

National Meeting of the IET Germany in Bregenz 2010

The meeting commenced with the AGM of the IET Germany Network. This was then followed by the IET Prestige Lecture:-

“Robots for Neurosurgery”

Presented by Dr Patrick Finlay

Dr Finlay stated that Europe has major investment in robotic units. 100,000 Industrial Robotic units are sold per year to factories. Service Robots are 18% of the industrial robots and Medical Robots are 6% of the Service Robots.

2000 Surgical Robots are in regular clinical use worldwide. The annual growth of Surgical Robots is about 25% per year.

There are two branches of Surgical Robots.

- i) Master Slave- Telemanipulator
- ii) True Robot - Image Guided

Robots have no memory; they are only a slave image.

There has been a vast improvement in medical imagery over the past 100 years. Today, a surgeon can see to within one millimetre of where he needs to make the incision.

Factory Robots are made to be very fast in operation, however; Surgical Robots are deliberately made to be very slow. The operator needs to know what the Robot is going to be doing next, before it actually does it.

Uses of Medical Robots:-

- i) Brain tumour Biopsy.
- ii) Epilepsy
- iii) Treatments of Tumours
- iv) Parkinson's Disease

Parkinson's disease can be treated by deep brain stimulation. Electrodes are inserted into the brain for deep brain stimulation. Accuracy is critical. If the electrode is inserted into the brain with an error of only three millimetres, the patient could be paralysed permanently. The brain moves slightly on its own, within the skull. This needs to be allowed for when carrying out the operation by electromagnetic tracking which will compensate for brain movement. The patient also needs to be firmly clamped to the operating table to avoid any further movement.

A tumour can be treated by firstly inserting magnetic nano-particles into the tumour itself and then applying a high frequency changing magnetic field from the outside of the patient. Due to the induced circulating currents within the particles, they will get hot and will burn the tumour away.

The first generation of Medical Robots were large, expensive to purchase and complicated to set up. The second generation of Medical Robots are only of hand size, of low capital cost and easier to set up.

The IET Prestige Lecture was followed by “The Michael Faraday Institute Lecture”

“Sustainable Development and Responsible Investing”

Presented by Professor Peter Dröge who is Professor for Sustainable Spatial Development, Liechtenstein

Professor Dröge stated that during the 17th, 18th and 19th centuries, the idea of using renewable energy was not considered to be that important. The idea of burning fossil fuels, oil and coal were considered to be reasonable. Today, we need to move away from the ideas of the 17th, 18th and 19th centuries and into a 21st Century responsible global economy.

Over the past forty years, there has been vast city growth worldwide. Urban development boosted the development of many new buildings. Very cheap petroleum products have led to cheaper housing which are not well heat insulated. Power Stations dismiss 60% to 70% of their energy into a river, the sea or into the atmosphere. They only send out 30% of their total energy as useful electrical energy.

Up until 1850, the atmospheric CO₂ was 280 parts per million (PPM). The atmosphere today has concentration levels of CO₂ increased to 390 PPM. Increases in atmospheric CO₂ will create more deserts and will increase Global Warming. Most of the world has decided to have a target of 280 to 350 PPM of CO₂ by the year 2020. The aim is to have all towns supply their own energy i.e. 100% renewable energy. Energy to be produced locally i.e. decentralisation. The use of Wind Power has risen over the past few years and today, more power is produced from Wind Power than Nuclear power. The aim is for towns to be self sufficient in Electrical Power.

Please see www.solarcity.org and www.100-percent.org for further information.

Munich is expected to have 100% renewable power by 2020. This is helped by the fact that Munich is situated on a geothermal underground heat source. The intention is to use this heat.

On the following day, Sunday morning, we had a guided tour on foot of the town of Lindau. We were split into two groups, one guide for each group. One tour was conducted in English and the other in German.

Finally, after 90 minutes, the two groups met at "The Alte Post Restaurant" where we had lunch. Following the lunch we said our goodbyes and departed. This was a very interesting week-end and well worth the effort to attend. It was good to be able to liaise with Engineers of other Companies and who also work in different parts of Europe. We look forward to the next IET German Network AGM which will most likely be held on either the week-end 23rd to 26th September or 30th September to 3rd October 2011.