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## Thirty years LNMB

Ladies and gentlemen,

Thank you so much for inviting me and many congratulations! LNMB, the Dutch Graduate Network in the Mathematics of Operations Research, is thirty years of age. At thirty, energy is still present and wisdom is approaching. A fruitful combination, and you will need it.

The Network was born in 1987. I would like to argue that it was not a singularity, a one-of-a-kind animal of an unknown species, but a step in a long and natural evolution.

Let me go back further, to the sixties of the previous century. Dutch academia was faced by developments for which it was ill-prepared. The babyboom generation arrived: more young people, of which a much higher ratio went on into higher education. The country got many more students. Next to education, those students also wanted more democracy in academia. This does not bear on my story and it died out due to natural causes. But what did not die out: they also wanted more mathematics, applied mathematics, needed by a society of increasing complexity and facilitated by the advent of computing equipment. Numerical analysis, statistics, and operations research.

The first generation of OR faculty included some giants, who set the stage for Dutch OR. First, Wim Cohen, of the single-server queue. Then, Jacques Benders, a household name in decomposition methods for linear programming. Also Guus Zoutendijk, of the feasible directions method in nonlinear optimization. He moved into industry and politics, and you may not know his name. But at the Optimization Symposium in Atlanta in 2000, eight awards were given to the founders of the field, and Zoutendijk was the only European among them. And finally Gijs de Leve, who worked on Markov decision processes and became, in OR, the embodiment of the sense of nationwide cooperation that set out to rebuild our country after the war.

It was De Leve who, in the seventies, made the first step towards what you could call the Dutch University of

OR. He made a traveling salesman tour visiting all his colleagues and started the Lunteren meetings in 1976. Strangely enough, not everyone thought this was such a great idea, but most did. It worked, we met, we talked, we got to know each other.

The second step was the start of the Dutch Research Community in the Mathematics of OR and System Theory in 1979, chaired by Jaap Wessels. Wessels was a clever strategist, who operated in the background and had a big and true impact on Dutch OR. The Research Community solidified our cooperation, under the auspices of the Dutch Science Council. For some time, it even gave us a voice in evaluating research proposals on a national scale. Being in one bag with systems and control was more a political necessity than born out of love and mutual understanding, a marriage de convenance that came to a peaceful end when both disciplines had gotten enough momentum of themselves.

And then, as the third step, we got the Graduate Network in 1987, after several years of hard labor by Wim Klein Haneveld, who did all the heavy groundwork and became its first director. De Leve, Wessels and Klein Haneveld are the three unsung heroes of the unity of Dutch OR. I know, because I served De Leve and Wessels as secretary and Klein Haneveld as chair.

As I said, all these steps were phases of an evolution, carefully stage-managed by our government, with the grand purpose of increasing the quality of Dutch academic education and research after the explosive growth of the sixties and seventies. Research communities, graduate networks, in later years conditional funding, research schools, and what have you, they all served this single purpose. It worked, step by step.

Founding the Network was not easy. Our ally in the government was Roel in 't Veld, deputy secretary of education and science, and our example was Arie Kapteyn, then in Tilburg, the founder of the Network for General and Quantitative Economics, for which he obtained several millions of guilders from the government. I knew Arie, Alexander Rinnooy Kan knew Roel, both of us knew

Wim Klein Haneveld, the three of us managed to get 2.6 million guilders, and the rest is history.

This is a simple summary of a complex process. If you wish to know more, please read the interview with Wim and me in the *Nieuw Archief voor Wiskunde* of June 2016. Let me just say that economists and system and control engineers are pragmatic, while some mathematicians tend to prefer a small-scale and more individual approach. It took Wim quite some massaging before the mathematicians of OR reached a consensus.

But even mathematicians accept a reality once it exists and the Network was off to a flying start. From what I understand, it is still flying, with a broad program covering foundations and applications, taught by the very best people we have. Now, thirty years later, the academic landscape has changed. The Network has survived and even reinforced many developments in Dutch academia. It still provides high-level graduate and master classes to universities and research schools, acting as the OR department of the University of the Netherlands.

And the Network is more relevant than ever. In the new century, university education is going through another wave of expansion. This is especially true for the mathematical sciences, which have evolved from the language of the natural sciences to the language of society. Academia has to respond to an increased demand, as in the sixties, but with restricted funding, unlike the sixties. The matching of funds for education and research is less evident than it has been. On both sides, in education and research, we need, more than ever, national cooperation rather than competition.

Your chairman asked me to give you some advice for the future. I'll try. First, there are only three criteria: quality, quality, and quality. Please continue to invite the very best speakers for Lunteren and the very best teachers for the Network. My second advice is a corollary: don't listen to me. I am seventy. Listen to the young people. They have the brains and the future. Thank you very much.

JAN KAREL LENSTRA

Het Landelijk Netwerk van Mathematische Besliskunde (LNMB)

bestaat 30 jaar. Tijdens de LNMB-conferentie die op 17 januari

2018 in Lunteren plaatsvond, blikte Jan Karel Lenstra terug op de

ontwikkelingen en de succes van de afgelopen 30 jaar