

COMBATIR LA NADA / COMBATTRE LE NÉANT / FIGHTING EMPTINESS

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ABSTRACT. *Combatir la nada. Combattre le néant, fighting emptiness.* This wonderful phrase by Cortázar (from the short story that inspired Antonioni's movie *Blowup*) has been a metaphor of our resistance, mathematical and vital. I will offer reflections/variations (some more mathematical, some less perhaps) on the topics of resistance in face of the void, of our changed perception of temporality, on the possible role logic may be called to play in a future enhanced awareness of our possibilities.

1. BLOWUP

Today, I will speak mostly in English, but there will be some excerpts in Spanish and possibly in French. I will also try to allow images to speak for themselves while I blurb my words.

Throughout several lectures this week, **time** has been a central character. Looking at the past (earlier crises; Bosnia, of course; the Cold War; the two World Wars of the twentieth century; earlier pandemics (Justinian's

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Thanks to Mirna, my sister-of-adventures (we share a common doctoral advisor *and* postdoctoral mentor! An advisor, Ken Kunen in Madison, who always let us explore our own thoughts - who clarified the picture when the time to visit his office came - but who never framed too much any of our projects. A postdoctoral mentor, Saharon Shelah in Jerusalem, whose work has opened the keys to whole areas of mathematics, and whose absolute encouragement to pursue our most free dreams is in a mysterious way behind all our connections to other pursuits of knowledge).

Plague, the 14th Century Plague), all the way back to geological epochs and continental drifts).

I propose now for a change and for contrast a momentary look at an era of enormous optimism, an era of **wide opening** for society, an era when previous constraints seemed to be shed: the 1960s. I was myself born in 1968 –I consider myself the child of a momentous era that now seems getting to its own closure. A movie of 1965 that grasps the optimism, the aura of possibilities (but also the enormous irresponsibility of those youths) is Michelangelo Antonioni's *Blowup*. I want to draw attention to two elements of that movie that will help me frame two later topics: the role of photography in effacing nothingness, in reducing the effect of forgetfulness - and the strong analogies with the role of mathematical logic, to which I want to come back later.

In his movie, Antonioni depicts London's obsession with fashion and photography in an engrossing way, pleasurable to look at these days if only for the contrast with our own confinement and reduction. But at the heart of the movie is a seed of darkness, a core of discontent, an enigma to be resolved. The enigma itself (some killing in some London field) is irrelevant to our discussion today. What is important is the *method*, the way the young (and until then vapid) photographer starts using techniques of enlargement, of enhancement, of shadowing and lighting, of augmenting and effacing noise. Of *blowing up* - until he finds reality is rooted on a much thinner ice than had been let see. Behind the enormous optimism of the 1960s there was a core of thin ice, of melting icebergs, that back then

needed perhaps the vision of an Antonioni, of a Julio Cortázar, to be blown up large enough to be made visible.

1.1. **Julio Cortázar.** The movie is loosely based on Julio Cortázar's short story *Las babas del diablo*.

Entre las muchas maneras de combatir la nada, una de las mejores es sacar fotografías, actividad que debería enseñarse tempranamente a los niños, pues exige disciplina, educación estética, buen ojo y dedos seguros. No se trata de estar acechando la mentira como cualquier repórter, y atrapar la estúpida silueta del personaje que sale del número 10 de Downing Street, pero de todas maneras cuando se anda con la cámara hay como el deber de estar atento, de no perder ese brusco y delicioso rebote de un rayo de sol en una vieja piedra, o la carrera trenzas al aire de una chiquilla que vuelve con el pan o una botella de leche. Michel sabía que el fotógrafo opera siempre como una permutación de su manera personal de ver el mundo por otra que la cámara le impone insidiosa (ahora pasa una gran nube casi negra), pero no desconfiaba, sabedor de que le bastaba salir sin la Cón-tax para recuperar el tono distraído, la visión sin encuadre, la luz sin diafragma ni 1/250. Ahora mismo (qué palabra, ahora, qué estúpida mentira) podía quedarme sentado en el pretil sobre el río, mirando pasar las pinazas negras y rojas, sin que se me ocurriera pensar fotográficamente las escenas, nada más que dejándome ir en el dejarse ir de las cosas, corriendo inmóvil con el tiempo. Y ya no soplaba viento.

(I read this excerpt to my students of an introductory set course theory at the very beginning of a two-hour session, a few weeks ago. Fighting nothingness, *combatir la nada*, seemed an adept concept.)

Fighting nothingness was also a metaphor for our situation, our confinement, back then in class.

2. LOGIC AND PROBING THE WORLD

A very interesting comparison has been made here between statistical methods to probe the world and other methods (astrological) to probe the world in search of an explanation. Mirna Džamonja has extended this comparison in one of her remarks to the existence of *discrete* methods, *continuous* methods and logic. I would like to expand slightly on this (I believe Mirna and Fernando will expand on this question), by merely illustrating the analogy between Antonioni's Blowing Up method (for revealing the hidden core, the hidden structurally rotten situation with the outwardly bright Sixties) with what we do in Mathematical Logic.

In Mathematical Logic we use language (although there are many possibilities on the choice and format!) to, as it were, **probe** the world. Frame the sort of questions we are interesting in exploring from a given structure (be it the SIR model of epidemiology, the real numbers, the structure of exponentiation in the complex numbers).

The twentieth century saw the rise and literal explosion of the methods of mathematical logic - mostly obtained when one fixed language and a fixed syntax and semantics were used. It saw both the extreme rise of mathematical logic methods and of theorems proving its own limitations.

The late twentieth century, and even more so our twenty-first century seem to be witnessing the beginning of a new “fusion,” an extremely interesting *rapprochement* between ideas coming from Geometry (especially from Grothendieck’s advanced version) and Logic, in forms that are still emerging but which, dare I say, will provide a much stronger grip on Logic’s original intent of grasping the world.

Zalamea has asked whether *peripheral* view (or perspective) brought about by physical (geographical) periphery may be in a way sensed in the wealth of non-classical logics. This is a difficult question to answer, but (in my view) extremely important.

Yet a (perhaps) even tougher challenge is (yet) to be met by mathematical logic, if we are to believe the words of the late mathematician and philosopher Gian-Carlo Rota.

3. THE TOUGHEST CHALLENGE FOR LOGIC? TEMPORALITY

In the mid 1990s Gian-Carlo asked a mysterious question, in the form of a “challenge for mathematical logicians”: find the right logic for the relation of Fundierung. I will avoid a detailed description of the technical term here, of course, but let me mention it deals with the *dependence* of our notions on their support in the world.

One of the origins of the quest that ends up in the so-called Transcendental Logic in Husserl is precisely the philosophical analysis of consciousness of internal time, the access and perception we may (or not) have of time’s unfolding. If we accept as a main role for logic *providing an objective anchoring to our perceptions (mediated, modalized, filtered) and be a place of synthesis of all our (“noematic”) acts of knowledge*, it is clear that a logical

relation adapted to *Fundierung* necessarily has to account (among other things) for the way we access the effect of time, the way we perceive it.

Husserl's analysis of time perception is immensely rich in examples, ideas and layerings of these, contrasting *memory of past events* with *intentionality* (the way our thinking directs itself toward an event and effectively manages to *interpolate* between visible instances of those events). For instance, if I see my hand rotating I may only perceive *some of the states* of this rotation (probably very few of them) but through intentionality I may "interpolate" to a continuum of intermediate stages and see ONE rotating hand - I do not interpret it as a distinct object in each one of the moments I perceive through sight. This way of "glueing" or creating a synthesis is a crucial element of the analysis of time.

Another crucial element, connected with (but not reducible to) the previous is *protention*, the "anticipation" or bounded extrapolation of the movement or temporal event. (This point has been much less analyzed mathematically; I expand on this point later.) An immediate version of this protention is that in some sense I may extend (my perception of) time beyond, "I overflow" the perceived instant and anticipate that the hand will "still be there" at least in a very close future. I *anticipate*, although in a very slight way. From these two elements, Husserl builds a network of time decomposition in a *continuum* of anticipations and interpolations, protentions and intentionalities, extremely refined and irreducible to a merely analytic description.

In an expanded way, this week has been an exercise in protention and intentionality.

There is really much more in transcendent logic than this description in Peircean terms; it involves temporality, it involves a stepping beyond language and direct objectuality (hence the name “transcendental” of that logic). The scope of these notes does not cover the philosophical complexities Husserl posits - almost in the style of a mathematical problem for the coming decades, reformulated by Rota.

The presence in our lives of a new void, a new emptiness, an inward turn, an internal closeup an inner opening bear witness to the importance of this idea.

Our usual external bridges have been severed, internal bridges have been somewhat brutally enhanced.

4. BACK TO PERCEPTION - ATSMI.WORDPRESS.COM

Before jumping to some final notions of what is beginning to happen and what some of us would *like* to happen after the end of the pandemic (even if such a notion is ever more undefined, ever more vague), here is a sample of emotions lived through, as recorded in my personal blog atsmi.wordpress.com

- The intensity of dreams during the first weeks of the confinement.
- The vivid awareness of inner time, of the baroque volutes of the environment.
- Dialogues (mental ones!) with many people already departed, with many ideal friends.
- Reading excerpts of Valéry - on confinement (

Un regard charitable

Que de choses tu n'as même pas vues, dans cette rue où tu passes six fois le jour, dans ta chambre où tu vis tant d'heures par jour. Regarde l'angle que fait cette arête de meuble, avec le plan de la vitre. Il faut le reprendre au quelconque, au visible non vu — le sauver — lui donner ce que tu donnes par imitation, par insuffisance de ta sensibilité, au moindre paysage sublime, coucher de soleil, tempête marine, ou à quelque œuvre de musée. Ce sont là des regards tout faits. Mais donne à ce pauvre, à ce coin, à cette heure et choses insipides, et tu seras récompensé au centuple.

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- Texture of life
- Dawns

5. PROJECTING TO THE FUTURE: OPTIONS

- Inner - Outer
- Periphery - Center
- Shutdown - Opening
- Logos / Harmotton
- Fixed truth / Strong understanding of possible truths (forcing)