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The Genome Centre Maastricht

 Jos Benders

There's a television advertisement that starts by showing the planet earth as seen from space. The camera zooms into the planet and shows Europe, and gets closer. Within the space of 30 seconds you see a country, a region, a town, a suburb and finally a single person.

Man has zoomed from big to small several times during his evolution. It's necessary to understand the small details if you want to grasp the overall picture. The process starts at school, like a science teacher comparing two beakers of transparent liquid. They both look the same but they react in totally different ways, because one is water and the other is alcohol. To understand the difference you have to go down to a molecular level. If there was a science of the many parallel phenomena in our world it would probably be called parallellogy. This non-existent science would be able to describe the similarity between the example of the beakers and Genomics,



a relatively young science of the genetic information stored in the deepest part of our being. A gene is the smallest piece of code, one which determines our existence. If you combine a person's genes you have their genome, the total sum of their hereditary information. A gene produces protein, and if you combine proteins you create an organism. Genomics is the science which studies this phenomena.

This young science had a radical breakthrough three months ago. Like many important scientific events, it made the newspapers. It was the conclusion of the worldwide Human Genome Project.

As our space camera zooms into earth it can now go even further, right down to a map of the individual human being. The Human Genome Project was like finding the Michelin guide to humankind.

Maastricht University

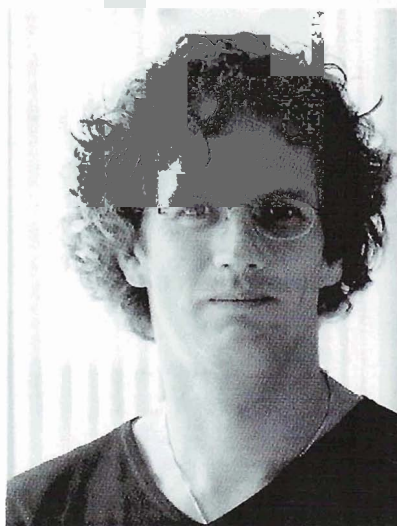
Dr Bert Smeets in Maastricht went further. Smeets is head of a group of twenty-three staff working in the field of molecular genetics. The latest scientific branch of the DNA tree is the establishment of the Genome Centre Maastricht. He has six scientific assistants. Developments are happening so quickly in the field that more personnel are likely. The forty year old scientist told us:

'The step from the individual genes to the complete genome is an unprecedented scaling up, comparable to changing from separate picture frames to a complete film. The application of this knowledge has implications for the whole of society. Genomics will have recognisable effects on the economy, agriculture, health care, defence, environment, law, in nearly every field of politics.' But why is there such an intensive interest in genome research at Maastricht?

'We Dutch are traditionally a nation of merchants. Science is the most important trade route of the twenty-first century. Knowledge plays a crucial role in the Dutch economy. The European Commission estimates that 25 to 50 percent of economic growth stems from research and technology. Since other countries are moving faster than we are, we tend to lag behind. Maastricht University wants to reduce this gap, or remove it altogether.' These grand ambitions are laid out in the department's mission statement. 'The new department will carry out leading genome research in Maastricht. The research will focus on illnesses like heart and vascular disease, cancer, epilepsy and dementia. It will also become a centre of expertise and provide consultation to other departments. Genome researchers and bioinformaticians will be trained in this department.'

The department's strategic goals are to develop

- 1) customised medical science
- 2) new medicines (pharmacogenomics)
- 3) improved harmony of food and health (nutrigenomics)



Bert Smeets, head of a group of twenty-three staff working in the field of molecular genetics

Anyone who saw the enormous computers built at the end of the 1940's would never have imagined that the future would bring the palmtop processor, the internet or the vast source of information which personal computers make available to everyone. Humankind is now at the dawn of the genomics revolution. Its effects will range from cleaning contaminated soil with bacteria to environmentally-friendly washing powder, from protecting crops to biological warfare, from preventing disease to curing it. The revolution driven by genomics will have major effects, among other things, on medical practice and the organisation of healthcare. The new Genome Centre Maastricht, based at the Maastricht University and University Hospital, stands at the dawn of this revolution.

For those interested, the technology used at the Genome Centre Maastricht is micro-array. More information is available by phone +31433875803/5843.