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Por una Vida Digna: Science as Technique of Power and Mode of Resistance in Argentina

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Por una Vida Digna: Science as Technique of Power and Mode of Resistance in Argentina[2]

"¡Andrés Carrasco, presente!" A tall man with sun-weathered skin and long chestnut hair which fell in tangled spirals down the back of his threadbare brown sweater had just addressed a crowd of about 100 people, young and old, who were gathered in the drafty, crumbling gymnasium of a high school in Paraná, Entre Ríos, Argentina one Friday evening in June of 2016.

The crowd had gathered for an event months in the making--- a panel discussion called "Con la Soja al Cuello" organized to bring awareness of the socio-environmental impacts of the expansion of genetically-modified soy monocultures in rural Argentina to the urban denizens of Paraná. The gymnasium was strung with colorful banners displaying messages like "Los agrotóxicos matan, la indiferencia también" (Agrotoxins kill, indifference too), "Justicia por Nicolás Arévalo"[3] (Justice for Nicolás Arévalo), and "Una bomba química nos extermina en silencio" (A chemical bomb is exterminating us in silence).

Groups of students, teachers, and community members sat in rows of folding chairs, bundled in scarves and sweaters, passing ornamented gourds of steaming

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[3] Child victim of death by agrichemical fumigation.

mate back and forth amongst each other with the requisite combination of graciousness and nonchalance. At the front of the room, the panel speakers sat at a folding card table draped with a banner depicting Argentina being hung by a noose, along with the phrase "Con la Soja al Cuello" (With Soy at the Neck).

The event had begun with a screening of the award-winning short documentary "El Costo Humano de los Agrotóxicos" (The Human Cost of Agrotoxins), a lurid portrait of environmental suffering in rural Argentina. Then, each of the three panelists spoke. The first speaker was Estela Lemes[4], "la maestra fumigada" (the sprayed or fumigated teacher), a rural school teacher whose repeated experiences with agrichemical contamination thrust her into the spotlight of national media. The second was Sofía Gatica, winner of the Goldman Environmental Prize and member of Las Madres de Ituzaingó[5]. The third was Dr. Damián Verzeñassi, physician and professor, director of the School of Medicine at the University of Rosario, Argentina.

The speakers each employed personal anecdotes and alarming statistics about accelerating degradation of the environment and public health to argue vigorously against transgenics and agribusiness, and for an immediate transition to agroecology. After the panelists had finished, the floor was opened for questions and comments, and several community members stood up to offer passionate and erudite expressions of anger, hope, and the need for organized resistance. The last comment was made by the tall, chestnut-haired man with whose comment I began this essay. He spoke on the need to implement a two-pronged strategy--- fighting the hegemony of agribusiness while simultaneously building an alternative from the ground up. As he began to wrap up his thoughts, he paused and said:

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[4] As everyone mentioned in this essay is a public figure, names have not been changed.

[5] Women's environmental justice group from Córdoba who won an unprecedented court case involving aerial fumigations in their barrio after a 10-year struggle. They continue their struggle, now divided into 2 groups.

"*Vienen por los minerales*
Vienen por la tierra
Vienen por el agua
Vienen por el aire
Vienen por los alimentos
Y vienen organizados.
Tenemos que luchar.
Es mentira que sí se puede--- es necesario trasformar la realidad!
Tenemos una responsabilidad muy grande en nuestros manos
Y es ponernos a estudiar."

(They're coming for the minerals
They're coming for the land
They're coming for the water
They're coming for the air
They're coming for the food
And they're coming organized.
We have to fight.
It's a lie that 'yes we can'--- we have to transform reality!
We have an enormous responsibility in our hands
And that's to get studying.)

The crowd erupted in raucous applause. *"¡Andrés Carrasco, presente!"* (Andrés Carrasco, here!) The crowd cheered even louder.

This article examines the contested role of science in current controversies over agricultural biotechnology in Argentina. I will illustrate some of the ways science has been used as both a crucial pillar of the legitimating discourse of agribusiness, and also as tool of anti-GM mobilizations, paying special attention to the lionization of the late microbiologist Andrés Carrasco who sacrificed his career to publish a seminal paper on the health impacts of glyphosate (Paganelli et al. 2010).

GM Soy in Argentina: Environmental and Health Impacts

Historically, Argentina produced a diverse array of agricultural products such as beef, wheat, corn, sunflowers, rice, and wine. In the last 20 years, however, Argentina's agricultural landscape has been dramatically transformed by the widespread adoption of GM soy, facilitated by the neoliberal restructuring of the Argentine economy under the administration of President Carlos Menem (Lapegna 2015) and extended under the 'post-neoliberal' Kirchner years (Cáceres 2015). Locally this process is known as sojización or "soyification."

While soya expansion in the region is promoted by powerful actors as a 'green' way of encouraging rural development and energy independence, and the technology has been appealing to many growers due to its simplicity of use, the soyification development model has created conditions of threatened food sovereignty and environmental crises such as deforestation, leaching, erosion, soil and water degradation, and chronic flooding (Newell 2009; Teubal 2008; Turzi 2011). La Via Campesina estimates that around 200,000 rural families have been forced off their land since 1996 due to the advancement of the soy frontier in Argentina, leading to a large-scale displacement of rural populations to metastasizing slums on the urban periphery of major cities such as Buenos Aires (Auyero 2000; Teubal 2008; Goldfarb and Zoomers 2013; Hetherington 2013).

Today, about 65% of arable land in Argentina is planted with transgenic soy (Goldfarb and Zoomers 2013). The soy frontier is currently pushing further and further into the lowland forest region of the Gran Chaco, which together with the Amazon has long been known as one of the two Lungs of the Americas.

It is undeniable that the GM soy boom has produced an array of grave socio-ecological problems in Argentina, but perhaps none has been so devastating as the problem of agrochemical contamination. In 1996, the year of legal introduction of transgenics, 821,000 kg of glyphosate were applied within Argentina's borders. By 2014, this figure had reached 88,000,000 kg (Benbrook 2016).

This rapid and dramatic increase in glyphosate use has been implicated in a major public health crisis for the nation's rural poor. Problems attributed to glyphosate

contamination include skin irritations; respiratory and neurological problems; kidney malfunction and renal failure; reproductive disorders, spontaneous abortion, and birth defects; and a sharp increase in incidences of cancer, leukemia and lymphoma (Aranda 2017a; Benítez et al. 2009; Vazquez et al. 2017).

"En la Argentina la Biotecnología es una Política de Estado"[6]

Mobilization against GM agriculture has been minimal in Argentina as compared to other countries, despite these far-reaching consequences. Peter Newell (2009) has argued that resistance from rural and urban publics has been constrained due to a "biohegemonic" cooperation between state and capital which precludes effective mobilization against GM soy. Pablo Lapegna (2014; 2016) provides insight into the complex "politics of demobilization" that occurred in rural Argentine communities between 2003 and 2009 whereby collective action and resistance to the negative socio-environmental impacts of GM soy attenuated to negotiation and accommodation.

Newell argues that hegemony is achieved by the biotech industry through its seizure of institutional and discursive power. Because the industry contributes so significantly to Argentina's economy, it enjoys heavy influence in politics and almost exclusively positive depictions in dominant media. "The hegemonic discourse in Argentina regarding agricultural biotechnology is that it represents an important, economically significant, socially beneficial, safe, and environmentally benign technology" (Newell 2009:53). As dissenting counter-narratives have been strategically marginalized,

> ...the question of whether and on what terms agricultural biotechnology should be adopted as a core element of economic policy, which has produced such intense social and political conflict in other countries, has continued to be a 'non-issue' in Argentina (ibid., 54).

[6] "In Argentina, biotechnology is a state policy." - Jorge Rulli, Grupo de Reflexión Rural.

Pablo Lapegna (2014; 2015; 2016) argues that early mobilizations against GM agriculture lost momentum not only due to clientelism and "patronage politics," but also because peasants who complained about contamination were frequently humiliated by local officials and powerful soy growers. For example, he recounts an instance where women in a Northern Argentine community suffering the impacts of pesticide drifts were told that their children's skin lesions were the result of poor hygiene, not agrichemical contamination, and that they should learn how to use soap (Lapegna 2014: 11-12).

Both Newell's and Lapegna's work demonstrates that agribusiness has seized and maintained power by monopolizing claims to legitimate knowledge and marginalizing other narratives about the impacts of biotechnology. Science, then, is a major field in which the struggle for environmental justice and territorial sovereignty is playing out.

Technoscience in Argentina

Argentina Innovadora 2020 (Innovative Argentina 2020), The National Plan for Science, Technology, and Innovation Strategic Guidelines for 2012-2015, begins with a collection of quotes from then president Cristina Fernández de Kirchner, each extracted from a speech she had made before a gathering of scientists (figure 2). It is notable that each quote emphasizes, in no uncertain terms, that the role of science is to bolster economic growth and to "add value" to the economy. Perhaps most striking is the following quote:

Además de ser excelentes productores de materias primas tenemos que ponerle a toda esa materia prima mucha ciencia, mucha innovación, mucha tecnología, mucha articulación entre el sector privado y nuestras universidades, porque eso es lo que hacen todos los países desarrollados del mundo para agregar valor. La unidad del conocimiento con la economía es el rasgo distintivo que le queremos imprimir

al crecimiento del Tercer Centenario en la República Argentina, y estoy segura de que lo vamos a hacer (Argentina 2011: 8-9).

In addition to being excellent producers of primary materials we need to infuse those materials a lot of science, a lot of innovation, a lot of technology, a lot of articulation between the private sector and our universities, because that's what all the developed countries of the world do to add value. The unity of knowledge and the economy is the distinctive trait which we seek to impress upon the burgeoning Third Century in the Argentine Republic, and I'm sure we're going to do it.

Given the historical and ongoing asymmetry in the relationship between so-called 'core' and 'periphery' nations, it is understandable that a president of Argentina would want to make moving beyond the status as primarily an exporter of raw materials a part of her platform--particularly when said platform is largely predicated on reversing the neoliberal reforms of the Menem administration. However, that Kirchner proposes to accomplish this not by, for example, revitalizing manufacturing, but instead by encouraging "articulation between the private sector and the university" and "the unity of knowledge and the economy," partially explains why scholars have argued that the Kirchner years are more accurately characterized as "neo-extractivist" than "post-neoliberal" (e.g., Cáceres 2015). The state's emphasis on the cultivation of a science and technology squarely focused on "increasing productivity" has led to an accelerated extractivism and staggeringenvironmental injustice that has led many in the science community in Argentina to ask "Ciencia para qué y para quiénes?[7]" (Science for what and for whom?)

[7] Guillermo Folguera de CONICET - Ciencia para qué y para quiénes? Guillermo Folguera of CONICET – Science for what and for whom? Accessed March 14th, 2017 - https://www.youtube.com/watch?v=n6PVPUfWCOo

Science for Sale? The Global Controversy over Glyphosate Herbicides

The impact of glyphosate on human health is the subject of fierce contestation on a global scale. Proponents of the herbicide argue that it is lethal to plants yet essentially nontoxic to vertebrates (Du Bois and Freire De Sousa 2008), and is quickly broken down into harmless substances within the larger environment (USDA 2002). However, glyphosate has been linked to several serious maladies in independent scientific studies, including cancer, kidney malfunction, and reproductive disorders. For example, Benachour et al. (2007) observed a link between glyphosate-based products and cell cycle deregulation— a hallmark of tumor cells and human cancers ---and linked glyphosate exposure to adverse effects on human reproduction and fetal development. Gasnier et al. (2009) documented disruption of endocrine and kidney function at well below "acceptable" levels of contamination. Benítez et al. (2009) linked glyphosate herbicides to congenital malformations in an epidemiological study of women living among GM soy fields in the Paraguayan Chaco.

In March of 2015, the International Agency for Research on Cancer (IARC), a branch of the World Health Organization, reclassified glyphosate as a "probable carcinogen" (WHO 2015), highlighting a previous IARC study which found evidence linking glyphosate exposures to doubled risk of non-Hodgkin lymphoma. Since the WHO reclassification, more than 1,100 lawsuits have been filed against Monsanto by farmers, landscapers, and agricultural workers in the United States who claim that their lymphoma was caused by exposure to Roundup (Monsanto's patented glyphosate-based herbicide). In March of 2017, a federal judge in San Francisco unsealed documents which reveal that Monsanto has exploited relationships within the Environmental Protection Agency to ensure prolonged regulatory approval of glyphosate despite accumulating evidence of its negative health impacts. The unsealed documents further suggest that the paper most often cited as evidence of the herbicide's innocuousness (Williams, Kroes, and Munroe 2000) was ghost-written by company scientists and then signed off by Gary

Williams, a pathologist at New York Medical College, and his co-authors (Cornwall 2017; Hakim 2017).

In Argentina, a 2009 review by the Ministry of Science and Health entitled "Evaluación de la información científica vinculada al glifosato en su incidencia sobre la salud y el ambiente" (Evaluation of scientific information related to glyphosate in its impact on health and the environment) concluded that there was a lack of evidence that glyphosate negatively impacts human health (CONICET 2009). The official report, which was vigorously criticized by civil society organizations and scientists from public university, repeatedly cites the work of the purportedly "independent" academic Gary Williams to defend the safety of glyphosate (Aranda 2017b).

Andrés Carrasco: Ciencia Sin Patrón[8]

> *La ciencia no es neutral ni objetiva. La ciencia siempre tiene ideología y un sentido político. La ciencia puede aportar a la liberación o al sometimiento. La ciencia puede ser aliada de las corporaciones o estar al servicio del pueblo*.
>
> (Science is neither neutral nor objective. Science always has ideology and a political sense. Science can contribute to liberation or submission. Science can be allied with corporations or be at the service of the people.)
>
> --- Andrés Carrasco, Declaración Latinoamericana por una Ciencia Digna (Latin American Declaration for a Dignified Science).

Andrés Carrasco was a microbiologist who specialized in embryonic development, and was at one point the president of CONICET (Argentina's National Scientific

[8] Science without a boss. Aranda, Darío. "Homenaje a Andrés Carrasco: Ciencia Sin Patrón." La Vaca. N.p., 30 July 2014.

and Technical Research Council). Having been made aware of the environmental suffering of rural communities, Carrasco decided to research the possible effects of glyphosate on human health by conducting tests on frogs. When he discovered the effects to be astoundingly strong, he decided to release his results to the public. He contacted Darío Aranda, one of the few journalists sympathetic to the plight of rural communities, and in April 2009 his story made it to the front page of Página 12, Argentina's main progressive newspaper.

Almost immediately, the anonymous threats began pouring in on the telephone, and a group of lawyers working for CASAFE[9] stormed his office looking for papers and other research documents. Lino Barañao, the Argentine Minister of Science and Technology rushed to publicly discredit Carrasco's research, and, as was later revealed in an email leak, privately implored that the head of the National Committee of Ethics in Science and Technology censure the microbiologist on ethical grounds (Adamovsky 2014). It was further revealed by Wikileaks that the US Embassy also lobbied against Carrasco during this time (ibid.). A paper was quickly published which condescendingly refuted Carrasco's claims, and was later linked to Syngenta (Fagan and Robinson 2012). In August 2010 Carrasco was almost lynched by a mob of landowners and local politicians while in the Chaco for a speaking engagement. In 2013, CONICET declined his petition to be promoted to the highest category of the public research system (Adamovsky 2014).

Carrasco's life as a well-respected but generally unknown (outside of the narrow field of embryonic microbiology) scientist was over. But his life as a leader and icon of an insurgent movement had just begun. He became an ally and advocate for the marginalized communities who were fighting the dispossession, displacement, and contamination generated by the technologically-driven expansion of the agricultural

[9] The Cámara de Sanidad Agropecuaria y Fertilizantes (The Chamber of Agricultural Sanitation and Fertilizers), an association that gathers together the main agrochemical corporations in Argentina.

frontier. Alicia Massarini, biologist and colleague of the late Carrasco, recalls that the scientist "did not position his study as absolute truth, but rather as a contribution that made sense together with other ways of knowing--- those of the communities that for years have suffered, resisted, and insisted that agrochemicals sicken and kill," and notes that his legacy has reinvigorated debates initiated in Latin America by Oscar Varsavsky, Amílcar Herrera, and Jorge Sábato about the non-neutrality of science and the need for a 'pueblo-centric' model of investigation and innovation (Aranda 2014).

Before Carrasco died of a heart attack in May of 2014, he formed important networks and alliances that persist, even as he cannot. The Red de Científicos Comprometidos (Network of Committed Scientists) is a growing network of scientists and academics in Argentina, Mexico, Ecuador, Costa Rica, and Brazil that are guided by the principles of the Latin American Declaration for a Dignified Science (Carrasco 2014). The declaration, penned by Carrasco days before his death, does not stop short at the condemnation of glyphosate, but inveighs against agricultural biotechnology and other forms of extractivism as neocolonial pillaging and declaims forms of scientific investigation that are complacent in this corporatist neocolonial project.

Día de la Ciencia Digna

"Carrasco ya es semilla."

Carrasco is a seed now.

--- Darío Aranda

On 16th June (Carrasco's birthday) 2014 at the School of Medicine of the University of Rosario, a group of scientists, activists, and community members instituted The Day of Dignified Science (UNR 2014) not only as an homage to the legacy of Carrasco, but to bring into being a network of militant 'pueblo-centric'

scientists ("científicos comprometidos"). The day has since been expanded to a week during which, all around Argentina, panels and workshops take place discussing the socio-environmental consequences of extractive GM agriculture, the role of science in perpetuating the model, and the responsibility of a "committed," "pueblo-centric" science in taking it down. Colleagues Guillermo Folguera, professor in the History of Science at the University of Buenos Aires, and Damián Verzeñassi, director of the Instituto de Salud Socioambiental (Institute of Socio-Environmental Health) at the National University of Rosario in particular carry on Carrasco's legacy. In October of 2016, Verzeñassi delivered a damning testimony at the first International Monsanto Citizen Tribunal at The Hague. His testimony was based on the results of an eight-year-long and running epidemiological study in 27 rural municipalities in Argentina. When he returned to Rosario, he found his office and lab, with 96,800 clinical histories inside, locked with chains.

Conclusion: "*Ciencia para Qué y para Quiénes?*"

A recent (2017) report of the UN Special Rapporteur on the Right to Food criticizes the transnational corporations that manufacture pesticides, accusing them of "systematic denial of harms," "aggressive, unethical marketing tactics" and heavy lobbying of governments which has "obstructed reforms and paralyzed global pesticide restrictions."

The report is unambiguous, stating that pesticides have "catastrophic impacts on the environment, human health and society as a whole," including an estimated 200,000 deaths a year from acute poisoning (UN 2017: 14-19).

The first International Monsanto Citizen Tribunal at The Hague concluded on April 18th 2017. The mock trial, overseen by five judges, was a symbolic international ruling which found Monsanto guilty of "crimes against humanity and ecocide" and concluded that the leaked documents alleging Monsanto influenced the EPA "make hollow the so-called scientific controversy about the risks

glyphosate poses on health."[10] The judges called upon civil servants, lawyers, and judges to heed their ruling and change international law to hold the company accountable.

Can a ciencia comprometida deliver justice to the thousands of Argentines suffering the devastating consequences of the expansion of agribusiness in Argentina? While legions of militant 'pueblo-centric' scientists gathering under the banner of Ciencia Digna is certainly cause for excitement, previous work in Science and Technology Studies gives reason for tempering one's optimism with respect to the ability of (even the most well-intentioned) expert knowledge to deliver justice in environmental justice struggles:

In a political context where contentious issues of equity and justice are frequently removed from public debate by transforming them into narrower scientific questions, EJ [Environmental Justice] activists' efforts to mobilize science to contest environmental injustices may simply reinforce larger patterns of scientization without giving them any strategic advantage (Ottinger et al. 2017:1047).

I see this dynamic playing out in Argentina, with some actors[11] frustrated that criticisms of biotechnology have been abandoned in favor of a focus on glyphosate, which is, at the moment, an easier target speaking in narrowly scientific terms. Still, Ciencia Digna goes further than mere reformism, arguing instead for a reimagination of what science can be and do, and for whom. In a recent paper, Martín Arboleda argues for a reimagination of class consciousness along scientific lines, thus highlighting the radical potentialities immanent in the current scientific relations of production:

[10] See http://www.monsanto-tribunal.org/

[11] Guillermo Folguera: "¿Porqué tenemos que discutir si el glifosato envenena? Que por eso fue generado."

In the face of the heightened proletarianization of scientific and intellectual labor that defines our era, a microscope or a computer program can exert violence toward the intellectual laborer, nowadays increasingly overworked, indebted, and alienated. However, such instruments of production can also revolutionize her consciousness and will in politically progressive ways (2016:12).

Such arguments highlight the importance of fighting deep cuts in science funding by both the Macri and Trump administrations, which jeopardize the ability of 'pueblo-centric' scientists to imagine and bring about a more just world.

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