

Rector Magnifice! magisteri! clerices, parentes,

It is a genuine honor to be honored by you here today at St. Olaf's, a college that through the years was and remains a home to so many of my compatriots, students and professors, who had fled communism and nazism and made their way to the Free World. All that seems like a faraway world today that people, many of the leading intellectuals from my country had to escape oppression and dictatorship and the jackboots of occupation to finally find safety here. And also give back, as professor Olaf Millert, emeritus, actually an Estonian who established the department of psychology here in 1960.

In fact, St. Olaf himself was known in Estonia already a thousand and six years ago when he invaded our largest island, Saaremaa, known in the chronicles as Osilia. Of course, he had some predecessors – the guy before him was Sweyn Forkbeard as king, and before them there was Olaf Tryggvason, who was taken hostage by Estonian Vikings around 967 and held captive by them for a number of years, so I guess we and the Norwegians are more or less even on that score.

The challenges that they faced back then were so different from those that we face today that we often find it hard to understand. The past is, after all – to paraphrase British Foreign secretary Neville Chamberlain when he justified his acquiescence to the dismemberment of Czechoslovakia by Adolf Hitler – a "faraway place about which we know nothing".

Today, unfortunately, I feel the past isn't something so far away anymore. In 2014 we are witnessing a return to a world where liberal democracy has not won the battle of ideas, as Francis Fukuyama thought we had a quarter of a century ago. Where the security architecture, the treaties and conventions upon which peace in the trans-atlantic space from Vancouver to Vladivostok we thought had been built, instead are coming unraveled, where the vanquished, banished and bankrupt ideas of communism and fascism again are rearing their heads, where annexation of neighbors' territories is allowed, in short where all of the horrors of the 1930s and 1940s seem to be returning.

But I shall not talk about those issues, pressing as they are in my part of the world, where we wonder whether the nightmares of the past will return. But rather more broadly about what we

face today and tomorrow, be it in Estonia or here in St. Olaf's, and especially you will face, as you will enter the world shortly as fully-fledged graduates of college and citizens of the world.

I wish to talk to you about what none of us ever knew about, or I didn't know about when I was in college – about things that we all shall face even when the current crisis in Europe is resolved.

That issue is the dramatically increasing dependence of our lives on the digital world, a dependence that will only increase, at an ever faster pace.

This new world has come to be considered the normal state of affairs in such a short time that most of you cannot even imagine a time with fixed line phones and manual typewriters, no personal computers, let alone iPads and smart phones, let alone apps, SMSes, iTunes, e-mails or Google searches. But it wasn't too long ago. That was the world when you, who are graduating today, were born. Indeed it was only 21 years ago that the first web browser was created.

Perhaps some of you will also contribute to developing our digital world even further. What lies ahead will change and develop even more, far more rapidly than in the past twenty-two years. Most of you know of Moore's Law, the empirical finding that the power of a computer chip doubles every 18 months. Which means that computers today are almost eight times more powerful than they were when you started college.

This exponential growth is head-spinning and we can predict that much of what we consider normal today – the new normal of iPads, iPhones and everything else – will be, by the time you attend your 10th reunion, just as quaint and part of the past the cassette tapes and Sony Walkmans of your parents seem today. For the doubling of today's computing power means that in the next 18 months the doubling of a level of computing power will be 32 times greater than the doubling of computing power was at the time of your birth.

This dizzying pace of change – change that makes the 19th century's Industrial revolution, in which the largely agrarian world of the previous 10 thousand years was transformed, look like a minor shift – will be your world.

I allow myself to say this because I believe that much of where the rest of the world will shortly be is actually already found in my own country, a country that when most of you were born was very poor, stunted by 50 years of lack of development under communist occupation, but it isn't that way any more.

In fact, in Estonia we can see a version of the interconnected and computerized future that is inextricably a part of the fundamental operations of society: 25% of the electorate votes online, nearly 100% of prescriptions and tax returns are done online, as is almost all of banking. We have given 160 million digital signatures, and last December the Estonian and Finnish Prime Ministers signed the first international agreement ever to be signed digitally, an agreement that will soon allow our citizens to access each other's services across national borders, and do it digitally. We have nearly 100% broadband coverage and countrywide Wi-Fi, we are one of the most wired countries in the world where children have started to learn to program already in the first grade. This fall, if you are interested, we will most likely begin to offer digital residency in our country, meaning you, too, will be able to use our online services even if you do not live there.

As a country so dependent on digital solutions, so dependent on the digital world to leapfrog our development out of our imposed backwardness before independence, we cannot help but be a proverbial canary in the coalmine that faces and senses dangers long before others.

Today, almost everything we do and soon the rest of the world will do, depends on some kind of a digitized system. It's not just that we are all used to using smart phones, but without our knowing it our entire critical infrastructure — our electrical, water or energy production systems and traffic management, on time food delivery to our supermarkets, the list goes on and on and on — it all is done digitally, and the digital side cannot be in any way separated from what we do in the rest of our lives.

Some things we do know about — such as cyber attacks, in which case unlike in conventional warfare we cannot identify the attacker, and thus know how to retaliate. Or against whom. In the modern digitized world it is possible to paralyze an entire country without even using military force — you can just turn a country off. You can impoverish a country in moments by simply erasing its banking records.

That means when we think about things such as cyber defense, we have to think about the entirety of our societies, we need to reconsider much of our thinking on defense and security. That's one problem we'll have to think about.

But there are other pressing issues as well, some of which are much more in the papers. Because we not only have to think about the future in terms of defense, but also in terms of our civil liberties and democracy. In the past year we have seen how different the digitized world can be when it comes to our most fundamental tenets about the role of the state and its relationship with its citizens.

In the 1960s Marshall McLuhan became famous for saying that we live in the Global Village. That was in the Television Age, this meant events around the world, such as the Vietnam War, could be seen by everyone in their living rooms. But it was an incomplete metaphor. In our living rooms you could follow what was happening elsewhere, but you yourself remained anonymous. No one saw you. Therefore, it was not yet a village.

Internet technologies have changed this. Today we do in fact live in a Global Village. Governments, Google, the apps you've downloaded in your smartphone, your creditcard swipes – these all make you an open book, just as in a small 19th century village, be it in Minnesota or Norway or Estonia. Surveillance, the two way television of 1948's 1984, which was just a pipedream for George Orwell, is enabled in every computer or iPad, unless you tape over its camera. Mobile phones are 24/7 microphones that also pinpoint your location. Big Data analytics know and can deduce more about you than George Orwell's Big Brother ever could – and often more than you can deduce about yourself. For example, just recently people found out they were pregnant because of their customer card swipes. Think about it.

Yet while all this is going on around us, we must not lose our fundamentals, the foundations of modern civilized life in liberal democracies, that is, respect for human rights, the rule of law, free and fair elections: These are the fruits of the non-technical revolution of the past 300 to 400 years in the West from the original ideas of the Enlightenment to universal suffrage to the civil rights movement in the U.S., the struggle of dissidents in the USSR and other totalitarian and authoritarian societies.

For wired and connected as we are, we have become incredibly vulnerable. Cybercrime, cyber-attacks, surveillance of citizens and people's online searches, where every laptop's camera is also a potential spy, where every mobile phone is a microphone, even when turned

off, that leaves a record of where you are at any time.

Most of us don't really care much about surveillance or about cybercrime, at least if you behave sensibly. Yet whether we are worried or not, we must all admit that we have entered a brave new world, where we have not figured out the new rules, where we are only beginning to grapple with what it means to be liberal democracy in the digital age that we have imperceptibly entered. For we are, all of us, in this case living in the buzzing blooming confusion that William James over a hundred years ago described as the world of the newborn, and in fact we are like the newborn.

We could also describe this state of affairs using Thomas Hobbes' characterization of the anarchy of life in the state of nature as a war of all against all, where there are no rules, where might makes right. I should say immediately that this is a metaphor. I'm not calling the digital world yet an anarchy in the state of nature. If we want to see what Hobbes meant unmetaphorically, all we need to do is look at Eastern Ukraine today.

To solve this metaphorical problem of a war of all against all, Hobbes posed a sovereign, a dictator if you will. If we look around today, in undemocratic countries, this is precisely the solution sought by so many authoritarian countries to the problem for them of the freedom offered by the internet. They want a ruling sovereign to control the technology.

In free societies, however, we rely on John Locke's solution to the state of nature by positing a contract between government and the people, which is the case, fundamentally, in all modern democracies. The problem we face today, ranging from child pornography to government surveillance on the Internet to indeed private surveillance to corporate use and abuse of our online searches, is that we do not have a Lockean social contract to figure out what the relationship should be.

And so today, again, we are in the midst of a massive debate on what liberal democracies can, should and should not do with the extremely powerful technologies in the world today. We have not found the answers yet. And we reject the solutions of undemocratic societies. So perforce we live in a Hobbesian world. We need our Locke and we need our Voltaire for the digital age. This will not be easy, this will take time, we will not come up with any quick fixes. But as I look out upon you, I certainly have hope that some of you might contribute to solving these dilemmas. So that is one challenge I ask you to think about as you head out into what even in my days was known by undergraduates as "the Real World".

Personally, I think much of the problem we face represents the culmination of a problem diagnosed 55 years ago by C.P. Snow in his essay "The Two Cultures": the absence of a dialogue between the scientific-technological and the humanist traditions. Bereft of understanding of fundamental issues and writings on the development of liberal democracy, computer geeks often devise ever better ways to track people, just because they can. Humanists on the other hand do not understand the underlying technology and are convinced, for example, that tracking meta-data means their government can read their emails.

C.P. Snow's two cultures not only do not talk to each other, they simply act too often as if the other doesn't even exist.

It is imperative that we bridge this gap not only for the future of democracy in the digital age, but also for a humanist future. It is only logical that as the digital world impinges ever more on the so-called real world, or more precisely, the real world becomes digital, that everyone must become digitally literate. In my own country we already have joint Masters' degree programs in law and IT, and in public administration and IT, because in 10 years from now you won't be able to do either one without knowing both. Sadly, today these are still the only courses of this type in the world. But that's only today.

So I guarantee that all things will be changing in the future, and you will be dealing with this world more than I can even imagine today. So you have quite a future ahead of you. It's going to be a difficult one; it's very promising; and you can probably do more than anyone else has been able to do before you. Because there's so much you can do when you have such a powerful technology with which to do it, but we yet have to figure out the rules, and how to best do it.

So my suggestion to you is: think hard where the world will be in 10 years and what you want to do about it, so that liberal democracy, as you and we in Estonia know it, will be strengthened rather than weakened by all of this rapid change. Whether you go on to be a doctor or an English professor, a company manager or an owner, a social worker or a Peace Corps volunteer, you will not escape this challenge. It is up to you. Now, go for it!