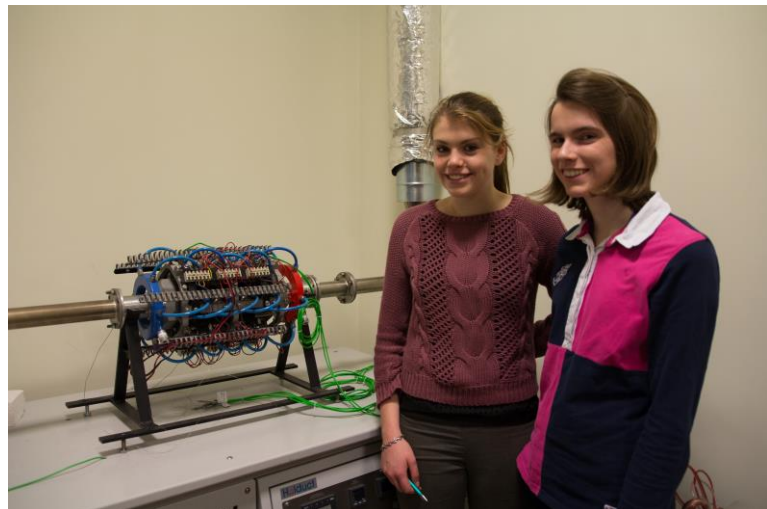


Report on the 2014 Oxford Materials JCCU Industrial Tour to Poland

It was 3:30 am on Sunday 16th March when students assembled at Gloucester Green in Oxford. We were there to travel to Krakow to take part in the JCCU Industrial Tour. These tours are a chance for undergraduates from the University of Oxford's Department of Materials to gauge how what they learn in lectures is applied in industry and also to learn about a new culture. Our rather sleepy collective made it to London Gatwick to board a plane to Poland, destination Krakow.

The first thing we noticed as we arrived in Krakow was its sheer beauty. The old town has an unquestionable charm about it and the Rynek Główny, once Europe's largest square, is simply breath-taking.

It was in high spirits then that we set off the next day on our first visit. We arrived at AGH University with the usual hint of anxiety but this was quickly swept away with the warm welcome of the students, led by Professor Robert Filipek our host and a Deputy Dean of the Faculty. We were then shown around their Faculty of Materials and Ceramics and treated to an excellent lunch animated with much conversation between the Oxford and AGH students. It struck me how everyone seemed to welcome us with open arms everywhere we went, how everyone seemed to be interested to engage with us.



We eventually left their campus and headed back to our hostel to prepare for the evening social that they had prepared. This was in a local bar in the centre of town.

Students visiting the laboratories at AGH. Picture courtesy of Pieran Maru

This was our first chance to mingle with the students properly and to start to learn the rather complex language that is Polish. Popular expressions included dzień dobry, proszę and the inevitable cries of na zdrowie! Conversation flowed well into the night.

On Tuesday we visited Krakodlew S.A, an iron foundry on the outskirts of the metropolis. The company occupies part of the huge site of what was the Lenin Steelworks. We entered a dark and dusty hanger with a tangible sense of excitement. We were soon rewarded by very impressive sights of molten metal poured from 25t ladles and sand-casting operations on a

large scale. We were shown around all principal operations and exclamations of amazement were common. We were then taken to the more familiar settings of a meeting room to have a small presentation about the company's history, activities and operations. We all boarded the coach back to our hostel with a better sense of heavy casting, a reminder of the importance of health and safety and a rather large smile on our faces.

That afternoon we visited the Wieliczka Salt mines. Mining began in the 13th century and the mine has continued to produce rock salt until very recently. The particularity of the mine is that some of its miners, after their long shifts, started to sculpt vast chambers and works of art on an unprecedented scale. This makes for a mine full of chapels, murals and various bas-reliefs depicting legend and faith. The highlight of the visit was the rather stunning Chapel of St. Kinga. This "underground salt cathedral", dedicated to the patron saint of the miners, is beautifully carved from salt and is filled with sculptures of different scenes of the bible and religious figures. The chapel, a UNESCO world heritage site, also houses relics of the late John Paul II. The variety of the features and the sheer scale of the mine were very impressive. It is truly inspiring to hear that men that worked long and tiring shifts in the mine stayed behind to carve and sculpt, dedicating years to their art.



Group picture in the chapel of St. Kinga. Picture courtesy of Pieran Maru

Wednesday was always going to be the longest day of the trip. We travelled to Legnica, a 4 hour coach journey away, to visit a copper smelting plant

operated by KGHM Polska Miedź. Before entering the unit we were given a presentation on the company. We learnt about its rich history as well as its position within various metal markets, namely copper and silver. It was interesting to hear that this once local company had become the largest silver producer in the world, becoming an international company in the process. The visit to the plant ensued as our students were separated into two groups.

Unfortunately our visit coincided with maintenance day so we weren't able to see many of the stages involved in the process in operation. On the up side we were able to see the machines from up close and combined with the experience from our previous visit we actually got a lot out of the visit. We saw a large part of the process taking the raw copper ore to the finished product, 99.99% purity electrolytic copper, including the huge banks of electrolytic cells which were in action during our visit. We also learnt about the company's focus on limiting pollution, a process which involves isolating many products from waste gases. Once again we were

touched by the effort that our hosts put in to make sure we got the most out of the visit including an excellent lunch; one of us was even interviewed by KGHM TV, the company's internal media channel!

The next day's visit was in sharp contrast. We travelled to Oświęcim to visit the former Nazi concentration and extermination camp of Auschwitz-Birkenau. The events that unfolded on the site 70 years ago have shaped future geo-political and historical landscapes. It was an interesting but silencing visit that led to much reflection and contemplation.



Heavy casting at Krakodlew S.A. Picture courtesy of Pieran Maru

On Thursday evening we all met up together to enjoy the Tour Dinner at a very nice venue. We enjoyed a large variety of dishes with various European influences. After delighting our taste buds we headed to one of Krakow's lively bars to enjoy drinks together and celebrate our successful trip. We were joined by some AGH students which made the whole event all the more enjoyable.

On Friday we enjoyed an industrial visit to ArcelorMittal's Krakow plant, only a stone's throw from Krakodlew's site. This is a site of great industrial tradition; steel has been produced there for the last 65 years. After a safety talk and a presentation on the company we proceeded to visit their hot-rolling plant. The mill has a capacity of 2.4million tonnes per annum and runs continuously. The steel strip is rolled several times before being rolled into a coil. Before it is rolled it is cooled and it is at this stage that the microstructure of the end product, and thus its properties, can be controlled.

This fully-automated process was very impressive and it was a prime example of us seeing first hand some of the processes that we dealt with in lectures. Some of us were caught out by the heat emanating from the 1200°C slabs and had a rather sweaty few minutes. The visit was short but thoroughly interesting and we gained a great insight in the operations of this world leader in the production of steel.

In the afternoon we did a bit of sightseeing in Krakow and visited Wawel Hill. We entered the beautiful cathedral, its bell tower and its crypt which houses famous national figures such as Adam Mickiewicz and numerous monarchs like Casimir III the Great. The cathedral is of great beauty and the numerous chapels made for a very interesting visit from a cultural and artistic perspective.

The next day we were already heading home, memories forever engraved in our thoughts. Seneca once said that “travel and change of place impart new vigour to the mind”. We have found this to be true. In those 6 days we met new friends, tied new links, learnt many things about a new culture and added new perspectives to our degree. All in all a truly enriching experience.

Feedback from the students includes:

“I had a fantastic time in Krakow. It was really interesting to see the differences in the educational aims of our relative universities. The industrial visits complemented each other well and I was fascinated by the scale and the importance of some of the companies.”

“The Polish students and the people in Krakow were very friendly, and most spoke incredible English - definitely a plus when Polish is really difficult to learn!

“The industrial tours were really interesting and helped me to visualise the processes that we learned about. It was interesting to see how Materials Science is used on a much larger scale than in our university laboratories, and how relevant the subject is to many different industries.”

“It was really interesting to see the process used to electrochemically refine copper, and the huge scale on which it was carried out, as it was very different to what I imagined. The AGH Materials Department puts more emphasis on ceramics, and we were able to gain more of an insight into this area of materials science during the departmental tour. Also, before visiting KGHM I would never have guessed that the world’s largest silver producer was located in Poland!”

“Everyone we met was incredibly friendly. I gained knowledge of large scale industry and got a grasp of just how large the scale was with 80t castings for example. I was amazed to see the effect the Oxford University label has in an international environment with everyone wanting to ask questions and know more about Oxford as well as the companies wanting to show their best technology to us.”

Jeremy Miles & India Kirkpatrick