

Address on the occasion of the 181th Dies Natalis
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Antoni van Leeuwenhoek: tradesman, civil servant, and at first a somewhat reluctant scientist. *“I have several times been pressed by various gentlemen to put on paper what I have seen through my recently invented microscope. I have constantly declined to do so”*, he wrote in one of his first letters to the Royal Society in London. Luckily, he changed his mind, or we may never have had the benefit of his discoveries, discoveries that would turn out to be of great importance to our understanding of life. It is why we celebrate him today. And we will do so throughout this entire Antoni van Leeuwenhoek year, here in Delft and elsewhere.

But what exactly *was* his significance? And what can we learn from this today? To me, it was the way he focussed on things that had been hitherto invisible to the naked eye, and thus unlocking that new, microscopic world. In fact, at the time his early microscopes were what super-resolution is to us today.

Like Van Leeuwenhoek, we too use instruments – vastly superior ones – to make sense of the world around us. Also, his careful observations and his meticulous way of describing them, are habits we can and do emulate here at TU Delft. Lastly, his unbound curiosity and determination are traits we share with him.

Thinking of Van Leeuwenhoek’s significance today, is akin to examining our purpose as a university. Van Leeuwenhoek lived in the 17th century, a time of peace and prosperity for the United Provinces of the Netherlands. We had a reputation for tolerance and freedom of thought. The arts and sciences flourished. Elsewhere in Europe too, it was an era of scientific revolution and enlightenment. It must have been an exciting time for an amateur scientist to live and work.

But three centuries have passed since his death, three and a half since his first letter to the Royal Society. Today, we live in an era of opportunities, but also of great uncertainty and crises. The war in Ukraine, the energy crisis and the unwavering pressure of climate change, to name the most obvious. However, the 21st century is also marked by the rapid development of technology, and an ever increasing flow of knowledge and information. We should be able to use that to alleviate these crises. And we are indeed part of the mission to make that happen.

I strongly feel it is our responsibility to ‘create impact for a better society’. That is how we have phrased it of late, but the idea is far from recent. We have actually been doing it, one way or another, for the past 181 years. By educating engineers, and by creating and sharing knowledge and inventions. As a university, our purpose is to serve society as best we can, in this country and the world at large. It is our *raison d’être*.

In recent decades, though, our focus and methods have shifted. The need for sustainable development, and for a fairer distribution of resources and wealth, have influenced our research agenda and strategy. We direct our efforts at such themes as climate and the energy transition, at creating a healthier society and more resilient cities. It is here that we start to diverge most from Van Leeuwenhoek’s methods and motives.

Unlike Van Leeuwenhoek, great man though he undoubtedly was, we cannot undertake our research in our studies, working in isolation, only satisfying our own curiosity. We cannot jealously guard our instruments and keep their manufacture a secret, nor can we communicate our findings in privileged circles only.

To make sure that our research efforts *do* benefit society by way of products and solutions, we have created an innovation ecosystem here on TU Delft Campus – as you probably know. An environment where researchers, entrepreneurs, innovators and policy makers join forces. Where minds meet in order to make innovation happen.

We have also entered into disruptive ways of collaborating with the universities and university medical centres in our region. With them, we are exploring types of transdisciplinary research, where the combination of different disciplines should lead to new scientific directions and solutions. This is of course what we call Convergence. Again, we do this to improve our joint problem-solving capacities, as we believe today's complex and intertwined challenges cannot be solved from a uni- or even multidisciplinary viewpoint.

We can, however, channel Van Leeuwenhoek, and try to emulate his clear vision.

'I have got hundreds of ground magnifying glasses, most of which give such a sharp picture, even on dull days, in no other light but daylight', he wrote in 1700.

What do we see if we train our – metaphorical – lenses on the world we live and work in? And what contours of our future can we then make out in the distance? Can we continue for the next 20, or 50 or even 180 years in the same way as now?

If I were to pick up my quill pen, and describe my vision, this would be the elements of my letter:

I feel a great sense of urgency. Sustainability cannot wait. Biodiversity cannot wait. The energy and climate crisis cannot wait. The world needs solutions, and engineers to deliver them. The Research Centre for Education and the Labour Market (ROA) at Maastricht University recently published a report that underlined this. Their report named the expected shortage of engineering professionals at higher education level as the biggest bottleneck to implementing climate policy! Hence, the education of more engineers cannot wait either.

But as we have heard Ingrid Thijssen explain just now, that means not only more engineers, but also engineers of a different kind: more broadly educated engineers, who are trained to view technology in a wider context. Who can bridge the gap between technology and society, and help accelerate the necessary transitions. Engineers who know their onions, so to speak (and their psychology, economics, robotics and so on).

To a great extent, this is already happening. We have created international classrooms, as an environment that broadens our students' horizons, promotes critical thinking and increases their awareness of the viewpoints of others, and equips them all the better for their professional future. We are also working on becoming a more inclusive, safe and welcoming environment in general. For instance, we know that there is a wealth of untapped talent among first-generation students. We owe it to them, and we owe it to society, to make them feel welcome to join us and to develop their talents. Likewise, we want and we have to become a more inviting and better environment for women students. We want to offer an attractive learning and working environment to all, all employees and students, now and in the future.

As an aside, we were informed that the Education Inspectorate has launched an investigation into social safety at our organisation. Let me be very clear: every instance of inappropriate behaviour is one too many, so we shall cooperate to our fullest, act if needed, and trust that this will lead to further improvements in social safety.

Our convergence activities, as I mentioned just now, are also part of this development of broadening horizons. Together with Rotterdam and Leiden Universities and their medical centres, we are aiming for breakthroughs in science and innovation, and creating matching educational programmes. Our collaborations within our TU Delft campus ecosystem also offer students increasing opportunities to develop their broader skills and prepare for their professional careers.

That ecosystem itself is evolving, with more and more organisations and businesses joining our TU Delft campus. Our student numbers are rising steadily, and will continue to do so. The Ministry of Education, Culture and Science has estimated that by 2030 the number of students enrolled at our university will rise to 31,500.

So despite our past efforts to limit our student numbers to 25,000 – the number we felt our campus and the City of Delft could comfortably accommodate – we have now grown to 28,000. We will continue to grow, even if we don't actively pursue it. Naturally, we will keep developing our TU Delft campus, and we will do so in close collaboration with the City of Delft, our home base.

But, as we know, there are limits to growth, and that goes for the city of Delft and our campus too.

Our strategies to limit student numbers have not worked, and our campus is starting to creak at the seams. At the same time, we want to respond to that urgent call from society for more, and more broadly educated, engineers. So we are now at a crossroads, and standing at that crossroads, I feel we have to start looking beyond Delft alone.

Naturally, when we first introduced that idea last autumn, that raised a few eyebrows, or perhaps more than a few.

I understand that. Looking beyond Delft may sound daunting at first. But we should not forget that change is a condition of life, one that Van Leeuwenhoek also observed under his microscopes. As an organisation, we have always made the necessary changes in order to fulfil our mission, we even consider ourselves drivers of change in science and technology.

Nevertheless, let me now stress that we are not going to move any faculties or departments forcibly, or discontinue any core programmes. A new location is most of all a means to develop new and exciting initiatives, and to create even more impact for society. Moreover, as daunting as it perhaps sounds at first, it is actually very much in line with what we are doing in our Convergence Alliance, or with AMS in Amsterdam. Or take our Master's programme Engineering and Policy Analysis, that has moved to The Hague on purpose, to be closer to policy and decision makers.

I think branching out, outside of Delft, is another step in that process, and a logical one in light of recent developments in our collaborations. As for our typical 'Delft engineer', we certainly don't intend to compromise on that; the quality of our education and our graduates is a *sine qua non*. Let me give you an example. Two years ago, our first students of Technical Medicine graduated from our joint programme with the Erasmus Medical Centre and the Leiden University Medical Centre. As clinical technologists, these graduates are far from 'typical Delft engineers', but they are in no way inferior because of that. On the contrary: they represent a new kind of graduate who will work in new domains, where technology and in the near future also AI will merge with more traditional fields. I believe they are an exemplar of things to come.

A multi-location strategy has another major benefit. It will allow us to actively steer our expansion, and set our own parameters for it. In the past, a steady increase in student numbers was something that simply happened to us. We subsequently dealt with the consequences and focussed on how many students we could accommodate. Understandable at the time, as growth in itself has never been our goal; our goal was and is impact for society.

This way, we will be able to continue taking our responsibility towards society, but in such a way that it is manageable and sustainable, for the City of Delft, and for ourselves.

Where does that leave us today?

After the consultation and the many conversations we have had in recent months, I know that many of you are open to the idea.

From here on, we will proceed together, step by step. We will take this year to work out the contours and parameters further. But whatever direction we will be taking, it will not be a straightforward A to B trajectory, but more of a quest. We will meet pitfalls and problems along the way, but I think you will agree with me, that with our typically Delft can-do attitude, we will overcome those, and we will seize this opportunity.

I, for one, get energized by the idea of taking more actively control of our university's future, and I hope you do too.

So let us now re-join father of microbiology, Antoni van Leeuwenhoek. You have just heard my letter to the future. I would now like to ask you: what would be your ideas, for that future, and how will you contribute to that?

I look forward to the discussions that will follow after this event, and over the coming months.

I want to express my great respect to our students and staff, as well as to all our partners. And I thank you.