

more maths grads



more maths grads
multiplying opportunities

newsletter

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

The sky's the limit with Maths!

Project Manager Makhan Singh finds the Maths behind the famous Cat

Having worked quite closely with Jaguar over the past decade, both as an engineer and as an educationist, I had the privilege of once again being reunited with this great company a few weeks ago.

Jaguar is a place where Maths comes to life - from the complex formulae used in the early stages of car design to the logistics engineers working out the transport plans for parts supply...Maths is everywhere you look at Jaguar!

Chatting with the enthusiastic kids from Archbishop Illsley Technology College who joined us for a tour of the Jaguar Visitor Centre - I was taken down memory lane when explaining to these excited Key Stage 3 pupils why I choose a STEM career as my first port of call. My simple answer was this - if you are creative and want to make a difference in the world - then a career in STEM is a great way of doing just that...and

if you go onto study an A Level and a degree in Maths, then the opportunities are virtually limitless - as cliché as it sounds - the sky's truly the only limit!

I now refer to the More Maths Grads team as the M-Team (some of you maybe be old enough to remember an iconic TV hit called the A-Team which I base this on!). Our mission is simple: to engage the hearts and minds of young people with the beauty of our subject.

The M-Team have a passion for their subject. I am very proud to be working with a group of people who are not afraid to exert their energy and drive into promoting the subject which they think is so special and important. Maths is more than just numbers. It plays a key role in the development of society and the world around us.

Around 10,000 pupils have so far engaged with More Maths Grads. Our impact evaluation is telling us that we

are doing a great job and going in the right direction towards changing the perceptions of maths as a subject. Our project has come a long way and I believe the new academic year will bring even further successes.

We have so much planned for the 2008/09 academic year, from a maths DVD to several competitions already on the go (check out www.mathscareers.org.uk)! And now I find myself feeling like I am back at school, citing the old classic catchphrase the leader of the A-Team used to say. So as I sign off for another jam packed newsletter (you know the drill by now - grab a cuppa and enjoy!), can I say, in celebrating our success to date, "I love it when a plan comes together!"

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top to bottom:

Jaguar employees give a thumbs up to More Maths Grads;

Kids pile in!!!;

More thumbs up from Jaguar team and the pupils from Archbishop Illsley Technology College

Out There!

The recent away day saw everyone in the More Maths Grads project getting into the spirit of sharing and being creative.

One of the topics we discussed was what will happen after the three-year

turn to page 2 for more...

Regional Roundup

Out There! ...contd

More Maths Grads project comes to an end. We talked about what legacies we would like to leave behind and the teams were asked to put their thoughts down onto a More Maths Grads tombstone! In true creative style, the teams came up with some amazing thoughts. It was a great team-building event which got the team sharing in each others passion and enthusiasm. The next away day is planned for spring 2009 and in the meantime I'll let the pictures do the talking ...



More Maths Grads away day, benchmarking and sharing...it's good to talk!

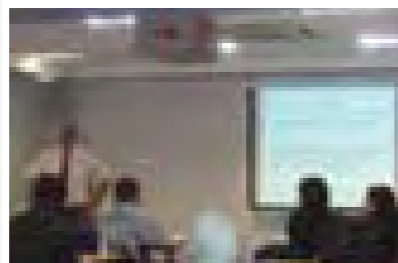
East London

Ahh – the new academic year... For all the teachers reading this, Zia has some sympathetic words for you:

"If a doctor, lawyer, or dentist had 25 people in his office at one time, all of whom had different needs, and some of whom didn't want to be there and were causing trouble, and the doctor, lawyer, or dentist, without assistance, had to treat them all with professional excellence for nine months, then he might have some conception of the classroom teacher's job."

Colman McCarthy, The Washington Post

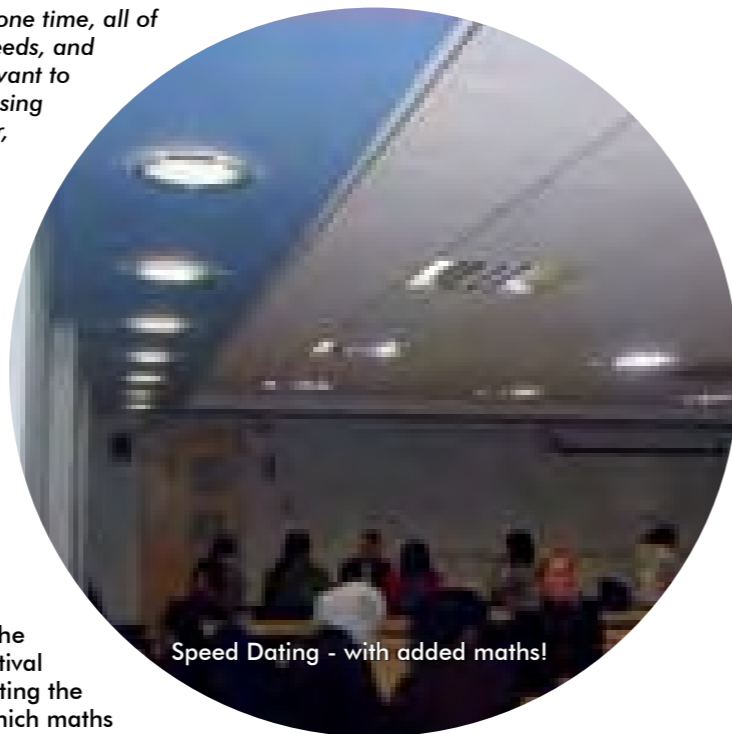
More Maths Grads spent two days in a very wet Liverpool at the British Association Festival of Science, demonstrating the fascinating ways by which maths and science can be communicated interactively. Judging by the efforts



GSK's Graeme Archer & Rachel Moate talking to students about pharmaceutical statistics

of young and old to complete puzzle cubes, solve mathematical challenges and take part in science activities, interest in maths and science is alive and well in the UK.

Closer to home, we held a Maths Works day in September together with the Education Liaison department at Queen Mary. A total of 82 students and their teachers attended from Tower



Speed Dating - with added maths!

Hamlets to take part in various sessions including Cryptography, Finance, Pharmaceutical Statistics and Speed Dating. Many thanks to all involved including the ambassadors from HBOS, One East, Queen Mary, Commtech, Buro Happold, Watermans Structures, PSI representatives from GlaxoSmithKline. We would also like to thank the Science and Engineering Ambassadors Programme. The event was a great success with over 90% of the students attending telling us they found it useful or very useful. We plan to run more of these events later this year and make them available to other London boroughs.

More Maths Grads also delivered a session encouraging undergraduates to get involved in ambassador, teaching and mentoring schemes. Over 60 Queen Mary students attended an hour-long session discussing a range of initiatives from the Student Associates Scheme to volunteering at Queen Mary's new Centre of the Cell interactive science education centre.

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Yorkshire and Humberside

While most people were having a well deserved break, August wasn't only about holidays for a group of young people from the Leeds area.

More Maths Grads had teamed up with the educational charity Reemap in order to offer a summer taster day showing students the interesting opportunities which maths, science and engineering can offer.

Reemap is a local charity working to raise educational attainment and aspirations amongst black and ethnic minority pupils in West Yorkshire. A group of 30 of these pupils attended the Maths and Science Taster Day on their first trip to Leeds University.

The taster day was also a collaboration with the Faculty of Engineering, where Dr Andrew Weightman introduced students to some exciting and high level experiments, including looking at the optimisation of a skeleton bobsleigh which was used at the Olympics. In a different session, pupils were given the chance to do some problem solving in the Mathematics Department using the FunMaths Roadshow. To help them understand their choices after school or college, they also attended a session on



Students at the FunMaths Roadshow engage with maths related activities and - what else? Have FUN!



Higher Education delivered by the Access and Community engagement team from Leeds University.

The day had excellent feedback, with 57% of students saying they are more likely to study maths and science as a result of the day. It was great to be able to use the expertise available from the University as well as from Reemap to put on an event of



this kind. More Maths Grads in Yorkshire and the Humber is looking forward to putting on similar days for schools throughout the year, working to widen participation in these key subjects.

www.maths.liv.ac.uk/lms/funmaths
www.reemap.org.uk

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West Midlands

The West Midlands team presented their findings to date about teaching and learning of mathematics at two conferences: the Continuing Excellence in the Teaching & Learning of Maths, Stats & OR 2008 conference in Lancaster and Coventry-based iPED (Inquiring Pedagogies) Research Network 2008 conference.

We also spent an evening promoting mathematics to local school pupils and their parents at the annual Connexions Careers evening in Leamington Spa. We were encouraged to see so many enthusiastic parents and youngsters enquiring about careers in mathematics.

At the recent British Association Festival of Science in Liverpool the MMG stand was inundated with young people doing the infamous More Maths Grads cube puzzles. In fact the puzzles proved so popular our West Mids officer Ewan had to call for fresh supplies mid-afternoon!



The confounding MMG cube puzzle!

Watch this space and our website for further information on the Student Ambassador Placements, a More Maths Grads-Maths Inspiration joint event in Birmingham in November and the Teachers Residential Conference.

There is also a season of employer led sessions at Coventry University and local schools coming up.

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Look out for the special feature on the Nuffield - More Maths Grads placements in the News and Features section.

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Curriculum News



Neil Challis as seen on Youtube speaking about More Maths Grads at the MSOR Conference

One event of note for the curriculum theme in the last two months was the presentation of a workshop at the MSOR conference in Lancaster in September.

This was a first opportunity to "go public" with some of our findings from interviews and questionnaires. After considering various alternative formats, we decided to pull out three major themes from our interview analysis and present these together with illustrative quotes for discussion and consultation with colleagues attending the workshop.

The chosen themes were Communities and Support: What methods of support work best, and how can these be encouraged through the development of a lively mathematical community?

Lectures, attendance and engagement: Problems with attendance and engagement

of some students is common - what are the reasons for this and what can we do about it?

You must be really clever if you do maths: Should a maths degree be intrinsically hard? Do students generally expect to find it hard and should they? Do we teach too much?

Although we would have wished for rather greater numbers, the workshop produced interesting discussions and the allocated hour flew by far too quickly. It was interesting to hear how different types of institution implemented student support in very different but equally caring ways. We made useful contact through the workshop with more colleagues from other institutions, notably the University of Hertfordshire and the Open University, which we will shortly be following up.

As if the workshop wasn't sufficient to

get the adrenalin flowing, Neil subjected himself afterwards to the nerve-racking process of being interviewed. The interview, about the workshop and the curriculum theme generally can now be seen on YouTube.

We are currently engaged with writing our findings from the interview analysis and questionnaires rather more formally and aim to publish in MSOR connections and elsewhere.

Work is also proceeding on a feasibility study for a foundation degree in maths and a study of the different methods available for adult learners to access the necessary preparation for a mathematics degree.

To see Neil in action go to: uk.youtube.com/watch?v=7GECCqGXZRI or simply do a search for Neil Challis at: www.youtube.com.

Career in Profile: Aaron Sugarman (TUI Travel)



Aaron Sugarman is the Head of Operational Research at TUI Travel in Luton. His team uses mathematical techniques to find working models and solutions of various organisational problems within the company.

What is your background in Mathematics?

I always liked Maths at school but for a while I thought it would be chemistry which I went on to study at university.

I realised that I was enjoying solving chemical equations more than the other material and my passion for Maths grew from there. I did my undergraduate degree in Mathematics from Oxford and then I did a Masters degree in Operational Research from the University of Warwick.

Can you tell me about your job history?

During my time at Warwick, I completed a three month placement at Natwest where I was looking at how applicants for new accounts are chosen based on past credit. I went on to work for a management consultancy company for two years. During that time I did a variety of interesting work. This included scheduling production for the Ford Mondeo, looking at the effectiveness of the supply chain at Marks & Spencer and also the effectiveness of the Trainline call centre.

What are some examples of typical tasks in your job?

Operational Research is basically applying analytical techniques to solve organisational problems such as scheduling, optimisation etc. and looking at efficiency of various procedures. One typical task here is forecasting holiday demand. In order to do this, we look at trends in historical and recent data across different variables, such as season of the year. We then carry out an optimisation of demand against capacity.

This leads us to the price which we should charge for the holiday which will be best for the company in terms of profit.

Has your perception of Mathematics changed in moving from an education atmosphere to the world of work?

I think one of the most important things to learn quickly in my job is being able to decide what is important and what is not and working to a deadline. There is always a new challenge and a constant supply of fresh problems which require new models to be developed. With Operational Research you are not stuck within one field and that keeps the job varied and exciting.

What skills do you use in your job?

I think that the most important skills required are problem solving ability and communication skills. In terms of problem solving, it is important to be able to clarify objectives, understand a problem and model the factors involved. Equally, it is important that you are able to communicate results and make others understand the ideas.

What are some of your hobbies in your spare time?

I did like rugby when I was younger but lately I have been playing a lot of five-a-side football. I also have a six month old son who keeps me pretty busy!

To find out more about TUI travel, visit the websites:

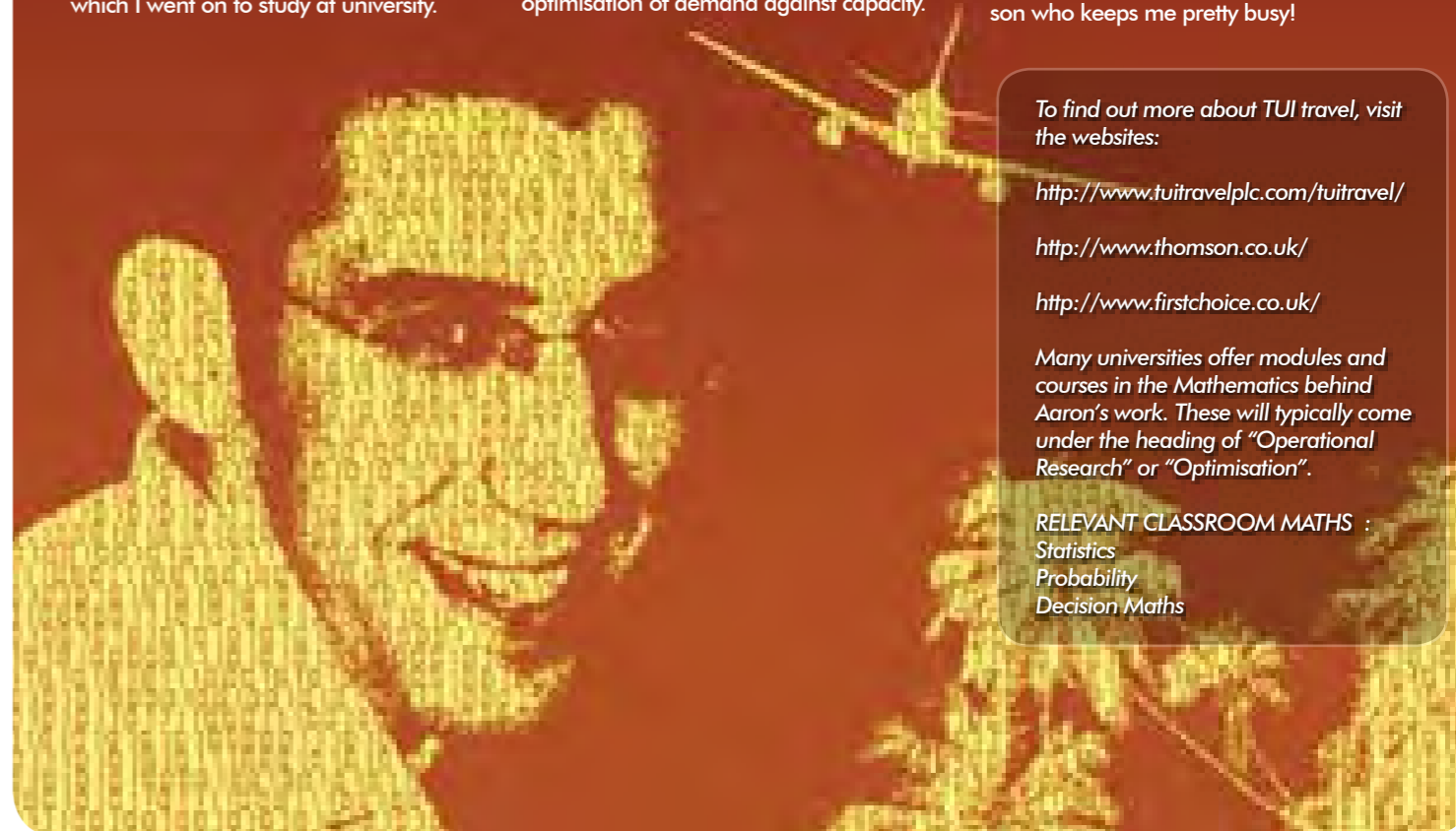
<http://www.tuitravelplc.com/tuitravel/>

<http://www.thomson.co.uk/>

<http://www.firstchoice.co.uk/>

Many universities offer modules and courses in the Mathematics behind Aaron's work. These will typically come under the heading of "Operational Research" or "Optimisation".

RELEVANT CLASSROOM MATHS :
Statistics
Probability
Decision Maths



The Inspirational Corner



Makhan shares a few words with TV boffin Adam Hart Davies at the recent BA Festival of Science in Liverpool.

I had the great privilege of meeting Adam Hart-Davis at the recent British Association Festival of Science in Liverpool.

The popular scientist, author, historian and broadcaster is well-known in the UK for presenting the BBC television series Local Heroes and What the Romans Did for Us.

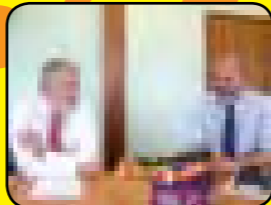
We chatted about the work of More Maths Grads at some length and I was inspired to hear his views about the wonder of maths. He explained, "Maths is the backbone behind all great creations and inventions in civilizations. It is amazing what formulae and calculations can create and give to the world. The world continues to change and grow because of the useful application of maths."

The message is simple but true – maths counts!

Makhan discusses maths and things with Adam Hart Davies

CAPTION COMPETITION

"Duncan and Jim are taking the biscuit with all this sweet talking!"



Winner of last months caption competition is Romilla Devi who sent me the caption: "Duncan and Jim are taking the biscuit with all this sweet talking!" A £10 gift voucher goes to Romilla for sending in the funniest caption!

This month, at a recent Executive Meeting, Nigel Steele (Emeritus Professor of Mathematics Coventry University) and Gerald Goodall (Director of Education and Professional Affairs at RSS) had a few words - but what are they saying?

Think of a caption and email it to the MMG newsletter HQ c/o: m.ashfield@bham.ac.uk

The funniest caption will win a £10 gift voucher and be published in the next edition!



Nuffield Summer Placements

The Nuffield Science Bursary Scheme together with MMG brings schools and industry together

Altogether, More Maths Grads helped 16 Year 12 students from schools and colleges in Coventry and Warwickshire to find placements under the Nuffield Science Bursary Scheme during the 2008 summer holidays.

These research projects, all mathematically-based, were kindly offered by Rolls Royce, Coventry University, Qinetiq, NHS, Women's Business Development Agency and Unipart Group. Details of the exciting projects undertaken are available on the Maths Careers website at www.mathscareers.org.uk.

The Nuffield Foundation paid the students a weekly bursary of around £75 for the duration of their placement and More Maths Grads paid for the students' travel and other expenses.

One student was placed in Coventry University, also home to the West Midlands region of More Maths Grads. Mrs. Sidney Tyrrell, a senior lecturer at the university and the student's supervisor commented, "It has really been fun and inspiring to have enthusiastic young people with fresh ideas on this project. I now have some very good resources which I'm sure will be extremely beneficial to my students."

To find out more about the Nuffield Foundation and Nuffield Science Bursaries visit the website www.nuffieldfoundation.org



"I had not heard about the scheme before, but I was invited to participate in the scheme by the More Maths Grads team. I thought it was a fantastic opportunity which could give my students an insight that they would not get in any other way. We were really grateful as we managed to get three placements. Peter went to Unipart Manufacturing and two other

students went to Rolls Royce, an ideal place to give students experience of real mathematics. As teachers, we can lose touch sometimes with the applications of the subject. Being aware of the jobs out there is crucial for us."

Mr. Martyn Rice, Head of Mathematics Coventry Blue Coat Church of England School and Music College

"There are gaps in life experience in school pupils which are not usually present in university students. I have personally found it very rewarding to have some role in trying to fill some of those gaps between the text book and the real world applications."



Nuffield Placement Supervisor- Andy Dryden, Logistics Manager Unipart Group

For more information about the Nuffield - More Maths Grads placements Contact:

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"The Nuffield - More Maths Grads mathematics placement at NHS Arden Cancer Centre gave me an insight into how maths can be applied in the real world. A lot of people question why they have to learn maths and think they are never going to use it again. Here I have seen how maths can be applied to very important and everyday situations."

Chandni Mistry, Yr 12 Student at President Kennedy School and Community College, Coventry

UK Mathematics Trust



During his travels, Makhan had the pleasure of meeting Mary Wimbury and her team at the headquarters of the UK Mathematics Trust (UKMT) in Leeds. More Maths Grads hopes to develop links with this inspiring maths project, but who are they?

The UKMT was founded in 1996 as a registered charity to advance the education of children and young people in mathematics. The UKMT organises national mathematics competitions and other mathematical enrichment activities for 11-18 year old UK school pupils. These range from popular "mass" Maths Challenges to team competitions, forums for teachers and the selection and training of the UK team for the International Mathematical Olympiad (IMO).

Through the Maths Challenges and team competitions, UKMT aims to stimulate greater interest in mathematics across the 11-18 age group, encouraging participation and rewarding enthusiasm and achievement. Last year over 600,000 pupils from 4,500 schools took part in the three Challenges, the UK's biggest national maths competitions.



UKMT (left to right)
Heather Macklin, Rachel Greenhalgh,
Nicky Bray, Mary Wimbury

MATHS PUZZLER

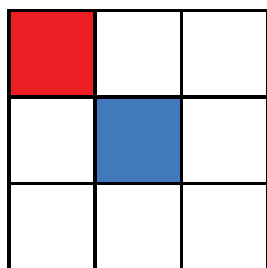
Congratulations to Vijay Kumar, winner of last month's puzzler competition. This month's teaser is contributed by Dr Farzana Aslam:



Play this game on a 3 by 3 square grid.

Two players, Red and Blue, take it in turns to paint a square according to the following rules. A square is adjacent to another square if it shares an edge - so the red and blue squares pictured are not adjacent.

1. You can paint a square your colour if it's unpainted and none of the adjacent squares are painted.
2. You can paint a square your colour - even if it's already painted - if you have more of the adjacent squares painted in your colour than in your opponent's colour.
3. If you can't paint a square your colour, you have to miss your turn.



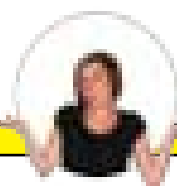
The grid starts blank and ends when neither player can paint any more squares.

A player wins if they have more of the nine squares painted than the other player.

You are playing Red and can go first. Assuming that the Blue player always makes the best moves possible, can you always win? Explain your reasoning.

If you like this puzzle, you might like to think about what happens if you play on a larger grid.

Answers by email to Melanie Ashfield:
m.ashfield@bham.ac.uk - **WIN A £10 GIFT VOUCHER!**



Diary Dates

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oct - nov 2008

22 October

- Langdon Park Community School, Tower Hamlets: Why do A-level maths?
- Enriching Mathematics, Queen Mary: Year 8 students from Tower Hamlets (this event also happening on Nov 5th, 12th, 19th, 26th, Jan 28th, Feb 4th, 11th, 25th and March 4th)

23 October

- Mathematical Trickery, Lawnswood School

12 November

- Leeds Labour Market Conference, Thackray Medical Museum, Leeds

13 November

- Maths Inspiration, supporting attendance of students from East London

17 November

- Paper Imagination, Wakefield City High School, West Yorkshire

20 November

- Careers Fair Skills London, Excel London

28 - 29 November

- Improving Standards in 'A' Level Mathematics conference, Stratford Upon Avon