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by Suzan Mazur
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Philosopher Vincent Müller has been to the mount. To the peak, of Mt. Olympus that is, many times, as a mountaineering enthusiast who now calls Greece home. These days Müller thinks a lot about how Artificial Intelligence will -- pro and con -- impact humanity, both in his role as a teacher of philosophy at Anatolia College in Thessaloniki (an hour's drive from Olympus) and as James Martin Research Fellow at Oxford University in the UK. But it will take an infinite number of conferences in the palace of Zeus before the answer to that question is clear. For now, the road ahead is a minefield with huge numbers of unemployed people worldwide not keen on being permanently replaced by robotics and aware that the so-called social momentum, the madness for robots -- at least in the US -- is driven by the PR machine of the wealthiest 1%. In other words, without consulting Zeus, the 99% can intuit just who will be getting richer.

I met Vincent Müller in September at a conference in Bergamo he co-organized on Synthetic Modeling

of Life and Cognition. Following the conference we had a chance to talk informally over dinner at a lakeside restaurant outside the city. It was Yom Kippur, and Müller (German) and another of the conference presenters (a Jew, with a masterful German accent) after a glass or two of local wine began trading Jewish - German jokes across the table. . . .

Müller has a somewhat furious schedule these days, including a commute every other week between Thessaloniki and Oxford. He is coordinator of the EU's European Network for Cognitive Systems, Robotics and Interaction and somehow is finding time to write a book on the problems of Artificial Intelligence as well as edit several volumes on the theory of cognitive systems and AI.

Vincent Müller's BA, MA and PhD are all in philosophy from, respectively, Phillips University Marburg, King's College London, and Hamburg University with postdoc work at Oxford and Princeton. I spoke with him by phone recently at his home in Greece. Our conversation follows.

Suzan Mazur: Can we begin with some background? You divide your time between Oxford University where you are James Martin Research Fellow looking at Artificial Intelligence and a professor of philosophy at the American College of Thessaloniki/Anatolia College in Greece, plus you are the coordinator for the EU's European Network for Cognitive Systems, Robotics and Interaction, plus you are working on a few books on Artificial Intelligence and have organized several conferences on it. You note in your biography that you've organized a Mountaineering Club. Let' start there. Tell me about the Mountaineering Club, if you would.

Vincent Müller: I've been mountaineering since early childhood, first with my parents and my grandparents. After I moved to Greece I discovered that it is essentially very mountainous, very beautiful mountains, even though most people think of Greece as a place of sunny beaches. I began organizing trips with my students to some of these surrounding mountains, including Mt. Olympus, the highest point in Greece as well as a place of great cultural significance. I haven't participated in many of these trips in the last couple of years because of my professional work and enjoying time with my family, but I do very much like mountaineering when I have the time. I was on Mt. Olympus just two weeks ago.

Suzan Mazur: You were you born in Germany, weren't you?

Vincent Müller: Yes, I was born in and grew up in Germany. I studied there as an undergraduate also. Then I went to the UK, to King's and Oxford, and returned to finish my PhD in Hamburg, followed by postdoc work at Princeton. I later got a job in Greece and moved here.

Suzan Mazur: Would you give me an idea of just how large the Artificial Intelligence and Cognitive Systems community is worldwide in terms of researchers?

Vincent Müller: That's not easy to say, especially because the borders are not clearly drawn. We have around 900 researchers (a PhD student or above) in our European EUCog network. Perhaps that is about 20% of the total number in Europe, so say 5,000 in Europe and 25,000 worldwide?

Suzan Mazur: That's quite a lot of researchers.

Vincent Müller: The European Commission is spending 80 million euros per year on the field, but there must be a lot more going on. Europe is one of the largest single funding bodies worldwide -- 80 million euros is quite a lot, particularly when compared to the funding of philosophy.

Suzan Mazur: In an upcoming book you're looking at some of the problems of Artificial Intelligence. Would you identify a couple of the problems? What percentage of the population is opposed to the ramping up of automation, for instance?

Vincent Müller: The "problems" I discuss are primarily the ones we need to overcome to achieve a

higher level of success with these devices. It is very clear that Artificial Intelligence has the potential for significant impact on humanity in a positive and negative sense and that is something I work on at Oxford. AI already has a very significant impact on the future of the self image of humanity, of how we see ourselves.

Suzan Mazur: The late science and technology historian, David F. Noble said the following almost 30 years ago in an article for *Science for the People* which Noble later developed into a book: *Progress Without People*. Here's what he wrote:

> "When we look past the veil of mystery that enshrouds the work of technical people, we find that their activities reflect their relation to power at every point. Their link with power give them power -- it entitles them to practice their trade in the first place, to learn, to explore, to invent; it emboldens their imagination; and it provides them with the wherewithal to put their grand designs into practice.
>
> In short, it is the support of those in power (in our society, those with money, or those with political, military, or legal authority) that affords technical people the luxury to dream, to dream expansively (yet within) well understood limits, and to make their dreams come true (by imposing them on others)."

Would you comment?

Vincent Müller: It's important to see that scientific and technological research are social phenomena, bound by the social and power structures within which they take place. It's doubtful that this research is a manifestation just of the powerful plus the dreams of scientists. The kind of research that we carry out is pushed by significant social support of it, both politically-guided support -- publicly-funded areas -- and economically-guided support, directed by common interests.

Suzan Mazur: That may be true in Europe but in the US the public does not have a say over what is done with publicly-funded research. This is a point David Noble made clear in our interview several years ago, that decades ago citizens were cut out of the decision-making process:

> "David Noble: The Vannevar Bush *et al*. legislation said essentially that science would be funded by the taxpayer but controlled by scientists. Again, scientists – this is important to emphasize – are not simply scientists, but scientists and the corporations they work for…
>
> There was a problem with the way the committees and panels overseeing the allocation of research funds would be set up. The problem had a name and the name is DEMOCRACY. The fundamental tenet of the democratic system is that the taxpayers funding something have control over what's done with the money.
>
> Harry Truman said it was the most undemocratic piece of legislation he'd ever seen and vetoed it. It went through minor changes and became what we have today -- a scientific establishment run by scientists with very little political oversight. The key thing is how they kept the taxpayer out was through peer review."

Tony Prescott's recent report in the *CLAWAR eJournal* mentions that a Eurobarometer survey found 60% of people polled in Europe think robots should be banned from use for children, the elderly and disabled citing possible psychological damage.

Vincent Müller: Yes, but people see this very differently if you ask them for technical means that enable people to be more autonomous.

Having said that, whatever the social power structure is that leads to research funding taking this road or that, it is clear that a very significant amount of research is beneficial to most of the population because it

results in economic productivity. Now we have much more powerful computer systems than we had 15 years ago. That enables us to be more productive and generate more wealth.

Suzan Mazur: The EU-funded "factories of the future," initiative was designed to make industry in Europe more robust through information technology that would ultimately lead to more jobs. Is it unfolding as designed? Are those jobs materializing?

Vincent Müller: That's a very complicated question. It's something that's being debated at the moment, whether robotic automation is just an aspect of "normal" technological development and improved efficiency. If that is the case, then a technology produces some technological advantage, generates a higher efficiency in one area of production, and thus reduces jobs, but at the same time produces employment for others. Overall, society benefits. There's more prosperity so the unemployed are able to find new jobs. There's more wealth generated.

Suzan Mazur: But it's the 1% who increasingly have the wealth.

Vincent Müller: When I was a child there used to be typesetters, people who set little lead pieces in rows for printing. When electronic typesetting and later desktop publishing machinery arrived these people lost their jobs very quickly. But that meant that newspapers and other printed matter could now be produced much more quickly and cheaply. So overall this was an economically beneficial development. Some people had to be retrained.

In a social democratic society there would be a state program to retrain so people don't just fall by the wayside. The question is whether this is a development we can continue indefinitely or whether there is some kind of limit. Can we keep replacing people's jobs with more sophisticated machinery?

Suzan Mazur: The US is not a social democracy, however, and the cost of retraining here will be left to the unemployed to shoulder.

A report by your colleagues at Oxford on the future of employment indicates that the reverse will happen in the US regarding creation of jobs. Carl Benedikt Frey and Michael A. Osborne in their recent study say that in the next decade or two roughly half of all jobs in the US will be gone due to technology. If you want a job, go to beauty school.

Some analysts here say this has already happened. The Oxford report also cites McKinsey's findings that 44% of all firms that downsized since 2008 did so through automation.

And try submitting a resume to the Human Resouces Department of US companies without a knowledge of the computer catchphrases. The question is, how will people survive in a world like this of robotics?

Vincent Müller: I don't want to comment on the technical details of Carl Frey's and Michael Osbourne's report. It's an economist's question and I'm not really qualified to do that. However, they are trying to gauge how many kinds of jobs could potentially be replaced, not how many people will be replaced. The replacement of humans by machines been happening for a very long time, basically throughout the industrial revolution.

Suzan Mazur: Yes, but companies in the past trained people and paid their trainees. Now in the US the norm is an unpaid internship -- MAYBE -- following training paid for by the intern. How do people survive if they don't have jobs or money to get retrained? Is the point to downsize the population?

Vincent Müller: If something of that sort is actually going to happen, and we don't know yet whether that's true -- it's not happening yet. But if something like that is going to happen, then we would obviously need to find a way to negotiate this very significant change as we did in the past when jobs in agriculture were almost wiped out.

Suzan Mazur: Are you saying that we should take a wait and see approach to see if people are beginning to die off?

Vincent Müller: As an example there was an enormous uprooting of entire populations as agriculture went from manual to machine-driven labor. Before World War II, the vast number of people were working in agriculture. Now in most developed countries less than 10% do so. So the question is whether (a) we will see a development like that, and (b) whether we will be able to turn that development into a positive for the society with more wealth generated for all or whether we will reach a point which economic historians have been talking about for a long time where we will not have enough work.

Suzan Mazur: Frey and Osbourne point out that the US high school movement in the early part of the 20th century eventually took us to a point where there was a "supply of educated workers outpacing the demand for their skills." This situation is now acute. They say "high-skilled workers have moved down the occupational ladder, taking on jobs traditionally performed by low-skilled workers, pushing low-skilled workers even further down the occupational ladder and, to some extent, even out of the labour force." That's the situation now and it continues to get worse. Very difficult.

Vincent Müller: If it's a matter of improving efficiency, which industry has been working on since it started, then I don't think it's a difficult problem. If we're looking at a categorically new thing, in which the movement of labor will not happen, then we are facing a substantially more serious problem. But it's a problem we'll be facing in the context of substantially increased wealth. And in that context we'll be able to deal with the problem.

Suzan Mazur: Again, the wealth is in the hands of the 1%.

Vincent Müller: The issue is whether we can make that wealth for a large part of society.

Suzan Mazur: As a philosopher, haven't you argued for the falsity of humans having minds and said that "the mind is dead . . . forget the mind." Would you expand on that and put those statements in context?

Vincent Müller: Quite a different issue. When I said the mind is dead, what I meant was that I find this a very un-useful concept for explaining what's going on, which shows in the context of the ‘extended mind’ debate. For example, in the context of free will I think there is a useful description of the cognitive structure that allows strong beings to have that feature and there is no particular reason to think that human beings have an exclusivity on that feature in principle. And there's also no reason to think that having the feature of free will requires that the world is somehow not deterministic. "Having a mind" only muddies the waters here.

Suzan Mazur: Do you make a distinction between consciousness and cognitive?

Vincent Müller: Yes. There are different procedures or processes that I would call cognitive and some of these are conscious and some of these are not.

Suzan Mazur: I'm still unclear about your statement that the mind is dead . . . forget the mind.

Vincent Müller: What I mean by that is that you cannot base the whole concept, to call something mental or not mental or the mind and not the mind in order to understand what is going on for humans or others. It's been an unfortunate term -- "mind" - in the history of understanding cognitive phenomena. Many languages don't have this term "mind".

My reference to the mind was in relation to the extended mind. And the discussion of the extended mind boils down to a borderline question -- what is mental and what isn't. That's the part I think is unhelpful. But that's not to say that all the terms that we've been using in the description of the mind are unhelpful.

So for example, the word consciousness has been used in several ways that are useful. There is consciousness in the sense of having experience of what is life, known as phenomenal consciousness. That I think is a useful term.

Indeed, if we think that that is what we mean by consciousness, then there is an interesting point as to whether we would have the ability to generate artificial beings with that feature. It's a difficult question because we already know there's no particular scientific test by which we can find out whether a creature other than ourselves actually has phenomenal consciousness. This is known as the other mind problem.

Consciousness is one aspect of our mental mind. It's not the only one, but it's one. There are obviously non-conscious features of mental life.

Suzan Mazur: Do you see any tie-in between origin of life and cognitive systems engineering/ artificial intelligence?

Vincent Müller: Yes. The artificial cognitive systems approach is exactly to try and understand what actual cognitive systems are like and use that understanding to generate artificial cognitive systems that also have those features. And also to use the understanding of the artificial systems as a test bed for a theory about natural creatures.

Suzan Mazur: Do you see life as non-algorithmic and artificial intelligence as algorithmic?

Vincent Müller: That's a complicated question, again. My view is that anything to do with our digital computer systems is fundamentally algorithmic. If the system that we're trying to generate is not fundamentally algorithmic, then we won't be able to generate it. It seems fairly clear to me that life is not of an algorithmic nature therefore we won't be able to generate it on our computers alone. So artificial life in that sense is not life.

Suzan Mazur: Would you like to make a final point?

Vincent Müller: I have fairly strong views on a couple of the theoretical points we've covered but I do not claim any expertise on the points for foreseeing the future, particularly the economic parts discussed.

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Suzan Mazur is the author of **The Altenberg 16: An Exposé of the Evolution Industry**.*Her reports have appeared in the Financial Times, The Economist, Forbes, Newsday, Philadelphia Inquirer, Archaeology, Connoisseur, Omni and others, as well as on PBS, CBC and MBC. She has been a guest on McLaughlin, Charlie Rose and various Fox Television News programs. Email: sznmzr@aol.com*

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