The ultimate basis of engineering is creating something for the purpose of enhancing life, whether that be through easing the difficulty involved in a task, reducing the time required, or minimising the necessary cost. An aspect of engineering which certainly achieves this, and excites me is 'Bioglass 45S5'. I'm intrigued by a synthetic material's being so receptive to human tissue that bone can chemically bond with it. The possible applications for this are staggering, and benefit people on an individual level. I find the prospect of working on projects of this nature, with applications so profound, not only exciting but also fulfilling. Hence my applying for this degree.

To gain an insight into engineering, I found courses run by the Smallpeice Trust. I was on the winning team in each of the three I attended. The first, when in year 8, was a simple design-build project for a remote control vehicle. As simple as it was, I see with hindsight that it encapsulated the essence of engineering: selecting materials and methods to achieve a desired end within a budget of time, cost and risk. The second course, in Structural Engineering, required a bridge to be built. I had a head start here, as I had made one when I was eight years old. This was a venture with my grandfather: we built a two-metre Warren truss bridge from MDF offcuts, which I could walk across. Last summer's course at Plymouth University focused on naval engineering; a field new to me. Much of the technical side of it involved hull design-altering ballast and chining to result in desired trim and freeboard. However, upon reflection, I see clearly that the greatest limitation wasn't in design, but in materials- the balsa wood was buoyant and flexible, but absorbed water, while the EVA adhesive set quickly and bonded well, but was dense, leading to instability. The use of something like a styrene-acrylic polymer coating would not only have maintained the advantages of the balsa and EVA, but also provided water-repellency and decreased drag.

I enjoy each of my A-Level subjects, but I have particularly liked the overlap between them. I am seeing Mathematics as the language in which Physics and Chemistry are expressed. I really enjoy getting to the root of a systematic problem, and solving it with the creative application of fundamental principles. In my chosen degree, I look forward to working in a field which has an interdisciplinary breadth, requiring an equal input from Chemistry, Mathematics and Physics. My interest in engineering spreads beyond academia, and has a large role in my activities outside of school. I am, and have been for a while, an enthusiastic cider maker. What I enjoy most about it is not so much the product, as the process involved; refining steps and redesigning equipment to increase yield and ensure the purest cider. In doing so, I designed and constructed a press, from sleepers and coach bolts, which incorporated a car jack to extract the juice from over 100kg of apples. Testament to the engineering, it has gone on to press three seasons' worth, obtaining roughly 600ml juice for each kilo pressed.

A favourite book at present is 'The Essential Engineer' by Henry Petroski. It raises the issue of confusing science with engineering, and argues that, whilst the former is elemental, more focus ought to be paid to the latter, should we want to solve global problems sooner. I agree to an extent, but think that the distinction is somewhat artificial, as they cross fertilise. The practical application of a scientific discovery can catalyse future scientific research. For example, following the use of x-rays for clinical purposes, the harmful effect of radiation exposure was observed, prompting further research into other, safer, methods of medical imaging, such as ultrasound and MRI scans. An ambition is to go onto research; to be at the forefront of innovation, where I would be not only researching as a scientist, but also applying this research as an engineer.