

Removing Carbon Dioxide From The Air To Fix Climate Change: An Interview With Graciela Chichilnisky And Peter Wadhams



Peter Wadhams

Climate change and global warming, caused by greenhouse gas emissions, pose a grave threat to humanity — even greater perhaps than that of nuclear weapons. Yet, just like with nuclear weapons, political inertia stands on the way of tackling the massive problem of climate change in an effective and meaning way. Moreover, the challenge of averting a climate change catastrophe can be met at the present juncture with the aid of carbon negative technology that can suck CO₂ from the atmosphere and thus stabilize and even begin reversing the warming of the planet.

Indeed, in the interview that follows, leading economist and climate change authority *Graciela Chichilnisky*, author and architect of the Kyoto Protocol Carbon Market and CEO and cofounder of Global Thermostat, and *Peter Wadhams*, Professor of Ocean Physics at Cambridge University and UK's most experienced sea ice scientist, highlight the necessity of sucking carbon dioxide from the air as the only way available right now to save the planet from the threat of climate change and global warming.



Graciela Chichilnisky

J. Polychroniou with Marcus Rolle: Climate change poses a massive threat to the world economy, to human civilization and to the planet on the whole, yet little seems to be done by the world community to break cultural and political inertia. What's your explanation for climate change inertia?

Graciela Chichilnisky: Climate change involves extraordinary and unprecedented risks that people and organizations are ill equipped to deal with. Put simply, most people do not know what can be done about it, and they do not even know how to think about climate change. This paralyzes them from action. In addition, there is an erroneous perception that the economic costs of taking action against climate change are too high making action impossible in economic terms, which is untrue. The global scope and complexity of the issue defies standard knowledge and paralyzes most people, and this couples with economic interests of groups and businesses that are invested in conventional energy sources such as fossil fuels. About 45% of all global emissions come from electricity plants, which are a \$55 trillion global infrastructure that is 87% run by fossil fuels.

Exxon Mobil is facing several law suits after allegedly misleading the public about the risks of climate change caused by burning fossil fuels, the source of their revenues, and presenting obstacles for solutions. Dated economic interests couple with denial, ignorance and fear, and cause climate change inertia. Because the issue is complex, even well-meaning people and organizations can be confused or ill informed. For example, the United Nations Framework Convention on Climate Change (UNFCCC), which is the single global organization responsible for

preventing climate change, and its Green Climate Fund created recently to make funding available to avert climate change, focus on “adaptation and mitigation” towards climate change, particularly in the developing nations that will suffer the worst damages. This would be a natural reaction to disasters such as earthquakes, droughts or tornados, which are of a smaller magnitude. The situation is quite different with climate change. It is not possible for human societies to adapt or mitigate the global damages caused by catastrophic climate change, and we should be focused on resolving the problem rather than in adapting to it, or mitigating it after the fact. The North and the South poles are melting, raising the world’s oceans ravaging coastal areas around the world and eventually submerging under the swollen seas 43 island nations that make up about 20% of the UN vote. Very little can be done to “adapt and mitigate” the human damages in a nation that is quickly and inexorably submerging under the oceans. There is no way to adapt to the chaos and destruction in large cities like New York as they face several disasters a year of the scope of hurricane Sandy, severing access to electricity and drinking water and to law and order, making transportation and working conditions impossible, with cars and vehicles floating in the flooded streets.

Rather than well-meaning but illusory adaptation and mitigation to catastrophic climate change, what is needed is to resolve the problem. We need to reverse climate change and to do it now. This is possible with existing technologies and it can be done within reasonable costs and conditions. This requires action right away since the costs increase rapidly the longer we wait. The action required was summarized in a 2014 UN IPCC 5th Assessment Report that states (page 101) that what is needed is massive removal of CO₂ from the atmosphere to avert catastrophic climate change. The IPCC is the world’s leading scientific authority on this area, and was awarded the Nobel Peace Prize for its work in documenting climate change. I used to be the US lead author of the IPCC and know that it no longer suffices to reduce emissions because CO₂ remains in the atmosphere for hundreds of years and we are dangerously close to the “*carbon budget*” that our atmosphere will tolerate before irreversible and catastrophic changes occur. We need to remove the CO₂ emitted by humans in the process of industrialization based on burning fossil fuels. There is hope if we act fast: there are now proven technologies to achieve these removals within manageable costs. Indeed, the project can itself create jobs and increase exports, providing a dramatic boost to innovation in the world economy. Why is this not already done? Most people have

difficulties with innovation and in conceiving new solutions as the IPCC indicates are needed. But it is possible and indeed desirable for economic as well as environmental reasons. Existing technologies can provide an extraordinary stimulus to the world economy; they are mild and safe, providing low cost solutions that increase energy available and help overcome poverty.

Peter Wadhams: There are several reasons, I think. One is the chronic failure by a mean, cowardly and corrupt press to bring climate issues to public notice and to press for action. Very often this is because the press is owned by fossil fuel interests (e.g. Murdoch). This is compounded by the placid, indeed complacent, approach of the Intergovernmental Panel on Climate Change (IPCC) which underplays really serious threats (methane emission from tundra and offshore, accelerated sea level rise from ice sheet melt) which require immediate action. The scientists involved with IPCC are themselves often complacent as they tend to be Government scientists who don't want to see their careers threatened by making waves. Finally, and most important I think, is the personal view held by many, or most people, that "this is too horrible to think about. If I don't think about it, it might go away" (similar to the response to Hitler's initial aggressions in the 1930s). That is bound up with the undeniable fact that our society, our cities, our communications, our industrial and economic system, are all bound up with fossil fuel consumption and it is hard to imagine how we can live without it. Green organizations haven't helped because they stress the moral need to reduce CO2 emissions and cast shame on people for their lifestyles, while in fact we now know that we cannot achieve climatic goals by CO2 emission reduction alone, but must make heroic efforts to develop methods to actually take CO2 out of the atmosphere. This would solve the problem.

Polychroniou with Rolle: What about the scientific community itself? Is it living up to its responsibility in warning the world of the actual threat that climate change poses to the future?

Chichilnisky: Yes, but only to a certain extent. Science is handicapped from achieving its potential because climate change lies in the nowhere land between two types of sciences that do not communicate well with each other: the social and the physical sciences. Indeed, economics is the *cause* of climate change. Fossil fuels are mostly emitted to produce energy and advance industrialization. Yet the *effects* of climate change are physical: atmospheric concentration of CO2, melting of ice bodies, rising of the oceans, intensity and frequency of draughts

and storms. The causes are economic, and the effects are physical. Since the effects are physical, economists do not measure them well. Since the causes are economic, there is little that physicists can do to solve the problem. The long standing division between the social and the physical sciences must be overcome: they should collaborate to solve the problem. Furthermore market economics does not measure the damages caused by climate change. A recent MIT study identified the true cost of gasoline when negative externalities are included and it is over \$15 per gallon. The current GDP measure of economic progress we use is dated, and global markets for the atmosphere, the hydrosphere and the biosphere is needed to change prices and align them with true values.

Wadhams: No, as I indicated above, the scientific community is not living up to its responsibilities, with certain exceptions. It is partly the result of overspecialization, even a climate change scientist might feel unqualified to make general remarks on climate change. And partly fear of losing career prospects.

Polychroniou with Rolle: How does the melting ice affect the environment, and is it too late to save Arctic ice?

Chichilnisky: The world's major physical systems are all connected. As CO₂ levels increase, the polar ice melts, the oceans rise because melted ice expands, and most life forms will go extinct with catastrophic climate change, possibly including our own human species. The atmosphere, the oceans, and the biosphere are a single global system. We are already in the midst of the 6th largest episode of extinction on planet Earth, comparable only to the one when the mighty dinosaurs disappeared. This time it can be us. Human extinction is indeed a likely outcome unless we take action. And, as humans, we have a unique capacity for awareness and to take action. It is possible as explained above, and must be done now before it is too late. Will we do it?

Wadhams: It is more or less too late. Melting ice causes many feedbacks that accelerate change: (1) albedo feedback due to ice melt and loss of snow area in the Northern Hemisphere, equivalent (as I show in my book) to increasing the quantity of greenhouse gas output by 50%; (2) sea level feedback, due to warmer air causing Greenland ice sheet to melt; (3) methane feedback, the increasing rate of emission of methane from Arctic coastal sediments due to warming of the water after sea ice removal; (4) weather feedback, where sea ice retreat changes

shape of jet stream bringing extreme cold or warmth to food growing areas.

Polychroniou with Rolle: While reducing greenhouse gas emissions by moving away from a fossil-fuel based economy seems to be a necessary and critical step in averting a climate change catastrophe, a case is being made recently for the removal of carbon dioxide already accumulated in the air. Why is this important or necessary?

Chichilnisky: It is necessary because, once emitted, CO₂ stays in the atmosphere for centuries. It does not decay like other forms of pollution, such as particulates. It stays there for a very long time. And we have used most of our carbon budget. We delayed taking action for too long, and we are very close to CO₂ levels that create a blanket, preventing the sun's heat from escaping and thereby causing irreversible heating and permanent change in climate that will kill the complex web of species that makes life on Earth. We are part of that web of life and our survival is at stake. The difference between us and the dinosaurs is that we know what is happening and what needs to be done about it. Will we do it?

Wadhams: It is important because of the persistence of CO₂ in the atmosphere. There is already more than enough CO₂ in the atmosphere to eventually cause a warming that exceeds 2 C, even if no more is emitted. So we have to take it out of the atmosphere instead.

Polychroniou with Rolle: There are plants already in existence, such as Global Thermostat in the Silicon Valley, which possess the technology to remove carbon from the atmosphere. The question here is twofold: firstly, what do we do with the carbon dioxide once it has been captured and, secondly, how many plants might be needed to clean up the air on a global scale.

Chichilnisky: Once CO₂ is removed from the atmosphere, Global Thermostat sells it as 99% pure CO₂ to be used for commercial products such as classic carbonated beverages — for example Coca Cola and Pepsi — for refrigeration since CO₂ is in fact dry ice, for building materials such as degradable plastics made from CO₂ and carbon fibers that favorably replace metals, for synthetic fuels that are identical to gasoline but carbon neutral, and for water desalination. There is a huge CO₂ market on earth. In terms of numbers: we can build 30,000 Global Thermostat plants that capture each one million tons of CO₂ per year, thereby removing all the CO₂ that humans emit right now, which is about 30

gigatons. This process will take about 15-20 years using conventional measures of technology adoption and deployment, where capacity can be doubled every 12-18 months. The cost is about \$200Bn/year, which can be covered by the UN carbon market that I designed and wrote into the Kyoto Protocol, which by 2012 was trading \$175Bn/year according to the World Bank. Each dollar traded by the carbon market can be used for this purpose. We can build carbon negative power plants that provide energy for developing nations while cleaning the atmosphere. Think of it this way: Global Thermostat “farms” the atmosphere. A bit over a hundred years ago, oil barons opened holes in the ground and out came very valuable petroleum. We burned it, and it became atmospheric CO₂. Now we farm the skies bringing down the CO₂. It can be easier to bring down the CO₂ than it was to bring the petroleum up. We need \$200 BN/ year for fifteen years – a total of US\$1 trillion over fifteen years — to clean the planet’s atmosphere and avert climate change. Actually, the upfront money is recuperated in two years by selling the CO₂ that the plants produce. We can build “carbon negative power plants”(TM), these are Global Thermostat plants that clean the atmosphere while they produce electricity – one such plant is in Silicon Valley at SRI in Menlo Park, where the Internet was created. Building Global Thermostat modular plants produces profits, creates jobs and increases exports: it leads to innovation and economic progress. There is every reason to adopt this or related technologies and avert catastrophic climate change while helping the economy grow.

Once carbon is removed from the atmosphere, climate will stabilize and temperatures will stop rising. On this note, let me also add some technical aspects about the plants like Global Thermostat using carbon negative technology: Each plant unit is 12’ by 16’ by 40’ and you put several units together to make a larger plant. Each single unit can remove between 100 tons and 25,000 tons of CO₂ per year and they last 20 years. To make a GT plant removing 1,000,000 tons/year we simply put several units together.

Wadhams: Any development of the kind that Graciela Chichilnisky has just described with Global Thermostat is highly promising.

Polychroniou with Rolle: Assuming that we possess the ability to reverse climate change, how do we go about doing away with political inertia?

Chichilnisky: The business sector implemented the Montreal Protocol and overcame acid rain once the limits on CFC’s emissions were established by

international law. Similarly, we need to continue the mandatory CO2 emission limits created by the UN Kyoto Protocol which is international law since 2005. These limits are then traded by the UN carbon market, which was trading already US\$175 Bn/year by 2012. With national CO2 emission limits in place, the business sector has a price on carbon emissions to guide its actions. Six of the world's largest oil companies already support a price on carbon. Businesses can now use carbon negative technologies that don't emit CO2. Indeed, there are reasonable robust and proven technologies that reverse climate change as Forbes Magazine and KPMG validated in recent publications and videos. The CO2 removed from the atmosphere can be sold at a profit. The UN carbon market has shown it can provide enough funding to build all the necessary carbon negative power plants in developing nations, resolving poverty and the climate change problem together, at once. The road is clear. The tools we need to resolve climate change are in our hands. We just need to choose the right path and move to action, and we need to do it right now.

Wadhams: We just keep plugging away! Or else demonstrate that CO2 removal methods are not only economically acceptable but may even be profitable.

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Noam Chomsky On The Evolution Of Language: A Biolinguistic Perspective

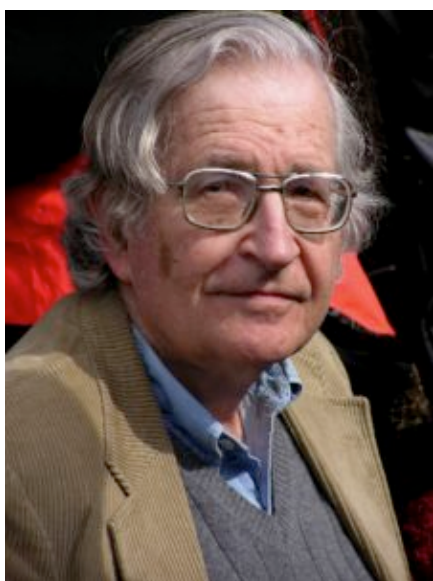


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Truth-out.org ~ September 2016. Human language is crucial to the scientific quest to understand what kind of creatures we are and, thus crucial to unlocking the mysteries of human nature.

In the interview that follows, Noam Chomsky, the scholar who single-handedly revolutionized the modern field of linguistics, discusses the evolution of language and lays out the biolinguist perspective — the idea that a human being's language represents a state of some component of the mind. This is an idea that continues to baffle many non-experts, many of whom have sought to challenge Chomsky's theory of language without really understanding it.

Journalist and "radical chic" reactionary writer Tom Wolfe was the latest to do so in his laughable new book, *The Kingdom of Speech*, which seeks to take down Charles Darwin and Noam Chomsky through sarcastic and ignorant remarks,

making vitriolic attacks on their personalities and expressing a deep hatred for the Left. Indeed, this much-publicized book not only displays amazing ignorance about evolution in general and the field of linguistics in particular, but also aims to portray Noam Chomsky as evil — due to his constant and relentless exposure of the crimes of US foreign policy and other challenges to the status quo.

C. J. Polychroniou: Noam, in your recently published book with Robert C. Berwick (Why Only Us: Language and Evolution, MIT Press 2016), you address the question of the evolution of language from the perspective of language as part of the biological world. This was also the theme of your talk at an international physics conference held this month in Italy, as it seems that the scientific community appears to have a deeper appreciation and a more subtle understanding of your theory of language acquisition than most social scientists, who seem to maintain grave reservations about biology and the idea of human nature in general. Indeed, isn't it the case that the specific ability of our species to acquire any language was a major theme of interest to the modern scientific community from the time of Galileo?

Noam Chomsky: This is quite true. At the outset of the modern scientific revolution, Galileo and the scientist-philosophers of the monastery of Port Royal issued a crucial challenge to those concerned with the nature of human language, a challenge that had only occasionally been recognized until it was taken up in the mid-20th century and became the primary concern of much of the study of language. For short, I'll refer to it as the Galilean challenge. These great founders of modern science were awed by the fact that language permits us (in their words) to construct "from 25 or 30 sounds an infinite variety of expressions, which although not having any resemblance in themselves to that which passes through our minds, nevertheless do not fail to reveal all of the secrets of the mind, and to make intelligible to others who cannot penetrate into the mind all that we conceive and all of the diverse movements of our souls."

We can now see that the Galilean challenge requires some qualifications, but it is very real and should, I think, be recognized as one of the deepest insights in the rich history of inquiry into language and mind in the past 2500 years.

The challenge had not been entirely ignored. For Descartes, at about the same time, the human capacity for unbounded and appropriate use of language was a primary basis for his postulation of mind as a new creative principle. In later

years, there is occasional recognition that language is a creative activity that involves “infinite use of finite means,” in Wilhelm von Humboldt’s formulation and that it provides “audible signs for thought,” in the words of linguist William Dwight Whitney a century ago. There has also been awareness that these capacities are a species-property, shared by humans and unique to them — the most striking feature of this curious organism and a foundation for its remarkable achievements. But there was never much to say beyond a few phrases.

But why is it that the view of language as a species-specific capacity is not taken up until well into the 20th century?

There is a good reason why the insights languished until mid-20th century: intellectual tools were not available for even formulating the problem in a clear enough way to address it seriously. That changed thanks to the work of Alan Turing and other great mathematicians who established the general theory of computability on a firm basis, showing in particular how a finite object like the brain can generate an infinite variety of expressions. It then became possible, for the first time, to address at least part of the Galilean challenge directly — although, regrettably, the earlier history [for example, the history of Galileo’s and Descartes’ inquiries into the philosophy of language, as well as the Port-Royal Grammar by Antoine Arnauld and Claude Lancelot] was entirely unknown at the time.

With these intellectual tools available, it becomes possible to formulate what we may call the Basic Property of human language: The language faculty provides the means to construct a digitally infinite array of structured expressions, each of which has a semantic interpretation expressing a thought, and each of which can be externalized by means of some sensory modality. The infinite set of semantically interpreted objects constitutes what has sometimes been called a “language of thought”: the system of thoughts that receive linguistic expression and that enter into reflection, inference, planning and other mental processes, and when externalized, can be used for communication and other social interactions. By far, the major use of language is internal — thinking in language.

Can you please expand on the notion of the internal language?

We now know that although speech is the usual form of sensory motor externalization, it can just as well be sign or even touch, discoveries that require

a slight reformulation of the Galilean challenge. A more fundamental qualification has to do with the way the challenge is formulated: in terms of production of expressions. So formulated, the challenge overlooks some basic issues. Production, like perception, accesses the internal language but cannot be identified with it. We must distinguish the internalized system of knowledge from the actions that access it. The theory of computability enables us to establish the distinction, which is an important one, familiar in other domains.

Consider, for example, human arithmetical competence. In studying it, we routinely distinguish the internal system of knowledge from the actions that access it, like multiplying numbers in our head, an action that involves many factors beyond intrinsic knowledge; memory constraints, for example. The same is true of language. Production and perception access the internal language but involve other factors as well, including again short-term memory, matters that began to be studied with some care in the early days of concern with the Galilean challenge, now reformulated to focus on the internal language, the system of knowledge that is accessed by actual production and by perception.

Does this mean that we have solved the mystery of the internal language? For example, the whole idea continues to be questioned in some quarters, although it is widely accepted, apparently, by most scientists.

There has been considerable progress in understanding the nature of the internal language, but its free creative use remains a mystery. That comes as no surprise. In a recent review of the state of the art concerning far simpler cases of voluntary action, two leading researchers, neuroscientists Emilio Bizzi and Robert Ajemian, write that we are beginning to learn something about the puppet and the strings, but the puppeteer remains shrouded in mystery. That is even more dramatically true for such creative acts as the normal [everyday] use of language, the unique human capacity that so impressed the founders of modern science.

In formulating the Basic Property, we are assuming that the faculty of language is shared among humans. That seems solidly established. There are no known group differences in language capacity, and individual variation is found only at the margins. More generally, genetic variation among humans is quite slight, not too surprisingly, given the recency of common origins.

The fundamental task of inquiry into language is to determine the nature of the

Basic Property — the genetic endowment that underlies the faculty of language. To the extent that its properties are understood, we can seek to investigate particular internal languages, each an instantiation of the Basic Property, much as each individual visual system is an instantiation of the human faculty of vision. We can investigate how the internal languages are acquired and used, how the language faculty itself evolved, its basis in human genetics and the ways it functions in the human brain. This general program of research has been called the Biolinguistic Program. The theory of the genetically-based language faculty is called Universal Grammar; the theory of each individual language is called its Generative Grammar.

But languages vary greatly from one another, so what's the link between Generative Grammar and Universal Grammar?

Languages appear to be extremely complex, varying radically from one another. And indeed, a standard belief among professional linguists 60 years ago was that languages can vary in arbitrary ways and each must be studied without preconceptions. Similar views were held at the time about organisms generally. Many biologists would have agreed with molecular biologist Gunther Stent's conclusion that the variability of organisms is so free as to constitute "a near infinitude of particulars which have to be sorted out case by case." When understanding is thin, we expect to see extreme variety and complexity.

However, a great deal has been learned since then. Within biology, it is now recognized that the variety of life forms is very limited, so much so that the hypothesis of a "universal genome" has been seriously advanced. My own feeling is that linguistics has undergone a similar development, and I will keep here to that strand in contemporary study of language.

The Basic Property takes language to be a computational system, which we therefore expect to observe general conditions on computational efficiency. A computational system consists of a set of atomic elements and rules to construct more complex ones. For generation of the language of thought, the atomic elements are word-like, though not words; for each language, the set of these elements is its lexicon. The lexical items are commonly regarded as cultural products, varying widely with experience and linked to extra-mental entities [objects entirely outside of our minds, such as the tree outside the window] — an assumption expressed in the titles of standard works, such as W.V. Quine's

influential study Word and Object. Closer examination reveals a very different picture, one that poses many mysteries. Let's put that aside for now, turning to the computational procedure.

Clearly, we will seek the simplest computational procedure consistent with the data of language, for reasons that are implicit in the basic goals of scientific inquiry. It has long been recognized that simplicity of theory translates directly to explanatory depth. A more specific version of this quest for understanding was provided by a famous dictum of Galileo's, which has guided the sciences since their modern origins: nature is simple, and it is the task of the scientist to demonstrate this, from the motion of the planets, to an eagle's flight, to the inner workings of a cell, to the growth of language in the mind of a child. Linguistics has an additional motive of its own for seeking the simplest theory: it must face the problem of evolvability. Not a great deal is known about evolution of modern humans, but the few facts that are well established, and others that have recently been coming to light, are rather suggestive and conform well to the conclusion that the language faculty is near optimal for a computational system, the goal we should seek on purely methodological grounds.

Did language exist before the emergence of Homo Sapiens?

One fact that does appear to be well established is, as I have already mentioned, that the faculty of language is a true species property, invariant among human groups — and furthermore, unique to humans in its essential properties. It follows that there has been little or no evolution of the faculty since human groups separated from one another. Recent genomic studies place this date not very long after the appearance of anatomically modern humans about 200,000 years ago, perhaps some 50,000 years later, when the San group in Africa separated from other humans. There is some evidence that it might have been even earlier. There is no evidence of anything like human language, or symbolic activities altogether, before the emergence of modern humans, *Homo Sapiens Sapiens*. That leads us to expect that the faculty of language emerged along with modern humans or not long after — a very brief moment in evolutionary time. It follows, then, that the Basic Property should indeed be very simple. The conclusion conforms to what has been discovered in recent years about the nature of language — a welcome convergence.

The discoveries about early separation of the San people are highly suggestive ...

[they] have significantly different externalized languages. With irrelevant exceptions, their languages are all and only the languages with phonetic clicks, with corresponding adaptations in the vocal tract. The most likely explanation for these facts, developed in detail in current work by Dutch linguist Riny Huijbregts, is that possession of internal language preceded separation, which in turn preceded externalization, the latter in somewhat different ways in separated groups. Externalization seems to be associated with the first signs of symbolic behavior in the archaeological record, after the separation. Putting these observations together, it seems that we are reaching a stage in understanding where the account of evolution of language can perhaps be fleshed out in ways that were unimaginable until quite recently.

When do universal properties of language come to light?

Universal properties of the language faculty began to come to light as soon as serious efforts were undertaken to construct generative grammars, including quite simple ones that had never been noticed, and that are quite puzzling — a phenomenon familiar in the history of the natural sciences. One such property is structure-dependence: the rules that yield the language of thought attend solely to structural properties, ignoring properties of the externalized signal, even such simple properties as linear order.

To illustrate, consider the sentence *birds that fly instinctively swim*. It is ambiguous: the adverb “instinctively” can be associated with the preceding verb (*fly instinctively*) or the following one (*instinctively swim*). Suppose now that we extract the adverb from the sentence, forming *instinctively, birds that fly swim*. Now the ambiguity is resolved: The adverb is construed only with the linearly more remote but structurally closer verb *swim*, not the linearly closer but structurally more remote verb *fly*. The only possible interpretation — *birds swim* — is the unnatural one, but that doesn’t matter: the rules apply rigidly, independent of meaning and fact. What is puzzling is that the rules ignore the simple computation of linear distance and keep to the far more complex computation of structural distance.

The property of structure dependence holds for all constructions in all languages, and it is indeed puzzling. Furthermore, it is known without relevant evidence, as is evident in cases like the one I just gave and innumerable others. Experiment shows that children understand that rules are structure-dependent as early as

they can be tested, by about age 3, and do not make errors — and are, of course, not instructed. We can be quite confident, then, that structure-dependence follows from principles of universal grammar that are deeply rooted in the human language faculty. There is evidence from other sources that supports the conclusion that structure-dependence is a true linguistic universal, deeply rooted in language design. Research conducted in Milan a decade ago, initiated by Andrea Moro, showed that invented languages keeping to the principle of structure-dependence elicit normal activation in the language areas of the brain, but much simpler systems using linear order in violation of these principles yield diffuse activation, implying that experimental subjects are treating them as a puzzle, not a language. Similar results were found in work by Neil Smith and Ianthi Tsimpli in their investigation of a cognitively deficient but linguistically gifted subject. They also made the interesting observation that [people with average cognitive abilities] can solve the problem if it is presented to them as a puzzle, but not if it is presented as a language, presumably activating the language faculty.

The only plausible conclusion, then, is that structure-dependence is an innate property of the language faculty, an element of the Basic Property. Why should this be so? There is only one known answer, and fortunately, it is the answer we seek for general reasons: The computational operations of language are the simplest possible ones. Again, that is the outcome that we hope to reach on methodological grounds, and that is to be expected in the light of the evidence about evolution of language already mentioned.

What about the so-called representational doctrine about language? What makes it a false idea for human language?

As I mentioned, the conventional view is that atomic elements of language are cultural products, and that the basic ones — those used for referring to the world — are associated with extra-mental entities. This representationalist doctrine has been almost universally adopted in the modern period. The doctrine appears to hold for animal communication: a monkey's calls, for example, are associated with specific physical events. But the doctrine is radically false for human language, as was recognized as far back as classical Greece.

To illustrate, let's take the first case that was discussed in pre-Socratic philosophy, the problem posed by Heraclitus: how can we cross the same river

twice? To put it differently, why are two appearances understood to be two stages of the same river? Contemporary philosophers have suggested that the problem is solved by taking a river to be a four-dimensional object, but that simply restates the problem: why this object and not some different one, or none at all?

When we look into the question, puzzles abound. Suppose that the flow of the river has been reversed. It is still the same river. Suppose that what is flowing becomes 95 percent arsenic because of discharges from an upstream plant. It is still the same river. The same is true of other quite radical changes in the physical object. On the other hand, with very slight changes it will no longer be a river at all. If its sides are lined with fixed barriers and it is used for oil tankers, it is a canal, not a river. If its surface undergoes a slight phase change and is hardened, a line is painted down the middle, and it is used to commute to town, then it is a highway, no longer a river. Exploring the matter further, we discover that what counts as a river depends on mental acts and constructions. The same is true, quite generally, of even the most elementary concepts: tree, water, house, person, London, or in fact, any of the basic words of human language. Radically, unlike animals, the items of human language and thought uniformly violate the representationalist doctrine.

Furthermore, the intricate knowledge of the means of even the simplest words, let alone others, is acquired virtually without experience. At peak periods of language acquisition, children are acquiring about a word an hour, that is, often on one presentation. It must be, then, that the rich meaning of even the most elementary words is substantially innate. The evolutionary origin of such concepts is a complete mystery, one that may not be resolvable by means available to us.

So we definitely need to distinguish speech from language, right?

Returning to the Galilean challenge, it has to be reformulated to distinguish language from speech, and to distinguish production from internal knowledge — the latter an internal computational system that yields a language of thought, a system that might be remarkably simple, conforming to what the evolutionary record suggests. Secondary processes map the structures of language to one or another sensory-motor system for externalization. These processes appear to be the locus of the complexity and variety of linguistic behavior, and its mutability over time.

There are suggestive recent ideas about the neural basis for the operations of the computational system, and about its possible evolutionary origins. The origin of the atoms of computation, however, remains a complete mystery, as does a major question that concerned those who formulated the Galilean challenge: the Cartesian question of how language can be used in the normal creative way, in a manner appropriate to situations but not caused by them, in ways that are incited and inclined but not compelled, in Cartesian terms. The mystery holds for even the simplest forms of voluntary motion, as discussed earlier.

A great deal has been learned about language since the Biolinguistic Program was initiated. It is fair to say, I think, that more has been learned about the nature of language, and about a very wide variety of typologically different language, than in the entire 2,500 year history of inquiry into language. But as is familiar in the sciences, the more we learn, the more we discover what we do not know. And the more puzzling it seems.

About the author

C.J. Polychroniou is a political economist/political scientist who has taught and worked in universities and research centers in Europe and the United States. His main research interests are in European economic integration, globalization, the political economy of the United States and the deconstruction of neoliberalism's politico-economic project. He is a regular contributor to Truthout as well as a member of Truthout's Public Intellectual Project. He has published several books and his articles have appeared in a variety of journals, magazines, newspapers and popular news websites. Many of his publications have been translated into several foreign languages, including Croatian, French, Greek, Italian, Portuguese, Spanish and Turkish

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Towards A New Spur For EU Democracy Building Learn And Engagement ~ Final Report Phase 1



New forms of Societal and intercultural engagement and volunteering as a New Spur for civic and democratic participation

at EU level

The project was an initiative of *Nea Smyrni* municipality, a municipality located about 4 km southwest of central Athens, Greece, named so after the city Smyrna (today's İzmir in Turkey), from where a large number of refugees arrived and settled in the Nea Smyrni area following the 1922 population exchange between Greece and Turkey.

The municipality implemented the project with the support of the "*Europe for Citizens*" programme of the European Union.

The main goal of "SPUR" program was to highlight and assess both the value of solidarity and volunteering in the current context of economic and humanitarian crisis inside United Europe as well as to improve the conditions for civic and democratic participation of citizens providing them, as a New Spur, New forms of Societal and intercultural engagement for the enhancement of civic and democratic participation at national and European level.

These forms - away from extremist or populist movements and radicalized behaviors and beyond xenophobia, intolerance and any discrimination against the vulnerable or excluded people within EU societies and underprivileged and disadvantaged populations, which often include youngsters and people of non - EU origins :

- a) Stabilize the social welfare, health, employment, education, environment, culture, etc. systems, which brutally affected in times of economic recession and poverty,
- b) Protect further the fundamental rights, in particular of minorities,

- c) Help restore law and civil parity for a decent living,
- d) Promote and foster the economy and the development and finally,
- e) Consolidate the faith, to the principles and values on which the European ideal is founded, in particular of the different types of Eurosceptics, and put forward the achievements of the United Europe and the cost of no Europe creating a new positive narrative for Europe and Europe integration.

Information about the four (4) non-formal education events:

[Also visit the website of the project “SPUR” <http://dnsspur.gr/en> for the analytical programmes, videos and photos. Presentations: <http://dnsspur.gr/en/presentations/>



Towards a New Spur for EU Democracy Building learn and engagement.

New forms of Societal and intercultural engagement and volunteering as a New Spur for civic and democratic participation at EU level was funded with the support of the European Union under the Programme “*Europe for Citizens*”

Event 1

Participation: The event involved 155 citizens, including 119 participants from the city of Nea Smyrni but also from various areas of the city of Athens, capital of Greece, and its suburbs and municipalities of Athens (Greece), 5 from the Greek entity-partner IMEPO/Greece, 4 participants from the city of Brossac but also from other cities of France (France), 3 participants from the city of Porto de Mós, (Portugal), 8 participants from the city of Mali Lošinj but also from other cities of Croatia, (Croatia), 2 participants from the city of Gdynia but also from other cities of Poland, (Poland), 2 participants from the city of Česká Třebová (Czech Republic), 2 participants from the city of Pazardzhik Region (Bulgaria), 1 participant from the city of Comune di Castel Goffredo (Italy), 5 participants from the city of Primaria Municipiului Bucuresti (Romania), 3 participants from the city of Strovolos but also from other cities of Nicosia region (Cyprus), as well as 1

participant from the city of Amsterdam (Nederland)

Location / Dates: The event took place in Nea Smyrni (Greece), from 21/04/2016 to 22/04/2016

Short description: The aim of the event was “Citizens on the Move” for a New Europe with the following Topics for development

- Development of citizens’ understanding of the EU policy making-process, EU history, values and diversity
- Deepening of the discussion on the future of Europe and on what kind of Europe citizens want.

Event 2

Participation: The event involved 151 citizens, including 117 participants from the city of Nea Smyrni but also from various areas of the city of Athens, capital of Greece, and its suburbs and municipalities of Athens (Greece), 5 from the Greek entity-partner IMEPO/Greece, 4 participants from the city of Brossac but also from other cities of France (France), 5 participants from the city of Porto de Mós, (Portugal), 2 participants from the city of Gdynia but also from other cities of Poland, (Poland), 1 participant from the city of Česká Třebová (Czech Republic), 3 participants from the city of Ljubljana (Slovenia), 5 participants from the city of Pazardzhik Region (Bulgaria), 2 participants from the city of Comune di Castel Goffredo (Italy), 3

participants from the city of Primaria Municipiului Bucuresti (Romania), 3 participants from the city of Strovolos but also from other cities of Nicosia region (Cyprus), as well as 1 participant from the city of Amsterdam (Nederland)

Location / Dates: The event took place in Nea Smyrni (Greece), from 11/05/2016 to 13/05/2016

Short description: The aim of the event was “Defining the local good – Searching the European good” with the following Topics for development

- Promoting innovative opportunities of democratic and civic participation
- Reinforcement of already existing instruments for participation in civic dialogue at local and EU level.

Event 3

Participation: The event involved 152 citizens, including 122 participants from the city of Nea Smyrni but also from various areas of the city of Athens, capital of

Greece, and its suburbs and municipalities of Athens (Greece), 5 from the Greek entity-partner IMEPO/Greece, 2 participants from the city of Porto de Mós, (Portugal), 4 participants from the city of Gdynia but also from other cities of Poland, (Poland), 1 participant from the city of Česká Třebová (Czech Republic), 1 participant from the city of Ljubljana (Slovenia) ,5 participants from the city of Pazardzhik Region (Bulgaria), 1 participant from the city of Comune di Castel Goffredo (Italy), 3 participants from the city of Primaria Municipiului Bucuresti (Romania), 3 participants from the city of Strovolos but also from other cities of Nicosia region (Cyprus), 4 participants from the city of London (United Kingdom) as well as 1 participant from the city of Amsterdam (Nederland)

Location / Dates: The event took place in Nea Smyrni (Greece), from 14/06/2016 to 16/06/2016

Short description: The aim of the event was “Creating long immersion volunteering youth networks” with the following Topics for development

- Local community-minded young citizens as educated and experienced in dealing of the European sides of social issues, empowered to make more informed decisions and take meaningful action as members of the European society who weigh in on issues that impact the democracy in EU

Event 4

Participation: The event involved 179 citizens, including 145 participants from the city of Nea Smyrni but also from various areas of the city of Athens, capital of Greece, and its suburbs and municipalities of Athens (Greece), 5 from the Greek entity-partner IMEPO/Greece, 2 participants from the city of Brossac but also from other cities of France (France), 5 participants from the city of Dublin (Ireland), 5 participants from the city of Mali Lošinj but also from other cities of Croatia, (Croatia), 4 participants from the city of Gdynia but also from other cities of Poland, (Poland), 1 participant from the city of Česká Třebová (Czech Republic), 3 participants from the city of Ljubljana (Slovenia), 1 participant from the city of Comune di Castel Goffredo (Italy), 3 participants from the city of Strovolos but also from other cities of Nicosia region (Cyprus), 4 participants from the city of London (United Kingdom) as well as 1 participant from the city of Amsterdam (Nederland)

Location / Dates: The event took place in Nea Smyrni (Greece), from 11/07/2016 to 12/07/2016

Short description: The aim of the event was “Learning critical EU social and political issues” – “Particular Interests and Social Partnership” with the following Topics for development

- The Disability, Ecology and Migration Strategies based on societal and intercultural engagement and volunteering as a new spur for EU Democracy
 - How people with particular interests harmed by the EU could be equal active citizens in Union
 - The accessible pathways for Eurosceptic individuals to ensure an inclusive and participative democratic life at EU level
 - Innovative models of cooperation between state, governmental and national institutions, the economic sector and voluntary unions of citizens
-

PARIS SCRATCH ~ bart plantenga [RQ's First Advertorial]



advertorial /,advə:'tɔ:riəl/ – noun: *advertorial*; plural noun: *advertorials* – a newspaper or magazine advertisement giving information about a product in the style of an editorial or objective journalistic article.

[The complete PARIS SCRATCH is now available from Sensitive Skin.](#)

The skill and intensity with which plantenga chronicles these sorties into life lived at the edge should ensure his place in the next pantheon of great bohemian saints and sinners.

Kevin Riordan, Chicago Reader, Coal Hill Review

I'm really excited to announce this because [PARIS SCRATCH](#) is a magical book containing 365 [1 per day] not quite poems; not quite journal entries - "zen blink meta-factual snapshots of everyday Paris life" where the author lived for some 3 years, deejayed, worked everyday jobs and wrote for outlets such as *Paris Passion*, *Paris Free Voice*, *The Frank*, etc.

"A marvelous book - imagine Baudelaire taking a camera & throwing out his pen in a rebellious manner then taking snapshots of everything that comes his way..."

• *Nina Zivancevic, author of Living on Air & Death of NYC*

bart plantenga spent much time roaming the Paris streets, but instead of documenting with a camera he chose a pen instead, scribbling observations while walking in ragged notepads in a handwriting not quite illegible.

I really like the way *he* describes it: "Wandering the streets & writing simultaneously fuses two key creative acts - if worn shoe heels & barely legible scribbles can be considered manifestations of creativity. When you live in a city long enough, you wake up one day & what was fascinating & compelling yesterday suddenly becomes the background for routine. You may not even notice you've stopped looking, curiosity curbed, eyes down to the ground & fixed on getting from point A to point B. To reinvent my relation to my surroundings - first Paris & later NYC - I came up with the Unloaded Camera Snapshots series, a simple exercise to document the 'snapshots' of everyday life. They served as attempts to re-pollinate existence with the fecund, oft-neglected details of the everyday, *la vie quotidienne*."

plantenga was born in Amsterdam, grew up on the American East Coast, lived all over America, moved to Paris and eventually back to his native Amsterdam. He is the author of the much-excerpted novel [Beer Mystic](#), which *Luc Sante* described as: "Top-fermented, with a good nose, an acrid middle, a dry finish - bubbly and acidulous in reserved measure - and with ambient yeast peculiar to the Lower East Side, the kind that turns concrete to dust. Plantenga is a poet and a prankster as well as a distinguished bathtub brewer. He deserves immediate

investigation.”

His short story collection [Wiggling Wishbone](#) and novella [Spermatagonia: The Isle of Man](#) earned him positive reviews and favorable comparisons to JG Ballard, Philip K. Dick, William Gibson. *Andrei Codrescu, National Public Radio* described his writing as “frightfully intelligent.”

His books on yodeling [YODEL-AY-EE-OOOO: The Secret History of Yodeling Around the World](#) [Routledge, 2004] [Yodel in HiFi: From Kitsch Folk to Contemporary Electronica](#) plus the CD compilation [Rough Guide to Yodel](#) received worldwide attention: NPR, BBC, Al-Jazeera, ABC television, WNYC, WFMU, *Rolling Stone*, *Vanity Fair*, *Washington Post*, *Entertainment Weekly*, *UTNE Reader*, *The Wire*, *Village Voice*, *London Review*. *New York Times Magazine* featured *Yodel-Ay-Ee-Oooo* in its “6th Annual Year of Ideas”. The books have created the misunderstanding that he is one of the world’s foremost yodel experts.

His work has appeared in many academic journals, popular magazines, literary journals: [*Ambit*, *Evergreen Review*, *Vokno*, *Exquisite Corpse*, *Downtown*, *Urban Grafitti*, *Fringecore*, *Sandbox*, *Carolina Quarterly*, *Mississippi Review*] and mainstream media: *The Guardian*, *Times of London*, *American Heritage*, *American Book Review*, *Actuel*, *New Hampshire*, *Michigan Today*, *Brooklyn Rail*, *KLM Holland Herald*, *American Lawyer*...

He also writes about refugees for both *Vox Populi* & *Truthdig*.

He has lectured/read at the Library of Congress, Rotterdam Opera Days, Sound Escape Conference [Toronto], NYU Fales Library, The Brooklyn Bridge Reading, & countless venues around the world.

Anthologies: *Nation-KGB Nonfiction Reader*; *Waiting for a Train: Jimmie Rodgers’s America*; *Up Is Up, But So Is Down: New York’s Downtown Literary Scene*; *Reggae, Rasta, Revolution: Jamaican Music from Ska to Dub* [Simon & Schuster]; *Sonic Geography Imagined and Remembered*; *Semiotext(e) SF*, *Crimes of the Beat*, *Radiotext(e)*, *Noirotica #3*, *Fiction International*, *Best American Erotica 1994* [Simon & Schuster].

He is one of the co-founders of the NYC-based [Unbearables](#) writing group, which has produced numerous anthologies and countless thematic lit events since their

founding in the later 1980s.

He is also a DJ-radiomaker and has produced guest radio shows for the BBC and VPRO (NL), has appeared on a dozen *NPR* radio shows, as well as *NBC* and *ABC* TV plus public radio in the Netherlands, France and Switzerland. He has produced his radio show *Wreck This Mess* since 1986 in NYC (WFMU), Paris (Radio Libertaire) & Amsterdam (Radio 100/Radio Patapoe/Mixcloud) where he now lives.

“Paris Scratch” is a beautiful, picturesque read that I’ve been savoring slowly for a couple of weeks now. In the tradition of writers like Georges Perec, Roland Barthes, Patrick Modiano, Jean-Paul Clebert, with echoes of Queneau’s “Exercises in Style,” Plantenga captures a Paris that finds beauty and wonder in simple exchanges between prostitutes and shopkeepers, children, workers, and random passersby. ... The synthesis of poetry and prose, the homage to the visual image, and the recognition of the sublime beauty of the unspectacular, make this a compelling and immensely satisfying read. Sip this book like cognac.

Alfred Vitale, author, academic, editor of RANT

The companion to *Paris Scratch*, [NY SIN PHONEY IN FACE FLAT MINOR](#) (Sensitive Skin) documents New York using the same tactics and will appear in November 2016.

Please let me know if you are interested. Thanks so much,
Blandine Broche

** For free pdf or paper reviewer’s copy: contact us & we will forward your request to the publisher.*

[The INSANE Logic Of The YODEL](#)

Printing A Book, Old School