

The brain and thought

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No doubt we all like to think that we think, and many of us would like to know how it is that we think as we do.* It appears that the question has ceased to be a purely theoretical one. It now seems that more and more of the powers that be [*plus en plus de pouvoirs*] also take an interest in our capacity to think. If, then, we seek to understand how it is that we think as we do, we do this in order to protect ourselves against the ways – either overt or devious – in which we are induced to think the way they would like us to. Indeed many people are asking questions of the manifestos put forward in various political circles, and of some of the methods of so-called behavioural psychotherapy, and of the reports issued by some computer companies. They believe they can detect in these things the possibility of a programmed extension of techniques that aim, in the last analysis, to normalize thinking. To simplify things without, I think, distorting them, it may suffice to mention one name, that of Leonid Pliouchtch, and one abbreviation, that of IBM.

Just as biologists believed they could not speak of the human brain without situating it at the end of a history of living beings, so I think it would be helpful to begin a presentation on the brain and thought by situating this question within the history of culture.

I

Today, although it is common knowledge that the human brain is the organ of thought, we ought nevertheless to recall that one of Antiquity's greatest philosophers, Aristotle, argued that the brain's function, in contrast to that of the heart, was to cool down the animal's body. It was Hippocrates who argued that the brain was the seat of sensations, the organ of movements and judgements, an argument assumed in

the Hippocratic treatise *On the Sacred Disease* (i.e. epilepsy). Plato took up this theory in part (notably in the *Timaeus*), but it is thanks to Galen that it became dominant in Western culture. Galen's militant Aristotelianism didn't prevent him from performing ingenious experiments on the nervous system and the brain in his attempt to verify the Hippocratic thesis.

The question of the brain was thus originally formulated as a question concerning the seat of the soul. Today's version of the problem retained this formulation over the course of the centuries and then, in the wake of Cartesian philosophy, gave rise to a long succession of theories and polemics, which we have inherited. A brief outline of this history is indispensable for determining the starting point of our investigation. This point lies in the nineteenth century, at the site of positivism's struggle against spiritualism: the theory of cerebral localizations.

Too often this historical account is said to have begun with Descartes. But this involves a total misunderstanding. Descartes taught that the indivisible soul is joined as a whole to the body by a single organ – an organ that is the physical equivalent, so to speak, of a single point: the pineal gland (the *conarion* of the Ancients, our epiphysis). With Descartes there can thus be no question of seeking to unite a divided thought to a federal organ. Those who later did not understand that the pineal gland's function was meta-physiological criticized Descartes, and continued to search elsewhere in the brain for the seat of the *sensorium commune*. The list of researchers is long and stretches from Willis to La Peyronie. Even the invention of the guillotine served as an occasion for eminent doctors – Kant's correspondent Soemmering, for instance – to weigh in on the side of this or that theory. Pierre Cabanis (1795),

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who argued that the brain secretes thought as the liver does bile, took part in the controversy and discussed the case of the decapitated Charlotte Corday.

Then, in 1810, Franz Joseph Gall published his *The Anatomy and Physiology of the Nervous System in General and the Brain in Particular*. This is where brain science really began, even if it still had to get past the initial obstacle that was phrenology, that mixture of naivety and conceit. The strong point of Gall's doctrine was the exclusivity it attributed to the encephalon, and more particularly to the cerebral hemispheres, as the 'seats' of all intellectual and moral faculties. It presented the brain, understood as 'the system of systems', as the sole physical basis of the faculties. Phrenology was then essentially a craniology grounded in the correspondence between content and container, between the configuration of hemispheres and the shape of the skull. In opposition to sensualist ideology, in opposition to what we might today call the acquisition of experience from the environment, Gall and his disciples argued for the innateness of moral qualities and intellectual capacities. But, unlike the spiritualist metaphysicians, they grounded this innateness in the anatomical substrate of an organ and not in the ontological substantiality of a soul. Seen from a distance, the interest of this controversy might seem merely theoretical, but in fact it wasn't.

Discovery of the so-called 'mathematics bump'¹ was met with widespread laughter, but we seem less ready, these days, to laugh away current talk about the chromosomes of the 'exceptionally gifted' or the genetic and hereditary basis of IQ. For, even with an average IQ, it is easy to see the possible consequences of such talk at the level of social conditions. We should remember, however, that Gall and Johann Spurzheim were already arguing for the practical applications of their theories in the fields of pedagogy, of aptitude testing (or what is today called 'career guidance' [*orientation*]), of medicine and of police work (prevention of delinquency). In fact, one of Daumier's illustrations for Antoine-François Hippolyte Fabre's *Némésis médicale* (1840) depicts a phrenologist standing in front of a traditional collection of skulls in plaster and examining the skull of a child who has been brought in by his mother, a working-class woman, for aptitude testing. In fact, as Georges Lanteri-Laura remarked in his *Histoire de la phrénologie*, shortly after Spurzheim and his Scottish disciple George Combe imported it to the United States, phrenology quickly developed into applied phrenology, becoming an instrument for selecting personnel and guiding their careers, and even for giving matrimonial advice.

It has been suggested that phrenology's success in the United States at the time occurred for similar reasons and was similar in scope to the more recent success of psychoanalysis.

Above all, however, the crucial influence that phrenology had on psychopathology should not be underestimated. It is simply impossible, otherwise, to understand why the first attempts to localize intellectual functions in the brain concerned difficulties with speech and the memory of words. On the topic of aphasia, Pierre Paul Broca and Jean-Martin Charcot confirmed Jean-Baptiste Bouillaud's findings (Bouillaud was a student of Gall), which located the function of language in the frontal lobes (1825–48). In the second half of the nineteenth century the use of both galvanic and faradic electricity became a privileged means of exploring brain functions; at the same time, some researchers were even inclined to elevate experimental neurology to the status of philosophy.

Thus, as early as 1836, a doctor from the Hospice de Bicêtre, Louis-Francois Lélut, in a work called *Qu'est-ce que la phrénologie?*, wrote: 'The only thing missing from this physiologico-psychological system, the only thing needed to make it fully complete, is to analyse the brain's role in the production of moral and intellectual facts, that is to say, to explain mechanisms of thought using modern hypotheses about the electrification or electromagnetization of the encephalic mass' (p. 239). Half a century later, Ferrier, Fritsch, Hitzig, and Flechsig would inaugurate what Henri Hecaen and Lanteri-Laura later called 'the golden age of cerebral localizations', making possible the first topographic map of the brain. Then, without further ado, as early as 1891 the Swiss psychiatrist Gottlieb Burckhardt converted topographical knowledge into psychosurgical technique – unsuccessfully, as it happens – and began performing the operation that came to be known as lobotomy.² Once again, we should pay attention to just how quickly apparent knowledge of the brain's functions was invested in techniques of intervention, as if the theoretical agenda was from the beginning driven by a practical interest.

II

Parallel to this research in cerebral neurology, the science of psychology evolved to become little more than a pale reflection of physiology, encouraged by a bad-thinking [*mal pensante*] philosophy that drew its reasons for thinking badly from that very psychology. In France, the leading thinker of this tendency was Hippolyte Taine. In his *Les Philosophes français au XIXe siècle* (1854) Taine contrasted the spiritualist

homilies of Paul Royer-Collard to Jean Pierre Flourens's experimental brain research, even though the latter could not easily be understood as materialist. Then, in his work of 1870, *De l'intelligence*, he defended on the basis of a theory of sensation the doctrine of so-called psychophysiological parallelism. It was this doctrine that French academic philosophers, the professors who taught my own professors, Bergson included, were especially determined to refute – and they did so under the disapproving eye of Théodule Ribot, who acted like the executor of Taine's legacy.

Even Freud himself, author in 1888 of an entry on the 'Brain' for a medical dictionary, acknowledged an initial debt to Taine. In 1895, after writing his *Project for a Scientific Psychology*, Freud wrote to Fliess (February 1896): 'I like Taine's book *On Intelligence* very much. I hope something will come of it.' This is perhaps what led Ludwig Binswanger to write that Taine's psychological naturalism had many points in common with that of Freud. However, without abandoning the topography of brain localization, in *Die Traumdeutung* (1900) Freud introduced the concept of 'psychic apparatus' so as to foreground the issues surrounding what he called 'psychic topography' [*Topik* in the German, *topique* in the French]. By 1915, he was able to write, in the chapter on the 'Unconscious' in *Papers on Metapsychology*: 'Every attempt to deduce from [cerebral localizations] a localization of mental processes, every endeavour to think of representations as stored up in nerve-cells has miscarried completely.' And he added that, for the moment, the configuration of the psychic topography [*Topik*] (the distinction of the system into Ucs, Pcs, Cs) 'has nothing to do with anatomy'.

To limit myself to the French domain, I shall recall the titles of two works from the same epoch, each of which was expressly conceived in the absence of reference to any philosophical concepts. In 1905, Alfred Binet furnished an essay on the nature of sensation entitled *l'Ame et le Corps* [*The Soul and the Body*]. Then, in 1923, Henri Piéron, director of the Institute of Psychology, published his *Le Cerveau et la Pensée* [*The Brain and Thought*].

The brain and thought had become so closely united, and even confused, in the thought – or the brain – of physiologists, doctors and psychologists that even some poets were led to attribute all responsibility for painfully lived experiences to the brain. Thus a celebrated man of letters, a poet and an actor, having difficulties with his ego or I [*moi*], wrote to Jacques Rivière: 'All I want now is to feel my brain [*sentir mon cerveau*] ... I am a man whose mind has suffered a great deal.

I only hope that my brain will change, that its upper drawers will open up.' The person in question is Antonin Artaud, in May of 1923 and March of 1924 respectively. Then, in the academic year of 1923–24, *Collège de France* professor Pierre Janet³ – who like Freud was a student of Charcot's, and who as a doctor was also engaged in treating another celebrated man of letters having difficulty with his 'I': Raymond Roussel – declared in one of his lectures:

We have gone too far in linking psychology to the study of the brain. For almost fifty years too much has been said about the brain: we've been told that thought is a secretion of the brain, which is no more than a stupidity, or at least that thought has a relation to brain functions. One day all this will be considered laughable: it is not accurate. What we call thought, or psychological phenomena, is not the function of any organ in particular: it is no more the function of the fingertips than it is a function of a part of the brain. The brain is only a set of switches, a set of devices which alter muscles affected by excitation. What we call 'ideas' or 'psychological phenomena' concern behaviour as a whole, they concern the individual taken as a whole. We think with our hands as well as with our brain, we think with our stomach, we think with everything: we should not separate one thing from another. Psychology is the science of man as a whole, it isn't the science of the brain: this is a psychological error that has caused much harm for a very long time.

This psychology is perhaps unjustly neglected today;⁴ I do not refer to it for the sake of erudition but in response to a pressing preoccupation of our time. This connection allows us to see in Janet's position a deliberately nonconformist stance on matters concerning the pathogeny and treatment of so-called mental illnesses. This stance was as anti-establishment then as is today the stance of this or that adherent of anti-psychiatry. For, as we cease to believe in the primacy of the cerebral we quickly become sceptical about the effectiveness of prison-like internment as well. According to Janet, the concept of alienation was not primarily psychological but first and foremost 'a police matter'. Janet declared: 'A demented man is a man who is unable to live in the streets of Paris.' No doubt it would have been easy enough to push him further to say that it is the streets of Paris themselves that are demented. This tranquil man, who in 1927, in his *La Pensée intérieure et ses troubles*, wrote that 'The word mad is therefore a designation used by the police', would probably have approved the piece of advice that some Oxford students wrote on the walls of their university: 'Do not adjust your mind, there is a fault in reality.'

So to sum up: a century after Gall and Spurzheim it had become possible to pursue the work of psychology without relying on arguments drawn from neurophysiology. However, to understand better what is at stake philosophically in the ‘brain–thought’ problem, we must briefly return again to phrenology.

III

Explanations of intellectual functions and their effects based on the structure and configuration of the brain harbour, from the outset, an intrinsic ambiguity. Attempts to popularize such explanations made this ambiguity glaring because they presented it in a crude form. One of the many works that sought to popularize and promote phrenology, Alexandre David’s *Le Petit Docteur Gall*, contains pages of commentary about a portrait of Descartes taken from Johann Kasper Lavater’s (1778) *Physiognomic Fragments*, a drawing based on a portrait by Franz Hals. The phrenologist, a disciple of Spurzheim, locates in various places on Descartes’s head ‘all the perceptive intellectual faculties’: individuality, configuration, extension, weight, colouring, locality, calculation, order, eventuality, time, tone, language. This apparently serves to explain why Descartes was so well ordered in the administration of his mind, and how it was that he came to apply algebra to geometry and mathematics to optics. The presence or placement in his brain of his sense of ‘locality’ is further meant to explain why he led a nomadic existence. David also praises an expert phrenologist, a certain M. Imbert, for having remarked that the *cogito* is a simple effect of ‘eventuality’, that is to say, of the ‘faculty which perceives the actions that occur within us’. Since the *cogito*, then, was not a result of the ‘reflective intellectual faculties’, Spurzheim seemed to be justified in stating that Descartes was not as great a thinker as generally believed.

In short, back in the days before phrenology, Descartes was considered a thinker, an author responsible for his philosophical system; in its wake he becomes the bearer of a brain that thinks under the name of René Descartes. Because Descartes now is the brain in which ‘eventuality’ is present, he perceives the *cogito* within him. Because Descartes is a brain in which ‘locality’ is present, he moves around like a nomad all the way from Poitou to Sweden, via Paris, Ulm and Amsterdam, where he preceded today’s hippies, who are attracted to it for other reasons. On the basis, then, of an image of Descartes’s skull, the expert in phrenology concludes that all of Descartes, his biography and philosophy, lies in a brain that must indeed be acknowledged as *his* brain, Descartes’s brain, since

it is this brain that contains the faculty to perceive the actions that occur within him or it [*lui*]. But who or what now is this ‘him’ [*lui*]? This brings us to the central ambiguity. Who or what is it that says *I*, not only at the beginning of *The Discourse on Method*, but also and above all at the beginning of *On Geometry* from 1637: ‘I shall call unity ... I shall not hesitate to introduce these terms ..., etc.’?

Throughout the nineteenth century, the *I think* was many times over refused or refuted in favour of a ‘thinking’ [*penser*] that proceeded without any responsible personal subject. In his *Philosophische Bemerkungen*, Georg Lichtenberg stated: ‘we should say “it is thinking” just as we say “it is raining”’.⁵

The neurologist Sigmund Exner, quoting Lichtenberg’s phrase in his memoirs from 1889, *Über allgemeine Denkfehler*, wrote: ‘The expressions, I think, I feel, are not at all good ways of expressing oneself. One should rather say: it thinks in me [*es denkt in mir*], it feels in me [*es fühlt in mir*]. The weight of arguments does not depend on our will; instead, a judgement takes shape within us [*es denkt in uns*].’ A little before this, and quite independently of one another, Rimbaud and Nietzsche both felt obliged to excuse themselves for having succumbed to the illusion of their thinking *I* [*leur moi pensant*]. In the famous letter to Izambard of 1871, in which Rimbaud portrays himself as a seer, he stated: ‘It is wrong to say: I think. One ought to say: I am thought [*on me pense*].’ And in *Beyond Good and Evil*, in 1886, Nietzsche wrote: ‘It is a falsification of the facts to say: the subject “I” [*moi*] is the condition of the predicate “think”. It thinks: but that this “it” is precisely that famous old “I” is, to put it mildly, only an assumption’ (§17).

Nietzsche expressed this same idea on many occasions; a list can be found in Bernard Pautrat’s book *Versions du soleil*, in the chapter entitled ‘Décomposition du cogito’. The more certain the conviction that there is an illusion to be denounced, the more incontestable the fact of the illusion becomes, and the more pressing the duty to account for it.

‘*Wo Es war soll Ich werden.*’ This phrase of Freud’s, whose interpretation has divided psychoanalytic schools, can be appropriated for my own purposes. And the last word of this historical overview remains a question: how can an *I think* come to this *It or Id* [*Ça*] indicated and described, after the phrenologist, by today’s physiologist – that is to *It*, to a brain?

IV

What is called thinking? Even though this question has Heideggerian echoes in fashionable philosophical

circles, I shall look at it from its banal and trivial angle. The definition one gives of thinking will determine the various kinds of thinker one is prepared to admit. The author of the *Pensées* and inventor of the ‘thinking reed’ wrote: ‘The arithmetical machine produces effects which approach nearer to thought than all the actions of animals. But it does nothing that would enable us to attribute will to it, as to the animals.’⁶ We are not far here from the computer, whose effects are even closer to thought than were those of Pascal’s machine. Better, they exceed thinking. The now hackneyed metaphor of the brain–computer is justified in so far as what is meant by thinking involves logical operations, calculation, reasoning. Reason, *ratio*, derives etymologically from *reor*, to calculate. As for the will of animals, though one might deem that Pascal improperly enlarged this concept to include all sorts of behaviour guided by the needs of living beings, we must admit that there is at least one animal capable of desiring effects without precedent in its experience, namely man as the inventor of machines – that is, people like Pascal himself. If the arithmetical machine is the effect of a brain’s calculations to which it itself approaches, we must at least admit that the stubborn determination to construct fifty variations of a machine before hitting on its definitive version is proof of a consciously motivated will to construct. Such motivation, Pascal argued, could never be attained by any mechanical device. But if it isn’t possible to conceive of a machine that is motivated by the project to build a machine, if there is no computer at the absolute origin of the computer, who can forbid the philosopher from asking, apropos of the brain, different questions than those posed by physiologists? This by no means amounts to contesting the physiologist’s knowledge on its own terms. The structure of and relations between the brain’s neurons are the condition upon which the exercise of this knowledge depends. The progress and correction of physiologists’ knowledge are the concern of physiologists. The physiologist is master in his own house. But the philosopher’s indiscretion knows no bounds.

The computer emerged as a by-product of an attempt, enabled by the development of twentieth-century electronics, to mimic properties of the brain already identified by nineteenth-century neurophysiology: stimulus reception, transmission and switching of signals, elaboration of responses, and the recording of operations. The description of this functional nature of the schema in the current language of computing does not fundamentally change it. Depending on our preference, we can speak of the computer as a brain or the brain

as a computer. In his book *Mémoire pour l’avenir*, François Dagognet can write: ‘The real breakthrough is that man has managed to externalize the cerebral processes thanks to which he calculates, speaks and thinks’ (p. 8) and conversely that ‘The brain itself ... emerges as redefined as a result of being relayed by material memory’ (p. 199).

Here we encounter a specific case of a general theoretical strategy that is typical of contemporary science: a model is constructed on the basis of observation and experiments undertaken in a certain domain of reality, and then knowledge [*connaissance*] is further refined on the basis of this model, as if it was a matter of reality itself.

Let’s consider the following question: physiologists clearly accept that the brain is part of an organism, that is to say, according to Jean Nageotte’s definition, that it is part of a mechanism ‘whose construction is part of its functioning’. Is this paradoxical property, considered as regards the mechanisms artificially produced by people, extended by that other paradoxical property that physiologists ascribe to the brain, that is, the property of being the organ in which the representation of its functioning would be included in the functioning itself? The editors of the journal *Pour la science*,⁷ who recently published a special issue on the brain, maintain that this ‘great computer of our life’ has discovered ‘its marvellous properties by reflecting on its own specific nature’. But it isn’t only journalists who say such things. David Hubel, a renowned neurophysiologist, dismisses the ‘materialo-spiritualist’ (i.e. dualist) argument according to which the cerebral computer is incapable of comprehending itself. Hubel accepts, incidentally, that the human brain (10^{12} neurons, 10^{14} synapses, i.e., one hundred thousand billion) is different to the computer, whose components may never attain such a number, even in the future. Besides, the brain doesn’t operate according to a linear sequential programme. In the same journal, Francis Crick also shows how the analogy between brain and computer is misleading. He notes with regret that physiologists have not yet managed to describe conscious perception in a way that sheds light on the ‘very direct’ experience we have of it. He writes: ‘This phenomenon is strongly suspected of being a feedback effect, but we do not yet know exactly how this occurs.’ As if an action that turns back on itself could be taken as transcendent in relation to a direct action.

However there are some physiologists who do not blur the boundaries and limits of their science and who, in trying to push back these boundaries are also more cautious about the possibility of overcoming

these limits. In the prologue to his work *Logique des neurones et du système nerveux*, the biomathematician Pierre Nelson concludes with reflections about ‘the unsatisfying objectivity’ characteristic of types of explanation that confuse logic and feeling [*le ressenti*]. Professor Michel Juvet, when asked by a journalist from the *Nouvel Observateur*⁸ whether he thought a chemical formula for ‘the consciousness of consciousness’ might one day be discovered, remarked: ‘One system cannot comprehend another unless it is more complex. Logic... So will our brain be able to decipher its own secrets? Even with the help of a computer, I am not very sure that we will be able to translate all the processes of consciousness in neurobiological terms.’ But is the question really one of logic? François Jacob once invoked Gödel’s theorem in order to back up an answer similar to that given by Michel Juvet.⁹ No doubt we should ask whether, in doing so, he took too many liberties, since the question is foreign to its domain of validity – that is, to formal arithmetic. Nevertheless we ought to credit these biologists for their reluctance to deduce consciousness from a science of the brain, even one enhanced through recourse to the computer.

It’s difficult not to be astonished by the very widespread interest that not only scientists but also the public at large have in the electronic machinery of human thought. There is a long list of publications in the Anglo-American domain with titles that combine *Mind* or *Brain* with *Machine*. As for more general-interest discussion, as M. Bernard d’Espagnat has noted in a recent work, there are no self-respecting spiritualists, today, who don’t feel obliged to think of their minds in terms of computer contacts. There is no need to draw attention to the growing use, that is to say the abuse, of inappropriate expressions such as ‘conscious brain’, ‘conscious machine’, ‘artificial brain’ or ‘artificial intelligence’. How, then, we might well ask, are we to explain these conjunctions of incompatible terms? The answer no doubt lies in the fact that these metaphors, first coined by scientists on the basis of a legitimate recourse to heuristic models or sophisticated simulators, were later cleverly reworked as advertising clichés during the industrial phase of computer technology. How could we have anything against computers, if our brains are themselves computers? Would you like a home computer? Why not, since we all have a computer inside of ourselves? A model of scientific research was thereby converted into a machine of ideological propaganda with a twofold purpose: to anticipate or disarm all opposition to the invasion of a means of automating the regulation of social relations;

and to conceal the presence of decision-makers behind the anonymity of the machine.

But regardless of whether we are talking about analogical or logical machines, the calculation or processing of data according to a given set of instructions is one thing, and the invention of a theorem quite another. A computer is capable of calculating the trajectory of a rocket in outer space; it isn’t capable of formulating the law of gravitation. Invention cannot proceed without the consciousness of a logical void, without being drawn to a new possibility, without the risk of being mistaken. When Newton was asked how he found what he was looking for, he is alleged to have responded: ‘By thinking on it continually.’ What sense are we to give to this ‘on’? What is this situation of thinking in which one aims at what one does not see? And what place is there for such an ‘on’ in a cerebral machinery that has been assembled to connect pieces of data according to the rules set by a programme? To invent is to create information, to upset normal habits of thinking and the established state of knowledge.¹⁰ Just as Torres y Quevedo’s *The Chess Player* includes a gramophone that can say ‘check!’, so we can imagine a machine that cries out ‘eureka’ upon having discovered the solution to a problem for which the data and constraints were given in advance. But we cannot imagine it discovering Fuchsian functions as described by Henri Poincaré in his *Science and Method*. After several periods of fruitless work, after several times abandoning the problem and taking it up again, Poincaré understood, in a sudden flash, that there was a relation of identity between the transformations that had enabled him to define these functions and those of non-Euclidian geometry. This flash came to him one day in Coutances as he was getting on a bus: ‘the instant I put my foot on the step, the idea came to me...’ Will there ever be logical automatons to which ideas might suddenly come in this way? I will respond by connecting two quotations. In his study *Au sujet d’Eurêka*, Valéry wrote that ‘mad research [*les recherches insensées*] can lead to unforeseen discoveries.’ And a mathematician, René Thom, who explored the difficulties of constructing models capable of approximating chance and of formalizing the unformalizable, wrote: ‘In this task, the human brain with its old biological past, its clever approximations, its subtle aesthetic sensibility, is still irreplaceable and will remain so for a long time.’¹¹

V

However, if we cannot arrive at an understanding of how the brain is capable of invention by comparing it

to an electronic machine, perhaps we might explain it in chemical terms? Since the use of certain so-called psychotropic substances has brought about real improvements in the treatment of certain nervous and mental disorders, some researchers have begun to hope that this power to affect the symptoms of a disorder could also be applied to their causes. Whence the increasing interest in cerebral chemistry and the specific molecules involved in modifying the transmission of excitations at the level of synapses. Discoveries of neuropeptides – enkephalins and endorphins – that is, of endogenous substances, have given us the power to inhibit a certain amount of physical and moral pain.

Anti-psychiatry's current hostility to psychopharmacology, its systematic denunciation of 'chemical straightjackets', stems in part from an unjust indifference to problems of metabolic disturbance, problems that it's perfectly reasonable to treat or attenuate by means of chemically affecting neuromediators. Two cases in point are Parkinson's disease, which can be counteracted by the action of the drug levodopa (l-dopa), and schizophrenia, which can be eased if not cured by the administering of chlorpromazine, a drug whose discovery might be deemed as important as was that of anaesthetics for surgery.

Given the spectacular results of some of their work, it would have been surprising if psychopharmacologists had not sought to extend the power of chemistry not only to try to overcome brain defects, but also and above all to enhance brain performance. The authors of an article in *Newsweek*¹² claim that the time is drawing near when, following the example set by memory-enhancing substances, we will discover invention-enhancing substances as well. There is talk for instance of developing a drug capable of arousing a feeling of déjà vu, so as to help people solve problems that appear difficult only because they haven't experienced anything like them before – no mention is made, however, of the particular problems to be solved. But there is a big difference between dealing with a temporary breakdown, or a problem of counter-espionage, and a mathematical problem such as the general proof of Fermat's famous theorem. It's hard not to indulge in irony about the lengths to which the popularizers seem prepared to go. And how can we not see that the invention of this drug – what we might call the conception pill – would itself be considerably facilitated by the prior invention of the thing it is designed to produce? In other words, research projects that aim to develop a chemical aid to invention [*un soutien à l'heuristique*] would themselves be dependent, as they try to put their ideas into practice, on the

prior achievement of the very project in question. Such projects believe they can solve, at the level of cerebral microstructures, the particular problem of the solution to problems in general via the invention of a sort of pro-solution [*pro-solution*] (or pro-conception) pill. In fact, however, they succeed only in reduplicating the problem, or, to put it more simply, in using a lever without a fulcrum.

Consequently, despite the existence of and welcome effects of certain chemical mediators, and despite the perspectives opened up by certain discoveries in neuroendocrinology, it seems we are not yet in a position to announce, like Cabanis, that the brain secretes thought as the liver does bile.

I have not forgotten that Pascal did not forget about memory. I shall recall two more of his *Pensées*: 'memory is necessary for all the operations of reason' (§369); and 'when I was small I hugged my book' (§371). In the first case, Pascal has in mind the memory of the calculator, the researcher, the administrator, the strategist. This is memory as archive and inventory. It is the memory we believe we can imitate, multiply, relieve, and, at the limit, replace with the automatic processing of banks of data, with an artificial memory exempt from memory disturbances.

But, to use an expression of François Dagognet, what kind of future does this 'memory for the future' open up for memory? What future is opened up for the memory that says '*When I was young...*', for that memory of time lost and time regained, for those memories of which, in the final lines of his book, Proust wrote 'that when the desire of a living body is no longer there to sustain them they will eventually perish'?

A proper examination of the subject deserves more than one conference paper and more than one conference. So I shall deliberately refrain here from treating a question that in all logic should lead us to consider the likelihood that some day we will see in the window of a bookshop a book entitled *A Computer's Autobiography*, if not *A Computer's Self-Critique*.

VI

What now are we to call thinking in cases where what is at issue is that power of a living being that Pascal calls 'will', that power which he says no machine can simulate? Pascal's insistence may appear clumsy to all those who might readily object by evoking today's robots, the tortoises and electronic animals of Grey Walter or Albert Ducrocq – so many machines to which are readily attributed a sense of appropriateness and an ability to adapt to circumstances and to learn.

Pascal could not foresee that in 1908, Henri Piéron would borrow the word *comportement* from him to translate the English word *behaviour*, a word adopted in the USA in the early years of the twentieth century by Thorndike, Jennings and Watson to designate guided forms of animal conduct [*conduites animales polarisées*] as biological phenomena of adaptation to the environment. Even though – thanks in short to a strange process of exclusion and retention – ‘psychology’ remained the name for this study of behaviour, all reference to thought and consciousness was forbidden, and the brain was treated merely as a black box whose only features worthy of analysis were the inputs that entered it and the outputs that left it. Of course, distinctions were still made between various forms of living behaviour, some of which were still considered as intelligent, though without reference to any reflective capacity of judgement. Intelligence in this objective sense consisted merely in the correction of behaviour in the face of obstacles encountered in the search to satisfy a given need.

It is well known that the objective study of behaviour uses techniques of conditioning by means of learning apparatuses. But there are two sorts of conditioning that are not always sufficiently differentiated: Pavlovian conditioning, which works by grafting a stimulus-response relation onto an innate reflex relation; and Skinnerian or instrumental conditioning, which works, through repeated positive reinforcement, to consolidate forms of behaviour that achieve satisfactory solutions but that were initially discovered by chance. Inside one of Skinner’s boxes, by dint of repeated experiences of error-punishment or of correctness-reward, a rat or pigeon acquires the apparently intelligent behaviour involved in the calculation of pros and cons. Both these theories of conditioning think it legitimate to apply conclusions obtained from the study of animals to humans. It would be hard to deny that those who rely on such conclusions come close to identifying learning with training [*dressage*], and to understanding every environment as a milieu (including the social and cultural environment in the case of people). Ultimately, they slide more and more away from the concept of education towards the concept of manipulation. To which of these two enterprises should we associate the techniques that orient and guide individuals in the social milieu, via the open or disguised distribution of rewards?

To be fair, however, we should note that the theory of conditioning based on Pavlov’s work has, thanks to an anthropology that claims to subscribe to dialectical materialism, been incorporated into a philosophy that

is non-reductionist in so far as it expressly recognizes that the human cultural environment is a historical effect and not a natural given. From this perspective, thought is not a purely cerebral function, a biological product; it is a social effect, an effect relative to the type of society in which it intervenes. In a conservative or repressive society, the equation thought = brain serves as a justification for techniques of normalizing conduct. Progressive neurologists consider Skinnerian conditioning to be the reflection of American society and the means of conserving it. To which American radicals respond by saying that conditioning, de-conditioning, brainwashing and chemical straightjacketing are not the privilege of any particular country.

But what is essential about the human social environment is that it is a system of significations. A house is not perceived as stone or wood but as shelter; a pathway is not levelled earth, it is a passage, a track. Even for Neanderthal man, sharpened flint is not simply stone: its hardness is not merely a given of sensibility; it is above all caught up in a project to make tools. Hammering or percussion is not merely a movement but a gesture whose primordial effects, tools and fire, are at the root of what human beings understand as the meaning [*sens*] of their existence. Can it be argued, then, that learning and mastering the meaning of things and acts in a cultural environment raise no other problems of method than those involved in the training of animals through conditioning? These problems culminate in that of language. The thought–language relation refers to the brain–thought question via the language–brain relation. Is language ‘learned’ in the same way as every other behaviour, as Skinner would have it? Is language teaching analogous to a type of conditioning whose aim is to form a stable relationship between a signifier, a signified and a referent? If we identify learning and conditioning, do we not thereby resuscitate empiricism, which as we know emerged during an epoch that knew nothing of brain functions? If it is necessary to take innate linguistic capacities into account, must we then identify innateness with genetic cerebral programming? This was the question at stake in a debate between Noam Chomsky and Jean Piaget, organized at Royaumont and recently published under the title *Théories du langage, théories de l’apprentissage* (Seuil, 1979).¹³

By arguing that a language’s grammar is not a property of that language but a property of the human brain, Chomsky believes he can account for why it is that a child who learns to speak the language of his adult interlocutors could just as easily have acquired

a different language by communicating with different interlocutors. When people object that what Chomsky assumes to be inscribed in the fixed core of language is something that could be attained through general intelligence, he responds by saying that learning to learn requires an initial disposition. Chomsky argues that the need to have recourse to a generative capacity in order to explain language learning simply confirms what Wilhelm von Humboldt recognized about creativity when he said: 'A language can make infinite use of finite means.' It's easy to understand why Chomsky claims an allegiance to Descartes and Leibniz, philosophies that defend the innateness of rational principles, but it is harder to see how he can identify the necessity of universal constraints of linguistic competence with the genetic determination of cerebral capacities. What is certain is that his opposition to Skinner and to the theory he presents in *Verbal Behavior* parallels his political opposition to Skinner's theses in *Beyond Freedom and Dignity* (1971):

The belief that the human mind is empty provides a justification for all sorts of authoritarian systems. If the human mind is empty then any method for fashioning minds to one's liking is legitimate, and this can be taken to extremes, as in Skinner, for example, where everything ends up in a sort of fascist schema.¹⁴

But Chomsky's opponents claim that arguments for the innateness of intellectual capacity can also be used in favour of elitism, in order to help justify inegalitarian social relations. Suffice it to say, for the moment, that in its current biological version the debate between empiricism and innatism supplies arguments to both sides of the political spectrum, indifferently. No doubt this indicates that justifications for political positions must be sought elsewhere than in the brain. On this latter point, by the way, the conclusion of Jouvett's¹⁵ lecture merits our attention. He puts forward the idea that dreams, the expression of a cerebral activity closed to external afferences, cut off from the environment, could be taken as the indication of an activity that serves to maintain the hereditary programme, as a rupture in social relations. Dreams would then be the guardian of natural freedom in reaction to cultural constraints. One is tempted to evoke Rousseau's opposition between savage and civilized man, and the axiom according to which man is born free but is everywhere in chains. But Rousseau's own *Creed of a Savoyard Priest* prevents us from including him among those who look to physiology for the foundations of pedagogy and politics.

VII

In short, human language is essentially a semantic function that physicalist kinds of analysis have never managed to explain. To speak is to signify, to give to understand, because to think is to live within meaning [*sens*]. Meaning or sense is not a relation between..., it is a *relation to...* That is why it escapes every attempt to reduce it to an organic or mechanical configuration. So-called intelligent machines are machines that produce relations between sets of data that we provide to them, but they are not in *relation to* what the user intends to do on the basis of the relationships that the machine produces. Because meaning is a *relation to*, people can play with it, twist it, feign it, lie, set traps.¹⁶ In all these instances, we have to take into account a gap in the *relation to*, an infringement or stretching [*entorse*] of meaning. The relationship of meaning in language is not that of an immaterial replica [*réplique*] of physical relations between elements or systems of elements in the brain of the speaker. Conversely, the meaning of uttered speech in the *relation to...* is not the production of a physical configuration in the brain of the interlocutor. Just as our visual cerebral sphere does not strictly speaking see the objects that our eyes are supposed to give us to see, so there is in the folds of the cortex no thought that contemplates ghosts of the objects or situations that our words have in mind. No more than in the nineteenth century, in today's electronic age we cannot explain scientific cognition and poetic experience by means of a cerebral replica of the relation between organism and milieu. When speaking with their gardener or valet, Copernicus and Galileo can say that the sun rises, since like them they saw the sun's globe rising above the horizon – but they do not think the sun rises. Victor Hugo can later claim to perceive the opposite of what he sees at sunset, to perceive in some sense the truth of the apparent movement of the stars; that is, to perceive what we have been obliged to think since Copernicus and Galileo:

The day was dying; I stood by the sea on the strand.
My daughter, dreamy child, I had by the hand,
The young soul was still and silent!
Rolling like a sinking ship caught up in a swell,
The earth pitched on through space as the darkness fell;
And the pale night began its ascent.¹⁷

[Le jour mourait; j'étais près des mers, sur la grève.
Je tenais par la main ma fille, enfant qui rêve,
Jeune esprit qui se tait.
La terre, s'inclinant comme un vaisseau qui sombre,

En tournant dans l'espace allait plongeant dans
l'ombre;
La pâle nuit montait.]
(Les Contemplations: *Magnitudo Parvi*)

The relationship between brain, thought and world thus cannot be conceived as the mental (or internal) reproduction of physical effects produced in the brain by the introduction of the (external) world into it via sensory pathways. Wittgenstein provided an incisive word on this point in his *Zettel* (fragments written between 1945 and 1948): 'Philosophers who believe that one can, so to speak, extend experience in thought, ought to know that one can transmit speech via the telephone, but not the measles.' Certainly, one cannot transmit the measles via the telephone, but one can transmit over the telephone discourses whose symbolic colour is not agreeable to everyone. Whence the practice of phone tapping. Whence the practice of evicting individuals for contagious thought disorders – evictions that generally last longer than the eighteen days during which you must stay home from school if you come down with the measles.

There are several ways to account for the fact that human speech refers to thought which itself refers to a subject that is not a part of the world but, as Wittgenstein says, 'a pre-supposition of its existence'. One can, for example, subscribe to critical reflection on the illusion of psychic interiority, as in the opening section of Maurice Merleau-Ponty's posthumous work, *The Visible and the Invisible* – without needing to accept all the theses of existentialism. Or one might prefer, on grounds of axiological neutrality, the reference to Wittgenstein, as quoted above. The author of the *Tractatus Logico-Philosophicus* insists on the fact, from which he draws a general consequence, that our field of vision is not itself seen by a sort of mental eye, an eye that might be localizable within the world of perception:

There is therefore really a sense in which in philosophy we can talk of a non-psychological I [*moi*]. The I occurs in philosophy through the fact that the 'world is my world'. The philosophical I is not the man, not the human body or the human soul of which psychology treats, but the meta-physical subject, the limit – not a part of the world. (5.641)¹⁸

Perhaps the best commentary on this text is not to be found in philosophy but in painting. The vision of the painter is also a signifying *relation to*. Maurice Denis has said that Cézanne used the term *motif* to name what he wished to represent, what he found invit-

ing him to paint, rather than the subject, that is, the represented things about which one can speak. It might be argued that, for the philosopher, the painter's vision as act of presence to the world is more instructive than a psychophysiological theory of vision. A painting by René Magritte, *Le paysage isolé*, is the image of a landscape contemplated by a man seen from behind, and who says in a speech balloon: 'I don't see anything surrounding [*autour du*] the landscape.' It is very true that *I* do not see anything surrounding the landscape, not as *I* would see the wall surrounding a painting that represents a landscape around which someone who says *I* sees nothing. *I* am the totality of my vision, but *I* can always change the whole of my vision by moving. This is proof that *I* do not coincide with that of which *I* constitute the limit. As Raymond Ruyer would say, the perceptual field is an absolute surface, but it is also mobile. The *I* is not with the world in a relation of overview [*survol*], but in a relation of surveillance [*surveillance*].

VIII

This brings us back to the point on which we ended our initial historical outline. Thinking is a human practice that requires self-consciousness in presence to the world, not as the representation of the subject *I* but as its claim or demand [*revendication*], for this presence is vigilance and more exactly surveillance. From a philosophical point of view, acknowledgement of a subjectivity without interiority involves no contradiction, and should not arouse suspicions of solipsistic idealism. Properly understood, the concept of interiority conveys a spatial image. Interiority is exteriority turned inside out [*renversée*], but not abolished. In this respect, the surveillant [*surveillant*] *I* of the world of things and people is as much the *I* of Spinoza as the *I* of Descartes. While Descartes inwardly considers the self-evidence of his *cogito*, Spinoza asserts the impersonal axiom *Homo cogitat*. But when he comes to compose *Theologico-Political Treatise*, Spinoza is that *I* who in the last chapter demands, confronted by the Sovereign's acknowledged right to govern over all things in the state concerning the actions of its citizens, 'that all be granted the right to be able to think what they want and to say what they think'. Although Spinoza generally used the modest pronoun 'we', at the end of this work he could not restrain himself from writing: 'I have thus fulfilled the task I set myself in this treatise I know that I am a man, and as a man liable to error.' Intentions, mistakes – these, we have argued, are among the marks of thought. The Spinozist *I* is not, despite the geometrically demonstrated *Ethics*,

any less *I* than is the *I* of Descartes's *On Geometry*, on account of the fourth section of the *Discourse* that precedes it. Regardless of the opposition between the Cartesian and Spinozist conceptions of the relation between soul and body, nonetheless Spinoza says *I* as if he were the solitary and outcast representative who acts in defence of his system, just as Descartes in his *Replies to the Fifth Set of Objections* says *I* when defending himself against Gassendi, whom he designates as 'Flesh'.

For my part, I have no qualms in saying, of Descartes and Spinoza, that it is the latter whose subjective function of presence-surveillance is the most manifest. In the second part of the *Discourse*, Descartes is very careful to defend himself against charges of having engaged in political critique. He states that all he wanted to do was to reform his own thought. He has kept his distance from people whose 'muddled and worried temperaments' led them towards opposition. The philosopher of *générosité* began with a philosophy of prudence. Spinoza, by contrast, took a public stand in favour of the right to freedom of thought. Friend of Johan de Witt, Grand Pensionary of Holland, whose republican convictions he shared, Spinoza was witness to the latter's assassination in 1672 by an Orangeist mob in The Hague, as the armies of Louis XIV were invading Holland. Spinoza's indignation and sorrow determined him to leave his lodging in order to put up a poster on the walls of the city on which he wrote: *Ultimi barbarorum*. It is said his landlord had to use force to restrain him.¹⁹ In short, Spinoza's philosophy, this philosophy that refutes and rejects the foundations of Cartesian philosophy – the *cogito*, the affirmation of freedom in God and people – this philosophy without subject, frequently reduced to a materialist system, this philosophy, lived by the philosopher who thought it, gave its author the strength of mind or spirit [*ressort*] required to rebel against *le fait accompli*. Of such spirit [*ressort*], philosophy must provide an account.

In pursuit of this end, philosophy can expect nothing from the services of psychology, a discipline that, as Husserl put it, emerged back in the days of Aristotle in a manner that has remained a 'permanent disaster' for philosophical minds ever since.²⁰ By 'psychology' I mean a science that pretends to be objective, to situate itself among the other objective sciences and to teach them about the intellectual functions that allow them to be the sciences that they are. Philosophy can only resist this pretension of a part to want to account for the whole. Philosophy must therefore leave it to psychology to continue to make suggestions as to

how its theoretical advances might be exploited in pedagogy, in the economy, and, ultimately, in politics. As for philosophy, its specific task is not to increase thinking's output or yield [*rendement*], but to remind it of the meaning of its power.

To assign philosophy the specific task of defending the *I* as a non-transferable claim or demand of presence-surveillance is to see its sole role as that of critique. This task of negation is by no means negative, however, since to defend a reserve is also to preserve the conditions of possibility under which one might leave or come out of it. Of course, I can easily imagine the sort of sarcasm the word *reserve*, employed to give sense to that little word *I*, cannot fail to elicit, on the one hand among psychoanalyzing psychoanalysts, who will take it as a symptom of misrecognition of the unconscious, and on the other hand among physicalizing physicalists, who will denounce the ridiculous preservation of something inherited from a defunct spiritualism. But philosophical reserve is neither hiding place nor sanctuary; it is the guardian of spirit [*garde du ressort*]. A suspension of acquiescence, of support [*adhésion*], of adherence [*adhérence*], is neither withdrawal nor abstention. This is why we must take care not to appear to internalize the *I*, at the very moment when we might be tempted to merge subjectivity and interiority – in reaction against the current assimilation of thought to what René Thom has called 'the electronic hardware shop'. To defend one's reserve obliges one to come out of it occasionally, as did Spinoza. To leave or come out of one's reserve is something we do with our brain, with the living regulator of active interventions in the world and society. Coming out of one's reserve means setting oneself against all foreign interventions into the brain, interventions that tend to deprive thought of its power of reserve in the last resort [*en dernier ressort*].

I think you will grant me that in taking Spinoza's conduct as an example, I have neither promoted confusion nor played on words. To come out of one's house is the symbolic image of coming out of one's reserve. It so happens that Spinoza actually did both. No doubt we should not attribute to Spinoza a philosophy other than his own. His conduct is the proof that, as it says in the last part of the *Ethics*, the order and connection of the body's affections arrange themselves in keeping with the order and sequence of thoughts in the mind; true freedom would be the perfection of this correspondence. But his last word is that 'all things excellent are as difficult as they are rare'. So, while waiting to attain 'consciousness of oneself, and of God, and of things, by a certain eternal necessity', the wise man may

on occasion find himself obliged to make an instant decision about what conduct to take regarding ‘the ordinary dangers of life... [which] through readiness and resource of strength of mind we can avoid and overcome’.²¹ This is why Spinoza came out in public to condemn certain men as barbarians, even though he had said that indignation is necessarily bad (since it generates hatred), and even though he knew that the crowd is fearsome when it fears nothing. The man who wrote that we do not know all the capacities of the human body and that we sometimes wrongly attribute them to the soul – this man came out of his home along with his brain, and he did so in a manner that was certainly in keeping with his philosophy. But perhaps he came out of it through an imperceptible Cartesian crack in its philosophical construction.

At first glance, we might think that Spinoza had made a mistake. He might have made the mistake of believing that the barbarians he publicly denounced would be the last of their kind. But he understood Latin and he meant what he said: the most recent, the latest to come along. Consequently, today’s philosophers, whatever their line of research, whether Spinozist or Cartesian, are guaranteed not to lack occasions or reasons to go out – at their own risk and in an act of commitment monitored by their brain – to write on the walls, fences or ramparts: *Ultimi barbarorum*.

**Translated by Steven Corcoran
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Notes

1. Paul-Jules Möbius (1853–1907), a German neuro-physiologist known as ‘Gall redivivus’, located the mathematics bump above the left eye-socket, on its exterior side. See his *Über die Anlage zur Mathematik*, Leipzig, 1907. He was the grandson of the illustrious mathematician and astronomer Auguste Ferdinand Möbius (1790–1868), inventor of the Möbius strip.
2. Gottlieb Burckhardt, ‘Über Rindenexcisionen, als Beitrag zur operativen Therapie der Psychosen’, *Allgemeine Zeitschrift für Psychiatrie* 47, 1891. On the beginnings of psychosurgery, see the article by Alain Jaubert, ‘L’excision de la pierre de folie’, in *Autrement: Guérir pour normaliser* 4, 1975–76.
3. Pierre Janet, *Cours du Collège de France 1923–1924*, cited by Marcel Jousse, ‘Études de psychologie linguistique’, in *Archives de Philosophie*, vol. 2, no. 4.
4. An interesting study on Pierre Janet is to be found in a thesis by Claude Prévost, *La Psychophilosophie de Pierre Janet*, Payot, Paris, 1973.
5. *Translators’ note* The German reads ‘Es denkt sollte man sagen sowie man sagt *es blitzt* (literally: ‘there is lightning’).
6. Pascal, *Pensées*, Harvard Classics, Cambridge, 1909, §340.
7. *Pour la Science*, Special Issue, November 1979.
8. *Nouvel Observateur*, 29 October 1979.
9. ‘But to describe a movement of consciousness, a feeling, a decision, a memory, in the terms of physics and chemistry – that is another matter. There is nothing to say that we will ever be able to manage this. Not only as a result of complexity, but also because we know, since Gödel, that a logical system cannot suffice to describe itself.’ François Jacob, *La Logique du vivant*, Gallimard, Paris, 1970, p. 337.
10. The persistence of a stationary state of knowledge, after a theoretical invention, is a sort of objective measure of the originality of that invention. This is what led Max Planck to say in his *Autobiography* that for a discovery to gain general recognition it is not enough to accumulate theoretical proofs: it often has to wait for its adversaries to disappear and for a new scientific generation to come to power.
11. Cited in Henri Atlan, *Entre le crystal et la fumée*, Seuil, Paris, 1979, p. 229. René Thom further stresses the adventurous character of theoretical invention when he says: ‘Almost all progress in algebra stems from the desire to carry out forbidden operations (negative, rational, imaginary numbers, etc.)’ *Colloque de Royauumont: Théories du langage, théories de l’apprentissage*, Seuil, Paris, 1979, p. 508.
12. ‘Drugs for the mind’, *Newsweek*, 12 November 1979.
13. Jean Piaget et al., *Théories du langage, théories de l’apprentissage: Le débat entre Jean Piaget et Noam Chomsky*, Seuil, Paris, 1979. (*Translators’ note* The English version was published as Jean Piaget, Noam Chomsky, and Massimo Piattelli-Palmarini, *Language and Learning: The Debate between Jean Piaget and Noam Chomsky*, Harvard University Press, Cambridge MA, 1980.)
14. Chomsky, *Théories du langage, théories de l’apprentissage*, p. 393.
15. See Michel Juvet’s paper: ‘Les états de vigilance: bilan et perspectives’, in *Prospective et Santé* 14, Summer 1980, pp. 73–80.
16. A machine cannot play tricks on you, any more than it can play tricks on itself. To put it differently, a machine is incapable of machination. Michael Scriven makes of the capacity to lie the criterion by which to distinguish between consciousness and an apparently conscious robot. ‘The Mechanical Concept of Mind’, in *Minds and Machines*, Prentice Hall, Englewood Cliffs NJ, 1964.
17. *Translators’ note* Translation of *Magnitudo Parvi* by Geoffrey Barto, http://gbarto.com/hugoinfo/2003_03_01_hugoarchive.html.
18. I should add that, even at the time of *Tractatus Logico-Philosophicus*, when he says metaphysical subject Wittgenstein does not mean ontological subject – and in his subsequent work he abandons this concept of metaphysical subject.
19. Occasionally disputed, this account of Spinoza’s conduct is reported by Jakob Freudenthal, *Das Leben Spinozas*, Stuttgart, 1904. Cf. Baruch Spinoza, *Œuvres*, vol. 1, ed. Charles Appuhn Garnier, Paris, p. 218 n1; and Georges Friedmann, *Leibniz et Spinoza*, Gallimard ‘Idées’, Paris, p. 110.
20. Husserl, *Philosophie première*, 1923–1924, vol. 1, p. 75.
21. Spinoza, *Ethics* part 5, proposition 10, note.