Towards a European network of knowledge

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Ladies and Gentlemen, Dear Colleagues,

It is a great honour for me to be invited to speak on the occasion of the opening of the academic year of a famous university such as Delft University. I have been familiar with this institution for many years now, due to its reputation, its scientists, and of course the excellent graduates it has produced over the years.

Today, I would like to briefly address one subject that is very close to my heart: building a Europe of knowledge and science. After a century of vicious wars between the nations, we have been able to start building Europe. Despite the difficulties and disagreements, we have gradually built a common market and then a European community. Today, after the Maastricht treaty, we have a European Union embracing fifteen nations. We have already created a common European currency, the Euro, for twelve of these nations, and everything seems to indicate that we are extending the new, united Europe.

Europe is like no other construction in the world. As we all know, people have a tendency to imitate. It has been said that we are trying to build something that resembles the United States of America. It has also been said that we are building something that approximates the Federal Republic of Germany. But I think that Europe is unique, because the strength of Europe lies in our diversity. If, through a misunderstanding, we try to change that diversity and create a uniform constellation, we will lose sight of Europe’s best interests.

I believe we have a common history, a common character, shared beliefs, and a common wisdom – but our habits are diverse and varied. So what is our current state of affairs? Today, political forces seem to oblige us to increase Europe’s size by allowing countries in the eastern part of Europe to be part of our European Union. There are several countries that have already applied for membership. And we have entered into a discussion as to whether the applicants are ready, whether they are in good shape economically, and so forth. The further expansion of Europe is of course a
legitimate process. The question is, should we be increasing Europe’s size before we have achieved greater political efficiency?

In my three years as a minister, I have been in Brussels many times and participated in the European Council. And I can tell you that it is extremely difficult to be unanimous when you have to make a decision for fifteen countries. Europe is becoming a highly bureaucratised union of nations. Unfortunately, we must conclude that Europe has become more of a bureaucracy than a democracy. This means that we have to increase the level of political co-operation, but we do not really know how to achieve this. And we have to understand that if we do not respect the nation – the body in which the democratic rule operates with a parliament, a government, etcetera – then Europe will fall apart. Thus, we have to respect the nation and we have to increase our political co-operation. Now this is where the difficulties begin. I do not want to enter into these matters extensively today, although I do have a few ideas about how we would achieve these goals. Clearly, this is neither the place nor the occasion to discuss that.

I do, however, wish to point out that Europe will grow in size before we will be able to deepen our political construction. So maybe we should seek our solution in another direction. Instead of forcing our political union into being too rapidly, why not try to concentrate on building a more stable Europe of knowledge, a Europe of science, a Europe of education, a Europe of students. If our children are educated in a common European spirit, the next generation will not have to face the same difficulties we are now trying to solve. Not least because they will be accustomed to the different parts of their European Union.

I firmly believe that, in building this Europe of knowledge, universities will play a vital role. Universities have an important function to fulfill for the future of Europe, because for several reasons, the modern world has given the university as an institution greater duties than it has had in the last thirty years. For a long time – in fact since the emergence of universities in Europe in the 12th century – the concept of a university has been that it produces and passes on knowledge, which means that research and teaching are intimately linked within the universities. Today this is no longer their only function; universities also create the new way of economic development. A university today is a place where you have research, where you have teaching, but also a place where people create new industry, new applications, new technology, and I agree wholeheartedly with your President when he says that technology is the key to the future.

More than in the past, too, universities need to continuously integrate new knowledge into their teaching. As a professor myself, I know this is extremely difficult. Everybody agrees that new ideas should be incorporated into the curriculum, but of course, unless your number of students increases exponentially, you also have to cut parts of that same curriculum. Only then do your problems really begin, for what parts of the curriculum should be cut? How do you teach mathematics with a computer? Should we continue to teach mathematics the same way as we did a long time ago? And should we, for instance, continue to teach integrals in the time-honoured way, while the computer can tell you so much more simply by pushing a button? Should we continue teaching physics in the time-honoured way and neglect the science and technologies that are being developed every day?

We must incorporate such new knowledge into the teaching curriculum very quickly. And very early on in the teaching process – not only in the advanced courses, but from the very beginning. Not only do students need to be taught; they also want to know how the world evolves. We therefore have a new duty. We must also teach our students how to create enterprise, how to enter the market. The position of distinguishing between academic or pure science on the one hand and applied science on the other makes no sense anymore today. In fact, applied science and pure science are completely and intimately intertwined. Fundamental discoveries may be useful to applied science, and fundamental research may have a deep impact on applied science. Consider the problem of polymer deformation, for instance. Are you studying pure science, or are you in fact working on applied science? The point being that this issue has a bearing on the lubrication of engines as well as on the fundamental structure of matter. It is my belief that we need to realise this fact and act accordingly. Another issue is that universities are going to be increasingly involved in continuous teaching. In the past, getting an education was a fairly simple matter. You went to university, got your knowledge, went out and got yourself a job. In that job, you then applied what you had previously learned at university. Today, getting an education is no longer that simple. Science and technology are evolving so rapidly that every student would have to go back to university several times in his career to expand his knowledge and learn about the new aspects of his specialty. Such continuous teaching is going to change the ways in which we create our university curricula. I believe that it is a big mistake to increase the volume of the existing curriculum. We have to let people enter the world market at a relatively young age because we need their energy, but we also have to give those people some time to come back to study modern science and technology. In addition, we need to attract people from the business sector to the university to create this knowledge, for universities no longer have a monopoly on knowledge; it is being created everywhere, everywhere. What all this means is that the university will become an institution central to all society. So far, I feel that only the United States have fully understood that.

And yet this is what we need to do in Europe. The Netherlands is in fairly good shape
in this respect, as is the UK, because universities and research are linked together. In France, Germany, and Italy, we are not doing so well because the research bodies are separated from the universities. If you are aware of my experience as a minister, you will know that a minister has to deal with heavy resistance. And you will see that it is very hard to combine all of the research bodies around the university, because these organisations — which by the way were created in imitation of the USSR academies historically — want to continue existing as bodies separate from the universities. This is a big mistake. Because this is the strength of the university: it is founded on its students. Young people are imbued with the new knowledge taught and challenge their professors. Because to challenge your professor intellectually, pushing him to reconsider what he knows, is a source of progress. So the university has to become a centre of knowledge, and this is why I believe that what we have done in France should be achieved throughout the European Union. On the initiative of Paris, we have started the so-called harmonisation of European diplomas.

I would like to briefly discuss why the European community has not been able to agree on this matter of harmonising university diplomas for many years, even though there is a clear need for a uniform structure of diplomas throughout the European Union. Because the response to the idea of creating a uniform European diploma is, in fact, symptomatic of the European reaction to a variety of issues. In every country, diplomas and curricula are the result of a long history, sometimes even of big dissension. People are just not ready to abandon what they feel is part of their national history and say, ‘let’s go ahead and create a European diploma’. Hence, we have a big problem.

So we decided not to say this. We decided to say, ‘okay... keep your diplomas, but try to achieve a correspondence level that will be recognised by the various countries, so that your students can be mobile’. So we decided, after high school, to have three years, then two years for the Master’s, and then the PhD later on. And this was the so-called 3-5-8 diploma. The Germans passed a law because of the trouble they had, since their universities depend on the Länder and not on the federal government. So they have to wait until the Länder accept their proposals, and some do and some do not. So they decided to keep their diplomas with their incredible complexity, but to introduce these three levels of grading, which are normal in science and are, in fact, equivalent to the Bachelor’s, the Master’s, and the PhD degree.

I think that an important step ahead will be to have a European association of university Presidents work together, unhindered by any political pressure. The time has come to create a link between the European universities. My first message is that universities, such as Delft University of Technology, should enter into a partnership with other universities in Europe by creating an exchange programme for professors and students. In fact, if we want to build a European network of knowledge, professors and students must be allowed to travel regularly to different countries and exchange knowledge. Thus, a professor from Delft would be teaching in Paris for two or three months and a professor from Paris would be teaching in Delft, or Cambridge, or Cologne; and a student from Cambridge should be able to study at different European universities. This must be done in order for us to move ahead towards a united Europe. I am, of course, aware that a number of problems will have to be solved, such as social security and retirement issues. We all know that we have to work on that, but I firmly believe that universities should take the initiative because I advocate the independence of universities. One simple thing that we can already do because we have the technology is to create an Intranet connecting the European universities. I do not know whether you are Internet users, but if you are, you are surely aware of the fact that after two p.m. — when the Americans go online — the speed decreases by two or three times the magnitude. Thus, the ideal solution would be to create a high-speed Intranet between universities, say at two gigabytes per second. This will allow us to communicate and to bring the students together.

A major question is of course: how should we build a community of science? You might even ask, why build a European community of science at all? You cannot deny that science is international, not a European prerogative. Yes, I will answer, this is certainly true. But we can — and should — build a community of science by co-operating within Europe, and by doing several things that the Americans have already done. Such as a very simple matter to begin with, the all-important high-performance equipment. Consider the budget of the different European countries, and you will see that every single one of them spends a far greater percentage of its budget on costly equipment than in the US. This is because everybody wants to have his own equipment. Let me give you an example. Universities in the US have three cyclotrons. European universities have seven, and we are planning to build two more. Do you really believe that there is any need for us to have three times the equipment available in the US? No, of course not. But everybody wants to have his own equipment. We have a number of nuclear reactors — which are used among other things for neutron research — and now we are building two more in France. The point is that, in my time as the Minister of Education, I already heard it said that there were too few customers for the reactor and that it should be shut down. That was five years after it was built. And there are so many examples of this problem, in astronomy and many other fields of research. If we team up to work with costly equipment, we can save a lot of money for laboratories and students.

My second point is about evaluation. In none of the European countries do we have total expertise on every subject at the top level, but in Europe as a whole, we do have
these skills. So if we would use the European community to evaluate research proposals and scientific research, our evaluation process could be as good as in the US. Evaluation is a key issue in science, because in modern science you have to be at the top or you are nowhere. We are no longer doing science in a way that says, ‘Well, maybe this is mediocre science, but it will do for our country’. No, science has become international. So we have to have the top team and the skilled young people to do the research – this is of course a two-headed point. Evaluation is therefore an extremely important issue. Evaluation at the national scale only stimulates rivalry and does not lead to optimal expertise.

My third point involves cross-fertilisation. If you look at the way in which small companies start up in the United States, you will see that this is not necessarily where the academics are working. They travel across the country. The United States have a lot of technical publications. Say that there is a small company somewhere in the United States that produces some rubber. If they discover that at the University of Maryland, researchers have elaborated some chemical process to reproduce it, they call Maryland and they start doing business. In Europe, to the contrary, if a university and a company in two different countries want to do business together, they have to deal with all kinds of financial and tax-related problems. This is another point we need to work on in order to see beyond nationalism. If a small company in France wants to co-operate with a professor in the Netherlands, then that is excellent – we should encourage them to do so.

As you all know, Europe has been very successful as an agricultural community. But in the future, European agriculture will have to be reduced. We will of course be confronted with problems, and since France is the first beneficiary of the agricultural policy, I would not be surprised if it turned out to be a very difficult issue. However, if we want to sign international agreements, we have to deal with people in the South who want to reduce the subsidies granted for agriculture. Again, I will not tell you how to solve this simply because I do not know, but I am certain that it will happen. And this means that we will recuperate large amounts of money at the European level.

I propose that we should not spend this money on some far-fetched project, but use it to build our Europe of knowledge. To build a fellowship of students and professors. To create a European society, a European journal, a European network, and all those things that are so desperately needed if we are to achieve our goals. I believe that we should have an extensive programme for the exchange and transfer of culture, knowledge and science, as extensive and far-reaching as the agricultural programme has been in the past.

I firmly believe that this is where the future of Europe lies. No one wants to lose his national culture, nor should they. National cultures, however, should not stand in the way of a network of European knowledge, and I think we can create it. Looking at scientific publications, I feel that not one European country could even begin to compete with the US, or even Japan, or in the future with China or India. If we would all work together, Europe could achieve fundamental science as good as any other country. Because we do not co-operate, the market currently revolves around the US. While I am definitely not saying anything against the US, it being a matter of honest competition, I firmly believe that a more equal balance could and should be achieved.

The future of our students will be safeguarded if we build a European society of knowledge.

In conclusion, I would like to say that I believe that Delft, because of its brightness, its reputation, and the excellence of its laboratories, should act as one of the pioneers in this effort, together with Cambridge, Grenoble and all of the other important European universities, in creating the European network of knowledge. And I hope, am sure even, that you will do so. Thank you.