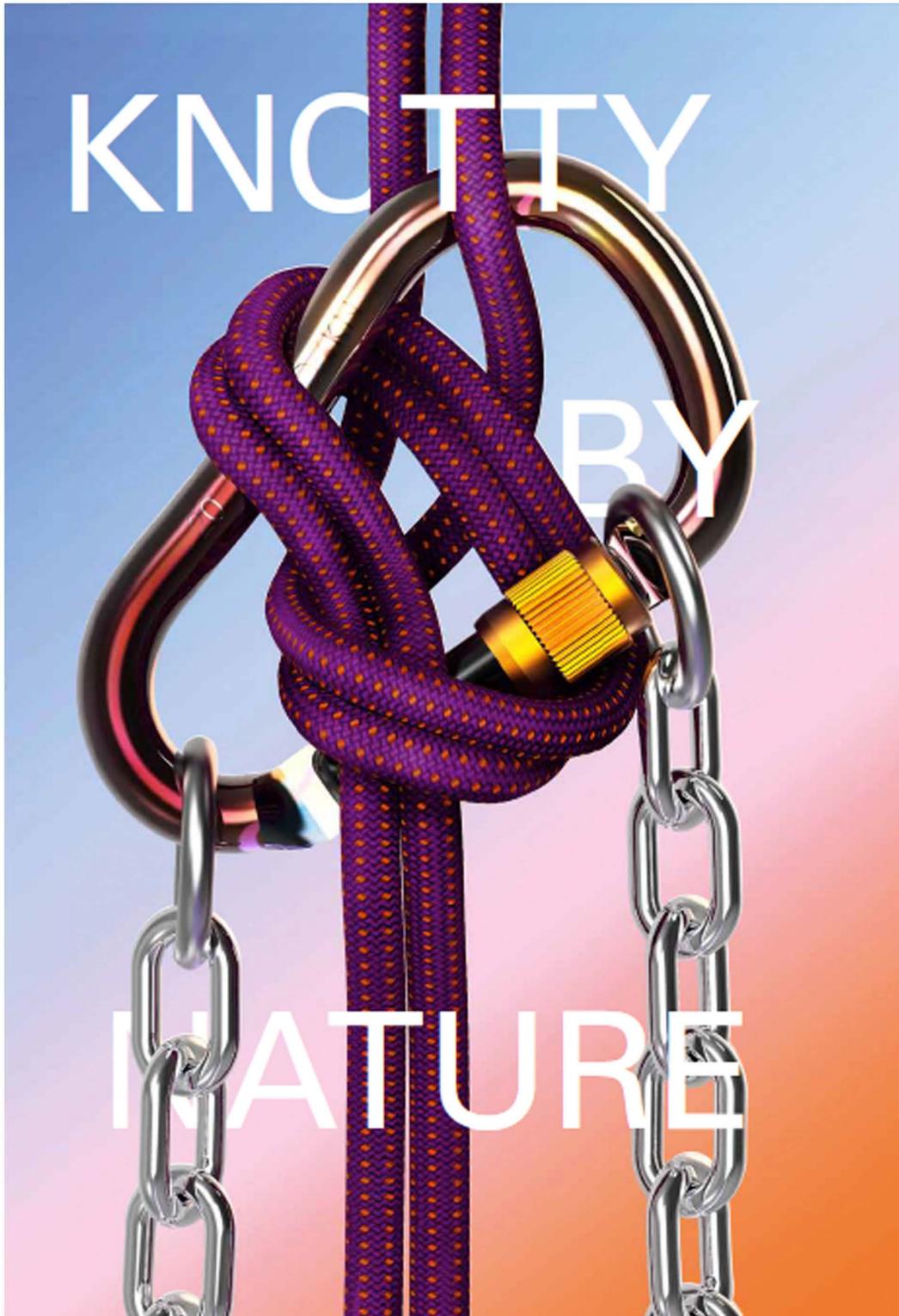


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Carolyn Christov-Bakargiev, "Knotty by Nature," *Mousse Magazine*, October, 2015

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KNOTTY BY NATURE
W. IRVINE, J. M. VAPPEREAU, E. ATKINS

Knots make for fascinating speculations, not just in relation to string theory and the by-now popular (or popularized) “theory of everything,” but also because they have tickled the fancy of many an intellectual, prompting the formulation of an alternative to alphabetical language. The background theme of all the later teachings of Lacan, for example, is precisely that of the Borromean rings, a *knotty* way of producing a new vision of clinical psychoanalysis. Carolyn Christov-Bakargiev approaches this complex subject in a conversation with William Irvine, a physicist and scholar of *knots*, Ed Atkins, an artist whose work is produced through indivisible factors, and Jean-Michel Vappereau, psychoanalyst and mathematician (to whom Lacan entrusted his collection of *knot* drawings), who is attempting to construct a system of writing akin to that of mathematics.

A CONVERSATION BETWEEN CAROLYN CHRISTOV-BAKARGIEV,
WILLIAM IRVINE, JEAN-MICHEL VAPPEREAU, AND ED ATKINS

CAROLYN CHRISTOV-BAKARGIEV

Let me introduce the three of you to one another.

William Irvine is a physicist working on knots. Knot theory began in the nineteenth century with Peter Tait, in physics, then it moved to mathematics (topology), and now it has reemerged in physics. William is making knots with water, inside water.

Ed Atkins is an artist preparing a new video for the 14th Istanbul Biennial, about the last thirty minutes of life of a man in a bed that vanishes into a sinkhole under his house. It is installed in an abandoned wooden house that is falling apart. It was a Greek Foundation property, but today there are very few Greeks left in Turkey because of Turkish nationalism and its repression of other ethnicities. It's located on the same island where Leon Trotsky lived for four years, and did many of his writings.

Jean-Michel Vappereau is a psychoanalyst and mathematician. He was one of Jacques Lacan's last students in the late 1970s. Lacan gave Jean-Michel a suitcase full of drawings of knots, of which he is now the custodian. These drawings are exhibited at Istanbul Modern, which is one of the venues of the biennial. Jean-Michel understands why Lacan was interested in knot theory, because of what it could mean from both a psychoanalytical and a mathematical perspective. I must say that for me the drawings are very difficult to understand, perhaps because they are mathematical. Yet they are also simple, in a way.

Let's start by sharing what each of us is passionate about. I will begin: what I am doing with passion is bringing the three of you together in knots.

JEAN-MICHEL VAPPEREAU

I must say that what I do has nothing to do with physics. And it's not that knot theory influences psychoanalysis; rather, psychoanalysis changes knot theory. Contemporary mathematics studies knots made with string using algebra and numbers. In psychoanalysis, the practice of knots is a practice of drawing and writing [*écriture*]. For Doctor Lacan, it was about finding a place where writing and spoken language [*la parole parlée*], two different practices, could be articulated together, at the same time. To find a form of writing is very close to spoken language. It's spoken language that knows how to write, in a way. But this writing is not a reproduction or a recording of spoken language.

CCB

The drawings, the diagrams...

JMV

They're not diagrams. I'm trying to build a system of writing akin to a system of writing as we know it from mathematical topologies. I've already done this for surfaces, and now I'm continuing with knots. I am doing what I've been doing since being with Lacan, and through reading Lacan and practicing psychoanalysis I have realized the stakes, the urgency, of resorting to knots in psychoanalysis.

It's a kind of writing that is not alphabetical. There is a hegemony of the alphabet of Western writing; it triggers a paranoia that is presently very pronounced in our societies. We have to learn how to read outside of the alphabet, a little like the Chinese are already doing, or the Japanese, or hieroglyphic writings, or Freud's dreams. It's about reading and writing outside of the alphabetical hegemony that comes from numerical systems in the written language.

CCB

This is a good moment to bring Ed, who is an artist, into the conversation. I think that artists are generally aware of this dichotomy between spoken language and writing; they don't take it for granted. Whereas a novelist, a physicist, or a philosopher might take that split for granted, as if they could take for granted the transparency of alphabetical language and writing and use it to achieve a desired effect. Your practice as an artist has visual elements, and there is a voice. Can you talk to us about your point of view concerning this question we are discussing, and also regarding knots in general?

ED ATKINS

It's a fascinating way to read something, that for me rings true as being fundamental about representation, I suppose, by which I mean the insufficiency of representation and representational structures to *do justice* to whatever the subject, or the concept, or the content might be. To insufficiently do justice to the thing that is being reproduced—the thing that is *not* the surrogate: the original thing, whatever that is. My work reflects my fascination with the limits of verisimilitude, in the computer-generated stuff and very particularly in the high-definition stuff, which pushes toward some sort of limit of visual representation. A lot of contemporary image-making privileges hyper-real verisimilitude over any other kind

Illustrations by Filippo Nicolini

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of development. One example of a kind of fetishism is the attention paid to, say, the re-creation of hair in computer-generated imagery, or every single pore on the skin.

To go back to this idea of text versus the spoken word: the fundamental structure of the computer-generated image is digital—meaning, numeric. The whole thing is constituted through a very intense, rule-based, structured, numerical strategy, which is very fascinating for me. A lot of my work tries to use these tools to oversaturate the forms of representation by speaking of potentially unrecoverable subjects, or things that we know very fundamentally as being impossible to reproduce with sufficient accuracy: concepts like love or death or the weather. Those are things that entirely elude the process of being captured.

Jean-Michel, I want to ask about your work with Lacan's drawings: is it a performance that you do live?

JMV It is also that. There is the solitary work I do on my own, everyday work, and then there are my lectures and presentations, where I draw in front of the audience. An important point you just made is that indeed it's not about representation, but its limits. Even if you take the motif of the string as a starting point, you very quickly abandon this aspect. It is indeed about doing justice to what psychoanalysis discovered regarding the unconscious, and identification that is different from imitation. In Aristotle's *Poetics* it's about mimesis, which is neither imitation nor representation. It's re-creation, and it's something new every time.

EA One of the interesting things for me in my work is that even though the technology of imagery itself produces an apparently hyper-real representation, its construction is generative; it comes from nothing. I like to think about "doing justice to something" and "being sufficient" as two different things. There is a moral or ethical moment in "doing justice to" rather than "sufficiency" that has a kind of technical precision about it, in some way.

CCB Ed, you didn't say anything about knots.

EA I suppose I don't know enough about these two theories about knots, these mathematical and Lacanian knots. But I'm fascinated by the more or less literal, more or less figurative language around this thing. I suppose the potential "knottiness" in my work would have much more to do with those things that are necessarily always in relation, that can't be split apart, that cannot be fragmented, but rather are determinedly like a knot. Even prior to being tied by anyone, they would exist as knots.

CCB William, what do you think of this "knotty" conversation? You are such a practical guy, you sit in a lab—

WILLIAM IRVINE It's funny, but I don't think of myself as practical! At my lab we create vortices, which are motions of a fluid, a little bit like smoke rings, or like a tornado, which is motion in air. But instead of having these motions be centered around circles as in the case of smoke rings, we tie the lines into knots. So the fluid is spinning around these lines that are tied into knots. And the shape they form determines the flow of the fluid everywhere, and that flow in turn determines the shape of the vortex thereafter. And this kind of interplay leads to an evolution of the knots. We watch to see what they do.

CCB Why make knots inside water? Why knot water inside water?

WJ It comes back to two themes we were discussed earlier: one was about something coming out of nothing, and the other was about trying to come up with something that is "sufficient" to "do justice to" something.

In physics, there are many unsolved problems, and one particularly intriguing one relates to turbulence. We know a lot about turbulence and how it works. But there's a sense of dissatisfaction, a sense that we have not found the right language that is sufficient to *do justice to* this phenomenon. So we are trying to explore, to find the missing ingredient in understanding turbulent flows, and one strategy involves looking not at the language that we usually use,

but instead at the structure of the vortices, and in particular how knotted and twisted they are. The knottiness of the fluid might be a strong interpretive key to understanding turbulence—focusing not on the fluctuation of velocity, but on the structure of the vortices.

JMV That is highly interesting. I'm wondering how you came to study knots after having studied vortices. And also, what kind of writing you're using to continue to think this through, scientifically and mathematically. How do you write out your physics as you describe the structure of the vortices?

WJ That's a very good question. In physics it's a habit to try and reduce something complicated to the simplest, coarsest measure possible, and very often that works well. So we reduce these shapes to numbers that one can calculate for a given shape. These numbers don't change; they represent the intensity of the knottiness, not of the shape. So if you take knots with different shapes, the number would be the same if it's the same degree of knottiness.

At the same time, we've encountered difficulties in writing our work, so we've relied thus far on videos where we show the evolution of the shape. But that's partly because we haven't found a better, more synthetic representational mode. There exists a mathematical language that's very good and very powerful, but to capture the physics that is going on, we haven't yet found quite the right language.

CCB How do you prove or disprove what you're doing, then? Why is it science and not just art, like making videos?

WJ Some of these simple numbers follow patterns that are very clear. That is the science part. We find rules, we find principles. For example, we've discovered that any knot that you tie immediately distorts and changes shape until it looks on the surface as if it has untied itself. What it's actually doing is taking this global knottiness and transferring it into helices and wiggles and waves that you find on the knot until it has untied itself.

CCB I feel like there is something almost un-human, detached from humanity, in what you're talking about, William, whereas one might say art and psychoanalysis are fundamentally concerned with the question of how to provoke as little pain as possible to others and oneself while living on this planet. That sounds moralistic, but it seems that there is this motivation behind getting involved in psychoanalysis, either as a patient or as an analyst, or getting involved in art.

Ed spoke about our, let's say, state of subjectivity in the digital. And there was a subtext about a type of freedom afforded by his practice. What I'm trying to understand is what makes you tick. Does your work relate to matters human or non-human, to joy on the planet? What is your research doing, how is it being applied? Do you have a sense that knowledge of, for example, turbulent flows might serve some further purpose?

JMV There are three different categories or dimensions here. There's nature, which William tries to observe and finds is a reason to write things. There are machines, which Ed spoke about, describing the digital, numerical part that is mechanical or electronic. And for my part, I suggest that what we're doing with Lacan is something akin to writing and language, because we situate ourselves within the symbolic. And the symbolic is presently disappearing into paranoia. Paranoia is the destruction of the symbolic, as we've seen with today's so-called terrorists. Actually they're paranoiacs, who want to destroy museums and archeological sites.

So you see, one can easily forget that what constitutes us as humans is language—language that is spoken, and then becomes writing. Animals and nature speak, but they cannot write or read. And machines are products of the human species in that we've created them as a technology for writing. You might say all technology comes from writing, it's simply writing that is more and more rigid. So you must reintroduce not nature, not machines, but unblockings [*débloquements*] of the symbolic itself, so that it can be recognized.

I'm not using readymade mathematics, but introducing,

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developing, showing that given the fact of language, of writing, of spoken language, and of reading (which is very difficult for us), this produces a sort of subjectivity. It is not conscience, not love. It's subjectivity, sex. Not the sexuality of animals, not genital sexuality, but what is called "the difference" [*la différence*], the difference that must be written. And so we in the discipline of psychoanalysis write. We construct this lack that William was speaking of, and also the difference. For example, I also wonder about knotiness, nodality ("what is a knot?"), but I claim that one can write it without having to understand it, without representing it. One can write it in order to practice it.

CCB So, in other words, the work of psychoanalysts is to reintroduce the element of the symbolic. And they use math, not for its own sake but to be able to redevelop a form of reading, a "lecture". It's the most difficult thing, reading, so I bring in "subjectivity" as a word, and Jean-Michel says yes, that's a good word, because it's not about sexuality or identity, but this need for writing, and what the psychoanalyst does is the writing of the mark. The writing of that thing, Ed, that you talked about as missing. The psychoanalyst is saying that you can write even if you don't understand what you're writing.

EA That's terrific, I totally agree. But I would also say that my interest isn't in the performance of the technology for its own sake. It's used to spell out its own failure, to a certain degree. The technology is pushed to its limits to reveal its insufficiency and its lack and its inability to do justice—the points where it fails to fulfill whatever one might want it to do. That is where, for me at least, there is a re-vilification of the symbolic, or the subjective, or those things that cannot be—that neither nature nor technology can approach.

JMV Yes, but William is also interested in water in water. Georges Bataille said that fish are like water in water. Whereas we are not like water in water; we are narcissists. We are divided in two in order to realize that we are facing a division that's very difficult to practice. I'm very happy to see that Ed, William, and I are working on things that are very closely related. I should say, however, that my practice stems from a technical minimalism. I'm not an environmentalist, either. I do see that we are destroying nature, and that we are wreaking havoc with machines, but I'm not an environmentalist. First and foremost we must talk about our position in the world, inasmuch as we have a responsibility, given the fact that we can destroy the world. In airports lately I have been seeing an HSBC advertisement that shows a bee and a computer with the caption "Nature and technology are collaborating."

CCB William hasn't yet replied to my question about why water in water, as opposed to smoke in air, and what motivates him in terms of his work's relation to the world or to humanity.

WI When you asked what motivates me to work on these problems, you were wondering if there were applications, and specifically if there was a social purpose for the work. One has to be a little careful in science, because these aspects really do exist and can have a big impact. But in terms of what makes us tick or what makes me want to work on these questions, it's less grounded in practicality. When there is an insufficiency, an inability for science to properly describe or capture something, that makes the phenomenon mysterious to a physicist. And for me there is nothing more fascinating than the mysterious. One is compelled to figure out and demystify the question. My inability *not* to work on something that I don't understand manifests itself as curiosity.

In terms of practical consequences: this type of work is what we in physics call fundamental research, that is, we're not directly trying to solve a practical problem, but there is a long tradition of practical consequences following from intellectual understanding. Things such as the computer came from tinkering with mysterious phenomena, for example the fact that you could rub something and then it would get an electrical charge. This was so curious that James Clerk Maxwell couldn't let it go; he had to try to understand what was going on. And then many years later this led to great technological advances.

CCB I find this very humbling.

JMV William, do you know Louis H. Kauffman in Chicago? He studies knots and is a brilliant mathematician, and he draws a lot in his books.

WI Yes, I know Louis! We meet about once a week.

CCB Ed, would you like to say something about an art exhibition? We would like to bring this into the world of art. Usually conversations like this are not prompted by science universities, whereas in the arts we have this opening, this kind of amateur curiosity, for different fields.

EA To sum up how I feel about some of the things we've touched upon, particularly in relation to how I make work, and knots adding to this "sufficiency" or this "doing justice to": there's a beautiful *remainder* in all of this. There is a final aspect that to some degree is unanswerable. I suppose that that remainder, that unanswerable thing, that ability to allow things to remain knots, to me feels like a fundamental, ethical way of being in the world.

I always remember a particular point made by Judith Butler about approaching the "other", about fundamentally allowing incoherence and not presuming that we ought to try to make everything cohere. One of the things that fascinates me, and which maybe relates to the symbolic as a subject, is that in some way incoherence can be afforded. One of the greatest things that art does is that it affords incoherence, as an attempt at translating across each of our circuits and our subjecthood and ourselves. Things can be beautifully opaque in the end.

Ed Atkins (b. 1982) works in video, sound, drawing, and writing to develop a discourse around definition, often explicitly thinking through digital media's apparent immateriality in relation to its possibilities for precise representations of the physical, corporeal world. Cadavers often appear in the videos as surrogates for this dialogue and its implicit subject. The process of making is tangible in each work, creating an awareness in the viewer of the surface of the image and the presence of the apparatuses used to produce it. Atkins's recent solo projects include "Recent Oujia", Stedelijk Museum, Amsterdam (2015), "Performance Capture" at the Manchester International Festival, England (2015); and 2014 shows at Serpentine Gallery, London; Palais de Tokyo, Paris; Kunsthalle Zurich; and Kunsthalle Mainz, Germany (with Bruce Nauman). This year he was included in the New Museum Triennial, New York, and the 14th Istanbul Biennial. In 2014 two books were published about his work: *A Seer Reader* (Koenig Books) and *Ed Atkins* (JRP Ringier). He is represented by Cabinet Gallery, London; Isabella Bortolozzi Galerie, Berlin; Gavin Brown's Enterprise, New York; and dépendance, Brussels.

William Irvine (b. 1979) is a physicist based in Chicago. He is Assistant Professor at the Department of Physics of the James Franck Institute, Chicago. His interests are in the fields of experimental soft condensed matter and theoretical and experimental "knotted fields." Irvine earned his PhD in physics from the University of California, Santa Barbara, DPhil in physics from the University of Oxford, and MS from the Imperial College in London. He is coauthor of several publications and was awarded the Northern Telecom Prize (experimental) and the Tyndall Prize (theory) from the Imperial College, London.

Jean-Michel Vappereau (b. 1948) is a psychoanalyst practicing in Paris and Buenos Aires. He gives public seminars as part of the group Topology in Extension for periods of one or two months, three times a year, alternating between the two cities. He also teaches at the University of Buenos Aires. His course in psychoanalysis and topology will result in the publication of six volumes of accounts, of which three booklets have already been published under the titles *Essaim* (the fundamental group of the knot), *Etoiles* (intrinsic topological surfaces), and *Nœud* (knot theory as treated by Jacques Lacan), as well as lectures such as "Lu" (the folding of Freud's theory).