# SCIENCE AND ‘HUMAN SCIENCES’

## The search for the “Truth”

Marina De Chiara and Ciro Discepolo

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It is simply not so that the researcher pursues the truth; it pursues him.

***Robert Musil***
*The Man Without Qualities*

# Preface

It is undeniable that there is a wide gap today between the scientific – or, better, *scientifist* – culture and the so-called culture of analogy. "Scientifist" is a term coined by the Italian philosopher Raffaello Franchini to indicate the absolute deterioration of the scientific thought, luckily confined to a cultural minority, that uses science as if it were a weapon. Opposing this is the so-called culture of analogy, which is not closely linked to standards that can be assessed instrumentally, but which is based, on the contrary, on the ideal or analogical connection between two or more elements that are represented in almost all the so-called Human Sciences. Such dichotomy derives mainly from the media misinformation that, in recent years, has celebrated the notion whatever is "scientific" deserves salvation, while whatever is not, must be thrown away. Hence, as Franchini points out, the pretension of making people "burp and copulate in a scientific way", with all the distortions deriving from this misrepresentation.

Blinded by idealization, we applaud space journeys and the wonderful toys provided by modern technology, easily forgetting – with the same superficiality that taints our world today – that this Science is the mother of all atomic bombs, of all germ and mass destruction weapons.

The "God of Logic" seems to have ousted Zeus from Mount Olympus, and a monotheism of numbers with too many omissions is now praised. By imitating the style of some journalists who wish to mock *Human Sciences*, we can claim that, having lost any religious link with life, today men have barricaded themselves behind the fortress of "science" where they would be unassailable since they would have "tangible" evidence of being right.

In my opinion, this attitude results in a search for protection, a flight from responsibility, since free thinking entails the discomfort

of supporting the theses chosen solely with the strength of our own weapons. It is obviously much more convenient to join the group, the majority, especially that of the "Palace", as the Italian intellectual Pier Paolo Pasolini called the centres of power.

By this, however, I do not intend to devalue scientific culture, but only to argue that it lives its own life, and it should not be antagonistically compared to humanistic or analogical culture. Otherwise, it would be like claiming that an apple is better than a pear, and vice versa.

Symbols are not just a vehicle of poetic inspiration but the real protagonists of our times: they permeate our lives, and end up characterizing them in the smallest details.

Who would dare deny the laws of mechanics? Yet, at the same time, who would doubt that a man who got married several times with women older than him, has been trying to replace his mother who presumably died when he was a child?

One example will be sufficient to demonstrate the importance of symbols in modern life: their use in advertising. Strategists of commercials are obviously not inexperienced, but on the contrary they are skilled manipulators of the striking power that symbols have on men. How many sexual references are there in advertising, from the vigorous cocktail to the biscuits for those who consume energy in love making? Not to mention the therapeutic use of symbols by psychoanalysts and their diagnostic use that is at the basis of the work of psychologists.

Defending the importance of symbols from the hysterical attacks of some *scientifists* is beyond the scope of the present volume, but I wish to suggest Carl Gustav Jung's *Man and his Symbols* to those who want to know more about this subject.

What on the contrary I wish to highlight in this context, following the subject of the pleasant conversation with Professor Marina De Chiara, is that it is necessary to decode the symbols we manipulate – as much as possible – for our own purposes.

A digression and a methodological reflection are needed here. We scholars of *Human Sciences* usually position ourselves along two directions in regards the relation to *Science* and the so-called official culture: either we attempt to create a constructive and fertile

dialogue, or we shelter behind our own positions, thinking of letting those who do not share our ideas stew in their own juices.

This second option, that I would call inflexible and pessimist, gathers first-class representatives of non-scientific culture in the world. I personally prefer the first option, although I reject any subordinate alliance or in any case dependant on the representatives of the Palace of Science.

I thus believe that, preserving transdisciplinary autonomy and even riding the wave of the *odium theologicum* that divides us, it is a good thing to look for a dialogue with our potential interlocutors. I call them "potential" because most of the time they choose to excommunicate us, removing any possibility for dialogue.

However, as logic teaches us, in order to dialogue it is necessary to speak the same language. So here is the first great obstacle that has prevented us from having a productive conversation with those who believe they are on the opposite side.

Speaking the same language means moving along the path of symbolic decodification. Namely, it is necessary to contain the possibility of analogical connection among symbols and try to proceed following the simplifications that, albeit in their limitations, can however provide this operation with a constructive result.

Obviously this may happen either if it is needed or if we wish to do statistical research in Human Sciences. Otherwise, I can't see what other form of dialogue may be possible between us and the men of *Science*.

Examples abound, and the work of Michel and Françoise Gauquelin is the highest evidence of it. The couple demonstrated, for the first time and without any doubt, that being born in a precise given moment is different from being born in another given moment; that the Natal Skies of the parents are very similar to the Skies of the children; that being born with a dominant Celestial means living in harmony with this Celestial's meanings. Nobody could deny the very high value of such demonstrations which are not discoveries – since they simply follow what Astrology has claimed for centuries – but which for the first time have assigned the status of "truth" to some items of astrological discourse.

The Gauquelins looked for Mars = energy = sport, and they found

it. Would this statistical research have given positive results had they looked for a trace of the igneous planet in any of its possible analogical expressions? I honestly do not think so, and even so it would have been useful to use a basic operative code so as to avoid that the elements examined could mean anything and its contrary.

We can represent the devil either with a pitchfork or with a snake, but if we intend to articulate a statistical research, we need to specify in advance such polarity, in order to avoid misunderstandings or subsequent unorthodox manipulations.

This argument of mine is probably doomed to receive little consent among those who do not intend to be blackmailed by *Science*. However, it is indispensable if we actually wish to leave the golden isolation we presently live in.

In my opinion, a partially favourable result is undoubtedly to be preferred to no results at all. This "nothingness" is in fact too often praised as a "whole" and justified with the (only in part true) impossibility of speaking the same language.

On the other hand, it is not possible to accept the aberrant use some wish to make of symbolic decodification in order to test the validity of one among the many *Human Sciences*. And, by the way, is it really necessary to test its validity?

What could potentially be read as a sane attempt to discern the bran from the flour, conceding that the latter is better than the former, could on the contrary lead to a hard wall blocking any truth.

The work of the Gauquelins is once again useful, as they present us with a series of simplistic attempts at symbolic decodification that have miserably failed. One thing is to relate Mars to energy and, thus, to sport, and something else is to ignore that a painter – such as, say, Vincent Van Gogh – could express his art despite the fact that he was a passionate Aries.

As André Barbault argues, it is fundamental to discuss both the form and the content: Van Gogh was a painter and not a sportsman, but his painting was characterized by brush strokes as vigorous as lashes, by bright red and violent hues; thus, he was perfectly in line with the fire of the strong Mars in his Natal Chart.

This leads me to consider the problem within the limits of a sound methodological premise. In other words, I believe it is right

and proper to run the risk of getting results that are unfavourable to the presuppositions that guide us, as long as we preserve a necessarily rigorous and scientific method.

I do not believe that Astrology or Psychoanalysis or Law are Sciences. I have never believed such a thing, but I do think that such knowledge can be investigated through scientific methods, i.e. with clarity, linearity, rigour, and according to those laws that make statistics, for example, a tool that is overall valid and not a point a view. For this to happen, it is crucial that we move along the path of symbolic decodification whose limits, in turn, must be closely respected so as to avoid transforming an analogical language into a logical language, and pretending, for example, of finding the transfer function – in mathematical terms – of an artistic fractal in pure algorithm.

However, I wish to conclude by arguing that everything I have written here is unnecessary, since those who love philosophy or literature never locate themselves in an antagonist position against those who work through the lenses of a powerful microscope.

The "challenge" – namely: the request of validation from a third party that should act as a "sheriff" in such a fight – usually comes from the taliban fringes of scientists who have turned into *scientifists*. These people could change their minds if only they would feed on Shakespeare's wonderful sonnets rather than solely on cold trigonometric calculations.

**Ciro Discepolo**

Naples, 18 February 2013
4.54 p.m.

# Science and 'Human Sciences'
# The search for the "Truth"

**Ciro Discepolo:** Astrology aside, my greatest passions are Literature and Cinema, passions I share with Mara De Chiara. Her culture touches upon some crucial issues that have always triggered my curiosity, such as her excellence in the field of Modern Literature, of anthropological studies of the Countries she visits geographically or literarily, and above all of the "borderlands" of postcolonial cultures.

What we have in common, even more important than literature and cinema, is the spirit of research that makes us look at the world with inexhaustible curiosity. In our discussions we have often confronted the subjects of Science and Human Sciences, and these very discussions originated the present volume.

In this book we do not intend to stay on antagonistic positions, neither between us nor with our counterpart – those the great philosopher Raffaello Franchini called "scientifists", the talibans of Science, those who use science as if it were a scimitar in a sort of degeneration of scientist thought.

Ours will not be a duel, nor an attack: we would rather like to frame a series of issues concerning contemporary culture without the presumption of using exclamation marks.

On the contrary, we wish to present our Readers with some question marks, thus inviting them to reflect upon some questions whose absurdity we have often highlighted in our discussions. Some, for instance, would like to theorize that everything that is science is valid, while everything that is not – strictly speaking – science is philosophy, intended as a pejorative term.

This attitude, aberrant to some extent, leads to unacceptable paradoxes in our culture, where some people still hold key roles in what Pier Paolo Pasolini, one of Italy's leading intellectuals, defined

for the first time as “the Palace”.

The Palace, intended by Pasolini as the centre of power, can obviously take on many forms, from the scientific (used in a taliban way) to the religious power. Our aim is thus to offer to the Reader’s attention some paradoxical inconsistencies so that he or she might give, according to his or her own personal experience and culture, an answer to these questions.

**Marina De Chiara**: Our conversations have often focused on the very status of disciplines. In particular, we have considered the way in which disciplines are assessed by the so called “Palace” Ciro referred to earlier. In the last ten years, something serious has happened to Human Sciences, in Italy as well as in other European and non European countries.

Following the guidelines given by a wider global framework, the Italian Ministry for Research and University has consistently and programmatically decreased and, in some cases, cut research funds in the humanities. This increasing impoverishment includes both the school system and the University.

It involves all those disciplines that are considered not directly aimed at technical skills, not immediately necessary, operational or useful: in short, human sciences.

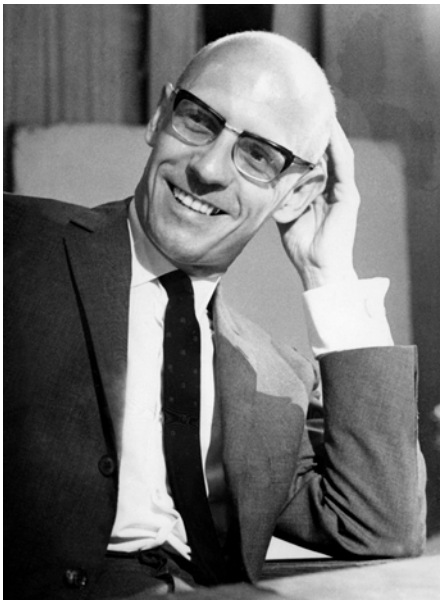
These disciplinary fields are not associated with an easily quantifiable level of productivity – especially in economic terms. Cultural choices nowadays declaredly privilege the so-called scientific disciplines that are generally considered more profitable for a kind of knowledge aimed at practical aspects of life.

In other words, funds are granted to all those disciplines that can assure an increasingly safer habitat for the preservation of the euro-western way of life enhancing, in particular, the biological security of the body, including military security.

This argument can be easily reduced to these simple dynamics: on one hand, the political-economic need to promote and increase the disciplines able to produce progress within systems of power. On the other, the practice to impoverish and devalue those disciplines that, in this perspective, are useless.

So, what can be included in this list of useless disciplines? Literature, first of all, and then Philosophy, Philology – just to mention some definitions of humanistic knowledge. And yet, this very knowledge triggered the tension toward rationalism, toward thinking, rigour and consequentiality meant as tools to improve human thought. If we focus on the origin of sciences like Logic – the foundation of classical philosophical thought –, it is clear that this discipline represented precisely the attempt of men to negotiate the reality around them.

*Logic* was in fact at the basis of thought, as it reduced external reality to language. It marked the passage from the ancient and almost magical bond between words and things, to the notion of words as representation of things, thus revealing the unbridgeable gap between words and things.



One of the best books on this topic is obviously Michel Foucault's *The Order of Things. An Archaeology of the Human Sciences*. Published in 1966, this book has revolutionised Human Sciences and is still crucial in any discussion on the foundation of science and knowledge.

To go back to my initial argument, in the last ten years all research activities in the academia must go through endless evaluation grids especially devised to assess so–called scientific productivity in the academia. However, in disciplines such as Literature, Literary Criticism or Philosophy, it is practically impossible to make a numeric measurement of productivity.

The criteria set for our research projects or our productivity statements are mainly concerned with the nature of the "product", which is often pondered in terms of the number of its pages, that should somehow determine the success of the result of the research.

What could be the much awaited, and most of all, measurable result of a research in the case of a poem, or of a novel? Differently from Mathematics, in Literature it is not possible to move from a declaration of intents, as in a theorem, and demonstrate it. Despite the profound differences among disciplines, be they humanistic or scientific, all researchers are valued according to criteria founded on the "quantification" of the product.

Moreover, another crucial issue is the insistence on the *impact factor* of a given article, essay or volume on the scientific community. For those who write in Italian it will be obviously more difficult to achieve a high *impact factor*, especially if their work is compared with products circulating in the Anglophone academic community that will be read and cited more because of the status of English as a global language.

Although these questions might seem irrelevant, on the contrary, they imply that the productivity of certain kinds of disciplines refers to numbers based on which the Ministry of University will distribute funds.

University funds are in fact given, with priority, to those disciplines that are ideologically considered more useful precisely on the basis of those cultural standards imposed by the collective unconscious orderliness that is used to impose current winning standards and values. In this case it is not possible to refer to a question of national ideology.

Since our lives are now inextricably globalized, national choices cannot but be heavily affected by wider mechanisms impacting even the branches of university research.

What I am interested in at present is thus the status of factuality itself. I believe that by questioning "facts" – inherent in the measurability of results that are required to Human Sciences – we will radically question the very meaning of "scientific nature"

I believe it is very worrisome that the scientific nature of the product required by this kind of cultural surveillance should be grounded on the product's reduction to a mere number.

Reasoning in terms of numbers gives us the illusion of having direct access to truth and quality. However, this leads us to forget that numbers and figures are mere abstractions.

We should investigate the reason why numbers have become the symbols of absolute certainty, when on the contrary they are the most abstract thing that can be.

Our notion of scientific nature is based precisely on this paradox: the blind and devout faith in numbers, which is paradoxically the purest abstraction.

**Ciro Discepolo**: Most of what has been said until now could be summed up in a sentence by Martin Heidegger from his *Discourse on Thinking*: "the approaching tide of technological revolution in the atomic age could so captivate, sizzle and beguile man that calculative thinking may someday come to be accepted and practiced as the only way of thinking".[1]

Scientifists for the most part know little about epistemology, so much so that they erroneously believe that Maths is an exact science, and they even ignore that it is a Logic.

Scientifists do not know that in this historical moment they no longer their philosophical epistemological viaticum. In other words, they no longer have a system validating their work, while they have placed themselves at the top of the echelon, in the "Palace", and determine what is good and what is not.

In reference to this, it is worth mentioning a scene from Steven Spielberg's masterpiece, *Schindler's List*, in which the Jews in the ghetto of Krakow parade in from of the SS officers who will decide their destiny on the basis of their job.

When a University professor of History and Philosophy is being told that "That is not useful", in a moment of dreadful dramatic intensity he will ask, astonished, "But from when is history not useful?"

But is it really assumed that scientific culture is superior to Human Sciences? The problem does not regard merely the validation of the discipline, but also its definition. Medicine, for example, is not science, but rather an art, as written on the Asclepius' symbol, the caduceus. Medical art, that in my opinion is far superior to medical science, in fact relies on the doctor's ability to listen to his or her patients, to visit and question them as the great Neapolitan doctor,

Vincenzo Cardarelli, used to do in the last century.

Yet, most scientifists ignore the difference between the "exact sciences" and Human Sciences, since they despise the latter. However, I would like to suggest to you three "challenges"/provoking thoughts before delving into the definition of science and demonstrating that it ignores it has been orphaned of its epistemological statute.

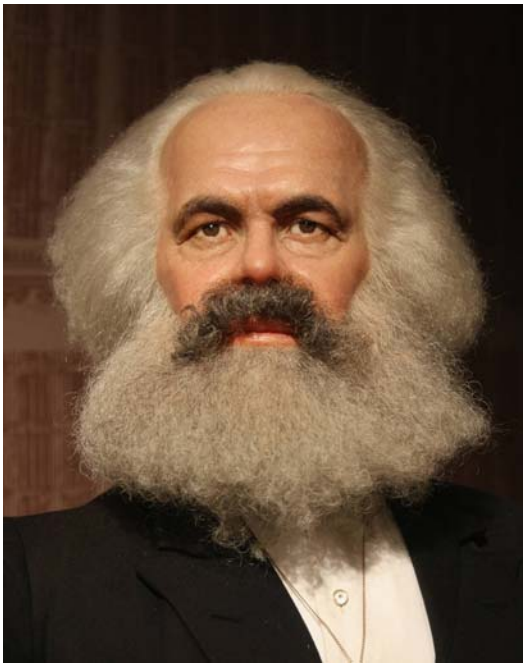
The first provocation involves a volume I read in the 1970s, years in which Michelangelo Antonioni's documentary ***Chung Kuo* (China, 1972)** showed the employment of acupuncture during a caesarean section while western medicine still demonizes this practice.

In those years I joined the debate that was being hosted by several Italian newspapers like *il manifesto*, *L'Unità* and *La Repubblica*. I participated in the discussion confronting the epistemologists of the time quoting a book titled *The Bee and the Architect* [*L'Ape e l'architetto*], a volume edited by Marcello Cini, Giovanni Ciccotti, Michelangelo de Maria and Giovanni Jona-Lasinio, published by Feltrinelli. The book begins with a quotation that says it all:

> … a bee puts to shame many an architect in the construction of her cells. But what distinguishes the worst architect from the best of bees is this, that the architect raises his structure in imagination before he erects it in reality. At the end of every labour-process, we get a result that already existed in the imagination of the labourer at its commencement. He not only effects a change of form in the material on which he works, but he also realises a purpose of his own that gives the law to his modus operandi, and to which he must subordinate his will.

This is a quotation from Karl Marx's *Capital*. Needless to say, *The Bee and the Architect* has been written by epistemologists who professed themselves Marxists and Leninists. This obviously offers a partial idea of epistemology but, as I said earlier, this represents precisely the first provocation I wish to offer to you.

An important scientific popularizer, Lyall Watson, the author of



*SuperNature* (1973), claimed that Astrology certainly contains some elements of mysticism, but to think it is just nonsense because of that, would be like thinking that the *Encyclopaedia Britannica* was produced by an explosion in a printing press.

According to Marcello Cini, bees thus build their cells without a plan in their mind because, in Cini's opinion, bees do not have a mind. However, since they do not have an initial plan, it is not clear how they could accomplish such a miracle of architecture that – by any chance, cannot be compared to the work of an architect who has a well-defined plan that, in this case, is aimed at the Marxist dictatorship of the proletariat. The first provocation entails precisely such combination of epistemology and politics.

I have quoted elsewhere the bumblebee paradox, a very interesting example that can be useful to illustrate my point of view. Students of aeronautical engineering are taught that the bumblebee, an insect with a huge specific weight and two tiny wings, from a scientific point of view is not supposed to fly because of its aforementioned characteristics. However, as some more humorous professor added, the bumblebee does not know anything about it: it doesn't care about it and flies all the same. This is the second paradox.[2]

The third paradox is about Jurisprudence that, in my opinion, is the balance of the present situation. From what we see in the media, it is clear to what extent the so-called scientific factor can determine the conviction or the discharge in a trial.

Once again cinema provides us with illuminating examples. *Final Analysis*, featuring Kim Basinger and Richard Gere, focuses on the story of a woman who has killed her husband under the effect – according to the doctor who is treating her – of "pathological intoxication", a clinical condition leading her to do something – even something as extreme as a murder – that she immediately forgets.

The jury is then called to decide whether the woman can be found guilty despite her pathological condition. Here the role of scientists into jurisprudence comes into play. The first expert, a psychoanalyst and psychiatrist, called by the prosecution, claims that such pathology has been invented by one of her colleagues.

When the expert is asked on how many cases she has been documented to claim the non-existence of this pathology, she candidly replies: "Two".

The defence then calls another expert, a psychoanalyst and psychiatrist himself who has been studying this pathology for thirty years. When he is asked the same question, he replies that he has documented his report on 87 cases. At this stage the jury has no more doubts: the existence of the pathological intoxication is confirmed and the accused is found not guilty.

**Marina De Chiara:** This testifies to the fact that ideology can never guarantee neutrality. Taking an example from literature, which is the disciplinary field I am more familiar with, a book I recently read is quite illuminating. The book is *Looking on Darkness*, written in 1974 by the South African writer André Brink. The very title of the novel raises doubts about the question of truth, intended as a vain fumbling in the dark, confronting and

interrogating this very darkness. The novel tells the story of a young black South African actor, Joseph Malan, who unluckily happens to have an affair with a white woman.

When this woman is found dead, Malan will immediately bear on his skin the sentence for this murder. As we read in the novel in fact, the only immoral action South African society recognizes is precisely this: "that a white girl and a brown man dare make love" (p. 14). Such is the most immoral action that can be conceived in a racist country like modern South Africa.

The novel describes the trial during which, as in a theatre play that must inevitably follow the script, everybody simply tries to find the accused guilty, in a sort of logic automatism simply triggered by the fact that the accused is black. When Joseph Malan is found guilty, the society is purged through the expulsion of an antibody from its "collective organism".

This metaphorical image of the antibody expelled from the "healthy" body leads us to the question of the interpretation of medicine itself as a science, a notion that has been previously touched upon by Ciro Discepolo.

In *The Order of Things* Michel Foucault discusses the way in which the very beginnings of medicine as a new field of knowledge are the result of a new vision of the world; in fact they mark the moment in which men ceased to be a thing among other things and the notion of "organism" was established, with all its different implications.

The body as biology, as organism is quite different from the body as a natural thing, since it offers the possibility of making a distinction between the internal and the external. In this light, the birth of medicine is related to the exercise of a sort of policing, a close control of the body intended as a well-defined territory that is bound to guarantee the foundation of the body.

As a consequence, the notion of treatment, and the notion of illness, should be assessed on the basis of precise criteria discerning what is sane from what is not.

Michel Foucault devoted much of his research to this issue with passion exploring not only, in works like *History of Madness* (1963), the sense implied in the discursive field of "madness" but

also, in *Discipline and Punish* (1976) the notion of medicalization and of control of the sick, the mad, the other as a form of surveillance and punitive repression within a well defined ideological construction.

In the novel by Brink (a), when the "facts" are presented during the trial things start to go wrong for the protagonist. Before leaving him, the young lawyer who defends Joseph Malan lights a cigarette, shakes his shoulders and thinks back to some details that, as he says, would not have made any difference, since the "facts" were before everyone's eyes.

These words, as well as the reference to "the facts of the case" (p. 34) – incontrovertible truths – resonate in Malan's head when he is sitting in the police car. His conclusion is that the truth is not a collection of facts that can be easily told; rather it is a landscape we walk across in absolute darkness.

Above all, this voyage in the dark originates in something that goes beyond the contingent moment. It is not the simple "facts" that had led Malan to the trial, but rather the infinity of time that has preceded it. Here begins a rich narrative of Joseph Malan's far past; the story of his family, of an entire place and a community that does not exist any longer – the community of District Six, an area of Cape Town from where in the 1960s all its black inhabitants were removed.

In the novel this community is animated with people and stories that voice life experiences that have been forgotten, and they reconstruct the human cartography that has been erased by the violence of European colonization.

The white people coming from faraway lands of colonial conquerors such as the Netherlands and England have settled in a foreign land for commercial reasons for more than five centuries, and have made those territories in their own image.

Brink's novel tells stories of extreme poverty and deportation: however – and this is literature's most beautiful gift in my opinion– , these stories fill the gaps of a history that is always written down by the conquerors.

In Cape Town there is today a museum of the community, District Six, that collects the objects – marks, memories, traces, fragments

of everyday life – donated by the people who lived in those places and then had to forcibly leave them. In a similar way, Brink's novel recomposes a sort of smaller scale community museum through Joseph Malan, going through the stories of his ancestors and passing on the "facts" of that side of Cape Town with its forgotten stories. So, what is the difference between the facts – the juridical evidence – and the telling of the story that makes up the lives of people, especially through literature? It was precisely in literature that, as a young girl, I would look for the truth.

**Ciro Discepolo:** Talking about Jurisprudence, I would like to recall the story of Marta Russo, a student who was shot in 1997 in the yard of the Faculty of Law in Rome. She was killed by two university researchers who wanted to demonstrate the thesis of the "perfect crime". In this case, the expert witness called two super experts who both demonstrated that the shot came from two different buildings, two different floors and two different angles.

This testifies to the fact that the huge importance attributed to the so called scientific proofs can determine the acquittal or the conviction of the accused. This is also the case of O.J. Simpson who murdered his wife and her lover and was acquitted. Among Simpson's consultant's was Kary Mullis, the 1993 Nobel Prize for Chemistry who laid the basis for cloning.

In *Dancing Naked in the Mind Field* Mullis explains how he could demonstrate that the DNA the Police was working on had been obtained following an incorrect process. As a consequence, the charges against O.J. Simpson were void.

I think we should clarify now some paradigms concerning science. At the dawn of civilization, when the first great philosophers started reasoning on the validation of science, they identified three main methods: the inductive, the deductive and inference.

The inductive method is mainly based on observation: if we observe a person holding a glass in his/her hand and then let it go, even if repeated a thousand times this action will always result in the glass shattered on the floor. From observation, we can inductively claim that this will happen even on the millionth time. The deductive method is based on reasoning, and is bound to verify a "fact" that

may become scientific. For example, if we see a blossoming tree in the desert, we are bound to suppose that there is a pool of a water under the tree.

Inference has been illustrated by the great Italian psychiatrist Silvano Arieti, considered as one of the world's foremost authorities on schizophrenia, in these terms. If the schizophrenic patient is a young woman called Mary, she will reason as follows: "My name is Mary; The Holy Virgin's name is Mary; The Holy Virgin is a virgin; I am a virgin; thus, I am the Holy Virgin." This is an example of *inference*.

The seventeenth century was an extraordinary moment during which four of the most outstanding astronomers of modern times lived: Tito Brahe, Kepler, Galileo Galilei and Isaac Newton. It was in this century that the notion of *Galilean science* was outlined. A crucial essay by the philosopher and science historian Alexander Koyré, "From the world of approximation to the universe of precision",[3] poses a fundamental question: why did some discoveries that could have been utilized two thousand years ago have to wait until the eighteenth century to be put into practice? Koyré refers to alchemists who, although they had the technical possibility to measure the elements of their experiments with great precision, purposefully used approximated expressions such as "a good pinch of salt" or "mild fire" instead of indicating the exact grams of salt or the temperature in degrees. In Koyré's opinion, they did so because they operated following art and magic, and refused to act "scientifically".

The discovery of the telescope, for example, dates back to years

before Vitellone's lenses and Galileo's telescope. Apparently it was discovered when the children of a Dutch glass maker, playing with some lenses, realized that putting one behind the other ,the intercepted object was magnified. However, it took a long time before the telescope could become an object with a specific aim. Galileo's "invention" in fact moved from a precise purpose, namely, the analysis of Saturn's rings. Since he had very bad eyesight, he commissioned an artisan, Vitellone, to do some modifications to the dioptre of the instrument he was using. Galileo's merit is thus that of giving a practical use to the instrument that has eventually enabled scientists to make repeatable studies.

And here we come to the modern idea of science, that entails the possibility of replicating an experiment in a laboratory. What characterizes Galilean science is the fact that, for example, a thousand researchers in a thousand different countries will repeat the same experiment a thousand times and will always get the same result.

If, until fifty years ago any scientists would have said that science is exclusively the Galilean science, the lacuna of this method has been immediately very clear.

The Italian physicist Antonino Zichichi, for example, has pointed out that, reasoning in Galilean terms, astrophysics itself should not be considered a science, since the explosion of a nova cannot be reproduced in a laboratory.

This leads us to the Thirties, to the Vienna Circle and the notion of science elaborated by Karl Popper. The main point here is that, as I have previously claimed, scientists and above all scientifists, are orphans of Popper, and *they don't even know*. According to Karl Popper, the weakness of the inductive method is that we can repeat an experiment a thousand times, but we do not know if we have the same result the thousandth and one time.

After Newton, the laws of physics have been valid until the twentieth century, when Albert Einstein proved the existence of relativity. The laws of physics are thus valid for relatively low speed, but as we approach the speed of light, the laws of Newton lose their validity.

The English philosopher Bertrand Russell ironically claimed that

the turkey knows, by induction, that every morning he will get his food from the farmer, but what he does not know is that one day he will be the food himself, feeding the guests on Thanksgiving Day. In Popper's opinion, the inductive method is fallible because one single contrary hypothesis is enough to falsify a law. The Austrian philosopher used two basic references to distinguish sciences from non sciences: psychoanalysis and astrology.

As for the former, Popper claimed that it is not possible to know whether the so-called "complexes" Freud and Adler discuss will lead a schizophrenic subject to kill a child or to develop an obsession for the child. For this reason, psychoanalysis is not falsifiable. At this we could object: should we then throw the huge work of Carl Gustav Jung – his knowledge and his experiments – in the dustbin?

As regards the latter, astrology, Popper claimed that, since astrological formulations are absurd (for example: all Aries will have a lucky year – a formulation I find absurd myself), such statements cannot be falsifiable.

Yet Popper had based his ideas on the work of Theodor Adorno who, in *The Stars Down to Earth* (Routledge, 1994) analysed the vogue of some Californian newspapers in the Twenties to make predictions for the astrological signs – a practice that is not part of the astrological world.

The fashion of "horoscopy", a neologism I have invented, was born in fact in California in the Twenties to increase the newspaper sales. It is actually nonsense since it claims that all the people who are born in the same sign, at any hour, on any day, month and year, will live the same experiences or will have a good or bad year.

A twelfth part of the world population will not get cancer, will not be fired, will not be abandoned by his/her partner, and this is obviously not plausible at all. However, first of all this demonstrates that Popper moved from a wrong assumption, since he referred to horoscopy, that has nothing to do with astrology.

Secondly, he could not know the studies of the Gauquelins who, through the 1950s and 1960s made experiments on hundreds of thousands of subjects to verify if and how the presence and the position of some planets in the Natal Sky could impact on the life of a subject. The Gauquelins, who were not

astrologers but made their research to confute astrology, achieved very important astrological results.

Since Popper's claim that psychoanalysis and astrology are clear examples of non science is evidently false, so called exact science automatically loses the status of "science". However scientists, among whom the scientifist Piergiorgio Odifreddi, generally ignore that Popper's principle of falsification has miserably failed.

**Marina De Chiara:** I wish to tune in with Ciro's words by referring to the reflections included in the a 2005 volume in Italian, *La logica delle scienze sociali e altri saggi* [The logic of social sciences and other essays], that collects Karl Popper's writings on social sciences.

In one of these essays, Popper argues that we would do anything in order to avoid that our own scientific theories, or those we believe in as if they were articles of faith, can be confuted. Popper refers to strategies and tricks created ad hoc so as to "immunize a theory against its confutation".

He argues that: "There are many immunizing and evasive stratagems of this kind; if nothing better comes to our mind, we can always deny the objectivity – or even the existence – of the refuting observation (remember all those who refused to look into Galileo's telescope). "Those intellectuals who are more interested in being right that in learning something interesting and unexpected are not rare exceptions" (p. 77).

Despite the evidence of facts, as in the case of Galileo, some people in fact refused to look into the telescope: this attitude is a good illustration of the resistance towards that knowledge or those new conditions that cannot be easily confronted since they produce a cultural or psychological displacement, disrupting our certainties.

In these essays Popper individuates in open thought a methodology to be followed if we want to pay homage to science. According to Popper, the scientific characteristic of a field of knowledge or of a discovery lies in its being open to doubt, in presenting itself as a hypothesis to be verified. Sciences for Popper ought to be marked as a field of investigation that identifies problems and seeks solutions.

Thus, hypotheses need to be verified, but scientists always have to run the risk that such hypotheses cannot be verifiable any longer. According to Popper, this is precisely what constitutes the sign of science's maturity: namely, to postulate problems, to find solutions and, at the same time, accepting the risk that these might not be final solutions, and they might be revised after some years, some centuries, or after some new discoveries. Popper's stance on science is very open and dismantles our assumptions on science as something exact that never questions its results. As Popper claims, we should expect a substantial difference between the natural scientist and the social scientist, since they both move from the same problems and the same hypotheses, operating in the field of the verifiability of these hypotheses. Scientific maturity and awareness thus lie in the ability to accept this state of risk and provocation.

Moving from these notes on Popper and on his metaphorical reference to the refusal of looking into Galileo's telescope, I wish to introduce a peculiar example of the resistance to let ourselves be persuaded into something we consider unacceptable.

Once again my reference point is literature. Talking with Ciro about some astrological portraits of famous people he had outlined, I wondered whether these people happened to know about the publication of these "portraits". As a response, Ciro showed me a letter by the writer Piero Chiara, of which I quote an excerpt here:

> Dear Mr Discepolo,
>
> I have wished to write to you for a long time to thank you for the horoscope you have recently published. I wished to tell you that, better than a literary critic, you could read in my books my character, my tendencies, my taste; in short, the true essence of the wonderful art I have been given as a gift. The fact that you got the point in my novel *Una spina nel cuore* [A thorn in the heart] is the clearest sign of your ability of reading. That book is in fact not just autobiographical: I do not simply relate

> an autobiographical experience, but it also reproduces a constant state of my character and, I would say, of my suffering. However, what has surprised more in your writing, is your hypothesis that I was born a bit later than 12 p.m. Although I usually claim I was born on May 23 1913 at 12, I was actually born at 12:30, at least according to what I have learned from my father who, waiting for my birth, was standing outside the bedroom with the watch in his hands. Everything in your writing shines with exact intuitions, acute intuitions, but above all, with human interest and sympathy. I am grateful for that, and I sincerely wish to number you among my critics and, more so, among my friends.

I think that in his letter Piero Chiara is clearly upset by the precision of the outline Ciro has sketched of him.

However, out of a sort of powerful inner resistance, with great stylistic skills he hastily states that he was struck by the way in which Ciro (as literary critic and not, *God forbid!* as astrologer) could get so many details from his books ("you could read in my books my character, my tendencies, my taste").

It is certainly true that Ciro's talent as an excellent critic is indubitable, but the details related to Piero Chiara's personality have been inferred from Ciro's analysis of his Natal Chart… This example thus provides an illustration of the famous Galilean telescope some refused to look through.

The writer in fact refused to acknowledge the fact that it was precisely from his Natal Chart that Ciro could retrace the complexity of his personality, and not simply from reading his novel.

The first time I had read this beautiful letter I was struck by the delicate game played by a very "serious" man in order to defend himself, before all evidence, from the possibility of having to admit that there might be some truth in the deductions of a scholar of astrology. Such is the resistance of prejudice that can be testified in many aspects of our everyday life.

This letter by Piero Chiara, dated January 27, 1982 made me feel honored to be Ciro's friend. Moreover, it was also a surprising and exciting sign of destiny since, just a few weeks earlier, I had

chosen Chiara's short stories as my bedtime reading.

**Ciro Discepolo**: This is undoubtedly a very special letter, not only because I love Piero Chiara, whose short stories I would get lost into – as Henri Laborit would suggest.

Like all those who have Saturn in the Third House, Chiara started writing quite late in his life, when he was sixty, just like Giacomo Casanova who wrote his wonderful *Memoir* a few years before his death. Chiara wrote he wished to include me among his friends, and I was greatly honored for this bond between us.

Moreover, as a good Aries, not only did he have the courage to get his letter published, but he also got it published in one of my books.

Along with such a written testimony of respect and praise, I have also received many phone calls from literary, political and even religious personalities. Some time ago a bishop came to consult me because he wished to be appointed cardinal but failed every year, and hoped he could succeed through an Aimed Birthday.

This should not be surprising since there had been astrologers among both saints and Popes. Instead, Chiara's letter gave me the cue to pose a question: are we really interested in this legitimation from scientifists? Does not our validation come from our everyday work – reading, writing, communicating?

We are thus facing a huge paradox: during a talk show, the famous professor Odifreddi, who indiscriminately attacked astrology, homeopathy and Padre Pio, was confronting a humble country monk. In his simplicity, the latter asked a particularly interesting question. He said he had heard the professor – a very respectable and educated man – claim that the things that cannot be scientifically proven do not exist.

Conceding that this statement is true, the monk wondered about the existence of love. Most of us would claim it does exist, thinking of the many forms it can take, from maternal to conjugal love. But is it really possible to prove its existence, the monk asked?

Since in the early Eighties I used computers and plotters, I have

been pointed at as the "scientist astrologer". However, astrology for me is an art, which is much more than a science. This does not imply that astrology does not work: quite the contrary. We should not be concerned about whether astrology works as art or as science: we should only be concerned about its ability to help people and, above all, to rectify itself (as it actually did) and to progress.

In the seventeenth century we see the transition from someone like the Florentine Francesco Sizzi, who claimed there could not be more than seven planets in our Solar System because there are seven holes in our body, to Morin de Villefranche, a very important figure who helped astrology go through modernity. For this reason, we can claim that astrology has certainly become a discipline capable of rectifying itself and to progressing.

Thus we should not ask if our work can achieve the seal of science, but we should rather question the responsibilities of science and the champions of science.

Fifty years ago, for example, even the greatest oncologists denied any correlation between cigarettes and cancer without providing any scientific evidence, just as today the role of cell phones in cancer is being underestimated or denied. Nonetheless, the instrumental use of science in the "Palace" is quite evident, as well as its bond with the economy.

Whether we want it or not, there is a third category of disciplines that advocates for a rewriting of the whole epistemological discourse. In the past there were only exact sciences and human sciences: nowadays we have "borderline" sciences, halfway between the two.

While in the past trials were based on the evidence and proof, now the outcome of the trial is put into the hands of an expert who, in most cases, is a psychoanalyst. If the expert of one side is better than the other, that may determine the acquittal or the conviction of the accused.

In Terry Gilliam's movie *12 Monkeys*, a man is sent to the Earth from a future age where an epidemic has almost completely destroyed the world's population. When the man reveals he has come from the future and asks for help in order to find the cause of the destructive epidemic, he is immediately institutionalized in a mental asylum.

The doctor who is treating him tries to persuade him that this story is just his imagination but then the man tells her about something that convinces her of the validity of the man's story. When the doctor tries to convince other scientists, she clashes against the same sceptical attitude she will rebel against.

She will eventually wonder how they had come to a situation where, after being ridiculed and ostracized, Freud's theories have become the holder of the seal of Absolute Truth.

**Marina De Chiara:** It is quite easy to fall into the tangle of pre-established discourses that operate like cages. I am referring here not only to psychoanalysis, but to any ideological grid that would and could reproduce forms of criminalization to keep social control.

All the so-called sciences could be carefully sifted, and we would end up finding that none of them is actually conforming to the absolute standards of science. We would discover that when we speak of sciences, we are actually referring to techniques based on observation and on the possibility of establishing connections, hypotheses, results, etc.

In the last few months I have been reading *The Art of Memory* (1966), by the English historian Frances Yates. This encyclopaedic study deals with the investigation of the first forms of knowledge in the classical Greek antiquity.

It discusses how these were basically elaborated through mnemonic techniques thanks to which man started building his knowledge impressing "places" and "images" in his mind as if it were a sort of inner wax tablet.

Rhetoric, a liberal art consisting of learning a rigorous system of reasoning and debating, was passed on in the Roman period (Cicero and Quintilian are the most well-known names in the art of rhetoric in the Latin world) as a heritage of techniques that have reached us through the Greek world (that included remote geographical areas like Asia Minor that have subsequently come to represent the mysterious and impenetrable East).

In his treatise of rhetoric, Cicero referred to illustrious Greek

figures such as Simonides of Ceos, Metrodorus of Scepsis, Pitagoras of Samo, to mention only a few, who in the ancient times had elaborated on processes able to impress evocative images in the mind. Memory, and the art of cultivating it, were fundamental for Cicero, who was a follower of Platonic philosophy. In fact, the importance given to memory by figures such as Cicero will make it one of the cardinal virtues of the Middle Ages.

Such complex systems of mnemonic composition designed an architecture of the mind, a set of buildings upon which were impressed the most useful images to "signify" and condense complex ideas that could be recalled at the most appropriate moment.

These symbols, that had been skilfully devised and learned in the past, during the Middle Ages and the Renaissance, when their sense and familiarity had been gradually lost, had been transformed into symbols and signs of occult powers.

Moreover, one of the merits of Frances Yates has been that of examining in depth the historical research on a sort of Western "hermetic tradition", tracing its origins in Christian as well as Jewish and Islamic traditions.

Apparently, the famous Shakespearean theatre, The Globe, was spatially conceived as a theatre of memory in which every place identified a figure containing in itself numerous symbols (also astrological). The figures of the Zodiac and the references to the celestial space, were also chosen by Metrodorus of Scepsis, as Cicero recalls, to act as mnemonic symbols.

Memory is thus a technique, and Yates' study illustrates effectively how knowledge itself is an elaboration of memory techniques. The way in which images are arranged in our mind is thus presented as Knowledge, as a dimension of absolute truth, while it is actually the result of an ancient passage of what has settled in our minds like a seal.

Today we obviously keep on using this art of memory. And yet, for some decades now we have had the opportunity to use external devices that make our minds obsolete in regards to archiving.

Knowledge, in short, is nothing more than the way we arrange spatially what we know; it is one of the possible orders that men choose to contain and control chaos. Regarding this, it can be useful

to quote once again the poetic and prophetic words by Michel Foucault in his *The Order of the Things*.

His words can be illuminating on the meaning of knowledge as epistemology, a term that in his Greek etymology contains both the meaning of "vision" evoking a scopic economy of knowledge, and the meaning of "collocation", "positioning", also referring to the spatial way in which knowledge is organized:

> This book first arose out of a passage in Borges, out of the laughter that shattered, as I read the passage, all the familiar landmarks of my thought - our thought, the thought that bears the stamp of our age and our geography - breaking up all the ordered surfaces and all the planes with which we are accustomed to tame the wild profusion of existing things, and continuing long afterwards to disturb and threaten with collapse our age-old distinction between the Same and the Other. This passage quotes a 'certain Chinese encyclopaedia' in which it is written that 'animals are divided into: (a) belonging to the Emperor, (b) embalmed, (c) tame, (d) sucking pigs, (e) sirens, (f) fabulous, (g) stray dogs, (h) included in the present classification, (i) frenzied, (j) innumerable, (k) drawn with a very fine camelhair brush, (1) et cetera, (m) having just broken the water pitcher, (n) that from a long way off look like flies'. In the wonderment of this taxonomy, the thing we apprehend in one great leap, the thing that, by means of the fable, is demonstrated as the exotic charm of another system of thought, is the limitation of our own, the stark impossibility of thinking *that*. [...] That passage from Borges kept me laughing a long time, though not without a certain uneasiness that I found hard to shake off. Perhaps because there arose in its wake the suspicion that there is a worse kind of disorder than that of the incongruous, the linking together of things that are inappropriate; I mean the disorder in which fragments of a large number of possible orders glitter separately in the dimension, without law or geometry, of the heteroclite; and that word should be taken in its most literal, etymological sense: in such a state, things are 'laid', 'placed', 'arranged' in sites so very different from one another that it is impossible to find a place of residence for them, to define a common locus beneath them all.[4]

When we eliminate the premises of the order in which we live – the very order that has been established for centuries by Tradition – then any order will be possible.

Foucault refers for instance to botanic classification arguing that plants at first have been differentiated according not to their function but to the shape of their leaves; this is why some insects, whose body was leaf-shaped, have been included in studies of botany.

Traditionally, knowledge was thus organized according to the principle of similitude, which implied the notion of an intrinsic proximity between words and things. This proximity can also be traced in alchemy, ancient knowledge based precisely on the inherent affinity between words and things: it is the word, as in charms and prayers, that contains in itself the thing. Indeed, it *is* the word itself.

On the contrary, in the modern age the word is severed from the thing and is taken as representation, symbol, image. The speculation on the split between words and things is crucial in more recent times. Let's consider, for example, the linguistic revolution carried on in the Sixties by the French psychoanalyst Jacques Lacan.

The groundbreaking work of Lacan has led the debate beyond this dualism. He examined the thought of Freud in the light of the new hypotheses produced by the structuralist epistemological breakthrough in fields such as linguistics and anthropology (think, for instance, of Claude Lévi-Strauss revolutionary thought).

He reflected on the assumption that, if we move within a structure in which we express our existential experience, this structure may as well be deconstructed. The very structure of the human "subject" ends up revealing itself as a primarily linguistic construction that makes the subject slide from a presumed essence (and hypothesis of a kernel, a core that would represent its identity) to a mainly verbal construct that is made of stratifications, just like an onion.

The subject thus becomes a notion that does not *consist* of but is rather performed as constant deferment, thus troubling the idea of identity that was familiar to modern thought since the Renaissance. Heidegger was among the first thinkers to highlight how modern thought is at heart nothing but an *anthropology*.

This means that, since the Middle Ages, all that concerns human knowledge has been included in a framework dominated by man,

who located himself at the centre of the world. A completely humanistic framework, to recall the notion of humanism that Heidegger discussed, as Ciro has already evoked in his reference to *Letter on Humanism*.

The challenge now consists in trying to understand what happens in an era in which man is not, as it was believed for centuries, the "measure of all things", standing at the centre of the universe with his presumed authority.

What happens when we realize that, rather, man is part of the network? Once again the groundbreaking thought of Foucault can be illuminating:

> Strangely enough, man […] is probably no more than a kind of rift in the order of things, or, in any case, a configuration whose outlines are determined by the new position he has so recently taken up in the field of knowledge. Whence all the chimeras of the new humanisms, all the facile solutions of an 'anthropology' understood as a universal reflection on man, half-empirical, half-philosophical. It is comforting, however, and a source of profound relief to think that man is only a recent invention, a figure not yet two centuries old, a new wrinkle in our knowledge, and that he will disappear again as soon as that knowledge has discovered a new form.[5]

Along this line, new forms of knowledge are already emerging. We can think, for example, of George Soros who, incidentally, was a student of Karl Popper.

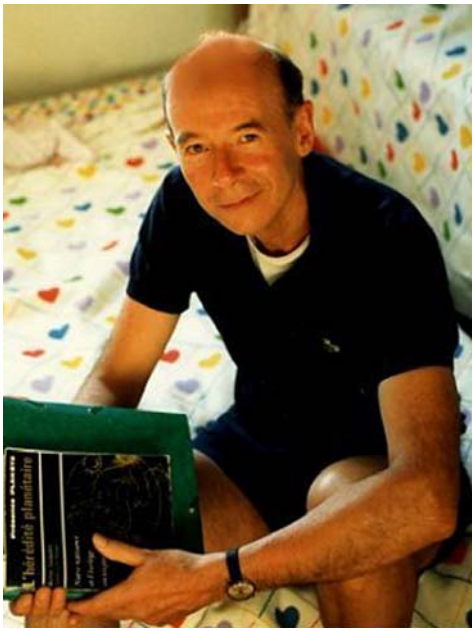
For many years now he has contributed to the circulation of knowledge and information through the *open access* system, and he has been supporting a radical re-articulation of the copyright system in the digital era. We are now living in a historical moment when we have made a transition from the notion of author – "I am the author of …" – to the notion of access – "I can access …".

It may be that, in the near future, it will not be necessary to learn a language, for example, through books and hard work but, like for any other kind of knowledge, we will only have to press a key on any device – possibly a watch – and our thought will be automatically

translated in another language unknown to us, as if we were ventriloquists. A certain kind of archiving we are now used to, could completely change its basic features.

**Ciro Discepolo:** The possibility of communicating and spreading information all over the world is undoubtedly an element of democracy. However, the option for anyone to write without the "filter" of an editor implies the risk of aberrations or unpleasant situations. Hosts of people nowadays have stopped reading books: they only read random sentences on the Internet and think they know something about a subject, pretending they are experts about it.

Unfortunately I have found myself victim of this situation, since I am often erroneously ascribed sentences that someone absent-mindedly reads on the Internet. I do not have the solution for this situation, but I think it is necessary to rethink some rules in the field of the search for truth.




However, while on the one hand I am positive and confident that this is going to improve, on the other I am not so confident because, in my study of the history of astrology – but I could as well refer to Psychology, Psychoanalysis and so on – I have become aware of some episodes that are little encouraging.

Let us take the example of the Gauquelins, scholars holding a degree in Statistics whose aim was that of confuting the laws of astrology and disproving its validity. However, their very long and exhausting work has produced surprising results.

As scholars with a scientific background Michel and, later, his wife and former student Françoise, did not take pride in their findings

but on the contrary, they humbly submitted their work to the Palace; in this case, the Sorbonne, the Institutes of Statistics and, finally, to astronomers. (This latter case testifies to the confusion deriving from a situation where astronomers are supposed to assess astrology while they belong to different fields.

When the Sorbonne experts in Statistics, the international professors and scholars verified the work of the Guaquelins, they made sure that there were no flaws in their research. These scholars did not claim that Michel and Françoise Gauquelin got their calculations wrong, and that as a consequence their research was invalid.

They did worse: although they recognized that the couple had obtained a good result, they pointed out that in statistics the result cannot be considered valid if it is not repeated n times, on different samples and at different times.

The poor Gauquelins started all over again and moved to Belgium. They would repeat their research for two or three years and submit their results again and again, always the same. The work was approved every time and the lords of the Palace would repeat the same thing, namely, that in order to have the certainty that the positive results were not due to chance it was necessary to do the research again.

It took the Gauquelins twenty years to realize that, had they repeated their test a thousand times, the lords of the Palace would have requested the thousand and first test since every time they got positive results their work was denied validation.

To this regard, I wish to highlight this particular aspect as related to my own experience. Paradoxically enough, I have luckily been the only astrologer in the world who has received the

validation from scientists, albeit I have received it for an item – one of my rules I wrote over thirty years ago – I have never made statistical research on.

Following the advice of some experts in Statistics, I have made 4-5 tests on the subject of astral heredity on a sample of 75,000 births. Out of this figure, I have had the generous help of two professors from the University of Naples who repeated my calculations on a sample of 8,400 births. They confirmed the correctness of my findings showing that my results were quite statistically significant.

The professors invited me to go on with my examinations but, remembering the Gauquelin's experience, I decided to stop after 5-7 examinations. Meanwhile, I published my "Thirty Rules" on the topic of Aimed Solar Returns in my books. In fact books for me are sacred; since they are kept in both public and private libraries, they will remain as testimony even in two thousand years.

The first of my thirty rules states that in the twenty days preceding and following anyone's birthday, very special events happen more frequently than in other days. The second rule claims that the birthday is a very special day in which extraordinary events take place.

Concerning this, I have not made any statistical research strictly speaking, but I have simply described my experience of tens of thousand of cases I have studied in over thirty years of study. However, I have obtained two outstanding confirmation of my rules.

A young astrologer with a degree in Statistics, Didier Castille, who was lucky enough to work for the French National Institute for personal data, took advantage of that by downloading something like 20-30 millions of personal data on a DVD. This, for an astrologer, is like winning the lottery. However, since Castille did not have the hours of birth of all the subjects, he decided to focus on research that would only require the days and not the hours of birth.

For this reason, he tried to demonstrate, without having read what I had written thirty years before him, that on the day of one's birthday there is the greatest concentration of the most important events in one's life: weddings, deaths, the birth of a child, a divorce, an incident. Castille could demonstrate this on the entire French population without obtaining, even in this case, the validation from science.

However, science has been "cheated" anyway since a team of researchers from the university of Zurich, unaware of my previously published work as well as of Castille's work, focused on the same research and tried to verify the frequency of special events on one's birthday.

The research had gone on for several years and, as it often happens in the scientific field among the scientists of the Palace, they only repeated the experiment two or three times. The results were always positive, and were ultimately delivered to a prestigious international scientific journal.

The procedure requires that the editors of the journal examine the work and, in case it is positively assessed, they deliver it to a third party, namely, to a Statistical Institute in another Country that will repeat the experiment so as to verify its correctness. The results were positive in this case and, as prescribed by the scientific protocol, they were published in an authoritative international scientific journal.

From that moment on, the result becomes "law". This is what the "cheating" consists of: these scientists demonstrated what I had already claimed and written thirty years before them. If they had known about that before the publication, they would have probably said that the result was "disappointing" just to play a nasty trick on astrology.

It is thus undeniable that there is sort of *odium theologicum*. It can be expected that the "commanders of the ship" are prejudiced against those who are not academics, but it is also true that some of them are right. If the media present the *horoscope makers* as representatives of astrology in bad faith, I believe it is fair that scientists are prejudiced when they are told that astrology consists of making predictions for every sign and not for every single individual.

Mine is the only case in the world in which an astrologer has obtained – unasked for – validation from science. And yet, I am little interested in this question. I making my knowledge available to myself, to my beloved and to anyone asking for help, I am moved by my "Red Cross nurse" motivation since I have a very crowded Twelfth House that, as anyone interested in astrology knows, indicates a vocation to help others.

Concerning this, I wish to recall what happened when Michelangelo Antonioni presented in Italy his documentary on caesarean sections performed with only the help of Chinese acupuncture. Until one month earlier, world medicine claimed that acupuncture was nonsense practiced by fanatics or sorcerers.

When Antonioni documented, frame after frame, the caesarean section of a young Chinese woman, what I had expected finally occurred. Professor Rocca, director of the Institute of maxillofacial surgery at the University of Turin sensed the business. He spent some months in China, where he learned the technique of acupuncture applied to anaesthesia, and when he came back to Italy every talk show invited him.

He claimed on TV that acupuncture actually worked, but not when practiced by Chinese charlatans. He demonstrated that he had tested it in the laboratory, claiming he had eliminated every trace of sorcery from this practice. He stated he had carefully chosen its scientific controllable aspects and had then improved them. In this way he obtained the first university chair in acupuncture in Italy, and many others followed.

It is always the same old problem. Should astrology be given validation in the future, with chairs and tenures, do you think they would give them to the most prominent astrologers in the world? Obviously not. They would give the tenures to astronomers, who have fought us astrologers for a long time.

Astronomers would similarly claim that they have purged astrology from all the elements of sorcery, thus delivering to the whole world an "academic" astrology and not its "charlatan" version.

This would evidently entail legal problems related to the protection of the users of astrology. Instead of the university tenure, in Italy nowadays anyone can create his/her own university, although not legally recognized, only by filling in a few forms. Anyone could set up, say, John Smith's Free University, and issue certificates and degrees with no legal value.

However, such certificates are a business for all those who hang on the wall these sheets of paper, as if they were sacred icons, thinking they will protect them from going to prison for fraud (especially in the case of swindlers…).

However, the problem still remains. Every time I look for a solution, the words of my Master André Barbault, whose books I have avidly read since I started studying astrology, come to my mind. When people asked him what they could do to become good astrologers, Barbault suggested that they did not have to promote their work at all.

On the contrary, he argued that one's worth, by word of mouth, would have widened the circle of people interested in consultations. In his *Practical Treatise of Astrology* he has analyzed a whole category of people whose data of birth were very well known: namely, French kings, whose dates and hours of birth were carefully registered by court astrologers.

Barbault has demonstrated that every position he had described in his *Treatise* was perfectly corresponding to the monarch's data. I thus believe that repeating the experiment with a much wider sample (500, 1000, 3000 examples) could lead to a productive master-student relationship that would make outside approval unnecessary. This is what already happens in many disciplines, especially at the University of Naples "L'Orientale", a very old and prestigious university where languages are taught authoritatively and there is no trace of the "battles" I have just described.

Nonetheless, I would like to invite the professors of this prestigious university to join the battle. In fact they should rebel against the arrogance and superciliousness of some scientifists who presume that a professor of Physics is more worthy than three professors of Literature of Philosophy.

I call for organized rebellion: I advocate for someone to lead a movement that forcefully protests against the fact that some people believe they are the guardians of knowledge, while they mark, report and rank professors in different leagues.

For many disciplines, like astrology, the seal of science is completely unneeded. What could a good Shiatsu masseur care about the seal of the Academic and of the Palace when he can free ten people in a row from their headaches? On one hand I believe that things would be easier if we stop this war waged by the media to gain an audience. I invite all those who belong to disciplines like shiatsu, astrology and so on, to avoid these battles: they should be satisfied with their remarkable practice, trusting that publications

will prove the results they have achieved.

We should not forget that medicine is an art, before being a science and, I will say that again, I consider art to be superior to science. If an epidemic breaks out in a village in Central Africa, and virologists realize that one medication is effective on seven cases, they will not certainly wait for three or four years for the World Health Organization to test the medication on a wider sample, approve the protocol and eventually use that medication.

They will choose to use the drug immediately to save the two thousand people in the village even if the test has been made only on seven cases which, from a statistical point of view, equals zero. And, by the way, who has decided that statistics is the solution for any ideological and cultural conflict in the field of epistemology?

**Marina De Chiara:** The issues that are emerging here are obviously connected not only to the digital and globalized dimension. The proliferation of certificates and private universities is a phenomenon preceding the emergence of the digital era, just like there are many disciplinary fields that have not necessarily passed the validation of those Ciro called "sheriffs, the guardians of knowledge." This discipline may have produced invalid or deceptive results, or they may have fought hard to obtain this validation.

One of the reasons why we have organized this meeting today, in the offices of the Centro Archivio Donne [Women's Archive], is that the Centre is closely connected to the struggles of women in the past few centuries to affirm themselves as subjects of history.

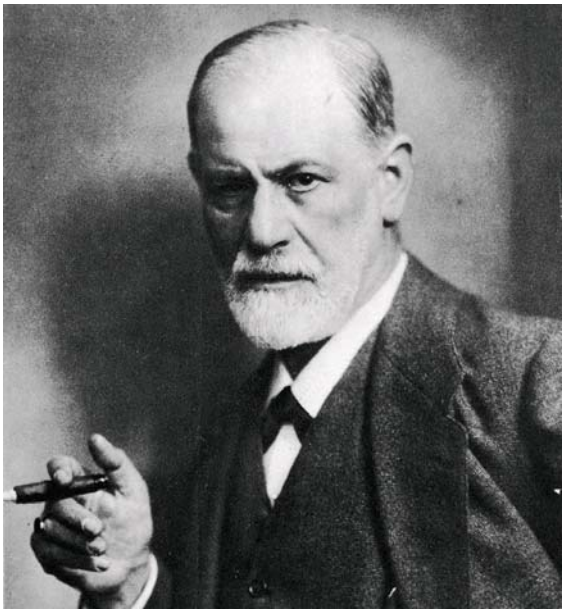
Though endorsing the psychoanalytical and epistemological notion that the subject in itself does not exist, and that there is no ontological entity constructed as subject, it is undeniable that, even only from a linguistic point of view, the female subject has a long history of marginalization and subjection. Even in writing, she had to fight strenuously to assert and affirm herself as subject.

Since the 1960s, (especially European) women intellectuals have committed to the revision of philosophies concerning subjectivity and the subject. Such revisions have moved precisely from psychoanalysis, examining theories (such as the Freudian) that have

identified women mainly as lacking.

Referring to the myth of Oedipus, one of the founding myths of modern civilization, Freud defined men in their full connotation as subject, while women were mainly identified through lack, the lack of the penis. The woman is thus characterized by an absence, a void, a mystery: a "dark continent", in Freud's words.

Moreover, we must not forget that the theories of Freud, along with Marxism, is one of the great narratives of modern Western thought. By narrative I mean all those founding "mythologies", or indisputable socio-cultural organizational models that in critical theory are called *Master Narratives*.



For this reason, they cannot be uncoupled from what had taken place and was still taking place at a global level in terms of explorations and colonization. Africa, described as the "dark continent", has become such only after the devastation brought about by the white man. By renaming it, the white man has transformed the continent into a *tabula rasa*, erasing its specificity, its traditions and its cultures.

In the imaginary of the colonizers, and of Europeans in general, Africa was the dark continent symbolizing obscurity and mystery. Freud's intuitions were drawn precisely on the interrogation of the "exotic" objects coming from Africa in a historical moment when the spoils of colonial objects were massively circulating in Europe especially among collectors (Freud himself was a fond collector).

After all, in the field of European Avant-guards, artistic movements such as Surrealism, Cubism and Dadaism gained their strength from

the displacing encounter with the artefacts coming from Africa.

The colonial enterprise also produced the birth of a European artistic fervor that testifies to the impossibility to uncouple European history from its colonial past. Concerning this, it is worth remembering the important emergence of postcolonial theory that has invited all modern disciplines to look at modernity through the lens of this disrupting event, colonialism.

The colonial experience has completely dismantled the old world order: since Christopher Columbus, the world has radically changed. It was precisely the so-called "discovery" of America, as many thinkers have argued, that has produced the need to tell the story of the "other".

Historians and thinkers have described modern historiography as a "conquering" narrative that has used the New World (to quote Michel de Certeau) as a blank page on which Western power will could be inscribed.

The same process of subjugation to a man's gaze – with the subsequent strife for emancipation – has been experienced by women. In the 1960s, a fair number of women psychoanalysts and philosophers started questioning the Freudian definition of woman as mystery, and a "dark continent."

Freudian theory referred mainly to the genitalia of the woman, based on the assumption that if the man has the penis, the lack of the penis is a void representing a cave, a riddle. The famous psychoanalyst of Belgian origin, Luce Irigaray, was the first to refer to the notion of the *speculum*, intended both as the ancestral platonic cave and as the hollow space represented by the woman's genitals. However, the speculum – the mirror – is also the tool used by the gynaecologist to explore the woman.

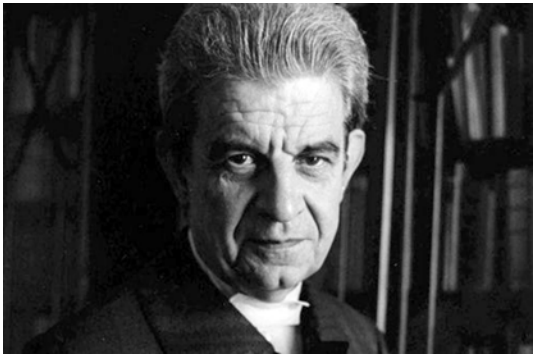
When Irigaray wrote Speculum in 1974, she questioned the idea that the oedipal myth could be the truth, and not just a myth that Freud had used functionally to build a history of sexuality. For this reason, she was immediately expelled from the University of Vincennes. In her study, Irigaray has undoubtedly highlighted how, through the use of the myth, Freud created an epistemology that has literally reshaped our modernity.

After all, Marx, for example, had created a new model of

economic analysis by interpreting the categories of our modernity that are at the basis of the pattern of labour and capitalistic production – which is another scientific law that cannot be questioned. And yet, the capitalist model impacting every aspect of our lives is not the only possible system.

We could have imagined any other economic model, while we are living the capitalist model as if it were the only possible alternative. On the contrary, it is just a structure, a system, an epistemology, indeed.

Apparently, the policemen and the sheriffs who monitor "the norm" have always existed, and this is the reason why it is extremely important to understand how the orthodoxy is constructed and what happens when we deviate from it. Any form of eccentricity, of diversion from the norm, of mental dysfunction, was punished with the stake in the past; later on, the punishment consisted in the internment in an asylum. In the 1960s, on the contrary, Jacques Lacan interpreted the so-called mental illness as different elaborations of language. That of the neurotic, the psychotic, the schizophrenic, is just a different language.



This intuition has led to a new awareness that tended to avoid the hospitalization for paranoid, schizoid or neurotic symptoms, suggesting on the contrary a looser vision of what is "sane" and "normal" and what is not. Not only has this attitude led to the experiments of Franco Basaglia in Italy on the treatment of mental illness, but it has also imposed a reflection on the speedy change of the scenario in a span of time of just fifty years.

Nonetheless, from the witch to the woman philosopher, we are in the same line; only the way in which she is judged has changed. In the case of Luce Irigaray the judgment led to her expulsion from University, as it had happened to many other women who had questioned the sacredness of the male discourse.

The English writer Virginia Woolf was the founding mother of the reflection on the status of femininity, one of the first women to question the reasons why women did not have access to places that were traditionally assigned to men.

When Woolf was writing her books, at the beginning of the twentieth century, women were still denied access to many public spaces. They could not be admitted to university, for example, nor did they have access to writing: they were not allowed even the textual space. Such struggles for spaces are necessary for survival, but we will always find sheriffs on our path, since borders and their policing are first of all related to discourses of power and hegemony.

The reflection on spaces and borders will inevitably lead us to our present world, and not just with regards to women's studies. When the open access system was invented, marking the passage from the hypertext to the Web, that was a clear act of trespassing, of border violation. What is more, this trespassing occurred in the very space the new order of modernity was born: the Cold War.

As the excellent book by Paola Castellucci on the cultural history of the Web argues, Los Alamos, New Mexico, is not only the city where the atomic bomb was created. The place where Oppenheimer was working is in fact the very place where, years later, the open access system was created. Los Alamos became the meeting place of the scientific community as well as of the many artists fascinated by the beauty of the environment.

At many levels, Los Alamos represented in fact the possibility of a new life, since that was the sacred place of old native communities, where artists and eccentrics would gather to look for the answers to their existential questions. At the same time, Los Alamos hosted the laboratories where X-men experimented with new technologies.

That technology that has paved the way for the construction of the atomic bomb which changed the world order, and created new enemies for the Western world – as can be seen in both literature and cinema; think of Stanley Kubrik's ridiculing the atomic scenario in his *Dr Strangelove*. This same technology that, thirty years later, in the very same place, created the open access system.

Hypertexts, the internet and the Web were thus created in the same place were the experiments concerning the destruction of

humanity were made. Open access, however, stems from a different inspiring thought. In this context, scientists can democratically submit the results of their research to a community of scholars; this is not the form of control exercised by the "sheriffs", but it is rather a "pre-print" sharing. Before the research was published in journals, the material could circulate and undergo the peer review process.

In the academic field, according to the current guidelines given by the Ministry of University and Research, if our work is not peer reviewed, the journal we publish in will be, as a result, less prestigious than others.

This new terminology has entered the university evaluation system like a sheriff, while when it first appeared in those communities I have just mentioned, it had a very positive communal meaning. Free access could in fact guarantee the circulation, the confrontation and even the modification of the shared work.

**Ciro Discepolo:** The Unix system, for example, allows users not only to enjoy open access information, but also to modify it, and to make it available again to others with added modifications. This is undoubtedly a horizontal process among people who have signed a protocol in which they all agreed to share information. Yet, things that have little to do with the New Age spirit of the communities born after 1968 happen on the Web these days. I am referring, for instance, to the fact that, searching for my name on a Chinese search engine, the first result is a link to download my *Transits and Solar Returns*. To me, that equates to stealing my book.

This clearly indicates that we have gone beyond open access and the notion of shared information, questioning even the notion of the author's property. I think we should be very clear on this point: if we contest property, does that mean that we are entitled to sneak into the house of Gianni Agnelli, Mr Fiat, and appropriate their cars?

What happens if, after years of hard work writing a book, this text of mine becomes open access behind my back? The Web is a democratic tool because it enables us to access a great deal of information, but at the same time there are some "commanders of the ship" who manipulate and select such information.

Thinking of the interesting topic of the Other Marina De Chiara has touched upon: as regards prejudices, I'd like to quote Eirik Newth's *Jakten på sannheten* [Short History of Science].

In his prejudice, Newth claims that Kepler was a sort of sorcerer because of his interest in astrology and because his mother was a witch who just barely escaped from the stake. He clearly ignores that Copernicus, Tÿcho Brahe, Galileo Galilei and Isaac Newton were also astrologers (in particular, the 70% of the work of Newton is in the field of astrology and alchemy, and only the 30% is about his scientific discoveries).

Going back to the question of the transmission of knowledge, I believe that Wikipedia is a negative form of open access. It would be interesting to know who is the puppetteer behind this evidently biased kind of knowledge, as my blatant case illustrates. When the article "astrology" was not yet on Wikipedia (while now there is even an article devoted to the various horoscope makers), my friend Pino Valente wrote a Wikipedia article about me.

He only wished to do something nice, but on the contrary he unleashed hell. I had to undergo a mediatic trial similar to those performed by the Inquisition in the past centuries, a trial during which my web page had to be metaphorically "burnt" on the stake. As you can see, this kind of information can be easily manipulated and anyone can modify it without any credit or reference. Anyone can write an article on, for example, the State of Israel, and others can edit and change its content from time to time, according to their personal opinions and political views.

On my part, I prefer an encyclopedia that is not "free", like the Encyclopedia Britannica, of which I had an online subscription. Some time ago I was doing research on the "death saga" of the Gandhi family and I needed to collect the data of the deaths and other information on the members of the family.

While other encyclopedias – like the prestigious Italian Treccani – devoted only a few lines to this topic, the Encyclopedia Britannica provided eightyfour pages in which even the precise time when Mahatma Gandhi was shot was reported, as well as after how many minutes he died, citing all the names of the peple who were present. The authority of the Encyclopedia Britannica is universally acknowledged, so much so that it was considered a reference point

by both sides during the Cold War. On the contrary, whenever I consult a so-called "free" open access encyclopedia, I find shameful things, as the following story demonstrates. Although I did not want my name to appear on *Wikipedia*, someone had written an article on Western Astrology claiming that *Active Astrology* is a branch of Italian Astrology, only because its founder (that is, me) is Italian. This is of course a complete falsity, because then we should claim that relativity is a Swiss theory. Quite the contrary, we should state that Astrology is becoming a branch of Active Astrology worldwide.

It is thus necessary to be very careful when we deal with this subject: there is undoubtedly democracy on the Web but we shoud ask who is pulling the strings and, above all, who controls information.

This concerns epistemology as well, because it is obviously related to *the pursuit of truth*. Since we have ascertained that search engines (whose names it is unnecessary to mention) perform their control on the Web, we are aware that there is an instrumental political and economic use of the search count and of the diplay of its results.

The "comanders of the ship" make very strategic use of advertisement. If a publisher invests 10,000 dollars a month on advertisements on a search engine, as a consequence, someone working for that publishing house who has written a short text on a given topic will find his or her name among the top results of that search engine for that topic.

If anyone else has written over twenty books on the same topic, plus a thousand articles, but has not published them with the publishing house that invests huge amounts of money on advertisements on search engines, the outcome of the search will be quite different.

Out of 380 million documents, a certain search engine will display as top result the name of the person who has written just five pages on the topic simply because he/she belongs to the "Palace". By contrast, the name of the scholar who is the most authoritative expert worldwide on that topic will be displayed in the second position.

This is not simply an injustice to the scholar, but it is also a falsification of the searches performed on some specific topics by

other researchers, even in the field of the academia. If you wish to make a search on, let's say, Colombian post-colonialism, the search engine is a very important tool. Yet, if these tools are subjected to political and economic mechanisms, you end up getting completely distorted data that eventually falsify your research.

Who manages information on the Web, then? The Web is democratic, but some kind of information can be easily controlled. Given the alternatives, I would choose to make an economic sacrifice and renew my subscription to the Encyclopedia Britannica online, rather than accessing a fake "free" encyclopedia which provides biased information.

I believe the epistemological discourse is crucial, but I insist on saying that, in my opinion, the academics of Human Sciences should not be so acquiescent, but should start fighting a hard battle. In public quarrels – the ones that give audience and power – you representatives of Human Sciences could easily win any dispute from a historical, philosophical and dialectical point of view, given that your adversaries have a limited and partial vision.

I do not understand why you are so acquiescent, especially you women that in this precise historical moment are the most active in advocating more emancipation in politics, in salaries and in contexts like that of the Arab world.[6]

I have the feeling women could effortlessly stand up in talk shows against any scientifist. I would like to ask Marina if she has ever interrogated on the reasons why women have apparently tolerated the insults of those scientifist who have been considering them "bush league" researchers.

**Marina De Chiara:** I believe the lack of women's presence in politics as well as in the media is a national peculiarity. This is what happens in Italy, but the stuation in other european contexts is quite different. I think that female quotas, the promotion of the women's presence in every public domain, both in politics and in the markeplace, might trigger a real change in collective imagination.

However, I believe that every aspect of our lives has to do with power struggles. Michel Foucault argued that social relations are

subjected to a "microphysics" of power; power operates in a widespread, detailed and differentiated way, at any level. Even knowledge itself can be arrticulated as a power struggle. If in any situation men are the majority, a woman's voice – no matter how good, smart and intelligent she can be – will not count much because she does not have the century-long power and authority behind her.

I think one of the possible solutions to let women's voices emerge, is to occupy as much space as possible. If we leave space to others, others will decide for us, exactly as it happens in politics. If many honest and competent people consider politics a dirty job to be left to others who are willing to fight useless quarrels, we leave to these people – some of them insensitive, ignorant or incompetent – a crucial aspect of our lives. In particular, we leave them the decision on the way the system in which we live daily should actually work.

**Ciro Discepolo:** The so-called "average man", who passively watches television and emerges from his torpor only when insults and fight increase the decibels of the discussion, probably have no idea of the issues we are trying to address.

It is not by chance that I have referred to acquiescence since, by contrast, you women scholars in Human Sciences know this topic very well. As you have brilliantly illustrated in the introduction, in the academia everything is reduced to fluxes of money moving towards some Faculties and excluding others.

If only for a problem of social justice, I do not understand why a student attending your lessons should not have access to the same tools and resources available to students of Chemistry, Physics or Pharmacology, whose research may have practical utilization in tomorrow's biological wars.

For this reason, since women have been supporting petitions for democracy and renewal for society, I think it is unreasonable that people who have fought for their political iideals have never joined a TV debate, in a moment when TV is invaded by mainly ignorant people.

I have been told that some time ago an astrologer who is primarily

into horoscope-making attemped a TV confrontation. Things went as follows: the "astrologer", in his crass ignorance, claimed that the CERN in Geneva studies *neurons*... On the other hand, I believe that people of great erudition in the field of humanities would effectively contrast their adversaries with cultured arguments.

Some time ago I happened to be "trapped" – at least in the intentions of the organizers – in a public confrontation. Some doctors invited me to hold a conference at the hospital Cardarelli in Naples. The room was crowded with doctors, but the real surprise was the presence of professor Sergio Piro, a renown Italian psychiatrist of vast erudition whom I have always admired. In short, the doctors had organized a "duel" between us without informing me.

However, being a very intelligent person, Professor Piro immediately realized that he could not compete since he did not have any knowledge of the subject he had been asked to discuss. As a consequence, he offered me the peace pipe by making a classy statement on his purpose to study Astrology seriously. The rest of the afternoon was subsequently devoted to the calm debate on some of the topics my interlocutor was more familiar with.

On another occasion, a trick[7] was organized on me at Città della Scienza, Bagnoli, the Science City near Naples that has been recently destroyed by an arson. The organizers of that meeting asked me to join a debate with the then Chair of Astrophysics at the University of Naples, Professor Giuseppe Longo.

I found myself in the conference hall of Città della Scienza with an audience made of more than two hundred students and colleagues of professor Longo, and with a bogus moderator. However, Professor Longo ended up stating such an amount of inaccuracies on Astrology that I think he will repent having accepted a talk on a subject he did not know at all for the rest of his life.

Just to mention one of his many slips, talking about Renucio Boscolo – who is considered the greatest expert on Nostradamus quatrains – professor Longo claimed that, if centuries ago Boscolo had not wasted acres of the Amazon forest to write his comments on Nostradamus nonsense....

I was then forced to rectify his statement pointing out that Renucio Boscolo is our contemporary. My interlocutor collected a good deal of such foolishness. Most scientifists – and, again, I am not against

scientists but only against the scientifists who are the taleban of scientism – do not read any book of literature, epistemology or of history of humanity, and are thus unprepared to face these kinds of "duels", making very poor figure.

Moving from these assumptions, I argue that if the representatives of Human Sciences were more belligerant against those by whom they are constantly insulted, and joined more talk shows, these ladies (among whom Rita Levi Montalcini and Margherita Hack, the latter being the most bitter enemy of all that is not "science", strictly speaking) and gentlemen would probably learn to be more respectful of other people's knowledge.

I believe this is the right time for rebellion, not intended as a mere personal outburst to claim principles of liberty and democracy, but also as a means to achieve some economic effects to contrast the heavy cuts to university funds we referred to above.

What we are trying to do, is thus to address some epistemological issues: if we pursue the Truth, this cannot be claimed as long as you will keep tolerating this infamy on the part of the "sheriffs" who wish to marginalize and erase your work, acting like the nazis who imposed the five-pointed star to Jews. This is why I urge you to consider this very carefully.

**Marina De Chiara:** Concerning this, we should remember that universities have been encouraged to ask for funds from private institutions. These institutions, usually banks or foundations, tend to support projects with an immediate economic return.

For this reason, they are generally not interested in projects in the field of Humanities. In this light, we should only count on the resources offered by philanthropists, people who have Arts, Philosophy and Human Sciences close to their hearts.

As I said, the main problem concerns power relations. If our life is so completely shaped by a system resembling Darwin's struggle for survival, escaping this logic is practically impossible. In the capitalistic model we live in, the ruling scenario can be described as follows: our main goal is to survive by defeating those who are weaker. In the same lines, we have to earn as much as possible in spite of the others, constantly trying to be superior and remain competitive.

And yet even this truth could be questioned, by suggesting instead a fair model in which sociality rewards solidarity. A number of scholars have tried to verify if the struggle for survival is truly the most fulfilled rule in nature. The results confirmed that the prevailing tendency in nature is that of organizing life following a consociative model rather than fighting against each other.

Darwin himself wrote a "narrative" which has been considered as truth, while in fact it was not an "exact" law to be endlessly repeated. However, this exact law is now leading us into a ravine, since it gave us the illusion that our only imperative was to fight and accumulate.

**Ciro Discepolo**: I had the honour to listen to an important validation of this when some years ago we invited the Nobel Prize for Economics John Nash Jr. at the *Fondazione Discepolo* in Vico Equense. With great simplicity and clarity, Nash explained to us the algorithm that led him to the Nobel.

The algorithm was based on an intuition he had had one evening while he was a student, and a beautiful blond girl entered the hall of the campus where he was studying. While he was observing the

behaviour of all the men in the hall competing for the girl's attention, Nash was struck by the intution that a "cooperative game" could have helped them. He thus developed an algorithm developing his idea of the possibility of working for oneself while at the same time working as a team, without damaging the others.

This is exactly what you were talking about, dear Marina: refusing to submit to a competitive logic harming others and at the same time trying to achieve my result through teamwork, with no damage to the others. In short, Nash advised his friends to ignore that girl and start courting other girls, arguing that the beautiful girl would eventually look for them once she felt deprived of their attention.

I think this is a fascinating story. However, from what I see I cannot be as optimistic as you are. Unfortunately, I am quite pessimistic because I do not think we are moving towards solidarity. On the contrary, I believe we are experiencing an increasing worsening of the situation, especially in politics (think for example of the last Italian electoral campaign, based exclusively on reciprocal insults to one's political opponents).

Moreover, at an international level huge economic interests come into play jeopardising any possible move towards brotherhood and solidarity.

**Marina De Chiara**: I agree with you, and yet nowadays you are considered eccentric if you do not comply with the imperatives of these false laws of truth: Darwinism on the one hand and capitalistic accumulation on the other. It is not true that nature imposes a race to overwhelm the others: this is just one of the many possibilities.

I have started my speech by quoting Christopher Columbus because he represents a watershed and a model. Upon his arrival in the Americas, he confronted with meek and supportive people who shared everything they had and who had no sense of private property.

Columbus thus wrote to the kings of Spain informing them that the shores on which he had just landed were inhabited by very docile people who could be easily subjugated and enslaved. His purpose

was essentially that of obtaining from the Spanish monarchs the money to continue his mission, reach the Indies like Marco Polo and bring Catholicism to the East.

At that time, it was still believed that monstrous beings lived beyond the Pillars of Hercules. In his logbook Columbus wrote that in truth he had not encountered monstruous creatures with two heads or one eye in the middle of his forehead, nor cannibals, but only very hospitable peoples.

It is thus that, after Columbus, the path is open for the Spanish *conquistadores* who encounter technologically advanced civilizations. However, these peoples were completely exterminated in a very short time, killed either by the illnesses brought by the Spanish, or by their guns. From sixteenth-century maps it is possible to see how whole territories, like present-day California, had been then populated by native tribes.

It is shocking to think that whole civilizations have been wiped away with their alternative way of life. The myth of gold and of Eldorado has been a very powerful and dangerous myth, the founding myth of European civilization. It is quite hard to imagine that, with our past of robbery, we Europeans could welcome models different from those of invasion and plundering.

**Ciro Discepolo**: Going back to Popper and to Truth, it is useful to remember that the philosopher invited a reflection on three subjects: Psychoanalysis, Astrology and Historical Materialism. Concerning the latter, the philosopher argued that only this was an "exact science", and I think this is a paradox.

Karl Popper also claimed that Historical Materialism could not be used as an exact science since, when Marx elaborated it, he argued that when a very rich and technologically advanced country confronts the contradictions of capitalism, the dictatorship of the proletarat will come, bringing universal well-being.

However, since the revolution imagined by Marx took place in one of the poorest and technologically underdeveloped countries such as Czarist Russia, Marxist theory inevitably failed, and Historical Materialism could not be considered an exact science

any longer. I believe this is in open contradiction with what Popper had claimed when refererring to Psychoanalysis and Astrology as examples of "non science" while including Historical Materialism as an example of exact science.

**Marina De Chiara**: Even if Historical Materialism has heavily affected the history of many countries, it is nonetheless just a model and it cannot be by any means be treated as an absolute principle of truth.

**Ciro Discepolo**: We have seen this model applied in many different countries and no theorist of Marxism has ever claimed that was the right model. When we argued that whenever Historical Materialism has been applied people wanted to flee and they couldn't, they answered that it had been applied in the wrong way, or in the wrong country, but not one single example has been made of a communist country were people lived happily.

In Cuba, for example, the government has recently started to issue passports and many people are thnking about visiting family in Florida: they will probably never come back.

I believe this remains the main and most serious point as regards Popper's claim. Scientists and scientifists ignore they are deprived of what Marina has called the *statute of factuality* or, as I would say, the validation from science, since they have rejected the notion of science intended in the Galileian sense, pointing to its limits.

At the same time, they have completely supported Popper's theory tconsidering it infallible, while they ignored that his theory had fallen at least thirty years ago. As a consequence, these people live in a sort of limbo in which they have the illusion they can still have a supposed cultural supremacy in the world.

This also leads them to absurdities such as the so-called programmes of scientific popularization that, despite their pretense of objectivity, end up being mainly political programmes.

Some time ago, for instance, the scientific popularizer Piero Angela made a TV programmes on the building of the atomic bomb

that was tested on Hiroshima and Nagasaki on 6 and 9 August 1945, when the war was practically over. Since they had to perform a demonstrative act (for the benefit of the Russians, in my opinion), the Americans could as well have made it in a desert territory, possibly on one of Japan's uninhabited islands.

Instead, they committed the atrocity we all know very well about. However, what is probably not very well known is that all the scientists that had collaborated on the building of the atomic bomb wrote a letter to the President of the United States asking him to avoid this demonstrative act. The only scientist who did not sign the letter was the Italian Enrico Fermi. Acting as a historian on that occasion, Piero Angela made that TV programme for one reason: to justify the fact that Fermi had no choice but not to sign the letter in order to defend science.

This is obviosly not true, because other scientists, as brilliant as Fermi, had rebelled against the lethal use of a weapon that they had realized only for industrial purposes or to improve the well-being of mankind.

I personally prefer and read the work of other scientific popularizers, like for example the already mentioned Lyall Watson, author of *Super Nature*, whose Italian version has been unavailable in Italy for thirty years. There is obviously a very strong censorship preventing publishing houses to reprint *Super Nature*.

However, what is interesting is that Watson does not limit himself to describe the mistakes of science; he is a good journalist presenting the pros and cons of every situation, and not a partisan person.

I similarly adore John Banville, the author of *Kepler: A Novel*. In this novel Kepler's life adventure starts with his arrival in Bohemia after his fortuitious encounter with Tÿcho Brahe, who invited him to his university as his assistant.

Kepler walked across Germany with his family to reach the castle/ university where Brahe treated him like a slave. One night, both men were quite drunk, Brahe challenged Kepler to prove his worth as a mathematician asking him how long it would take him to write the laws of the celestials' movements. Kepler bragged he could write them in twenty days. This claim was followed by the three worst years of his life, devoting every day and night to solve the problem.

Then he finally had the intuition that would make mankind leap forward of three or four centuries. When he asked himself who had ever said that the orbits of the planets should necessarily be circular, he found the key to the problem.

Postulating that the orbits were elliptical, all his calculations finally proved correct.[8] Kepler sent his publications to Galileo Galilei but Galileo treated him as if he were a student; in fact, after his abjuration (which Kepler never did), Galileo had the Church on his side and felt stronger. To the aforementioned examples of Watson and Banville I would like to add that of the English journalist Dava Sobel who has written two beautiful books, one on the determination of longitude when at sea, and the other on the institution of time zones around the world.

However, today in China 4 or 5 time zones are still included in the same time zone, that of Beijing, so that paradoxically the inhabitants of Bejing wake up every morning at dawn, while those who happen to live in Lhasa, Tibet, 5 time zones away, have to wake up when it is still night because the Party "claims" it is morning.

**Marina De Chiara**: Going back to the other issues you have raised, concerning open access to works of art on the web, and the digital dimension that has created a globalized space we all belong to, I would say that this scenario changes the terms of epistemology itself. The author stops actually being the author, or he is such in completely new forms. The notion of ownership of the work becomes something different and needs a new statute.

Meanwhile, new terms have started to appear. One of them is the expression "creative commons", that I will briefly illustrate after a short historical parenthesis to explain the historical origins of the term.

In feudal times, England began the practice of *enclosures*, a system of fencing that for the first time demarcated the limits of common land; from here derives a term, the opposite of *enclosure*, which indicates shared resources: *commons*. Today the speculation of sociologists focusing on a theory of socal justice often describes shared resources as "commons". Contemporary struggles for water as a resource available to all are an example of the struggle for the

*commons*. On the other hand, in the digital world the expression *creative commons* is used to describe a situation when works of art, movies, pictures, books and music can be freely downloaded from the Web, utilizing these goods without paying anything.

It is crucial to start reflecting on this new dimension. We need new terms and a new statute for this wonderful chance of total accessibility. I am thinking for example of a film that has been recently released by Universal: *I AM*, whose Italian subtitle is: "You have the power to change the world".

The film tells the story of its director, Tom Shadyak, who has directed blockbusters such as *Ace Ventura*, *Liar liar*, *Bruce Almighty*, and *The Nutty Professor*.

In the film Shadyac recounts what has happened to him after a cycling accident had caused him serious mental problems. From that moment, he started asking himself questions, aware of the fact that the way he had been living until that moment might not have been the only possible way.

The first ten minutes illustrate the way in which it is possible to think of a different world. After having earned a great amount of money in a very short time, Shadyac says that the first thing he did was buy things. He bought houses, first of all, in Hollywood and then in other places, and these houses were bigger and bigger. Soon after her had relocated in one of the houses he had just bought, he suddenly realized that he was not any happier.

The idea of owning more and more was not evidently making him happier. To this realization follows a flashback on American history based on the imperative of making money; referring to Darwin and to his theory of evolution, the filmmaker reflects on this tainted model, wondering whether it is really the only model available to us.

This film has been produced by Universal, a corporation that, like all the others, faces the serious problem of bootlegging. Possible alternative solutions have been proposed in the musical field by artists who allow the download of their music without payment.

**Ciro Discepolo**: My digital books, for example, are sold at one

third the price of my paper books.

**Marina De Chiara**: In this way you open your publications to the global market. What is sure is that it is necessary to study and devise new strategies for the digital circulation of goods. This is truly a new world: we have been made different people in the last twenty years. We are no longer what we used to be, it is no longer possible to think in terms of "I am the author".

I have published but few books, but in my modest experience of authorship I am aware of the fact that my books are on the web and they are accessible in pdf. Nevermind.

But I also need to consider that one of the theories on which the Web was based has been carried on precisely by post-structuralist authors such as Roland Barthes, Jacques Derrida and others, who discussed a new dimension of textuality, referring to man himself as "endless textuality".

Of course I could as well say "my book", but my very language is not mine: in fact I am chewing the thoughts I have appropriated. I cannot give the seal of ownership to my thoughts, and the idea itself of "author" probably needs a radical rethinking.

**Ciro Discepolo**: If we wish to make a very simple and practical example, do you think the camera of the artist Pino Valente, who is here today, is really his, or I can take it home?

**Marina De Chiara:** It depends on the power relations between you two...

**Ciro Discepolo**: My friend Pino Valente has recently brought to my attention the fact that a bunch of jokers has created an entry on *Wikipedia* on an imaginary war that is supposedly been on for ten years.

**Notes by Marina De Chiara:**

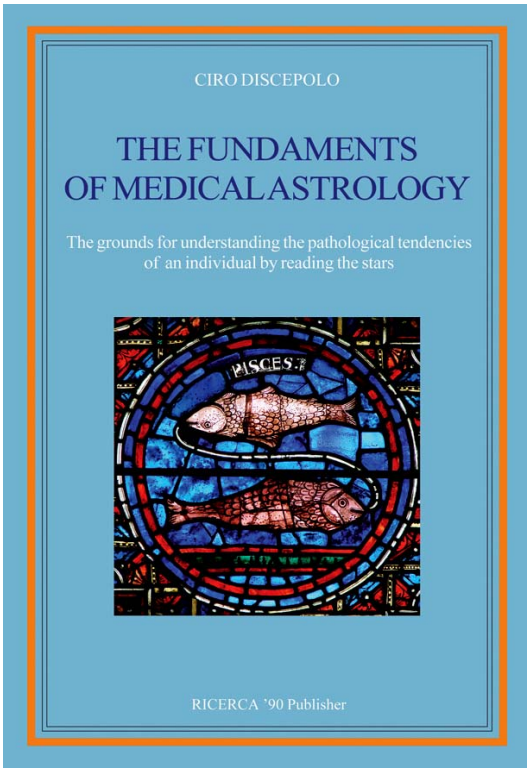
a) All quotations are taken from the edition included in the bibliography.

**Notes by Ciro Discepolo:**

1) Martin Heidegger, *Discourse on Thinking*, New York, Haper & Row, 1966, p. 56

2) In the present conversation I will often refer to a short essay of mine, the preface to my *The Fundaments of Medical Astrology*. For this reason I have deemed useful to include the full text of that epistemological writing:

> On the doctors' medical symbol (the *caduceus*) you can read: *Medical Art* – not *Medical Science*. Personally, I believe that this does not debase medicine – in fact, it dignifies it. Let us consider the case of a 'measuring' doctor. Once I had an ophthalmologist check me. In many ways you could define him as a 'scientific' doctor – one thousand per mil. My problem was a sort of dryness on my eyes.
>
> He examined me with precision instruments, clocking certain times, consulting tables and – eventually – he declared that my value of dry eyes was... thus implying that I was fine. Later on, I had another doctor check my eyes. She was an ophthalmologist too, but a less 'scientific' one. I did not mention my problem to her.
>
> She too examined my eyes with instruments, but above all she asked me a sequel of questions about my life, my job, and my food habits. She almost seemed to be willing to analyse my whole persona, but she eventually concluded that my problem was dry eyes, and that it would be a good thing putting drops on it, as well as following certain therapeutic and prophylactic protocols specifically suited for this lesser pathology.
>
> **Interesting, isn't it?**
>
> Now you tell me – in your opinion, should a medical doctor be a *scientist* who perfectly knows how to use his instrumentation and knowing perfectly about everything that




has ever been tested and discovered in a laboratory? Or don't you rather think that for your health it would be better if a medical doctor behaves more like the Italian physician Antonio Cardarelli, who used to observe carefully, to interrogate cautiously, to speak very little, and eventually to formulate his diagnoses, which usually proved to be exact? In other words: would you trust better a doctor with portable computerized equipment, or a doctor with good knowledge of psychology, sociology, literature?

A doctor whose interest is to keep himself updated in the fields of agricultural policy, pollution, animal abuse? Who likes reading about the ancient research on water memory, about the discoveries that help validate astrology, and so on? The bottom line is – as a good friend of mine, an important professor of medicine at a university, a man with a fantastic classical culture and thousands of interests in virtually every field, claims – in the overwhelming majority of cases the so called *scientist* of our days is nothing more than a *technician*.

So, if you stick to the etymology of the word, the paradox could be exactly the following: nowadays, a technician with a great passion for knowledge could embody better than a scientist the spirit of Plato's motto: *The unexamined life is not worth living*. This quote from Martin Heidegger's *Letter on Humanism* explains the same notion. "[…] the atomic age could so captivate, bewitch, dazzle, and beguile man that calculative thinking may someday come to be accepted and practiced as the only way of thinking." (I)

Thus we have reached the point where I wanted to lead my readers – to the question of the 'radio repairer'. I would like to delve into it a little, then come back to medicine and eventually, explain what spurred me to write this book on medical astrology, which you hopefully are just beginning to consult or study.

You may know that I have stated several times that *when dealing with astrology, I try to act as a radio repairer, who knows that if he replaces a valve, the radio will play again even if the owner of the radio set is a physicist who claims that this is not possible.*

Now I believe that the most interesting example to delve into this notion is that of the flying bumblebee that should not be able to fly. Let us put it in other words. In a nutshell, more or less the question is as follows. From the books on flight mechanics, every student of aeronautical engineering has learnt that bumblebees can not fly. In fact, their squat shape, their specific weight – excessive compared to the extension of their wings – and their overall physical structure are opposed to the possibility that they could ever take off and fly. **But the bumblebee doesn't know it, hence it flies.**

## Wonderful, isn't it?

So, let us consider whether anybody has ever been able to expose these notions at a higher level of knowledge and culture in a broad sense. In my opinion, within the frame of the subject we are developing in these pages, science historian Alexandre Koyré's *From the World of Approximation to the Universe of Precision* is extremely interesting. (II)

I present to you some passages with the clarification that in his book Koyré, who's a giant of the philosophy of science, specifically deals with science and technology. Among other things, he wonders how come the science of ancient Greeks

could remain – so to say – hibernated for several centuries before finding practical application that may be useful to man. Let me quote the passages more relevant to the notion of the 'radio repairer'. "… In an essay published in this very place, I have claimed that one can not find satisfactory solution to the problem of *machinism* considered under its double aspect: a) Why was *machinism* born in the 17th century? Why wasn't it born twenty centuries earlier, particularly in Greece? …" (III)

"… This is a paradoxical enterprise. For reality – the reality of daily life in which we live and stay – is not mathematics. Nor is it possible to mathematize it. For it is the domain of the moving, of the imprecise, of the 'more or less', of the 'roughly'. …" (IV)

"… That the technical thought of common sense does not depend on scientific thought, even if the former can absorb from the latter the elements that can be embedded in common sense. That it can develop, invent, adapt ancient discoveries to the new needs, as well as making new discoveries. That guided and stimulated by experience and action, by victories and blows, it can transform the rules of *techne* and can also create and develop both tools and machines.

That with often rudimental means – thanks to the ability of those who use them – it can create works whose perfection (not to mention their beauty) highly exceed the products of scientific technology (particularly at its earlier stage) – the history of Middle Age gives us striking evidence of all this. …" (V)

"… **Nonetheless, it is possible to wonder whether this apparent double deficiency could be explained exactly through the typical mentality and the general structure of the 'world of the more-or-less'. Now, as regards to this, it seems to me that the case of alchemy gives us the definite answer.**

**In fact, during its millenary existence, unique among the science of the earthly things, alchemy could build its own vocabulary, notation and even equipment that our chemistry has received and preserved in inheritance. Alchemy gathered treasures of observation; performed thousands of experiments; it also made important discoveries.**

**Yet it has never been able to make a specific**

**experience – this is because it has never even tried to. The descriptions of alchemical operation have nothing in common with the formulas of our laboratories: they are cooking recipes – as imprecise, approximate, and qualitative as recipes. It is not the material impossibility of performing measurements that constrains the alchemist – he simply does not make use of them even though he has them at hand.**

**It is not the thermometer that he lacks: it's the notion that heat could undergo an exact measurement. Thus he is content with the terms of common sense (high flame, low flame, etc.) and he virtually never uses scales. Yet scales exist. And the scales of the goldsmith and jeweller are fairly precise. But this is exactly the reason why the alchemist does not use it. For if he used it he would be a chemist. Better said, had he in mind the notion of using scales, he would already be a chemist.** …" (VI)

"… But to tell the truth, Galileo didn't know much more than Vitellone. Yet it was enough to allow him to concretize his idea after contemplating it. Also, there is nothing simpler than a telescope, or at least a spy glass.

To build them there's no need of any science or special lenses, therefore, not any specialized technique. Two spectacle lenses put one after another – this is what a spy glass is. [A note from the Author: roughly speaking, this is what a 'radio repairer' does when replacing a valve in the radio receiver.] As surprising and unlikely as it may be, for four centuries, it did not occur for anybody to see what would happen if they had used two pairs of spectacles at the same time, instead of simply one. It is a matter of fact that lens makers were no *opticians*: they were only *craftsmen*.

They did not make an *optical instrument*: they made a *tool*. So, they built it according to the traditional rules of their art, without looking for anything else. There is a deep truth in the (perhaps legendary) tradition claiming that the invention of the first spy glass is due to *chance*, to a little son of a Dutch lens maker who was simply *playing* with lenses. …" (VII)

"… Nothing will reveal this fundamental difference better than Galileo building his telescope. While Lippertshey and the Janssens, having discovered by mere chance that a specific

combination of lenses builds up a spy glass, restricted themselves to making the unavoidable and somehow inevitable adjustments to their 'reinforced spectacles' (a tube, a mobile eyepiece), when Galileo gets the news of the 'approaching spectacles' from the Dutch, he comprehends their theory.

Based on this theory – surely insufficient, still a *theory* – Galileo carries each time farther the precision and the power of his lenses, thus building his series of *perspicilli* that gape at the immensity of the sky before his eyes.

The Dutch glasses had never done anything like this before, exactly because they hadn't the same idea of the instrument that guided and inspired Galileo. So, the aimed (and attained) goal was completely different between them and Galileo. The Dutch lens is a practical device: it allows you see a far away object at a shorter distance, overcoming the limitations of the naked eye.

It does not go farther, and it does not even want to go farther. It is not by chance if neither its inventors not its users ever used it to watch the sky… [On the contrary, the 'radio repairer' replaces the valve to have the radio receiver work; but after this initial stage of passive literacy of his own 'science' through practical experience, he progresses in his knowledge and creates a path of theoretical-practical experiences that allow him to achieve (the necessary changes having been made) to 'Galileo's telescope'.]." (VIII)

This leads us to a crucial point that forces us to a newer flash-back of some thousands of years. As the historians of astrology teach us (IX), the first 'written' testimonials of this discipline date back to about 2,800 years before Christ in Mesopotamia.

There and then, the astrologers/astronomers priests advised their monarch to promulgate laws in order to compel his subjects to try to conceive in the month of July, so that many individuals be born in the sign Aries because they were – rightly – considered to be the best fighters (in those times war was a very serious matter, requiring people to deal with it full time). This was based on the observation of the astrologers considering the features of those born in Aries. They did not ask for the approval of statistics or science: they simply noticed a matter of fact. **It worked.**

Let us consider medicine once again. Often but not always,

medicine makes use of statistics. Sometimes the testing of certain drugs whose aim is healing serious diseases is carried over few dozens of patients. If the doctors establish that the active principle works without evidently harming side effects for the patient (not even after a span of time), the drug is approved. Without the seal *of science*? No, **without *external* seals.** This line of reasoning (eventually, you would say…) leads to me and this book..

Medical astrology has never been at the top of my thoughts, neither as an astrologer nor as a person. I was and am convinced that in this field the best author should essentially be a medical doctor. Nevertheless, I could not avoid thinking that I had almost thirty-six years of experience, studies and researches.

Thus I have been collecting an impressive (to me) amount of objective knowledge and data – a real fortune that would run the risk of being lost, hadn't I resolved to write it all down on paper. Of course, I am aware that my knowledge in this field is only a tiny segment of an infinite line.

Nonetheless – as you can directly notice by studying the life of your beloved ones, of yourselves and of your acquaintances in the light of the lesser and major fragments of truth that I am going to expose – many things can be affirmed much beyond a simple theoretical hypothesis. Perhaps, statistics one day will validate certain items of my medical astrology. For example, my statistical work carried over thousands of seriously ill hepatic patients, which you can read at the end of this volume, has been limited by the lack of the exact time of birth in the studied sample. This may have spoiled, statistically speaking, the positive result that I yet achieved. Had I known also the time of birth of each patient, not only would I have searched for Jupiter in Sagittarius: I would have also considered the significantly strong elements in Sagittarius / 9$^{th}$ House, or a ruling and blemished Jupiter, or the cusp of the 6$^{th}$ House in Sagittarius, and so on.

But for the time being I think I am already able to claim certain bits of truth with enough tranquillity and intellectual honesty. Dozens of cases examined and studied with the craving of a researcher and with the support of my extraordinarily good memory (X) have thrown at me pieces of evidence in such a clear way that only a blind person or someone in bad faith could not have been able to notice them in practice. Take, for example, the case of blindness and deafness.

You will get convinced – not much with my examples, rather *with your own examples* – that the astral combinations that I have detected are, virtually in the totality of cases, those which actually indicate these pathologies.

The converse, however is not true. That is, in every chart in which such a combination exists, the disease does not manifest itself in the individual that it represents. This is why I agree with a good friend and colleague of mine, whom I value very much, who wrote about the difficulties facing the multifactoriality of a system of analysis.

But such multifactoriality does not allow us to freeze and hibernate in thought and actions. We shall state that a certain illness or disease can be certainly detected clearly in the native's birth chart, even if there is one case over one thousand that does not match that particular tenet, and even if we'll never be able to 'see' a multitude of other pathologies in someone's birth sky – not to mention that many medical doctors also aren't able to see them… I would also add that the book you are reading is no substitute for your doctor at any stage of the possible pathological life of a human being.

It is intended particularly for researchers, to my good colleague astrologers, and to beginners who are thirsty for knowledge. Of course, nothing would prevent you from putting into practice the teachings of this book. For example, should you notice a danger for the sight of a newly born baby, you could advise its parents to have it checked often by an ophthalmologist, while you should never suggest drugs or therapies. I would like to add that this volume has been greatly inspired by the wonderful essay of André Barbault that you can read in the *Postface* of this book, which by no chance takes the very same title as his essay.

In my opinion, his essay is an essence of truth and includes very clever statements that I had never had the chance to read anywhere else.

I think it is equally imperative for me to add that this text does not pretend to be exhaustive in the field. It deliberately limits itself to the only pathologies of which I have had a significant and direct experience.

This means that I provide a 'maimed' list of items, yet a list that 'everybody can verify', a list of items concerning specific pathologies. I prefer so rather than to expound a purely

theoretical exercise wishing to attain an alleged completeness, yet a work that would reveal to be totally unfulfilling and unable to describe the practical reality of our existence.

I would have liked to add many more things; but this would open too long threads that may probably be worth individual and separate future elaboration. Before concluding, I feel bound to give my warm thanks to my friend Lorenzo Vancheri. With affection, yet without any trace of indulgence for any sort of typo, he helps improving the quality of my works with highly precious suggestions and remarks.

Let me also express my gratitude to my friend Pino Valente. He is an important international artist as well as an excellent computer expert. He has helped me 'tailoring' this book, particularly enriching it with the drawings he has personally cast using my software programs *Astral* and *Aladino*. The birth data are almost exclusively taken from my personal database or from Grazia Bordoni's data collection.

Ciro Discepolo

Naples, the 14th of March 2005

**Remarks:**

(I) **"In the opinion of most specialists of aerodynamics, considering its weight, its shape, and the physical features of the air, the flight of the bumblebee is impossible. Yet bumblebees fly."**

Although science and its technological employments are repeatedly promoted by media, attracting the interest of the public (especially for their use in the medical and the biological field) only in the last decades has this sector suffered from such serious problems of image like never before.

Forgetting that in this field we are also talking of human activities – thus subject to the moral and social rules that a community decides to apply through the individual and collective compromise – many of those who feel ill–at–ease with science prefer to take refuge in the ideological contrast or to escape to a non-existent past in which they suppose everything stood in harmony with nature.

At a practical level they pose again the old, nineteenth-century 'romantic' reaction according to which nature is

something good *a priori*: its imitation was not only an act of sacrilege – it was also a serious mistake of presumption.

This attitude sometimes shows through every day conversations. How many times have you been asked the following? "If science is really what it pretends to make us believe it is, why isn't it able to explain that such a small-sided winged, weighty insect like the bumblebee is capable of flying in spite of everything?"

No scientist with a minimal practical experience would ever dream to preach the omnipotence of his discipline or to call into question the cleverness of the results of a long-lasting biological evolution of the organisms.

Obviously, one of the reasons they don't do so is because challenge is mainly considered as an element of moral reflection. Personally, I believe that allegations of this type are fundamentally wrong. As I have stated before, reflection should not address to science 'itself' but to those who practise science instead – analyzing their degree of freedom, the degree of conditioning they receive, and the chances they stand of being able to react and to make their voice heard.

As for the bumblebee, there is only this specific question left: are you really sure that scientists are not able to explain why this insect is capable of flying?

**A legend was born**

According to aeronautical engineer John McMasters, the bumblebee paradox began to spread in the Germany of the Thirties of the last century, precisely at Göttingen University.

It is precisely there where Ludwig Prandtl (1875-1953) laid the foundations of fluid dynamics. According to McMasters, the first who exposed this enigma was a Swiss professor, deceased long time ago, a pioneer researcher of the dynamics of gases at supersonic speed in the Thirties and Forties. According to legend, at a dinner, the gas dynamicist had a conversation with a colleague biologist, who made the notorious question, "What aerodynamic properties have the bumblebee wings to let it fly?" The Swiss scientist did some quick calculations supposing that its wings were smooth, without wrinkles.

His conclusion was astonishing – based on his calculations, bumblebees shouldn't have been able to sustain themselves floating in the air! Clearly, something was wrong. Soon, the dynamicist realized that the mistake was in his starting assumption.

In fact, he examined the bumblebee wings with a

microscope and they revealed not to be smooth at all. But it was too late to stop the spreading myth of the impossibility of the flight of the bumblebee: also with the help of journalists and scientific publishers, the supposed paradox had started to spread like a rumour. In 1957, J. Pringle, who was the author of a well-known essay on the mechanics of the flight of insects, succeeded in reconstructing the most significant stages of the birth of this legend.

Rather than reconstructing the dialogues, it is worth noticing the reasons that initially led scientist to consider the impossibility of the bumblebee flight, and subsequently to analyze the physical tricks that make the insect effectively able to sustain itself in the air.

**Why bumblebees fly**

The Swiss dynamicist's considerations were based on the presumption that if the bumblebee wings have a smooth surface, they must have a very low 'Reynolds number'. This parameter is named after a fluid dynamicist of the 19th century. It gives a

measure of the evaluation of the ratio of inertial forces to the viscosity of a fluid – in other words, the product of the mass of a body moving through the fluid by the acceleration received by the body itself.

A dust particle floating in the air has very low Reynolds numbers (typically 1 to 10), while jet airliners usually exceed the value of ten millions. With a value between 100 and 10,000, the wings of insects are positioned in the lower range of a graph showing speed compared to the Reynolds numbers. One way to figure out this situation is to imagine that insects must fly with their little wings through a fluid that they find to be much viscous – say, as pasty as golden syrup.

Assuming that the bumblebee wings have a low Reynolds number and a smooth surface, the Swiss dynamicist supposed that the air flow on them was of a laminar type, i.e. without turbulences. This implied the lack of adherence between the air and the wing surface, and consequently the loss of lift – the force that sustains flying airliners preventing their 'stall', i.e. their vertical fall. Intuitively, the aerodynamics of the bumblebee is not the best possible.

Birds' wingspan allow them to glide for long distances, while the wings of this insect are so ridiculously small that if you catch a dead bumblebee and let it fall, you see it precipitate to the soil like a stone under its own weight. So, how could the mystery of its flight be solved?

The answer is that the bumblebee has found a way to sustain itself in the air by exploiting the turbulence created by the furious flapping of its little wings. In 1975, in the magazine *Nature*, Christopher Rees exposed certain observations on the shape and the function of corrugation of the wings of insects.

He had noticed that the sequel of strongly irregular sections on their wings implied huge aerodynamic advantages without jeopardizing aerodynamics itself.

In fact, Rees explained that if you draw the chart of the lift and the aerodynamic resistance of those wings, they are seen to possess features similar to those of the conventional wing profile of an airplane. Nonetheless, the most recent explanations on the flight of insects have followed a different path than classical aerodynamics: they have taken into consideration the tricks that allow them to fly in conditions of instability. Returning to the bumblebee, there was a need of explaining how it could succeed in exploiting the aerodynamic turbulence around its body in order to maintain itself to float.

It is now clear that the aerodynamics of insects is different from the aerodynamics that the aeronautical technicians had

studied until then, always considering static wings and uniform airflow.

Using high-speed film recordings of insects flapping their wings and comparing them with computer-simulated models, around 1990 it was discovered that insects create air vortexes around a central nucleus. This way the lift (i.e. the force that keeps them flying) is not generated on a continuous basis, like it happens with the wings of airplanes – it is generated in intervals.

Insects use their wings in a way that is more similar to those of helicopters than to airplanes, thus being able to fly not only horizontally but also vertically, diagonally, not to mention their ability to keep still in mid-air. Unlike helicopters, which have a central axis of rotation, these creatures flap their wings downward, they rotate them upwards, they flap them upwards, then they rotate them once again and so on.

These movements do not necessarily take place vertically, i.e. perpendicularly to the ground: they may take place slantwise, thus allowing them greater manoeuvrability. Thanks to the vortexes created by these manoeuvres the air flows more quickly on the upper surface and more slowly on the lower surface of the wing. This generates a difference of pressure that gives the necessary lift to keep flying.

There is a danger in ambush though: stall, that is the sudden loss of lift depending on the angle formed by the wing and the flow of air arriving on its surface.

When a wing with a large angle of attack is strongly accelerated, a new temporary air vortex is generated that adds lift and delays stall. It was commonly believed that this phenomenon was too ephemeral in insects to be able to contribute significantly to their flight capability, until Charles Ellington and his team of collaborators of the department of zoology of Cambridge University proved the contrary in 1996.

They studied *Manduca sexta*, a moth that had already been useful to science in studies of endocrinology and neurology. Ellington and his team used a 3D photo camera to take pictures of the movements of the moth wings, and then analyzed them on the computer.

They compared all the results with the behaviour of a robot called 'the flipper', which mechanically imitated the movements and the deformations of the moth wings, but with a lower frequency of flaps to counterbalance the fact that the robot was ten times bigger than the *Manduca*.

The researchers discovered that in these situations, a vortex was generated on the edge of the wings that remained attached

to the wings, coiling along their surface and creating an area of low pressure.

That explained why the insects are able to generate a lift three times higher than the lift deduced by the calculations of conventional aerodynamics, and why the stall that one would expect under those conditions does not take place. Pictures were taken of 'the flipper' in a wind gallery, showing the turbulences generated along its wings, thus giving clear evidence of the phenomenon in process.

Following this pioneering work, different laboratories elaborated different mechanical models for a more accurate comprehension of insect flight.

Nonetheless, studies are to be extended over the following years before we can hope to see a robot-insect fly in a fully autonomous way. The formation of the 'spiral vortex' can explain fairly well the flight of the bigger insects with a relatively wide wingspan.

With smaller insects though, the viscosity forces tend to dissipate the vortex quite quickly: hence the necessity of elaborating a further mechanism that allow them to fly. Once again the solution came out from a robot-insect simulating the flight of *Drosophila*, another insect commonly studied in genetics and biology.

In 1999 in the journal *Science*, an article appeared by Michael Dickinson, an expert in physiology and mechanics of flight, and a group of collaborators. They had sunken a 24-cm mechanical model of *Drosophila* into mineral oil to simulate the viscosity that the real insect feels during flight.

A series of motors connected with its wings allowed the simulation of real movements, including the rotation of the wings at the end of every single flap. A series of pressure gauges connected to the wings allowed them to measure stronger forces than those expected under non-dynamical conditions.

What had been detected was that the movement of the insect wings 'captured' the vortex generated during the previous flap. Another crucial factor highlighted by the researchers was the high sensitivity to small changes in the synchronization of the rotation of the wings, which allows the insect to change significantly both the intensity and the direction of the forces acting on them.

This is another factor that must be taken in due consideration in the 'instable dynamics' of the world of insects. Can the most recent theories and models proposed on the flight of insects explain the paradox of the bumblebee flight? Experts are inclined to think that each kind of insect has developed its own

peculiar manner of exploiting instable dynamics.

Direct observation of real flight and its comparison with computer simulations and mechanical models have revealed the secrets of certain insects like *Drosophila* and *Manduca*. There is no reason to believe that this might not happen also with the bumblebee.

Meanwhile, in the last years there has been a constant progress in the comprehension of insect aerodynamics, to such an extent that specialists believe that the creation of the first robotized insects is at hand. We are talking of the so-called MAV (micro air vehicles).

They will be provided with tiny radio transmitters and other sensors so they will be able to fly in narrow spaces that man could hardly reach. For example, they would control the performance and the level of security of the complex network of pipes designed for carrying gases and chemicals in large industrial plants.

Currently, at least three nations are developing their own MAV and, of course, there is an interest in their possible use in military and espionage. If they are carried out, it is not the fault of the poor bumblebee and those who have studied its impossible flight are innocent.

[*In conclusion, the Author dares to say that, for the time being, he is still allowed to claim that the bumblebee can not fly:* ***but since it does not know, it keeps on flying***].

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(II) Alexandre Koyré, *From the World of Approximation to the Universe of Precision*. Italian edition: *Dal mondo del pressappoco all'universo della precisione*, Piccola Biblioteca Einaudi, Torino, 2000, 136 pages.

(III) Ibidem, p. 89

(IV) Ibidem, p. 90

(V) Ibidem, p. 92

(VI) Ibidem, p. 98

(VII) Ibidem, p. 100

(VIII) Ibidem, p. 101

(IX) I refer to historians like Franz Boll, Carl Bezold, Wilhelm Gundel, Eugenio Garin, and Will-Erich Peuckert. I would never refer to the makeshift historians of astrology who swell the ranks of our detractors.

(X) There is a short period of my life in which I was forced to take extremely strong and rather harmful medicines trying to sedate an insistent cephalgia that I would completely abandon later on. In that short span of time I used to have real lapses of memory (limited to recent memories though) caused precisely by those drugs – which would be soon subject to an inquiry that led to their withdrawal from the market. With the exception of that period, luckily I have always been able to rely on my extraordinarily good memory. Among other things, being fond of cinema, I am able to remember every single scene of movies that I have watched only once twenty years ago.

**Here continue Ciro Discepolo's notes:**

3) Alexander Koyré, "From the world of approximation to the universe of precision", in Pietro Redondi ed., with P.V. Pillai, *The History of Science: The French Debate*, Hyderabad,

Orient Longman, 1989.

4) Michel Foucault, *The Order of Things. An Archaeology of the Human Sciences* [Les Mots et les choses, 1966], London, Vintage, 1994, pp. xiv-xvii.

5) M. Foucault, *The Order of Things*, p. xxiii.

6) I am thinking here of the revolts in the Arab world that have been repressed though violence, of the genital mutilations of women, etc.

7) I will avoid repeat the word *trap* because I do not want to give the impression of feeling victim of persecution. On the contrary, on such occasions I have felt quite gratified by the amazement I could read in the eyes of the public.

8) The calculations with 7 or 8 decimals made by Kepler at that time are precisely the same made today by the NASA when it sends its shuttles to Mars. This will give you an idea of Kepler's greatness.

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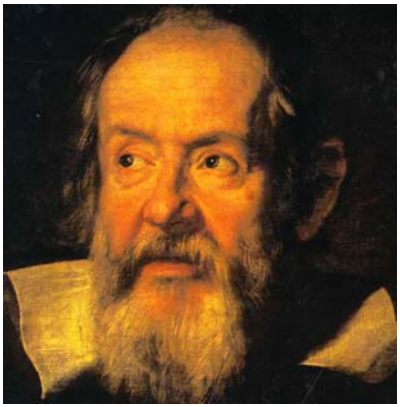


# Afterword

# Popper and his failures: praise of the stubborn

By Guido Marenco

## A petit bourgeois hero?

Karl Raimund Popper did his best or maybe his worst to appear unpleasant in the eyes of others. To think that this is relatively important for a philosopher is quite right. To appeal oneself to the power of reason is often unpleasant. Kant was neither a pleasant nor a popular philosopher. This is an old story that dates back to the Ancient times. Not even Heraclitus and Plato experienced the rapture of a *standing ovation*. In the case of Popper, however, one is led to think that a more philosophical and thought-out hostility, due to evident exaggerations perceived in his writing and in his behaviour, was added to the instinctive hostility of the enthusiastic supporters of someone or of some splendid idea.

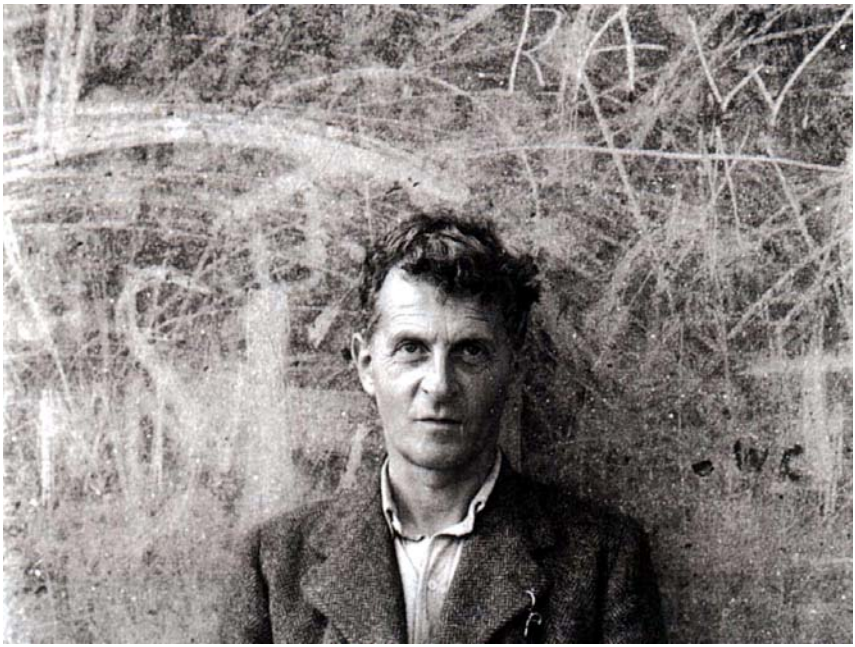
He was immodest, aggressive and contemptuous. Despite the recurring refrain – *I may be wrong*- repeated in many ways and emphasized in every writing, Popper was convinced he was more right than others. He came to this understanding in many ways, the most well-known episode goes back to October 1946.

The stage was the parlour of the Moral Science Club in Cambridge. There were different characters of the English (and not only English) philosophical world. Amongst those there were Bertrand Russell and Ludwig Wittgenstein.

Popper – as he recounted some years later – presented himself at the appointment with the intention of provoking Wittgenstein. He wanted to force him to acknowledge that philosophical issues make sense, that some sentences of the *Tractatus* did not make sense in their turn, suffocated in the universe of the events of Neo-positivist

kind. From a psychological point it is difficult to understand what Popper could expect from this attack. When you are invited to lecture you ought to speak but not to pass the threshold of a respectable confrontation.

Popper crossed that line and Wittgenstein reacted even more impolitely, threatening Popper with the chimney's poker. One could try to understand why Popper acted in such a provocative manner. Perfidious minds suggested that his attitude could be seen as part of his the personal class struggle. The petit bourgeois hurled his grudge against the illustrious scion of the aristocracy, responsible of all the evils of Austria and Europe.



The galloping inflation ate up all his father's savings and the young petit bourgeois was forced to go to work to keep up his studies. It is really devastating to put together Marxism and psychoanalysis, the pseudo-sciences fought by this hero, because one could discover that the champion of the rational thought and the super-conscious was a victim of a subconscious seething with anger. He used a *politically incorrect* term.

He had a grudge against that dandy, capable of creating a logical poem drenched with nihilism and skepticism like the *Tractatus*.

Popper's grudge was a grudge *ad personam*. He never had such provocative behavior towards members of the Vienna Circle like Carnap or Slick. On the contrary, he tried to attract their attention and to be ushered into their milieu.

**If Wittgenstein did not know how to take a joke, so did Popper.**

The reconstruction of the event told by Popper in his intellectual autobiography – *Research never ends* – (1) differs from that told by Peter Munz, an eyewitness. "I was present during that meeting and I can testify that Wittgenstein really grabbed the white-hot poker and shoved it under the nose of Popper, but at that time I did not think he really had the intention of attacking him.

Even so, it was a dramatic situation at least until Bertrand Russell, who was sitting between the two men, took the pipe out of his mouth and said firmly "Wittgenstein, drop that poker immediately." (2) Munz, in his short article, states another important thing, that Popper was not informed about the changes that had occurred in Wittgenstein's thought. Popper's attack was inappropriate and with bad timing, maybe spurred by ignorance and haughtiness. When Popper became aware of the existence of the "second" Wittgenstein, he wrote that "the fly wasn't able to come out of the bottle" and, frankly, I think nobody can deny it. The high tension zones in Popper's life are many and varied.

He managed to create a breaking off for 12 years with a philosopher very close to his philosophical positions like William Warren Bartley III, because of a lecture where the latter dared to criticize him for some aspects of his thought deemed as dogmatic, particularly for the use of the expression "irrational faith in the reason" in the second book of *Open society and its enemies*. It's possible to read the criticism in Bartley's *The Retreat to Commitment* (1962), never translated in Italian.

Even Joseph Agassi, Popper's pupil and one of his most convinced supporters, ended in the infernal circle of the "wasps nest" together with Lakatos, Feyerabend and John Watkins. In the wasps' nests were thrown pupils and colleagues guilty of lese majesty. Popper preached tolerance, but in reality he often behaved as an intolerant man. He would say "either with me or without me",

in ways which were sometimes obsessive.

In conclusion, our hero always had a very high opinion of himself, which is not bad if it is not accompanied by a very low opinion of others, used as mirror where his supposed greatness was reflected.

## A musical aesthetics devoid of true attention to the free expression of the artist

In writing this introduction, which is very close to being *gossipy*, I hope I have been able to stimulate the reading of Popper's intellectual autobiography, useful to understand less summarily the man and the philosopher. My first impression was negative because it's not possible to lie shamelessly in that way writing a relation concerning his own cultural evolution. The account of the "row" with Wittgenstein is clearly artificial and minimized.

He said he was joking and that Ludwig could not take the joke. One needs to understand how the Poppers joked. Armed with caution and informed of the risk of finding a slight modification of the truth that would make it very similar to a lie it is possible to say that it's necessary to read *Research never ends*. This is a precious book at least for two reasons. The first is that it spares the average reader from reading heavy pages difficult to digest even for the expert. All Popper's philosophy from alpha to omega is condensed here in a very comprehensible language.

Secondly because, under the skin of the tough and arrogant philosopher, appears from time to time a sensitive man. Nobody has the right to think that also this one is a pose for the commemoration. When Popper goes on talking about musical aesthetics, he does not criticize the expressionism and dodecaphony of the second School of Vienna, with position very close to the repression of the degenerate art of the Third Reich.

Only a praise of the spans and the vortices in Anton Bruckner's symphony would make the similarities complete. It's not only a conservative and conformist position but also illiberal, as if the experimentation of new forms of expression and the desperate attempt to give account of the failure of the modern musical reason-from Bach to Beethoven – would establish once again lese majesty. Popper regarded the artist as a servant asked to satisfy his taste

and not as an individual free to express his feeling through musical media and their command.

This is not exactly a liberal attitude. The hero did not understand the importance of revolutionary works such as Schoenberg's *Moses und Aaron* and Alban Berg's *Wozzeck*. He discussed music on the basis of subjective tastes, which is not a sin for a mere mortal, but for the philosopher of *open society* is a symptom of narrow-mindedness.

## Freedom and/or democracy?

After a first reading of Popper's intellectual autobiography, it's possible that anybody who knows something about history, history of philosophy and history of science, will feel quite annoyed. We all agree that totalitarianism failed. We have only to read Tocqueville and Thomas Jefferson, John Stuart Mill and John Dewey. But what about the tragedies carried out by democracies controlled by a minority of unscrupulous businessmen?

We all know about the bombing of Hanoi, the use of napalm, the support of Saigon's corrupt regime, the death and mutilation of thousands of American soldiers thrown into the fray, the coup d'état in Chile, the support offered systematically to the gorillas in South and Central America.

There is no sign of these important matters in his writings. Popper said nothing about these issues, probably mistaking freedom for democracy, paying no attention to the inauspicious consequences of a kind of democracy that can be populist and ruled by people who use the power to their own ends. His criticism of totalitarianism was persuasive. His criticism of historicism was slightly less convincing. His deafening silence on the crimes of Western imperialism was disgusting.

Thinking that the world problems can be solved only fighting ideologies and pseudo-sciences is the most partial and one-sided idea that was ever seen in the second half of the last century. For this reason, the curious reader and anyone who is confused about Popper's anti-totalitarian and anti-historicist rhetoric and who is seriously worried about the destiny of the world, would do the right thing turning to thinkers as John Rawls, Jürgen Habermas, Hans

Jonas and Norberto Bobbio, who are much more critical than the critical realist Popper.

To sum up, I suggest the following line of thought: Popper spent a large amount of time and energy defending his *critical realism*. Following Einstein *almost* through the end, Popper vigorously opposed the *subjectivism* of quantum mechanics and the Copenhagen interpretation. The core of realistic philosophy is the acknowledgement of the existence of an objective reality beyond the perceptions improved by the instruments.

Therefore, the reader will be surprised when he/she will realize that the warrior's battle was coming to an end before the temple of neo-liberal subjectivism in economics and politics. After Marx and Ricardo, all the theories were mainly subjective, with the exception of Keynes and a few others. Why then Popper's favourite targets became Keynes and his inductive logic? (3)

## Popper's praise is his failure

The principle from which I started is that, in order to draw up the praise of an individual, it's needed to speak ill of him as much as possible. It's not a universal rule, but in Popper's case it seems appropriate, considering his excessive ambition.

The quotation of a historian of the philosophy of science in this case is extremely useful and enlightening in a Popperian sense, which is the sense that Popper himself meant to give to the word "enlightening." I am talking about David Oldroyd and his *History of the Philosophy of Science* (4).

I reckon that, in recent times, the ability to narrate the adventure of human knowledge with such acumen and depth has been lost. Therefore to read Oldroyd, according to my point of view, would be necessary.

One of the thesis expounded by Oldroyd, very attentive to the history of philosophy from the beginnings to his time, was the one I am going to tell you about. Popper's epistemology proved to be asymmetrical and broke the unitary process of knowledge. Starting from the interpretation of a famous passage from *The Republic* by Plato, Oldroyd pointed out that the

discovery process is similar to a bow leaning on two pillars.

One allows it to descend, following the inductive way, while the other allows it to ascend, following the deductive way. Such process was analyzed and described even more accurately by Aristotle. In the course of time, according to Oldroyd, there have been different developments, but basically nobody moved beyond the platonic scheme if not by force.

Francis Bacon forced on the side of the ascending pillar. Popper, instead, forced on the side of the descending pillar, failing to explain how to get to the top, whether using the moving stairs or climbing and struggling or, even better, taking the run and jumping. At the end of his thorough investigation Oldroyd gave a very negative judgment regarding Popper: "On the other hand I think that the theory of falsification and the explanation of the theory of the scientific method according to Popper must be considered as failures.

The nightmare of the thesis of Duhem-Quine is not yet exorcised successfully, so in reality there is no more certainty in the process of falsification than there is in the process of verification or induction."

I disagree with Oldroyd about the dismissal of the *theory of falsification*, procedure that Popper inherited from Einstein and that he tried to re-elaborate in a too sophisticated fashion, moving from a dogmatic phase (in the twenties when he did not publish anything) to a more rational and articulated one. When everybody ponders about the consequences of their action and their words, they use Popper's method in everyday life.

This can be applicable to all the theories of the physics and those related to it. It's out of the question that a falsifiable theory is more reliable than another one that does not show which events and which experiments could confute it. When a new pharmaceutical product is put on the market, without having clear the benefits and the side effects, is quite likely to create disasters like the infamous case concerning Thalidomide.

Thus, the frontal attack to the *theory of falsification* threatens to be more dogmatic than the enemy one intends to fight. It's a moral right, in Kantian sense, to think scrupulously about the consequences of everything that has been theorized. The first

Popper's failure is called *demarcation*, the attempt to separate in a clear-cut way science and pseudoscience, willing in addition to distinguish between sensible metaphysics, for instance Darwin's *theory of natural selection*, and a nonsensical one.

Failure was, under many aspects, inevitable because it's impossible to separate science and pseudo-science in almost every field of scientific research and in everyday life. A consistent nominalist, like Popper many times claimed to be, would have operated another distinction: it's the individual who makes the difference.

An economist of Marxist orientation could approximate a forecast much better than a subjective economist. The same could be true in the pseudo-therapeutic field. Why a Freudian analyst should get wrong the diagnosis of a depression? On the other hand, looking at the actual scientific communities, it's easy to see that the picture is very different from the one imagined by Popper and find it more in accordance with the one outlined by Lakatos.

More often, one would investigate hypothesis and research programs that tend to escape the logic pointed out by Popper. The second failure is called criticism of the *inductive thought*. Persisting in this battle against the windmills, Popper ended by making the impression of being pig-headed and obsessed.

He chose as a target the boorish inductivist, the tabula rasa with a newborn's mind that does not know anything of the reality that surrounds him. It is obvious that in these conditions the individual could not learn a lot about the reality of the world through inductive procedures. He stops at the data gathered by Neanderthal man. Somebody has to explain to him how the world and civil society works. Induction is a thought process very widespread even among the most ignorant individuals.

Aristotle supposed that, if somebody comes to our house and takes a bath and that every time he/she comes to see us takes a bath, at the third or fourth time we have the right to suspect that he/she comes to see us in order to use the bath. This is the naïve inductive thought in the most elementary form, often used in gossip.

Induction is a technique of intelligence and reason. The user and how it is used determine its efficiency. To deny that the inductive pressure stimulated by attention to facts, things, traces and their

gathering has no role in the formulation of the hypothesis is a sort of stubbornness beyond any reasonable attitude.

It's possible that Popper was strongly impressed by the conceptual and methodological revolution carried out by Einstein, that is the passage from a *constructive physics*, not necessarily inductive but with sound inductive roots, to a *physics of principles*, from which logic necessities follow. Quite probably, there is a second explanation that helps to understand Popper's stubbornness.

He was, for all his life, impressed by his juvenile readings of Hume. The core of the disastrous Hume's endeavour can be summarized in the idea that the past has nothing to teach to the present and that our beliefs are based on our habits and nothing scientific. It's not possible to forecast the future on the basis of the past. That's the point.

Criticism of historicism and rejection of the inductive method join on this fragile base of extreme skepticism. In his autobiography Popper tried to become aware that a process of emancipation from skepticism, that involved even Einstein, was needed.

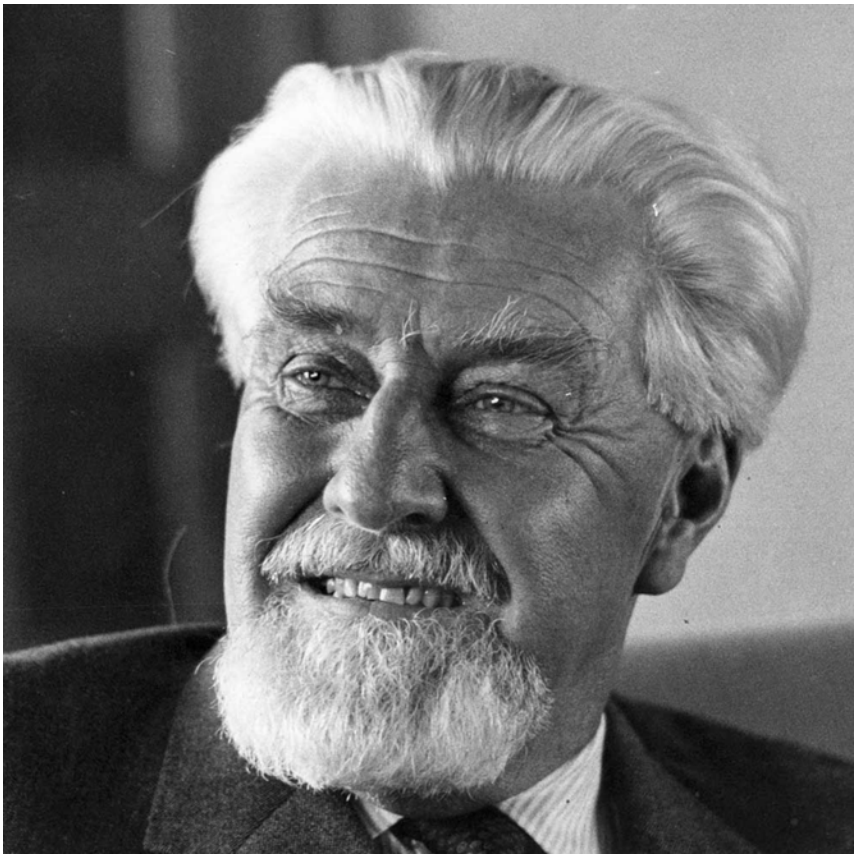
However, when he went talking about an educational system based on the studies of the ethologist Konrad Lorenz, he could not understand that the *imprinting* presented by Lorenz as a process of irreversible learning is often really irreversible also in human beings. Maybe, in order to become free of the conditioning of the *imprinting* a shock is needed. Grandma Duck Hume was the first philosopher followed by Popper and the umbilical cord was never excised.

## The Duhem – Quine objection

We mentioned "the Duhem-Quine nightmare", but we haven't explained what is about. First of all, I would avoid calling it "nightmare" as Oldroyd does. Due to reasons pertaining to vital statistics, the priority is given to Pierre Duhem, philosopher and historian of science, who lived between the nineteenth and the twentieth century. He wrote: "The physicist must submit a set of hypothesis to the experience instead of an isolated theory.

Only when the experience doesn't match up with the expectations,

the experience teaches that at least one of the hypothesis is unacceptable and it must be modified, but the experience doesn't suggest which one should be changed" (5). This is not a small problem, if we consider the history of physics and astronomy. It's interesting to point out that Duhem's thesis was critical of Poincaré's theory.



For the latter, in fact, the principles of Newtonian mechanics don't represent the simplest available beliefs, irrefutable experimentally. Those were the foundations of physics. According to Duhem, Poincaré made the mistake of considering every principle of mechanics separately. If Poincaré was a true conventionalist, Duhem was even less. In some respects, Duhem was the forerunner of the theory of falsification, rather, the supporter of a kind of restricted theory of falsification, because he knew that some theories of physics, considered separately, can resist experimental revisions.

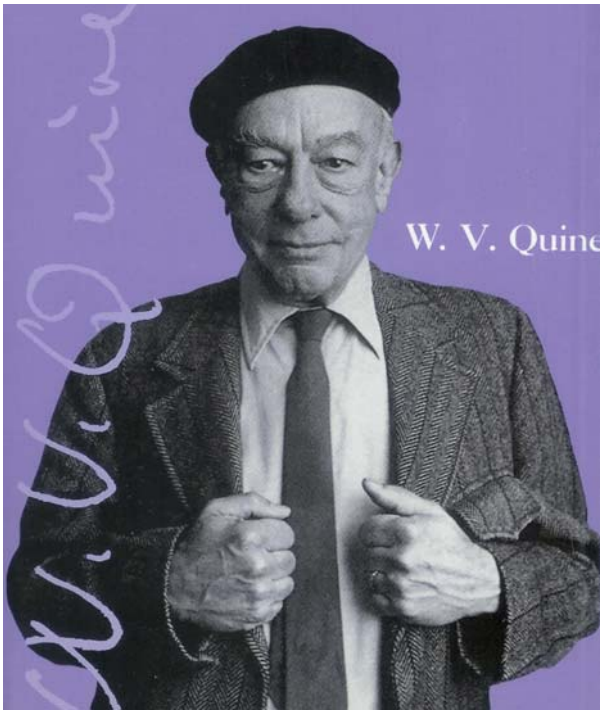
The idea that Duhem came to, something like a challenge of Popper's theory of falsification, is that crucial experiments don't exist in physics. As a consequence, not even crucial falsifications exist. It doesn't mean that they don't exist in other fields as in physiology. Duhem, in fact, admitted the validity of the crucial experiments made by doctor Claude Bernard.

It's incredible that the positions are totally reversed in a few decades. Some people will say, in fact, that physics can be falsified, but not biology.

Duhem, of course, stated his position, thinking over the famous experiment made by Leon Foucault in order to measure the speed of light into the water. This was an experiment designed to decide between the corpuscular and the wave theory of light.

Duhem showed that it was not sufficient to begin with a single proposition, but it was necessary to have recourse to different auxiliary hypothesis. He, therefore, wrote: "Foucault's experiment

doesn't decide between the two theories about the emission and about the waves, but between two sets of theories and each of these has to be considered independently: Newton's and Huygens' optics." But this obstinacy led to a blind alley, into a situation of indecisiveness.




Now we speak about Quine. In his famous article *Two dogmas of empiricism* (1951), Quine presented remarks quite similar to those of Duhem, but with some important differences. First of all, Quine outlined his thought within the framework of a distinction between analytical and synthetic assertions. He didn't accept the distinction between the two types of assertions.

In his opinion, it was not true that analytical propositions like these: "all single men are not married" don't have a factual content and they are 'true' regardless of the facts. What has that got to do with it? Quine's position was more or less the following:

The social use of the language modifies it. This is determined by "convention" and by "convention" every word fades away and changes it's meaning. So, if an analytical proposition like that we

saw before is pronounced in a place and in a time where the word 'single' doesn't mean unmarried, but teenager or widower, without a factual equivalent, it ceases to be true. If an enunciation is true because it is analytic, so it's true by convention inside a linguistic context. Therefore, we are witnessing a sort of "rapprochement" between the positions of Duhem and those of Quine in addition to those of the second Wittgenstein, ill-treated by Popper.

In this global vision of experience "the unit of measurement of empirical significance is the whole science in its entirety." (6) Quine considered the dimension of the scientific language as a "force field."

"Science in its entirety is like a force field whose boundary points are the experiences. A disagreement with the experience at the periphery causes a rearrangement inside the field; some values of truth must be bestowed again to some of our clauses.

However, the entire field is determined by its boundary points (i.e. the experiences) in such a vague way, that there is always considerable freedom of choice in order to decide what are the clauses that need a new evaluation in light of some unfavourable experience."

There are remarkable differences between Duhem's and Quine's positions. Quine's opinions, according to the most credited interpretations, defy the theory of falsification in a much more radical way because they did not restrict themselves to the field of physics, like in Duhem, but embrace the entire cultural, linguistic and epistemological field. If the truth of an assertion cannot be analyzed, dividing the linguistic and factual parts, we will come to the conclusion that the truth of an assertion can be ascertained only through a combination of semantic and empirical criteria.

This means that even the truth of the assertions formulated by Popper in the ideal language of deductivism would depend on either logical and empirical elements and, above all, would be very difficult to determine a line between all that is logical and all that is empirical. The conceptual situation was further complicated by Quine's following assertion: "Our sentences about the external world are brought to the court of sensitive experience not individually but only in agreement" because human knowledge is "a building made by men who touch experience only along the edges." In my opinion, it was given an excessive importance to Quine's theories. They defy

the dogmatic falsification of the young Popper, but touch only marginally that of a more mature Popper and above all, that category of scientist that proceeds with extreme caution. Furthermore, one should not forget that Quine's criticism was not explicitly addressed against Popper and the critical realism but against the dogmatic empiricism of the neo-positivists.

Whoever thinks in the order of magnitude started by Popper, has the right to consider Quine's observations negligible.

## The myth of the frame (the fly cannot come out of the bottle)

Popper replied in a very convincing way. He called the kind of Duhem-Quine's objections "the myth of the frame", the vision according to which a rational debate is possible only between people who share a common linguistic and conceptual framework.

Being framed in a language, we would not be able to understand others. He wrote: "I acknowledge that in every moment we are prisoners, trapped in the web of our theories, of our expectations, of our past experiences and of our language.

We are prisoners in a Pickwickian sense. If we try, we can escape from our picture in every moment. Undeniably, we will found ourselves still in a picture, but this will be a better and larger picture and we will be able to escape again in every moment. The crucial point is that a critical debate and a comparison of the different pictures are always possible.

It's only a dogma (and a dangerous dogma) that according to which different conceptual frameworks are similar to reciprocally untranslatable languages. The thing is that even totally different languages (like English, Hopi and Chinese) are not untranslatable and there are a lot of Hopi or Chinese individuals who can master the English language. (7)

According to Popper, the opinions of Quine and of the second Wittgenstein border on irrationalism. These philosophers thrust themselves in the bottle and then cannot get out of it. I cannot see the reason why we should end up like them.

## The "wasp" Lakatos, gets in and out of the bottle with agility and elegance

Imre Lakatos, in *The methodology of scientific programs* (8) noticed that the Duhem-Quine's thesis has a twofold interpretation with a weak version and with a strong version. The strong version states the impossibility of scoring an experimental shot against a theoretical target closely specified and the logic possibility to mould science in a indefinite number of different ways."

For Lakatos, therefore, the weak interpretation hits only the dogmatic but not the methodological side of the theory of falsification: "it only denies that is possible to refute a separate component of a theoretical system." The strong version, on the other hand, excludes the possibility of having any rational rule between different alternatives. This position is "incompatible with all the forms of methodological falsification." According to Lakatos, this could prompt us to ask the following question: "is every control a challenge to our knowledge on the whole?" Popper's followers resist this radical challenge because they carry out a semantic confusion between two different ideas of control.

According to Popper, control defies only "a finished and specified conjunction" like if O (control) defies T (theory) T&O cannot be true. The interpretation of control according to Quine is that "the substitution of O&T could require some changes outside O&T. The successor of O&T could be incompatible with some H in some remote area of knowledge. This semantic confusion gave birth to logic misunderstandings. "Some people perceived by intuition that the *modus tollens* primed by refutation could "hit" a very remote basis of our total knowledge and therefore could be trapped by the idea that the "clause *ceteribus paribus*" is a preamble that is linked by a conjunction to other evident preambles.

But this "hitting" is not an outcome of *modus tollens* but of our following substitution of the original model". Lakatos admits that Quine's weak version is "banally true." As for that, people could be differentiated between naïve (and dogmatic) falsificationists and sophisticated falsificationists, as Lakatos is regarded.

"The sophisticated falsificationist allows to substitute every part of body of science, but only provided that this could be substituted in a "progressive" way and that the substitution would anticipate

successfully new events." In Lakatos' rational reconstruction of falsification "negative crucial experiments" don't play any part.

For him there is nothing wrong if some brilliant scientists act, as mutually agreed, in order to pack everything they could in the research program with an inviolable nucleus (or, if someone prefers "in the conceptual framework") preferred by them. Until ingenuity – and fortune – allow them to expand in a "progressive" way their program, remaining faithful to the nucleus, this is permitted.

If a talented researcher decides to substitute "progressively" a totally undisputed theory because it happens to him to consider it unsatisfactory on a philosophical, aesthetic or personal basis, then, good luck to him. If two teams that pursue rival research programs were competing one against the other, success would probably smile on that team whose members have more creative talent, unless God wants to punish them with an absolute lack of empirical success.

## The empire starts to crumble

Lakatos was only one of many critics and followers of Popper in the specific field of philosophy of Science. It was in 1965 that a real opposition to Popper came to surface.

David Oldroyd (9) revealed that the opposition didn't have a directly dialectic trait, but gained ground slowly, as a manifestation of some discomfort in regard to the more evident unilateral views of Popper's thought. The situation went out of control only during the International Convention about Philosophy of Science at the Bedford College in London, precisely in July of 1965.

This convention saw the contrast between a crowd of Popper's supporters – some of whom were timid dissenters –and Thomas Kuhn with few disciples of his.

This is not the place to explain in details Kuhn's position, but we must observe that, nonetheless, for Kuhn science proceeds by revolutions, that are extraordinarily amazing moments of science to which long phases of ordinary science follow.

These are periods during which science cannot do anything but fortify the scientific paradigm that became popular with the revolution facing, within the limits of the prevailing paradigm, all the

problems and puzzles that arise. According to Kuhn, Popper's examination of the scientific discoveries has a relative validity in relation to the moments of revolutionary science but doesn't take at all into consideration periods of ordinary science.

During his speech at the convention Kuhn pointed out that Popper's approach was "natural and common. Copernicus' or Einstein's enterprises impress more than those of Brahe or Lorenz. Popper would not be the first to mistake what I call normal science for a lackluster enterprise.

However, it's possible that both science and development of knowledge cannot be understood, if research is considered exclusively through the revolution that it occasionally generates.

For instance, although the control of special efforts takes place only in extraordinary science, it is the ordinary science that discovers either the steps to check and the methods of control." (10) This was a criticism partially excessive, but that hit a visible target.

In the history of science, falsification did not often occur according to Popper's method, which is before making a hypothesis known. It was up to Popper's "heirs" to discover and explain all the anomalies, until a moment of "crisis" was reached and the necessity of a more satisfying paradigm was needed. If we look

with hindsight, after almost 50 years from then, it's not easy to understand why people got so excited.

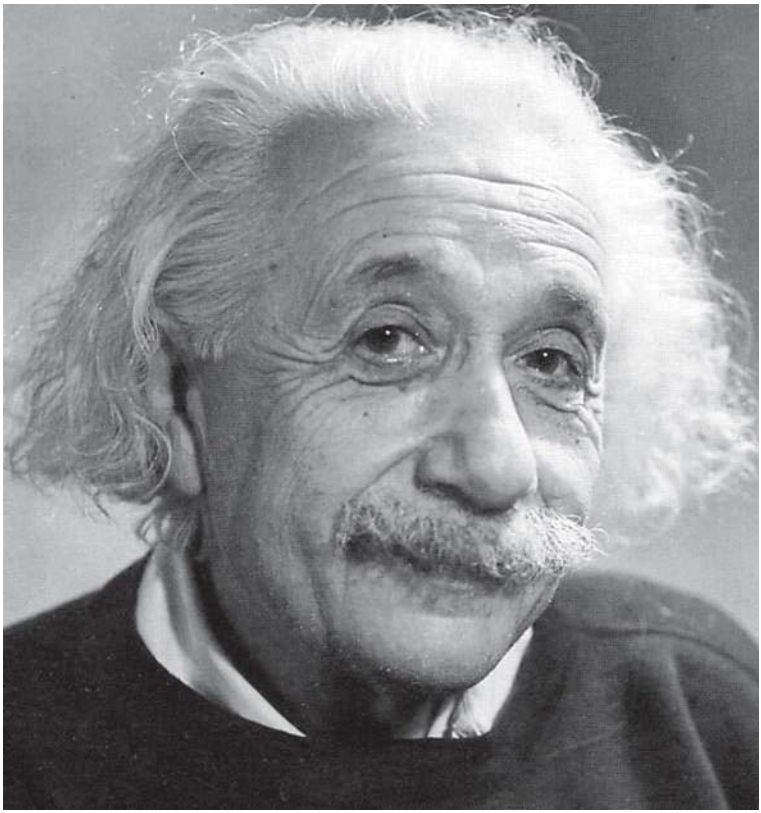
Kuhn's observations concerned internal history of science – nothing was falsified up to Einstein – and not the internal history of philosophy of science. A real disagreement would come to surface much later when Lakatos wrote a criticism of Kuhn – too approximate in the historical reconstruction – and will provide a very different historical reconstruction. However, we need to grasp that Kuhn unmasked Popper's *Trotskyism*, the vision of the scientific enterprise as a *permanent revolution*.

## Popper is challenged

In his autobiography, Popper claims to be proud for having *destroyed* neo-positivism and he is generally happy and pleased with his philosophical work. These are statements that make people smile because 1) it results that only one of the many belonging to the Circles of Vienna and Berlin (Hans Reichenbach) forsook the general lines of the original positivist manifesto. 2) because neo-positivists still exist. One could argue that neo-positivists exist from time immemorial, at least from the times of Thales, but they were not called with such a name.

Neo-positivism is a *forma mentis* that constantly comes up again in the history of philosophy because, I would dare to say, it's inevitable that he who begins to think how the world is made and why, stops believing in myths and fairy tales and trusts only facts and observations.

Neo-positivist tendencies still exist today in Italy. I would like to think it's clear that there is also a popular neo-positivism used by simple individuals like Thomas the apostle who, in order to believe, needs verification. There is even neo-positivism in the Church. One believes in God, like Wittgenstein, and then shuts himself up in the bottle of facts or in the two-litre bottle of language. This is the reason why the pleased triumphalism of Popper, who writes a precocious autobiography, cannot but provoke a bitter smile of condescension. This is not the smile that abounds on the mouth of the fool. When autobiography assumes an air of self-celebration it becomes unbearable.



This prompts the question "Who the hell do you think you are?" I insist on the psychological reaction, because that too was sodden with rancour.

Popper's critics have often exaggerated, being harsh on his shortcomings and being silent about his merits, but it's not only their fault. The objections took different "routes" and attacked Popper's thought in different steps of the final architecture. I am not aware of the emergence of any global objection, if not in some negligible idiocy of old fashioned Marxists (the petit bourgeois brand viewed as the original sin) and old fashioned psychotherapists.

Trying to put order in the disorder and select the most important criticism is a really hard task, especially if, in my opinion, all the criticisms can become useful, even those coming from flies trapped inside the bottle.

## Habermas and the ethical foundation

Focusing attention on Popper's ethical and political theory, I regard as noteworthy Habermas' remarks. Popper abruptly separates facts and values, knowing and evaluating, like a neo-positivist.

Doing so, Popper thrusts himself in turn into the bottle, because he cannot expand anti-dogmatism beyond the borders of science. Besides, he shows himself to be unable to defend his enlightened project and to get out of the limits of a rational way of thinking. Habermas, as Geoffrey Stokes correctly points out (11), states that facts and values are equally known and communicable. For this reason he criticizes Popper and Bartley's metaethics that force people to have recourse to faith, feeling, existential undertakings and even decisionism.

In this way one falls into a circular way of thinking that doesn't justify the existential undertaking but simply decides it. This means giving up finding the last groundings through the use of conversational reason. It goes without saying that the effort required by Habermas, in turn runs the risk of being founded on something very fragile.

Going back to Kant, Habermas' morning star, the imperative to behave as an honest person has only one justification, that of absolute duty (not to enter paradise, nor to earn the respect of friends.) This is the categorical absolute and it's not negotiable. If one is looking for a grounding, therefore, he should stop following philosophy – as Wittgenstein said – that is the senseless disputation about what is ethical and what is not.

Wittgenstein talked about *decency*. Actually there is only one way to exit the infernal circle of ethical disputation: starting to perform yoga, observing our thoughts with the maximum detachment we are capable of and then ask ourselves: "What kind of person have I been so far?" The grounding is to find ourselves.

Obviously, it has to be a self enriched by culture, science and by the good acquaintance of people. What is more, it's a further delusion to hope to solve the problem recovering the self. Then, one needs to live, to stay in the world, to work, to contribute to a fairer society. Here is the rub, for the guru fanatic and the new age follower.

The moral imperative that comes from the self can result being

paralyzing. There is no party, no congregation, no friendship, no sympathy, no cause, no man, no woman that does not involve a sacrifice of the moral absolute.

What are we supposed to do, kill ourselves? Or become eunuchs for the kingdom of self? I think I have tried to underline a priority in the disorder and show how useful it is to criticize Popper as well as his detractors.

**Hume's law.**

Staying within Popper's dimension of rationality, it is surprising that the criticism of the hero did not lead to the *destruction* of one

of many laws that are nothing but adulteration of a very weak thought. Hume's law, product of an extreme and blind neo-positivism, states that is not possible to obtain moral precepts from a factual situation.

From what then do we obtain precepts? From Hume's feelings, from Adam Smith's ethics, from Shaftesbury's likings, from several utilitarianisms born and developed in the perfidious land of Albion. It's much better to give up prescribing and let everything occur naturally, for instance "because of love".

The invisible hand discovered by Adam Smith will guide the dynamics of the relationship to its right destination and without any effort, without us being aware. Hume's law is the counterintuitive principle that clouds the philosophers' head. Its opposite and its confutation however arise from the lowest and most sober human customs. In order to write the highway code, for instance, one should start from a factual situation.

This bend compels people to slow down. Going through built up areas is a delicate matter. You must not drive while drunk. Rules are rational –more or less, there's no point to argue-and they are rational because they correspond to factual states and to the repetition of unwelcome events like accidents, and other factual states. Value, in this framework, is represented by the principle of conservation of the integrity and of the human life. This is love but also responsible love. It is a sign of sober and modest rationality to draw out precepts from an evaluation of factual states.

## The reassembling

Having unmasked the absurd we are only at the beginning, a new beginning that the lucky Popper did not have the time to see, being himself trapped in the bottle of subdivision in watertight compartments. In order to have more detailed and documented ideas of the most rational criticism directed against Popper's epistemology, I advise to have a look at the article by Silvana Poggi "Everybody against Popper (the catalogue of the objections)"(12)

**Notes**

1) K. Popper, *La ricerca non ha fine* [Research never ends], Armando publishing, second edition entirely revised 1978

2) Peter Munz, “Ma Karl e Ludwig erano solo nemici apparenti” [Karl and Ludwig were only apparent foes] in Giancarlo Bosetti, *Popper liberale riformista* [Popper, a liberal reformer], Venezia, Marsilio, 2003

3) On this issue, you can read my opinion published at the following web address: http://digilander.libero.it/moses/popper05.html

4) David Oldroyd, *Storia della filosofia della scienza* [History of the Philosophy of Science], Milano, Il Saggiatore 1989

5) P. Duhem, *La teoria fisica: il suo oggetto e la sua struttura* [The Physical Theory: its object and its structure; La theorie physique: son object et sa structure, Paris 1906], Bologna, Il Mulino, 1978

6) W.V.O. Quine, “Due dogmi dell’empirismo” [Two Dogmas of Empiricism] in *Il problema del significato* [The Problem of the Meaning], Roma, Ubaldini 1966

7) K. R. Popper, “La scienza normale e I suoi pericoli” [Ordinary Science and its Dangers], in Lakatos/Musgrave (edited by G. Giorello), *Critica e crescita della conoscenza* [Criticism and growth of knowledge], Milano, Feltrinelli 1976

8) Imre Lakatos, *La metodologia dei programmi scientifici* [Methodology of scientific programs], Milano, Il Saggiatore 1996

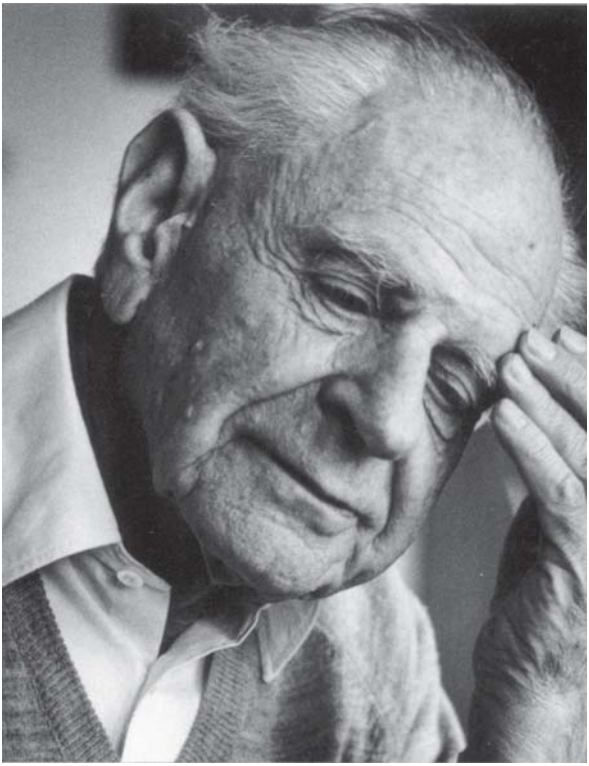
9) Oldroyd, cit.

10) T.S. Kuhn, *Logica della scoperta o psicologia della ricerca?* [Logic of the discovery or psychology of research?], in I. Lakatos, *La metodologia dei programmi scientifici*, cit.

11) Geoffrey Stokes, *Popper*, Bologna, Il Mulino, 2002

12) Web address: http://digilander.libero.it/moses/tutticontropopper.html

The Authors wish to thank Guido Marenco for his essay. Not only is his contribution an interesting and stimulating "third voice" in this dialogue of ours, but it also invites readers to reflection by raising some crucial issues.



**Karl Popper**

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