

OLLSCOIL NA hÉIREANN, GAILLIMH
NATIONAL UNIVERSITY OF IRELAND, GALWAY

Text of the Introductory Address delivered by **DR JOHN MURRAY**,
National University of Ireland, Galway on 12 June, 2015 on the occasion
of the Conferring of the Degree of Doctor of Science *honoris causa*, on
SVANTE PÄÄBO.

A Uachtaráin, a Sheánsailéir, a mhuintir na hOllscoile agus a dhaoine
uaisle.....

Few scientists working today could lay claim to having revolutionised our
understanding of our place in this world. Svante Pääbo is, without
question, one of those inspirational visionaries.

Professor Pääbo is a founder in the field of palaeogenetics, or study of
ancient DNA. His work in recovering genetic material from the fossil
remains of long extinct creatures, such as mammoths, ground sloths and
Neanderthals has been both pioneering and groundbreaking in equal
measure.

Svante Pääbo was born in Stockholm, Sweden, and from an early age developed a fascination with Egyptology and the ancient world. Whilst studying for a PhD in molecular genetics at Uppsala University in the early 1980's he wondered if ancient DNA might be preserved in archaeological remains. As this was not part of his PhD project, he had to conduct experiments in his spare time. In 1985 he published his findings in the journal *Nature* - DNA had indeed survived in the cells of a 2,400-year-old mummy of an infant boy.

Following this, Svante completed postdoctoral research at Allan Wilson's lab at Berkeley, California, before becoming a professor of biology at the University of Munich. In 1997 he assumed his current position as a Director at the Max-Planck Institute for Evolutionary Anthropology in Leipzig, Germany. During this entire time he patiently developed and honed many of the techniques necessary for isolating and extracting ancient DNA.

In 1997, in what is considered a scientific milestone in evolutionary genetics, Svante and his colleagues reported the recovery of mitochondrial DNA from the original Neanderthal specimen, who lived 40,000 years ago in Germany. These initial results suggested humans

and Neanderthals were indeed separate species, who shared a common ancestor c.500,000 years ago.

Professor Pääbo followed this by leading an international consortium of scientists in a highly ambitious project to reconstruct the entire nuclear genomic sequence of Neanderthals. In 2010 they published a draft sequence of that genome, based on an analysis of four billion nucleotides. This represents one of modern science's greatest achievements. Astonishingly they revealed that up to 4% of the DNA in people living today was derived from Neanderthals. This implies that Neanderthals and modern humans successfully interbred when they first encountered each other and that we have a shared history with them. In other words - they played a part in our own genetic origin.

Also in 2010, Svante's team discovered a completely new species of fossil human (Denisovans) who lived in Siberia c.41,000 years ago. We would never have known of their existence, save for their DNA, which was extracted from a tiny fossil finger bone.

More recently Professor Pääbo's group produced a complete genomic sequence for a Neanderthal woman from Siberia, revealing intimate

details about her family history. They also extracted DNA from an ancestor of Neanderthal people, who lived over 300,000 years ago in Spain. This is the oldest DNA ever recovered from one of our human forebears. It represents scientific investigation at the limit of what is possible - a hallmark of Svante's research through the years.

Svante has also investigated the genetic relationship between humans and apes, and identified genes believed to have played a critically important role in our evolution, such as the FOXP2 gene, which is associated with language development.

Professor Pääbo's research has provided fundamental insights into our understanding of human origins and resulted in numerous prestigious academic awards and prizes. Understandably, his work has captured the wider public imagination and in 2007 *Time Magazine* included him in their list of the 100 Most Influential People in the World.

In May 2014 Professor Pääbo delivered an outstanding keynote presentation, on the Neanderthal genome, at a symposium in NUI Galway marking the 150th anniversary of the coining of the scientific

term *Homo neanderthalensis* by William King, Professor of Geology and Mineralogy in Queen's College Galway here in the 19th Century.

Svante's talk was delivered to a packed auditorium and was attended by President of Ireland, Michael D. Higgins, along with members of the King family. It was a remarkable moment in the history of this institution and a fitting tribute to King.

As far as we know, Neanderthal people never reached Ireland. This did not dissuade one audience member from asking Svante after his presentation:

"What would an Irish Neanderthal look like?"

Without hesitating Svante responded:

"They would have red hair".

William King remains the first scientist to name a new species of fossil human - marking a significant moment in the birth of palaeoanthropology and also the beginning of one of the longest-standing debates in human evolutionary studies: what was the precise relationship of Neanderthal

people to us? Professor Svante Pääbo has played an instrumental role in addressing that question in recent times.

In 1870 the then Queen's University of Ireland awarded its first ever honorary D.Sc. to William King in recognition of his scientific work. It is therefore entirely apt, and of some historical significance, that today, 145 years later, that institution's modern counterpart now bestows the same honour on an individual presently working at the cutting edge of our attempts to better understand those enigmatic, yet iconic of people - the Neanderthals.

I will finish with a quote from a 19th Century scientific contemporary of William King. In his masterpiece, *Origin of Species*, Charles Darwin allowed himself just a single line concerning the topic of human evolution, prophesising that:

Light will be thrown on the origin of man and his history.

Svante Pääbo's work in deciphering the genetic makeup of our ancestors has served to brilliantly illuminate that epic, and most profoundly moving

of stories, and in ways we could never have thought imaginable, nor indeed dreamed.

In doing so, he has afforded us a much better impression of what it truly means to be human.

It is my privilege to introduce Svante Pääbo as a worthy recipient of an honorary doctorate from this university.

PRAEHONORABILIS CANCELLARIE, TOTAQUE UNIVERSITAS:

Praesento vobis hunc meum filium, quem scio tam moribus quam doctrina habilem et idoneum esse qui admittatur, *honoris causa*, ad gradum Doctoratus in Scientiae, idque tibi fide mea testor ac spondeo, totique Academiae.