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smallpeice
Dare to imagine



FOREWORD

BY **KEVIN STENSON**
CHIEF EXECUTIVE OF THE SMALLPEICE TRUST

What does our future hold in store for us? This question always carries a certain amount of weight, but it feels like a much weightier question today for those living in the UK. For students entering Years 11, 12 and 13, or equivalent, this is about imminent exams and the opportunities success in them makes available. However, these exams and opportunities carry a degree of uncertainty today, that will become clearer over the course of the Academic Year. This uncertainty affects confidence and poses the following questions:

1. Am I good enough?
2. Have I made the right decisions?

As a nation, we face the great Brexit test, and the opportunities its success makes available. However, we face much uncertainty in leaving the European Union on the 31st October 2019, with or without a deal. This uncertainty ultimately affects our confidence as a Nation, and poses similar questions:

1. Is the UK good enough to find its way in the world?
2. Have we made the right decision?

The UK needs to find its confidence as a great Engineering Nation once again, with its ability to turn research into wealth, improve lives, and to drive economic and social progress. I am confident that our Engineering sector, with its world class talent, universities, companies and facilities will be at the heart of delivering renewed prosperity to the UK.

I also recognise that engineering success is based on people, the best and brightest at all levels, and whilst we have a world class research base and world-renowned engineers across all sectors, we face a serious engineering skills crisis.

The Smallpeice Trust's vision must therefore be a UK that is confident in its ability to once again be the world's leading engineering Nation, drawing on increasing numbers of diverse world class UK talent leaving our schools, colleges, and universities, confident in the contribution they can make through engineering.

Engineers will always need leaders in the mould of Sir Richard Arkwright and Dr Cosby Smallpeice, and hence why it is so important that we continue to identify the future engineering leadership potential in schools via our Arkwright Engineering Scholarships programme. We are indebted to you for your support of this essential programme.



SCHOLARSHIP NOMINATIONS ARE NOW OPEN

FOR ARKWRIGHT ENGINEERING SCHOLARSHIPS 2020

Spread the word! The Arkwright Engineering Scholarships portal is officially open for the 2020 round of applications!

The Arkwright Engineering Scholarship Programme inspires the best and brightest young leaders to pursue their dreams of changing the world through engineering. Awarded at the beginning of Year 12, Year 13 in Northern Ireland and S5 in Scotland, this prestigious Scholarship is recognised for nurturing talent across the engineering sector.

An Arkwright Engineering Scholarship is perfect for highlighting individual achievement when applying to university and degree apprenticeship programmes. To be selected for an Arkwright Engineering Scholarship, students must excel during the selection process which includes a 2-hour exam and a formal interview at one of the UK's most prestigious engineering universities.

If you know of any eligible, engineering minded students, please encourage them to apply through their affiliated school for this prestigious award! It's completely free for schools to become affiliated and only takes a few minutes for a teacher to complete. For more information on the Arkwright Engineering Scholarships please [click here](#).



A SCHOLAR'S PERSPECTIVE

Arkwright Engineering Scholar Lowena Hull tells us about her first year scholarship experience...

What were the awards like?

There were so many students and sponsors at the award ceremony in London I felt a little overwhelmed at first! Before the awards, there was a networking opportunity to meet my sponsor. I was happy to be matched with a company that seemed to have a close-knit feel and very much enjoyed hearing all about their business. During the awards presentation, each student was given a short introduction - it was fascinating (and a little nerve-wracking) to hear how accomplished everyone was, not only in academics but in sports, music and other fields too!

What is your mentor like?

My sponsor is Stannah, a company which designs and manufactures stairlifts, lifts and escalators. I was lucky to get a week of work experience at their main site at the start of the summer. During the week I worked in various departments including hardware, software and testing. I spent most of my time designing an ergonomic toothbrush handle to help people with arthritis. What was great about working in the Concepts Department was getting their input and continued support during the design process, which helped make my design better overall.

What have you put your funding towards?

The funding enabled me to buy circuit boards and a GPS module which I used in my project for the SatELife Competition, a nationwide competition run by the UK Space Agency for students to propose ways to use satellite data to benefit life on earth. I won the top individual prize which I couldn't have done without being able to buy the equipment to test my idea. I was able to experiment and try out pieces of equipment I otherwise wouldn't have been able to use.

Which Connect Days have you attended?

I've attended several different events. Early on, I went to a training day with UKLA, to learn about oils and lubricants. Recently, I was thrilled to get a place visiting the Dyson Institute of Technology. I also gained a place on the 4-day Nuclear Engineering Summer School at the University of Manchester. I had never really thought about the possibility of working in nuclear engineering, so that week was useful in gaining an insight into an area I was unfamiliar with.

Has the Scholarship opened any doors for you?

Having an Arkwright Engineering Scholarship opens so many doors, not just because of mentoring and financial aid, but also in terms of opportunities. Attending Connect Days lets you learn about different industries and areas for work, and the residential events give a deeper insight into studying engineering at University. The Arkwright Engineering Scholarship is invaluable

if you are applying for an engineering course or apprenticeship, as it not only demonstrates an interest in the field but also gives you background about the subject you couldn't gain anywhere else. I got to see many more applications of engineering I wouldn't previously have been aware of!





RAF LEADERSHIP RESIDENTIAL

BY HARRIET COOPER

The RAF Leadership Residential was an incredible week of activities at Gilwell Park, combined with a trip to RAF Benson. The week began with a day of team building activities including raft building and high ropes, which quickly allowed us to get to know each other. Additionally, we took part in a pioneering course and built items including a swing and a table out of only bamboo and string.

On Wednesday we had the amazing opportunity to visit RAF Benson and discover what it is like to be an engineer in the RAF. One part that was particularly interesting was seeing the flight simulators and learning about some of the unbelievable technology that was implemented in them. Being able to go inside a Puma helicopter was really exciting, and I'm sure I was not the only one riveted by learning about the complexities surrounding the helicopter blades.

Thursday came with a beautiful hike, followed by a huge bonfire in the evening, a highlight for many of us. Several of the other evenings during the week were spent completing and learning about the SDI motivational system and how we react in different situations. I found this exceptionally useful in gaining a greater understanding of myself as it was incredibly accurate.

Overall, the week was an unforgettable whirlwind of activities and learning which significantly improved all our leadership skills. I think it is safe to say that many of us will now be considering a career in the RAF having experienced such an amazing week.

CONNECT DAYS

Exclusively for Arkwright Engineering Scholars, Connect Days link Scholars with real-world engineering organisations. Interested in attending one of these events?
Contact Poppy James, poppy.james@smallpeicetrust.org.uk.



AN INTRODUCTION TO LUBRICANTS AND CHEMICAL ENGINEERING

DATE: WEDNESDAY 23RD OCTOBER 2019

LOCATION: MOOVE EUROPE, GRAVESEND

Overcoming complex problems using effective lubrication is the foundation of many careers in engineering. From chemical engineers to those managing large-scale machining operations, lubrication affects the whole of the industrialised world. During this Connect Day, you will discover the unique world of tribology, lubricants and lubrication in engineering.

[FIND OUT MORE](#)



CIVIL, ELECTRONIC AND APPLIED SOUND ENGINEERING

DATE: WEDNESDAY 23RD OCTOBER 2019

LOCATION: UNIVERSITY OF WEST LONDON

Explore and discover at this hands-on Connect Day with the Rochester Bridge Trust! You will have the opportunity to try out a range of activities in Civil, Electronic and Applied Sound Engineering, including Hydraulics and Soil Engineering. This will also include the application of non-destructive testing methods, including Ground Penetrating Radar and 3D Laser Scanner.

[FIND OUT MORE](#)



LIGHT MICROSCOPY FOR ENGINEERING

DATE: SATURDAY 23RD NOVEMBER 2019

LOCATION: NATURAL HISTORY MUSEUM

Scholars will work in pairs with a range of microscopes to discover the basis of light microscopy. The microscopes will then be used to examine a variety of specimens to illustrate the use of microscopy in the field of engineering. Experienced microscopists from the Quekett Microscopical Club will explain what to look out for and will offer advice on how to use optical microscopes at home or school.

[FIND OUT MORE](#)



FUTURE LEADERS INSPIRE NEXT GENERATION OF FEMALE ENGINEERS

The Smallpeice Trust has donated 100 Think Kits to schools around the UK, to enable 100 female future leaders to start their own STEM Club, inspiring more girls into engineering.

The charity presented the first Think Kit to current Arkwright Engineering Scholar and Didcot Girls' School student Alice Bracher. Alice, aged 17, is sponsored by The RAF Charitable Foundation.

The Think Kit provided by The Smallpeice Trust, contains all the project materials Alice will need to lead 20 younger students at Didcot Girls' School in a new STEM Club, and includes structured session plans, worksheets and guidance videos.

Alice, who is studying maths, further maths and physics - and hopes to pursue a career in aerospace or astronautics - said: **"The opportunity to help other younger students in my school to be inspired about engineering and for me to proactively encourage more females to take up STEM subjects is very rewarding and I'm looking forward to seeing the results."**

Dr Kevin P Stenson, CEO of The Smallpeice Trust, said:

"No one meeting brilliant Arkwright Engineering Scholars like Alice can fail to be inspired by them and their incredible potential. That is why I believe enabling role model Scholars like Alice to engage and inspire younger female students by leading a structured STEM Club in her school will help address the gender imbalance in UK engineering."



83,000

**MORE ENGINEERS
NEEDED ANNUALLY
TO MEET INDUSTRY
DEMAND**

Talent pipelines are simply not keeping pace with industry requirements. Engaging the next generation of engineers at the earliest opportunity is essential in tackling the skills gap.

HELP US INSPIRE MORE FUTURE ENGINEERING LEADERS

Every year The Smallpeice Trust raises every penny that we need to fund our Scholarships. Our 16-18 year old Scholars rely on the generosity of our Donors to enable their Scholarships. Our funding comes from sponsorship and donations from over 160 Commercial Companies, Universities, Foundations, Trusts, Trade Associations, Professional Institutions, Worshipful Companies, Industry Regulators, the Armed Services and Personal Donors.

HOW YOU CAN HELP...



**SPONSOR A
SCHOLARSHIP**

Support one or more Arkwright Engineering Scholarships at £2200 each (£1100 per annum).



**BECOME
A MENTOR**

Donate your skills and experience and become a Mentor to one of our Scholars.



**BECOME AN
INTERVIEWER**

Volunteer to become an Interviewer in our unique UK-wide Scholar selection process.



**SUPPORT THE
WIDER TRUST**

Support The Smallpeice Trust's programmes for 11-17 year olds to help us inspire more future engineering leaders.



**BECOME A
BENEFACTOR**

Small or large donation – your support will go towards a Benefactors' Scholarship for a deserving young engineer.

To learn more please email enquiries@arkwright.org.uk or call 01926 333210.

ARKWRIGHT NUCLEAR SUMMER SCHOOL

This year saw the inaugural Arkwright Engineering Summer School take place in Manchester with the theme of Nuclear Energy. The Summer School invited Scholars to stay at the University of Manchester, where they had the opportunity to experience life in University accommodation and take part in educational activities alongside like-minded individuals. Scholars visited the Heysham Nuclear Power Station and the University of Sheffield Advanced Manufacturing Research Centre where they could contextualise their learning and speak with working professionals.

Over the week Scholars were also introduced to Professors and Graduates who volunteered their time to deliver presentations, offering an insight into the working life of the Nuclear sector, along with demonstrating the variety of routes available to our Scholars as young, aspiring engineers. In our aim to inspire and nurture the country's future leaders of the Engineering profession, it is imperative our Scholars are aware of the multiple pathways available to them at this stage as they take the next steps towards their future and career.

After the success of these 4 days and as part of Smallpeice's ongoing commitment to Scholar enrichment, we will be introducing more summer schools in the coming years as we look to double the number of Scholars over the next five years.

Arkwright Engineering Scholar Charlie Johnson tells us more about his experience at the Summer School and his highlight of the week...

The Summer School began with the 28 Scholars set to work ordering pictures to make a nuclear fuel cycle, giving us a fantastic insight into the stages before, during and after materials had been used.

The following day, we went to the University of Manchester and participated in various experiments alongside PhD students. This included computerised analysis of rocks using radiation patterns to determine the radioactive elements present in the different samples!

My absolute highlight of the trip came on the Wednesday when we visited Heysham Nuclear Power Station, which was incredible! Not only

were the areas covered earlier on the course contextualised, but also explained in greater detail. The guides were a fantastic source of knowledge and everyone left the site feeling far more informed on the practical side of a Nuclear Power Station. The size of the generator seen from the viewing platform was awe-inspiring and something that I will never forget!

On the last day, we all went to the Advanced Manufacturing Research Centre in Sheffield. We went on a tour of the site and stepped inside their Virtual Reality room. I found their role in developing ideas from academia into concepts easier for business' particularly interesting, as it is a crucial part in allowing the nuclear industry in the United Kingdom to continue to develop and thrive!



LAND ROVER 4X4 CHALLENGE

BY ALEXANDER CHRISTOPHERSON

In 2017, King Edwards School (KES) entered the Land Rover 4x4 Challenge after reading about it in the Arkwright Newsletter. We did well, but I wanted to do better – so I put together a new team for the 2018/2019 season. The challenge involves designing and building a scale 1:18 off-road car, sourcing sponsorship from relevant companies, and marketing the project.

In January 2019, we competed at the southwest finals, winning 1st place for the professional class and the award for the best engineered vehicle. This secured us a place at the National Finals at the British Motor Museum. The seven weeks between the two finals were perhaps the most intense weeks any of us have ever experienced: not only did we redesign the car, we added more complex electronics, secured more sponsorship, remade our website and reinvented our team identity. This was worth it, as at the two-day national finals we won 'Best Engineered Vehicle' again, and joint 1st place with The Panthers from Devon. Next stop: World Finals, so once again we are looking for sponsorship to fund new cars, displays and travel.

Seeing how the real world of engineering works has shown us a lot about creative problem solving, cooperating with companies and working as a team. My role in managing the project, including the finances and timescale, has taught me to be efficient, forward thinking and confident.

Not only does the challenge provide such invaluable skills, it's also a lot of fun. Yes, it's a lot of work, but it really is worth it.

Find out more about the challenge and register for the 2020 season at www.4x4inschools.com and more about our team at www.fractal4x4.com



ENGINEERING EVENTS

Build your CV and UCAS application by attending one of these third-party Engineering events.

NORTH

Big Bang Fair North East 2019
9th - 10th October 2019 - [More Info](#)

Manchester Engineering & Technology Careers Fair 2019
18th October 2019 - [More Info](#)

MIDLANDS

MIA Motorsport & Automotive Jobs Fair
3rd October 2019 - [More Info](#)

Birmingham Engineering & Technology Careers Fair 2019
23rd October 2019 - [More Info](#)

Hack The Midlands 4.0
26th - 27th October 2019 - [More Info](#)

The Apprentice Engineer Show
30th October 2019 - [More Info](#)

SOUTH

Bristol Engineering & Technology Careers Fair 2019
9th October 2019 - [More Info](#)

South Coast Engineering & Technology Careers Fair 2019
16th October 2019 - [More Info](#)

London Engineering & Technology Careers Fair 2019
30th October 2019 - [More Info](#)

Bournemouth Careers in Engineering Event
7th November 2019 - [More Info](#)

Plastic Hackathon 2019
9th February 2020 - [More Info](#)

SCOTLAND
& IRELAND

Edinburgh Engineering & Technology Careers Fair 2019
2nd October 2019 - [More Info](#)

Glasgow School of Art Pre-Application Advice Session 2019 - Product Design Engineering
17th October 2019 - [More Info](#)

SCHOLARS GAIN FIRST-HAND EXPERIENCE OF SCOTTISH ENGINEERING

The Rochester Bridge Trust took five of its Arkwright Engineering Scholars on a three-day tour up, over and across some of Scotland's most iconic bridges as part of its education enrichment programme, to provide real-world experiences to complement classroom learning.

Aileen White, Education Officer at the Trust, explained: "Our Scholars have already started their journey to become civil engineers, so trips such as this, which enable them to interact with engineers and go to otherwise inaccessible places are invaluable for feeding their enthusiasm and answering any questions they have about their chosen career."

High points of the tour were a hoist to the top of the north tower of the Forth Railway Bridge, and the lift to the top of the Forth Road Bridge. Other activities included cable inspections, a tour of Edinburgh's key civil engineering sites and an engineer-led tour inside the Falkirk Wheel.

Scholar Joe Igoe said: "I already know engineering is an important part of life but to be able to visit these bridges and see the civil engineering in action was fascinating."

"I really enjoyed the whole tour but my favourite part was seeing the inner workings of the bridges, as there's many things you don't take into account when you drive across crossings such as these."

This trip was part of a series of engineering experiences offered to the Scholars as part of their sponsorship by the Rochester Bridge Trust.

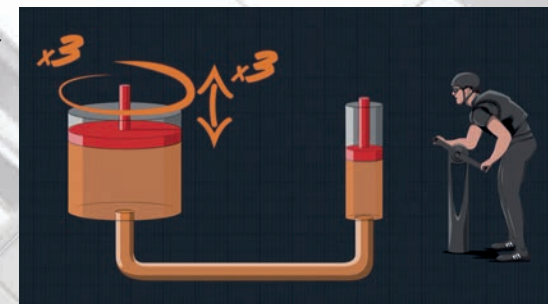
For more information on the Rochester Bridge Trust and their engineering education initiative, please visit www.rochesterbridgetrust.org.uk.



STEM CREW PROVIDES LEARNING BEYOND THE TEXTBOOK

The digital resources are available for free and are currently used in over a thousand schools in the UK. STEM Crew uses the real-life example of sailing to bring STEM subjects to life for students; showcasing the cutting-edge innovation and technology behind Britain's America's Cup Challenger.

Register today for FREE
www.stemcrew.org.



YOUR SPONSOR NEEDS YOU

Why? Because they have invested £2,200 in helping you achieve your potential as a future engineering leader.

How? By sending them an update on your progress every February and June. They are keen to find out if their Scholarship has helped you with your studies or an Arkwright activity has inspired you to pursue a particular engineering degree or apprenticeship.

Remember you must reply **politely** and **promptly** to any correspondence from your Sponsor and you should always conduct yourself as an **Arkwright Ambassador** and fully demonstrate the **dynamic, high-calibre** student that you are. Your relationship with your Sponsor could well influence their decision to support another Scholarship in future years.

Please ask the **Arkwright team** if you are unsure who your contact is within your Sponsor's organisation.

Thank you!



Arkwright Engineering Scholarships

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