Eva Verena Müller: Between Science and Theatre

A conversation with Peter Tepe | Section: Interviews

Summary: Eva Verena Müller is both actor and scientist. She is currently doing her doctorate on forest ecology. This interview traces her development and, in particular, the interfaces between science and art. The topic of scientific objectivity also comes up.

Eva Verena Müller, on the one hand you work as a scientist and on the other as an actor. In w/k we would classify you as a border crosser between science and the performing arts. This interview seeks to describe your *interface situation* as precisely as possible. Let's begin with your scientific work: how would you characterise it?
I work at the *Research Institute for Forest Ecology and Forestry* (FAWF) in Trippstadt. I'm doing my doctorate there on the regulative ecosystem functions of the forest with regard to qualitative and quantitative groundwater recharge. In other words, I am researching how we can better protect our groundwater resources and preserve them in times of climate change.

And what about your acting?
I act in various film and television productions. Currently, I'm involved in a bigger project for a well-known streaming service.

How did you become a scientist, specifically a forest hydrologist?
I have been passionate about nature for as long as I can remember – passionate about the nature of the world as we know it and the nature of mankind as part of it. As a child, I spent as much time in the forest as possible – despite being a city dweller! Even back then, the forest somehow made me feel healthier, and through all my years as an actor this connection has always remained strong. I visit the forest regularly and enjoy its many health benefits: one's perception shifts, certain things are put into perspective, the mind calms down. The forest itself has to be healthy and well cared for if it is also to have health benefits for us humans. Knowing what the forest needs for it to stay healthy requires research. To me, this represents a form of healthcare for people, animals and plants, as well as for the material cycles of the spheres of water, soil and atmosphere. If we fail to keep our world healthy, we will not keep ourselves healthy. I'm afraid we humans will now, more than ever before, have to prove that we are intelligent enough to maintain our own species. And this simply won't work irrespective of the other species. So I figured, someone has to do the work. At the time I came to this realisation, I was knee-deep in acting with a degree in performing arts. But thanks to a passionate personal statement I wrote, I was admitted to the University of Rostock for a master's degree in environmental science without a bachelor's certificate (not, of course, without first sitting an exam in the fundamentals of natural sciences). What a laudable example of scientific integrity and impartiality and, by the same token, of equal opportunities! After my master's degree, I began work on my doctoral project.

Changing focus, how did you become an actor?
I followed what is probably deemed the *classic career path* to becoming an actor: joining the high school theatre group and youth club, going to acting school (Folkwang Hochschule Essen), followed by my first acting job in 2003, then a couple of years of freelance work, various film and television productions, and

from 2011 on, a long-term commitment – with Kay Voges at Schauspiel Dortmund. I absolutely love acting. There aren't many other professions that allow you to understand so deeply that every person has good reasons to be the way they are. As a teenager, in the midst of the phase when, for the first time in life, the world turns out to be a total disappointment, I realised that conflicts cannot be reconciled without seeking mutual understanding. I believe that the ability to find mutual understanding for one another is crucial to a democracy. Isn't that what makes ours a free world? I think that theatre has the power to remind us of our ability to empathise. I consider theatre to be a social organ that promotes empathy and democracy. As a teenager I was convinced of this, and I still am today – that's why I took up this profession in the first place.

How did the connection between science and the performing arts come about for you? What were the most important phases in this development?
This connection is like an intrinsic part of me. From a young age I was very drawn to both areas. Although I ought to mention that it took a little detour via philosophy – a humanities subject – to finally discover my passion for natural science. As a teenager, I was driven early on by the question as to what holds the world together at its core. I sought answers to this question in philosophy; finding them would probably have been easier in religion. But since I was never baptised and was raised to be critical of religion, I was more fascinated by the never-ending quest than by understanding. I think that's what drove me unconditionally towards the arts. Yet after graduating from high school, I enrolled in philosophy, psychology and German studies at the Technical University of Darmstadt. In the meantime, I was becoming increasingly aware of "the two souls, alas, housed within my breast". And so my time at the TU soon came to an end.

Let me dig deeper: did you gain insights on your *detour* that are still relevant to you today?
I never gave up on philosophy. Essentially, it forms the link, the cradle of science and the foundation for art. Acting is, if you will, another form of studying psychology, and philosophy is also a good place for anyone who likes German poetry. Pretty much everything about my *detour* has remained meaningful throughout my life.

Can you recall the main reason you switched to drama school?
When I started studying at the TU, I put acting on hold. However, barely a year had passed before I realised that the thorn of the performing arts was lodged too deep in my flesh for me not to be plagued by withdrawal symptoms were I seriously to leave acting permanently. A thorn way too strong at the time, to which I succumbed. I yearned to explore and taste human life that extends beyond my own horizon of experience. Expansion – an expansion of consciousness, if you will.

If I understand correctly, you also have a passion for physics, which is quite unusual for an actor: what are the issues that you deal with in physics? And has this had an effect on your acting work?
Well, since I found pleasure in examining all the nooks and crannies of existence, in approaching the question of what holds the world together at its core from every possible angle, I felt that the issue of what binds spirit and chaos still lacked substance. And it is physics – quantum physics, to be precise – that explores what holds matter together at its core. It was in my early twenties, when I was studying Plato's theory of ideas and the concept of truth in philosophy, that I came across Albert Einstein's theory of relativity. According to Einstein, nothing is faster than light. Yet in one of the books on this theory I

read a reference to the fact that quantum particles travel long distances without loss of time – hence faster than light – and that Einstein was critical of quantum theory, especially of the role of chance in it, even though Einstein himself, alongside Max Planck, can be considered one of the discoverers of quanta. This aroused my interest. Most people think of themselves as independent observers of an objective reality. But even the questions we ask of this objective reality are based on interpretation. Collecting data independently and without bias is simply impossible. Inevitably, what we call neutral information follows solely our thought patterns. Science already filters out possible answers through the questions it poses to the world from a perspective which sees matter as stable and data as objective. The world of quanta shows that objectivity, at least as perceived from within us as subjects, is a myth, since we are already busy shaping our perception of the world while simultaneously perceiving the world in a supposedly neutral way.

The w/k interview is maybe not the right place to have a detailed discussion on the subject of scientific objectivity. We can only touch briefly on this topic: what do you understand by objectivity in relation to quantum physics and why do you consider it impossible, a myth even?

When I say objectivity is a myth, I am referring to the concept of objectivity that characterises the observer or the subject as independent of judgement. That would be quite a paradoxical demand to make of a subject, don’t you think? Regarding quantum physics, my considerations go back to the double-slit experiment as a means of demonstrating wave-particle duality. Put simply, it goes something like this: you let waves, of light, for example, pass through two narrow, parallel slits. At some distance behind these two slits the waves hit an observation screen, a surface, on which an interference pattern is formed, caused by the impact of the light waves: it is a very specific pattern, generated solely by the waves, their diffraction passing through the slits and their subsequent superimposition. In simpler terms, imagine water: the waves can be in different locations simultaneously. A classical particle, on the other hand, can only be in one place at the same time. The two properties seem to be mutually exclusive. Interestingly, the interference pattern only appears on the observation screen if the test setup is not actually being observed. If you install a recording device, even though the physical possibility for observation alone is enough, the light behaves like particles and forms a striped pattern on the observation screen. Hence, it must be said that the observer has, at least on the subatomic level, a not negligible influence on the observed system of objects. In other words, the smallest building blocks of matter transform their identity just through the act of being observed. They seem to be interacting with the observer. Our observation – hence we too as observers – is excluded from a process, from an aspect of reality.

That should suffice to represent the situation in quantum physics. Many experts might say there is a special constellation here which can be summarised in your words as follows: at the subatomic level, the observer has a not insignificant influence on the observed system of objects. On the other hand, in other empirical disciplines, many – of course, not all – researchers adhere to an understanding of objectivity that can be explained as follows: first, they strive for a careful description of the respective facts and then they aim to deliver the best possible theory-based explanation which, nonetheless, can always be improved upon. Here (and this also applies to many science theorists), objectivity cannot be taken as complete independence from the subject qua observer, which in turn would be considered fundamentally unattainable. Rather, the quest for humanly achievable objectivity is seen as an endeavour based upon theoretical constructions that conform to facts as closely as possible that thereby seeks to achieve the most comprehensive and most profound

explanation possible. Such results are independent of and superior to the opinions of the individual subject. Would you reject this notion of objectivity too?

To avoid any misunderstanding: I am not denying the existence of objective reality. And, of course, I follow the scientific working method as you describe it. But you already raised a crucial detail: the results are independent of the opinion of the subject. For natural sciences, it would certainly be fatal if findings were based on the opinions of the individuals performing research. And yet I dare to doubt whether human subjects will ever succeed in fully freeing themselves from interpretation. It might be a question of terminology, but I think the term "objectivity" should be used with caution. I'd like to describe my approach using the theory of *radical constructivism*: this philosophical position deals with the question of the extent to which we as human beings are ultimately able to grasp the objective nature of an external reality. Within the system of human existence, of our perception and experience, cognitive structures are constructed in our sensory processing system, the brain, which cannot elude the limitations of this system. Given this assumption, we can only access those questions that arise from within these structures. In a sense, our questions already correspond to our expectation of the reality we perceive and experience in a certain way. As long as we can neither withdraw our cognitive system from its relationship to the environment, nor prevent ourselves from interacting with the object systems surrounding us, we cannot help but adopt the viewpoint of a subject. And I consider this an important position insofar as it helps to put our knowledge of the world into context and to be more conscious of the human perspective. This is, of course, imperative once we take into account the parameters of the knowledge on which we rely to intervene in highly sensitive processes in nature without being aware of possible consequences. The claim to objectivity runs the risk of suggesting a superiority that can easily lead to hubris. Many examples in the history of mankind are a striking demonstration of this – for instance, the climate crisis and the stubborn denial in many parts of the world of our involvement in it. Ever since it was recognised in the 1970s that human activity does have an influence on the climate system, there have still been certain scientists using supposedly objective facts to rebuff anthropogenic, or man-made, climate change. So science is indeed also a question of interpretation. And, unfortunately, often of money too.

Your dissertation project is about answering the question of how we can better protect our groundwater resources and preserve them in times of climate change. How would you classify this project in terms of your constructivist beliefs? Does this not imply a claim to objectivity in the sense I set out?

Ecological systems have a highly complex network of interactions through countless biotic and abiotic relationships, i.e. those that affect animate and inanimate nature. To this day, we understand very few of these fully, and every time we don't – or don't yet – understand something, a corresponding question emerges, waiting to be asked. Meanwhile, the human factor has had such a grave impact on natural systems, mainly driven by subjective interests, that their very functionality is endangered. From the interactions both within nature's functional relationships and between natural systems and human beings, we can learn what we have to do and how we can adapt our behaviour in order to coexist with the natural systems, whose maintenance is vital to our survival. When you propose "a claim to objectivity", meaning the scientific way of working, I would suggest, instead, seeking our orientation in logic. Any attempt here to achieve objectivity in the proper sense would be doomed to failure – naturally, a contentious point of view in the eyes of many scientists. Not for nothing is objectivity an ideal that we try to approach in science by means of established methods, i.e. through frequent

repetition of tried and tested methods. From this we try to derive regularities as a means of orientation. These regularities that we postulate can be described as snapshots of the current state of knowledge at a certain time within the given cognitive system (i.e. in terms of how it is provided with the mind and senses).

Let us move on from our discussion of the concept of objectivity here. How did your engagement with quantum physics affect your acting?

These insights influenced me as an actor in that I understood the absoluteness of all forms of subjectivity in my roles. After spending more than 10 years on German stages, during which my inner chaos had celebrated its supremacy, it gradually subsided, and what emerged in the remaining silence was the kindred call for *matter*. I aspired more and more towards science. So my engagement with physics drove me above all into the arms of my second job. If you look at physics through the eyes of interaction – the same way as my eyes are led by art – you quickly arrive at chemistry. Physics deals with the fundamental interactions, with the basic forces of nature, whereby the properties of the various interacting partners are retained throughout the interaction. In chemistry, substances enter an interaction that creates something new. The result is greater than the sum of its parts. Art is often about precisely this quality of interaction, creating something that is greater than the sum of its individual parts, something that transcends itself. One master of the ability to bond and thus of chemical interaction is carbon, the key protagonist of organic chemistry. And there you are, in the sphere of the living, which is hardly rivalled by anything when it comes to complex interactions. I finally arrived at a synthesis of art and science on the boards that mean the world, when in 2018, Kay Voges, the director of the Schauspielhaus Dortmund, asked me to co-author a theatre piece on quantum physics. Only then did I realise what kind of synthesis had formed inside of me, that I’d finally found the missing piece to my puzzle.

Eva Verena Müller (2017). Photo: Gregory B. Waldis.

What artistic goals do you pursue as a border crosser? And following on from that: how do you yourself cross these borders?

By entering unfamiliar territory, by trying new things, by questioning what I think is right, by challenging myself and others, by keeping an open mind in my thinking and acting, by not sticking to what is familiar. Art has reinvented itself over and over again in the course of history. And that is important for keeping up with the times and for expanding, for breaking new ground. I am particularly interested in this new territory. The production *The Parallel World* by Kay Voges, which I was invited to co-author for the first time, is a good example of exploring new artistic territory. The performance took place simultaneously at two different venues, at the Schauspiel Dortmund and 492 km away at the Berlin Ensemble. The two ensembles were connected via live video transmission and were able to perform with one another without any time lapse. Members of both ensembles spoke some of the texts as a joint chorus, and the fact of inhabiting two different places at the same time was also taken up thematically, with quantum physics providing a central contextual aspect. This kind of experimental arrangement called for the actors to extend their sensibility towards their fellow actors beyond the real space and into a virtual dimension. It also requires viewers to engage in the experiment, to shed familiar notions of theatre and even to push themselves to the boundary of what can be understood in terms of content. At this boundary, non-understanding could potentially be experienced as an inspiring process, bringing me into contact with associative thinking and thus with my own inner life. My inner life and the theatre performance enter a reciprocal relationship, whereby the performance is staged within me and is greater than the sum of both parts. Essentially, this is true of any performance with an audience.

Nonetheless, the dissolution of the boundary between my inner life and the performance is clearly tangible in this particular production. What excites me most as an artist is to think about boundaries, to identify them and to bring awareness to the fact that you can cross them. I mean “cross” in every imaginable sense, be it social, political, scientific or personal boundaries, inside or outside. Boundaries can be very important when we need to protect ourselves from something. But they also restrict us. In our spirit, our potential, our creativity. They are limiting – and what’s more, they don’t seem to exist on the subatomic level, the deepest, most interior level of our being. The deepest level of our matter appears to us in such a way that it manifests no separation whatsoever. Only interaction. Evidently, interaction is not just fundamental to nature: the idea that together we are greater than the sum of the individual parts is an approach that can have an invigorating effect, both on our democracy and on how we relate to our livelihood. I believe that the problems of the 21st century won’t be solved on the societal level as long as the interactions of our countries continue to be based upon territorial demands and protectionism, rather than reflecting on their mutual dependencies. On the scientific level, we can hardly master the challenges of the 21st century without interdisciplinary thinking, without interaction between scientific disciplines. We have reached a point where, in order to continue, we will also need to master the level of complexity that we have so far surmised. This begs the question: where does one end and the other begin? And the same, of course, also applies to all art that deals intensively with time.

What is the relationship between your scientific and artistic work? What connections or interactions are there between the two realms?

The connection is me, is my life spent in a society that cannot be separated from me, in an environment that cannot be separated from me, on a planet holding the entirety of life that cannot be separated from it. That is the ultimate connection. This interaction is consciousness. Art as a profession creates awareness and seeks to open every door needed to achieve it. It elicits the reality out of us, as you were. Science as a profession exposes reality, channels us into it and constantly takes us to the limits. The limits of consciousness. Here, mind and matter are brought face to face, each affecting the other. Science can help art in its quest to browse precisely on these boundaries and to ask questions. There can hardly be a more fruitful source of absurdity – a practice that theatre professionals have to laboriously acquire – than quantum physics! In return, art can teach science to think creatively in order to come up with new questions – because the questions we ask the world determine the answers we get. Many a brilliant scientist owes their genius to the fact that they were able to connect loose ends.

Do you attribute creative thinking entirely to art?

No. I’m not talking here about art or science in absolute terms, but about the aspects both *can* borrow from one another. The major potential of art is creativity. That is what defines it above all other things. In my opinion, this does not mean that art alone is creative. And the fact that it *can* help science tap into this potential does not mean that science is categorically uncreative.

Where do you see artistic activity having favoured the production of scientific theory – and/or vice versa?

Do you mean me, or Albert Einstein and his violin? I am currently working on my doctoral thesis onforest hydrology. So far, it is hard to say where there might be room for artistic activity in this, eventhough I cannot subtract creative thinking out of myself. But it is certainly helpful when it comes toidentifying connections between things. My scientific activity, on the other hand, has already generatedtwo artistic theories in the form of stage pieces. One of which is still waiting to be realised.

Eva Verena Müller, thank you for this illuminating interview.

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