer says to the sexton "I am older than any of you. I am sure you can solve the puzzle now."

From this narrative deduce the age of all three worshippers, the sexton and the vicar. You may assume that all the ages line in the normal human life span and are integers.

This puzzle was also supplied by Tony Claridge and is dedicated to his memory.

John Prentice



Lost for words

If people from Poland are called Poles why are people from Holland not called Holes?

If you take an Oriental person and spin them around several times do they become disoriented?

via Tony Johns, Mentoring Officer