

Technical activity, technology and language: comparing money and language from a Cassirerian perspective ¹.

My aim in this article is to discuss Ernst Cassirer's conception of technical activity in relation with the notion of a symbolic form. The questions I shall raise are: in what sense is technical activity a symbolic form? What kind of relationship does technical activity entertain with other forms and in particular with language? And what does this relationship teach us about technical activity today? After trying to answer these questions in a theoretical way, I shall use the comparison between money (interpreted as a technology) and language (interpreted as the paradigmatic symbolic form) as a case study.

1. A disparity in Cassirer's philosophy

1.1. Linguistic versus technical activity

In Cassirer's *Philosophie der Symbolischen Formen* (hereafter *PhiSymbForm*), the relationship between symbolic forms is always interpreted from the point of view of language, since it is ultimately the human attitude towards language which makes new symbolic forms possible: the vision of the world remains mythical, says Cassirer, when the human attitude towards natural language is that of proximity, and it becomes scientific only when the human attitude towards natural language is that of a divorce. If mythical thought is considered as the most primitive symbolic form in the historical order, it is nevertheless the attitude towards language which allows for the further symbolic developments of humanity. In the case of technical activity, how should its relationship towards myth and language be described? Is technical activity opposed to myth and language, the same way science is? Or, on the contrary, does technical activity possess a common ground with myth and language?

If we take into account Cassirer's *PhiSymbForm* only, we are left with speculations, since technical activity is not analyzed as such. Consequently, technical activity is not

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considered as a primary symbolic form alongside language, mythical thought or science and we do not even know if it is a symbolic form at all. Rather, what is stressed in the first two volumes of *PhiSymbForm*, as well as in other works of the same period², is the proximity of mythological thought to language. And in *PhiSymbForm* in general, the relationship between language on the one hand and mythological thought and science on the other is always kept in balance: the most mythical layers of meaning are always active in language, which is nonetheless a means of escaping from these very layers at some later step in the development of symbolic forms. Language possesses therefore the unique versatile power of pervading all symbolic forms, from the most mythical to the most scientific ones. Thus, at the time of *PhiSymbForm*, Cassirer's philosophical agenda was clearly focused on the attitude towards language, since it is this attitude which directly modifies the inner balance between other symbolic forms, especially mythical and scientific thought. Hence the crucial role played by language right from the beginning of *PhiSymbForm*.

The importance of *Form und Technik*, published in 1930³ (from now on *FormTech*), clearly derives from its focusing on the question of the nature of technical activity in its relationship with the notion of symbolic form. What is striking in this article is that an opposition is being made between language and technical activity on the one hand and mythological thought on the other: when man was still immersed in a mythical vision of the world, says Cassirer quoting Herder, language and tools opened up an entirely new realm by severing him from the immediate present and attracting him into the workings of mediation. But one has to ask the following question: is the linguistic mediation of the same kind as the technical one? In the case of language, two dimensions seem to be at stake: the dimension of *expressivity*, i.e. the fact that one has to acknowledge that he or she is the addressee of what happens in a particular situation, and the dimension of *semiosis*, i.e. the fact that any given meaning of a sign is appointed by repetition and it is thanks to other signs that a sign is recognised as such, otherwise the sign loses its character of sign and becomes a mere piece of matter deprived of meaning. In the case of technical activity, the mediation is not of the same kind because it operates between a tool and *Nature*, defined as this entity which neither addresses anything to humans nor depends on their semiotic conventions. Hence the obvious

² In 1925, Cassirer published not only the second volume of *die Philosophie der Symbolischen Formen* focused on mythical thought but also the article *Sprache und Mythos ; ein Beitrag zum problem der Götternamen* which I consider Cassirer's best analysis of the relationship between language and myth.

³ i.e. only one year after the last volume of *PhiSymbForm*. Cassirer's personal evolution on the question of technical activity seems to have been influenced by his 1929 meeting with Heidegger in Davos.

discrepancy for any unbiased reader between the two kinds of mediation. Nevertheless, in *FormTech*, linguistic and technical activities are both seen as primitive symbolic forms, used as vectors of a progressive disengagement from the mythical attitude to the world. Cassirer seems therefore to answer the question regarding the relationship of technical activity to language and to mythological thought in a twofold way: first, he identifies the case of technical activity with that of language from the point of view of their mediating power; secondly, he argues that technical activity is opposed to mythological thought in the same way as language can ultimately become opposed to mythological thought.⁴

Thus, it seems undeniable that the two points of view in *PhiSymbForm* and in *FormTech* are in opposition to one another, even if language keeps its fundamental role in both of them. Is it only a difference of presentation? The discrepancy seems much deeper than this. The description developed in *PhiSymbForm* is in fact transcendental: language is construed as the basic form within which other symbolic forms can be conceived of on an *a priori* basis. Even if the description starts with language and ends with science, there is no finality which would lead from mythological thought to science as the ultimate symbolic form,⁵ and both of them appear more as examples of symbolic analysis than as steps towards an ultimate knowledge conceived in a kind of Hegelian way. The point of view developed in *FormTech* is historical: the mythical interpretation of the world is the basic socio-semiotic situation in the history of humanity, from which a way out became possible thanks to the mediation of language and technical activity. It is the inner relationship between language and technical activity which prompted the mutation leading from a mythical attitude to the world to a scientific one. Therefore, the two viewpoints exposed by Cassirer do not match, not only because finality is not interpreted in the same way in the two works but because the emphasis on language in the first one involves a semiotic state which is immediately given thanks to the presence of signs conveying meanings, contrary to what happens in the second one, where technical activity is not immediately semiotic, i.e. is not characterised as using conventional signs the way language does. What seems to characterise technical activity in general is its

⁴ From this sketchy outline, one could easily be led to conclude that the symbolic evolution of humankind consists in the progressive separation from mythological thought and its replacement by science. But this is not the case: if it were, language would stop occupying the transcendental core in the system of symbolic forms and would eventually be replaced by science, the development of which is based on a divorce with natural language, as Cassirer often pointed out. But this replacement never happens, for linguistic activity is the unique driving force able to mingle into all human activities in general.

⁵ We know that Cassirer prepared a sequel which was published in 1995 only under the title *Zur Metaphysik der symbolischen Formen*, John Michael Krois ed., vol 1 of *Nachgelesene Manuskripte und Texte*, Hamburg, Felix Meiner.

neutralization of the expressive dimension, due to the fact that it operates unconsciously: even if the final goal of a technical activity can be represented and evaluated by the individual, the technical activity itself is embodied in such a way as to be forgotten entirely. For example, nobody has to think of the potential difference in wires to switch on the light: this is typical of a technical activity in which the process activated to reach a goal is entirely blind. And science in general is precisely a form in which the main goal of technical activity is directed towards *objectivity* conceived as deprived of any expressivity. The point at stake is therefore the following: how is it possible for technical activity, the inner workings of which are deprived of any expressive dimension, to be recognised eventually as an activity in itself and therefore as performing a specific form of expression?

We are therefore faced with two problems: (i) if a symbolic form is symbolic thanks to the semiotic presence of signs only, in what sense can technical activity be considered as a symbolic form in its own right? ; (ii) and if technical activity is nonetheless acknowledged as a symbolic form, what is the relationship between language and technical activity?

There is, I think, a way to answer both questions which remains faithful to the spirit, if not to the letter, of Cassirer's philosophy.

12. Activity as the basis of language and tool-making

As for the first question, language is an *activity* just as much as technical activity, as Cassirer pointed out repeatedly, borrowing the Greek concept of '*energeia*' from Humboldt and Bühler in order to characterize its nature. It is therefore because both language and technical activity are activities that they have a common ground, not because language makes use of signs whereas technical activity does not necessarily do so. What does 'activity' mean in this context? An activity is a regular sequence of actions focused on a collective goal which is performed for its own sake. It involves a way of performing specific gestures⁶ in which the use of linguistic signs can be included. The collective aspect of an activity should not therefore be interpreted in terms of one to one transactions between individuals since it is not the more or less large number of individuals which makes the activity collective. It becomes collective when it is performed for its own sake, defining by its own process what should be considered as proper for the activity under way. Once an inherent norm is recognised in

⁶ A well documented example is the social difference between the right and the left hand. Cf. Roger Hertz, "La prééminence de la main droite; Étude sur la polarité religieuse" [The Preeminency of the Right Hand; A Study of Religious Polarity], *Revue philosophique*, LXVIII, Juillet-Décembre 1909 : 553-580, translated into English by R. Needham in R. Needham ed., *Right and Left. Essays in Dual Symbolic Classification*, The University of Chicago Press, Chicago and London, 1973.

specific marks and gestures, these marks and gestures acquire a social status: the marks may then be interpreted as signs and the gestures as involving tools. From this moment on, they can be used for their own sake, defining the norm which should be followed by the activity. It is therefore not the fact that tools are external objects extending an activity already achievable by other means like the movement of a limb (arm, hand, finger, etc.) that makes them tools; in order to take place, a human activity needs social landmarks that must be recognised as such by those involved in the activity. These landmarks can eventually become tools when the landmarks are involved exclusively to reach the goal of the activity itself. Hence the fact that tools are used unconsciously, except when they become dysfunctional. And it seems to me that the same holds true too for the use of linguistic signs, as some psycholinguists have already pointed out⁷.

If language and technical activity are to be associated, as it is the case in *FormTech*, we must expand the notion of a symbolic form to any kind of shared activity, semiotic or semiotic-to-be. Consequently, we can interpret the nature of linguistic activity as the symbolic form which keeps transforming itself through the interface it has with other activities, like the technical one. It is through this interface that new symbolic forms evolve in their own right, like science. Language remains therefore the fundamental basis from which other activities become susceptible of bearing some expressivity, thus becoming symbolic forms. It is, I believe, this *internal symbolic drift* which is the core of *PhiSymbForm* as well as *FormTech* and, more generally, of Cassirer's published philosophy.

As for the second question which deals with the specific relationship between language and technical activity, it boils down to the question of how the technical activity becomes a symbolic form. We have to focus on the definition of technical activity given by Cassirer to answer this question.

2. Three points in Cassirer's conception of linguistic and technical activities that should be reconsidered

If technical activity, along with language, plays a mediating role which gradually involves a withdrawal from the mythical attitude to the world, how is this role to be conceived of? It seems to me that at least three points should be re-examined in Cassirer's position if we want to take into account recent advances in the nature of technical activity.

⁷ Cf. infra and M. Tomasello (1999), *The Cultural Origins of Human Cognition*, Harvard, Harvard University Press.

21. *Language and tool-making as criteria for humanity*

In *FormTech*, Cassirer, along with most of his contemporaries⁸, defends the idea that both language and technical activity are criteria that can be used to characterise humanity as such. This question has received close scrutiny in the last twenty years or so and, in view of these recent findings, it is not possible to expressly defend Cassirer's point of view today.

Let us take the case of technical activity first. The debate concerning a possible "animal technical activity" oscillates between two extremes: either the cases of humans and of superior primates are identified by promoters of the animal cause or they are separated by defenders of a human specificity. There are very good arguments in contemporary archaeology and ethology to claim that this second viewpoint is just wrong: technical activity has been tracked back to pre-humans⁹ and, to some extent, even to animals. Consequently, the position held at the time of Cassirer is not sustainable in the same terms any longer. But this new state of affairs is an opportunity to clarify the nature of technical activity. Thus, the point under discussion is less the presence or absence of technical activity in animal groups, a fact which is not questionable today, than the way animal technical activity is organised and connected to other activities. The indirect consequence of this last point is that the notion of a symbolic form has to be refined as well.

Let us point out first that in the debates concerning animal technical activity, and more generally concerning animal culture, the extensive use of ill-defined and polysemic concepts such as "culture", "tradition" and "cooperation" makes it almost impossible to validate any serious advance on the issue. But we should try nevertheless to clarify them by going back to some anthropological definition of technical activity, like the one proposed by Marcel Mauss as early as 1936¹⁰, and compare it to recent findings in ethology, as it is suggested by anthropologist Frédéric Joulain¹¹. The definition of technical activity given by M. Mauss is based on three features: it is an *activity* which is *embodied* and based on *tradition*. F. Joulain

⁸ A notable exception should be made for the Gestalt psychologist Wolfgang Köhler who published in 1921 an important book on ape intelligence, *Intelligenzprüfungen an Menschenaffen*, Berlin, Springer.

⁹ See for example, S. McBrearty & A. S. Brooks (2000), "The revolution that wasn't : A new interpretation of the origin of modern behavior", *Journal of Human Evolution*, 39 : 453-563. I will not consider the case of pre-humans here, for it would take too long. An analysis of this case can be found in J. Lassègue (2007), "Introduction" in *Emergence de la parenté*, Editions Rue d'Ulm, Paris (in French) ; http://www.pressens.fr/cgi-bin/automaton2.pl?Automaton_State=PLUSINFO&Cata_Action=PlusInfo&PlusInfo=978-2-7288-0383-5

¹⁰ "Les techniques du corps" [Bodily techniques] in *Sociologie et anthropologie* [Sociology and Anthropology], Presses Universitaires de France, Paris, 1950 : 365-386.

¹¹ Frédéric Joulain (2000), « Techniques du corps et traditions chimpanzières » [Bodily techniques and traditions among chimpanzees], *Terrain*, n°34 - Les animaux pensent-ils ? [Do animals think?]. URL : <http://terrain.revues.org/index951.html>.

points out that M. Mauss could only take into consideration the first feature, i.e. the notion of activity, which in his times was studied among superior primates. But today, says F. Joulain, contemporary primatology is able to track down traditions of behaviours among specific animal groups (such as the famous example of the potatoes being washed by a specific group of Macaque monkeys), as well as embodiments of special ways of performing gestures. Far from resting upon external and rather mechanical criteria to define what a technical activity is, such as the difference between a bodily gesture and an externalised tool, primatology and paleo-anthropology are now focusing on what seems to be the collective dimension of activity. But has this collective dimension a *social* aspect in the case of animal groups?

In actual fact, there is a difference in the collective aspects of technical activity in animal and human groups. What seems to be lacking in animal technical activity is the technological *heterogeneity* which is found in human activities¹²: once a specific tradition of embodied activity has emerged within a particular animal group, it spreads over the entire group, just as a chemical reaction would do, and is transmitted as such. Contrary to what happens in the case of animal technology, human technical activity keeps transforming itself while maintaining nonetheless a certain stabilised form. For example, this is the case with the different styles of stone arrowheads, the evolution of which can even help determining a chronology of prehistoric civilisations. On the contrary, animal technical activity seems to immediately reach a standard norm which is not subject to change or in which the change seems to appear randomly. Therefore, it is not the technical activity as such which introduces a difference between humans and animals, but rather the way embodied and transmitted activities are collectively lived, either in a purely symmetrical mimesis as in the animal case or in asymmetrical relationships defining roles among a socially diversified group of individuals as in the human case¹³. Technical activity is therefore not human specific but the way it is merged in a social network of activities is very likely to be. This has at least one consequence on the notion of a symbolic form: it is not by any activity arbitrarily limited to humans that a symbolic form should be characterised, but by a specific connection between instability and stability in its inner features. It is this connection which can help elucidate the notion of a symbolic drift I mentioned before.

¹² This idea was defended by Yves-Marie Visetti in the Parisian workshop already mentioned ‘Perception sémiotique et socialité du sens’.

¹³ It seems that the notion of group coalition which has been studied extensively among primates does not fulfil the social requirement I just mentioned: it is a way of solving a crisis between two individuals by forming coalitions on each side, however strong the two individuals are in the beginning. It is not properly social in the sense I gave to the term, for there is no object of transaction which would be pursued for its own sake.

We must therefore add one feature to the definition of technical activity proposed by Mauss: technical activity is an embodied activity based on tradition and depending on a social, and basically invisible, organisation in which roles between humans are heterogeneous. We can therefore introduce a difference between the technical activity displayed by animals and humans on the one hand and the *technology* only displayed by humans on the other. This way, we can stress the difference between technical activity which is not considered as symbolic yet and technology which belongs to the domain of symbolic forms.

Thus we can say that, even if the position held by Cassirer is now out of date, it does not mean that the debate on the status and the extension of technical activity in the human and animal world is over. The term 'technical activity' can therefore be attributed to a dimension of experience in animal groups but this activity cannot be akin to the technological one developed by humans, not because the notion of a tool would not be used properly in animal groups but because the social dimension in which tools are used seems to be lacking among them. It is therefore possible to draw a continuity between animal and human groups from the point of view of technical activity but only if this caveat is kept in mind: technical activity has not only to do with tools but also with a social experience of the world which, in the present state of knowledge, is thoroughly different in animal and human societies.

Let us briefly mention the case of language now. Language is considered as human specific in Cassirer's philosophy. This question has stirred a very passionate debate in linguistic circles, as old as the one concerning technical activity, and for the same reasons. Though the problem is immensely complex, it would be however a mistake" to claim that language is spread among other species than humans, even if some species like apes, parrots and many other ones are able to display abilities to communicate. At least two reasons could be given to stress the specificity of the human case in the animal world. First, the fact that many species have evolved modes of communication does not mean that these modes can be assimilated with language. On the contrary, it would be very surprising, from an ecological point of view, to find other species having developed modes of communication that were not fully adapted to their own ecological niche. The human niche is by no means a *terminus ad quem* in the global evolution of species and other species do not tend to join the human case as if it were the ultimate goal of evolution. Secondly, I am yet to be convinced that the kind of ability to communicate other species have evolved can be characterised as linguistic: the

fact that an ape seems to be able to categorise different kinds of predators¹⁴ or that a primate can use a word or even a sentence to refer to material objects or feelings like pain or hunger is still very far from a linguistic performance which has ultimately to do with an intentionally shared social world¹⁵. As Michael Tomasello has pointed out, a linguistic sign emerges only when it is shared by several individuals in a very complex intentional framework in which every individual in a given situation is able to project his or herself in everybody else's place, in order to view the same object or situation which is referred to but from several points of view at the same time¹⁶.

The purpose of these remarks is not to suggest that the problem of determining what is linguistic in the animal world is out of date. But what seems to be now more promising is the recent discovery that some linguistic features one would consider as necessary for language to be identified as such are in fact spread over several species in the animal world. M. Tomasello and his collaborators very clearly showed the existence of cognitive limits between humans and primates both from a psychological and linguistic point of view¹⁷ but also showed that these limits are not the same when humans and dogs are compared with one another as when humans and other primates are concerned¹⁸. What seems therefore to be specifically human is rather the synthesis of features otherwise spread over several species in the animal world, like the act of pointing or the sensitivity to attentional states. It is of course the way this synthesis becomes effective that has to be determined precisely. But whatever the features comprised in this synthesis, we can infer that they are not contained in some unique capacity the humans would be miraculously endowed with, but more likely are found within a particular social structure which is unique to them. If this is the case, it is not the linguistic features *per se* but their synthesis in a single unity which makes the human language qualitatively different from

¹⁴ This very famous example is still a matter of debate.

¹⁵ M. Tomasello (2004), "Why apes don't point?", Plenary talk at the 5th Evolang Conference, Leipzig 31 March -3 april 2004.

¹⁶ "To learn to use a communicative symbol in a conventionally appropriate manner, the child must engage in what I have called role-reversal imitation. That is, the child must learn to use a symbol toward the adult in the same way the adult used it toward her. [...] "The child's role and the adult's role in the joint attentional scene are both understood from an 'external' point of view, and so they may be interchanged freely when the need arises. [...] The result of this process of role-reversal imitation is a linguistic symbol: a communicative device understood intersubjectively from both sides of the interaction." M. Tomasello (1999), *The Cultural Origins of Human Cognition*, Harvard, Harvard University Press: 105-106.

¹⁷ Tomasello, M. & Rakoczy, H. (2003) "What makes human cognition unique ? From individual to shared to collective intentionality", *Mind and Language*, 18 :121-147

¹⁸ J. Call, J. Braüer, J. Kaminski & M. Tomasello (2005), "Domestic Dogs (*Canis familiaris*) Are Sensitive to the Attentional State of Humans", *Journal of Comparative Psychology*, vol. 117, n°5: 257-263.

other modes of communication. This conclusion seems therefore to go in the same direction as the one which was reached when the nature of technical activity was discussed.

22. Technical activity as organ-projection

In *FormTech*, Cassirer, reinterpreting in an entirely different way speculative ideas first developed by Kapp, suggests that the artificial extension of a bodily organ provided by a tool implies a progressive self-recognition of its function as a mediation in various contexts. Hence Cassirer's idea that using a tool is also transforming its usage, committing the individual to the ever increasing power of mediation by a progressive detachment from the immediate environment in which it was first conceived. It is this last process that Marx, as Cassirer remarks, rightly called "the emancipation of the organic barrier". But I wonder if Cassirer – along with Marx before him – does not finally give too much credit to Kapp in acknowledging the existence of a kind of primitive "natural state" of the body, in which individuals would be bound to their organic selves only and from which humanity parted thanks to the mediation of technical and linguistic activities. For what would be this "primitive state" of the body deprived of language and tool-making? As I said before, the long process through which proto-humans finally became the speaking and tool-making species we know of does not need to have started from scratch, triggered by a cognitive capacity suddenly becoming active and generating all the cultural changes in the subsequent history of humanity. Without projecting on a distant and imaginary past a "state of nature" of the body which reminds more of Rousseau than of current anthropology, we must rather acknowledge that the notion of a bodily organ which is in question has very little to do with the naturalised image biology has provided us with. In fact, it has more to do with mythical and linguistic traits that are always present in human cultures. Let me give an example.

Clarisse Herrenschmidt showed, in a very cassirerian way so to speak, that the invention of writing as a tool used for the transcription of oral languages in Mesopotamia took place when the organ of speech was externalised under the appearance of a speaking mouth made of clay on which signs were engraved¹⁹. Much later, in Ancient Greece, the invention of coined money in the sixth century B.C. followed a similar process: it is through the representation of

¹⁹ C. Herrenschmidt (1999). "Ecriture, monnaie, réseaux. invention des Anciens, inventions des Modernes" [Writing, Money, Network; invention of the Ancients, invention of the Moderns], *Le Débat* n°106, Paris, Gallimard, 37-65.

an eye able to see and evaluate that coins first appeared²⁰. But her discovery is not referred to a naturalised organ-projection as is described by Kapp but to the myths and states of knowledge current in Mesopotamian and Greek cultures at the time of these technical inventions. Thanks to a patient reading of the Mesopotamian myth describing the origin of writing as well as passages from Herodotus referring to vision and, in a concealed way, to money, she was able to show that it was the mythical organs as they were imagined in archaic Mesopotamian and Greek cultures that laid at the heart of the technical role bestowed to the organs.

In the particular case of the emergence of coined money in Ancient Greece, which will be, for obvious reasons, of more interest later on in the discussion, two cultural facts seem to have played a part in the connection between the eye and the valuation of goods. First, the eye was considered at the heart of the process of vision: nobody would guess today that the state of knowledge at that time was that the human eye was endowed with the capacity of throwing material rays enabling vision and that the notion of light as it is commonly used in physics since the 17th century had absolutely no place in this process, except for expressing colours²¹. Secondly, a semantic network in ancient Greek connects (i) the goddess Artemis, (ii) the eye, the coin and the moon, all of them being compared to shining disks and (iii) the process of measuring and evaluating. Let me briefly describe this network. The rounded shapes of the moon, the eye and the coin have obvious morphological similarities. But they also glitter from the inside since they do not receive their brightness from an external source, such as light for us today. As for the moon, its etymology in ancient Greek refers to measuring and evaluating since “moon month” is “that which measures” (*mên*), as Cassirer, among others, pointed out in *PhiSymbForm*²². Even if this etymology is still philologically controversial today, archaeology can be of some help on this particular matter: the moon is an attribute of Artemis since a very remote antiquity and it is in the temple of Ephesus devoted to Artemis²³ that the first coined money ever found was discovered during the 1904-06 excavations directed by archaeologist D.G. Hogarth. There seems to be, therefore, a connection between the cult of Artemis as goddess of the moon and the use of money. The act of measuring and evaluating

²⁰ C. Herrenschmidt (2007), *Les trois écritures; langue, nombre, code* [The three writings; language, number, code], Paris, Gallimard: 232.

²¹ G. Simon (1988), *Le regard, l'être et l'apparence dans l'Optique de l'Antiquité* [Gaze, Being and Appearance in the Optic of Antiquity], Paris, Seuil: 88.

²² E. Cassirer (1929/1954), *Die Philosophie der Symbolischen Formen*, Darmstadt, Wissenschaftliche Buchgesellschaft, band I: 257.

²³ The Artemision in Ephesus was considered one of the Seven Wonders of the ancient world.

which is necessary for the exchange of goods could then be associated with vision through the morphological motif of the shining disk, joining together the moon, the eye and the coin. There is therefore enough evidence to show that, contrary to Kapp's point of view, it is not the artificial extension of a bodily organ only that can explain the progressive self-recognition of its function as a technical mediation in different contexts but a specific cultural and social background, both technological, linguistic and cognitive. This example amply shows that there is just no "natural state" prior to a hypothetical moment where an "organ-projection capacity" the existence of which we have to bet on would activate such mediations as language and tools. In fact, there is just no way in which a state of human activities could be conceived of as deprived of mediations.

This being said, the idea of organ projection is not to be entirely disposed of, for it is true, as Cassirer points out in *FormTech*, that it is related to the idea of self-knowledge, even if today's advances in psychology would interpret this relationship in a very different way.

23. Technical activity as an anticipation of self-knowledge

In the case of technical activity, Cassirer insists upon the fact that the individuals encounter from outside something which is in fact unconsciously produced by them and in which they can later on recognise the mark of their own self. We already noticed that this was the way in which Cassirer conceived of the progressive mutation of technical activity from a globally unconscious activity to a consciously oriented one, that we called "technology". The reason why technical activity is interpreted by Cassirer as an anticipation of self-knowledge is therefore that it is the only way technical activity can become progressively integrated in the realm of symbolic forms. But since I just showed that this progressive integration cannot be the result of an organ projection capacity only, is it still possible to construe technical activity as an anticipation of self-knowledge? Can we conceive technical activity as an activity which progressively becomes consciously oriented, just like any another symbolic form? And if this is so, does this process follow the same direction as language?

231. From unconscious to partially conscious activity

In the case of technical activity, the steps leading from an unconscious activity to a subjectively conscious one are not as straight as Cassirer seems to assume. There are at least two reasons why technical activity keeps being a challenge for a subjectively conscious reflection of its own process: (i) in technical activity, the projection of the self made possible by tool usage implies an embodiment which has necessarily an unconscious phase; (ii)

technology cannot be mastered by a single individual and is the result of a global social structure in which the individual plays only a small part.

Firstly, the incidence of technical usage on self-knowledge seems doubtful at an individual level: for a technical device to be efficient, it must be unconsciously incorporated and must therefore become a part of the individual's body. Let me take an example borrowed from psychologist Charles Lenay: if I try to park a car and if I hit the pavement, I perceive that "I" hit the pavement, not the wheels of the car which became part of myself during the process of driving. Drawing from this example, Charles Lenay makes the following remark: "[...] when a tool is used to perceive, it is not itself perceived. The tool does not participate in the perceptive activity as a perceived form but as it transforms the conditions of action and therefore, all the perceptive field accessible."²⁴ Therefore, it is true that the use of a technical device unconsciously expands the self by way of what can be called an "organ projection" and it is true that the perception of the self is being modified in the process. But it is only when the device becomes dysfunctional, i.e. when the expanded self stops being projected in the device that the individual becomes aware of this expansion which has now disappeared. It is therefore in a very peculiar situation only that the expansion of the self becomes conscious, that is: only when it is *remembered* and not presently perceived through the technical device. We must therefore come to the conclusion that there will always be an unconscious moment in technical usage and that the relationship between unconscious and conscious moments in the case of technical usage does not necessarily lead to an additional self-knowledge.

The second reason why technology is not directly connected to self-knowledge has to do with its social aspects: as far as the process of creating technological devices is concerned, it is by no means a rule that it is mastered by a single individual. Although the example of Leonardo da Vinci mentioned by Cassirer in *FormTech* seems to go in the opposite direction since Leonardo managed to use his creative genius in technology as much as in art, even him was not able to master the whole process of research and development that is needed to complete a technological device: most of his engineering projects remained unfinished at various stages of development because they lacked the relevant social structure. Moreover, the example of Leonardo shows that technological creation is interpreted by Cassirer through an Aristotelian perspective, which induces some kind of misunderstanding regarding the difference between individual craftsmanship and socially-based technology. But a tool is not a

²⁴ C. Lenay (2005), *Ignorance et suppléance : la question de l'espace*, [Ignorance and Replacement : the question of space], Habilitation à Diriger des Recherches, Université de Technologie de Compiègne, Compiègne: 113.

technology, precisely because its conception and usage can be mastered at an individual level, contrary to technology. One can even claim, as Alfred Sohn-Rethel did, that technology rests precisely upon a social division of labour between those who collectively develop and apply science on the one hand and those who do not on the other²⁵. Still, self-knowledge entertains some link with technology interpreted as a social activity.

232. Publicly shared activities as symbolic forms

Self-knowledge does not depend on the private capacity of organ projection which would find an expression in technology. Self-knowledge depends on publicly shared forms through which the individuals find ways to express themselves. This interpretation of self-knowledge supposes that the individuals do not naturally possess the semiotic means of expressing themselves but find these means in socially instituted forms, such as technologies and languages, which were present before the individuals and that they inherit and transform. Therefore, self-knowledge depends on socially warranted activities materialised in specific symbolic forms, one of them being technology. Interpreting Cassirer's notion of a symbolic form this way, self-knowledge is not the immediate response one can naturally expect from technology usage: self-knowledge in general is a socially mediated effect of several symbolic forms on the individuals. The case of technology, both from the point of view of usage and of creation, is particularly clear on this point since its whole process cannot, as a social activity, be mastered from an individual point of view. A 'symbolic' activity will therefore be broadly defined as an activity which makes possible the organisation of social behaviours and anticipates their course via publicly shared forms, symbols and values at the same time.

These three points being clarified, I would like to study the relationship between technical and linguistic activities in a particular case: the analogy between money and language.

²⁵ He uses the notion of a symbolic form in a rather personal way, which is somewhat different from Cassirer's. See *Geistige und Körperliche Arbeit, Zur Theorie der gesellschaftlichen Synthesis* [Intellectual and Manual Labour], Suhrkamp, Frankfurt am Main, 1970, english translation by Martin Sohn-Rethel, Humanities Press, Atlantic Highlands, N. J., 1978 122 : "The capitalist control over the labour process of production can only operate to the degree to which the postulate of automatism functions. The stages in the development of capitalism can be seen as so many steps in the pursuit of that postulate, and it is from this angle that we can understand the historical necessity of modern science as well as the peculiarity of its logical and methodological formation. As pointed out earlier in this study, the mathematical and experimental method of science established by Galileo secured the possibility of a knowledge of nature from sources other than manual labour. This is the cardinal characteristic of modern science. With a technology dependent on the knowledge of the workers the capitalist mode of production would be an impossibility."

3. The analogy between money and language²⁶

First, let me justify the use of this analogy by quoting the third volume of *PhiSymbForm*, in which Cassirer extensively recalls the Kantian phrase according to which modern science is able to “spell out phenomena so that we may be able to read them as experience”. If we take the image literally, modern science started when nature became readable. The comparison between the letters of the alphabet and the atoms of the universe is recurrent since the beginning of philosophy in ancient Greece, as Eric A. Havelock has pointed out²⁷. Though this is not explicitly stated by Cassirer, it is therefore the technology of writing and reading which contributed to the severing of language from myth and its redirection towards what would become science. If we agree in saying, as it is stated in *FormTech*, that “the tool announces the twilight of the magical and mythical world”, then the comparison between technical activity and language should focus on one of its most powerful means, the graphic technology of writing. Writing construed as a graphic technology is used for many purposes, even if what comes immediately to mind is the translation of oral speech. But another usage is of equal importance: the possibility of describing and extensively using the notion of numbers. In the third volume of *PhiSymbForm* I just mentioned, Cassirer states also, quoting pre-socratic philosopher Philolaus, that it is by mastering the realm of numbers *per se* that science started altogether.

Therefore, I suggest that rather than studying the relationship between the technology of writing and language interpreted as oral speech only, the comparison should also include the relationship between the technology of writing and the notion of numbers, considered as the main semiotic medium of science. This way, language can be both studied from a technical angle and in its full range, from its mythical to its scientific usages. That is why the comparison between language and technical activity I would like to defend in the following pages as a case study concerns the notions of *money* considered as a technological vector of arithmetic on the one hand and *language* as the most fundamental symbolic form on the other. This way, I hope to provide an example of what makes possible the “symbolic drift” I was referring to earlier on.

²⁶ This part of the article directly derives from J. Lassègue, V. Rosenthal & Y.-M. Visetti, “Économie symbolique et phylogénèse du langage” [Symbolic Economies and Phylogenetics of Language], to appear in *L’Homme*, April 2009.

²⁷ For example, Eric A. Havelock, *The Literate Revolution in Greece and Its Cultural Consequences*, Princeton University Press, Princeton, 1982: 80-81.

31. Three common features

Contrary to a classical viewpoint which would consider that either the monetary value or the linguistic meaning depends on the intrinsic nature of the entity they refer to, the notion of a symbolic form helps clarify the fact that it is through the transactions themselves that the very notion of value or meaning can emerge. This is, I think, what Cassirer calls a mediation: an activity produces its own material medium but it is through this medium that the activity keeps being elaborated. From this point of view, money and language are not different: as material mediations, any monetary value or linguistic meaning is indistinctively a sign of a shared interaction and a tool for its investigation. This has several important consequences.

311. General equivalent

To make myself clear, I will start with a very simple model of exchange first developed by anthropologist Alain Testart²⁸. Let us suppose that three persons A, B and C exchange different goods with one another in one-to-one transactions: A exchanges with B, B with C and C with A. In most cases, after a certain period of time, no one will have exchanged exactly the same quantity of goods and individual A can be in debt with individual B, as well as B with C and C with A. If they finally decide to use a certain kind of monetary token in order to get rid of the debt each of them has towards another one, they will therefore replace a contextual debt related to a specific person and a specific transaction with a decontextualized situation in which neither the persons nor the transactions matter any longer. Money transforms personal relationships into arithmetic quantities as long as the tokens of these quantities are recognised and trusted as such by all the parties. As soon as a monetary token becomes decontextualized, the value given to the token depends on multiple transactions which all depend on the expectations of the different protagonists. Money becomes therefore a general equivalent as it gives access to any kind of goods, whether present or not, for it anticipates the attribution of any value to any good on a predetermined scale.

This is also exemplified in the history of coined money in Ancient Greece: used first in the *Artemision* as a propitiating token given by women before childbirth, the use of money would expand in other directions of activity, reformatting the notion of exchange itself and imposing its own standard of monetary exchange²⁹.

²⁸ A. Testart ed. (2001), *Aux origines de la monnaie [Money Origins]*. Paris, Éditions Errance.

²⁹ C. Herrenschmidt (2007), *Les trois écritures; langue, nombre, code [The three writings; language, number, code]*, Paris, Gallimard: 229 sq.

This is also true of language: the attribution of a particular linguistic meaning to a sign depends on the collective use of this meaning which is not only related to the context in which it is presently in use but also to a collective usage which plays the same part as a market governed by supply and demand. And in both cases, any monetary token or linguistic sign, once it is recognised and trusted as such, anticipates the value or meaning of any other token or sign, whether it is present or not. But of course, language is a much more complex form than money, for the latter lacks the very intricate compositionality that one can find in languages and which cannot be accounted for on a simple arithmetical scale.

General equivalents are only tentatively universal: it is through the diversity of languages that something like a meaning can be conceived of, as it is only through the operation of monetary exchange that distinct currencies keep a differential value and remain valuable. Consequently, what appears to be an instability of value or meaning is not a shortcoming but the very condition of possibility of their existence: it is necessary that interactions modify the open series of their occurrences if a value or a meaning is to remain alive.

312. Self-evaluation

Since a monetary value or a linguistic meaning does not depend on a predetermined nature derived from the entity (thing or good) it is attributed to³⁰, it must be within the transaction it participates in that it takes shape. As a result, an activity defines its own criterion of evaluation because it modifies its own shape by modifying the internal medium it has itself produced. To this extent, any activity involving money or language as material mediations is at the same time, as Cassirer said in *FormTech*, an activity *on* money and language themselves, interpreted as a sign of a social interaction and as a technology for its investigation. This is made clear by the example I already used: the progressive extension of monetary use in Ancient Greece changed the very nature of what was considered valuable because what was exchanged was henceforth a measurable good, sold or bought by protagonists who then became private individuals taking part in a market (*agora*), itself warranted by one or several third parties (market supervisors appointed by the city called

³⁰ “Because wealth is what the others consider as wealth, what matters is not to find a particular thing defined in terms of natural properties, but to imitate others in order to discover in which direction the collective consensus heads to. Money does not originate from a Contract or from the State but from the mimetic and spontaneous convergence of individuals looking for protection [and for the true definition and value of their desires]”. M. Aglietta & A. Orlean (2002), *La monnaie entre violence et confiance* [Money between Violence and Trust], Odile Jacob, Paris.

*agoranomoi*³¹; state mint; customs)³². Starting from a ritual and religious context, coined money became the archetype of an exchange of goods. Consequently, what is considered valuable depends as much on symbolic values as on ‘useful’ ones because the very notion of utility is not defined once and for all but emerges from the transactions it makes possible. Therefore, any monetary or linguistic theory which presupposes that a predetermined and objective criterion can be assigned to an object or a sign, for example utility in economics or logical reference in linguistic, is bound to be criticised on the same ground as Kapp was criticised by Cassirer, for there is no objective nature from which values and meanings can be derived prior to the effective activity itself.

313. Practical and mythical aspects

The fact that what is valuable or has a meaning cannot be determined in advance outside the effective transactions it is engaged in casts light on what Cassirer means by the “mythical” aspects of tool-making and language: practical and mythical aspects of value and meaning are intertwined and cannot be severed from one another. Let me start with money first, in which the fictional and practical dimensions are clearly intermingled.

Money is fictional because its purchasing power entirely relies on trust and mutual anticipations between the individuals who accept its role and are therefore engaged in a specific kind of transaction which was non-existent before it was set up. Moreover, when the historical origins of money is examined, one finds that it was not the utilitarian perspective which was the key factor that triggered its emergence. Money appeared first in a mythical and ritual context in order to respond to social commitments that had no mercantile basis: marriage, mourning, vengeance, favouring the gods. On the other hand, money cannot be considered as fictional only because, as a general equivalent, it completely revolutionised the structure of exchange itself by transforming the very idea of what an exchangeable good was. From this point of view, it is a constraint placed upon every other individual exchange once it has been set up as a standard form. There is, therefore, a strong continuity between the social obligation, the mythical participation to the world and the economic exchange.

The same is true about language: language is fictional in the sense that the meanings attributed to signs entirely depend upon a mutual agreement which is arbitrary ; but language

³¹ The ‘nomos’ here being a territorial division of the size of a district and not the ‘nomos’ meaning ‘law’, which is spelt differently.

³² Descat R. (2006), “Le marché dans l’économie de la Grèce antique”[The market in the economy of Ancient Greece], *Revue de synthèse*, t. 127, 5^{ème} série : 253-272.

cannot be considered as fictional only, because it also participates in the production of things, actions and social roles and is not merely a recording of what would go on otherwise. Language is more an ongoing drama in itself than a way of reporting what happens outside itself. This drama cannot be founded only on the search for pre-existing meanings because meanings the search for which is described in language are themselves built and concretely accessed through language activity.

Following Cassirer's example, who showed many times that, in order to scientifically describe an object, one has to abstract its functional role, I will now describe the four main functions that money usage and linguistic activity have in common.

32. A chart of four common functions

Four traditional functions of language can be analyzed by analogy to those classically assigned to money: evaluation, payment, circulation and saving. They all can be described in a chart which shows tight correspondences between the two kinds of activity:

	<i>MONEY</i>	<i>LANGUAGE</i>
<i>Evaluation</i>	<ul style="list-style-type: none"> - Anticipation of supply and demand - Differential valuation of goods - Money as a means of evaluation is part of evaluation itself 	<ul style="list-style-type: none"> - Anticipation of future usage - Differential meanings determined through predication - Language as a means of evaluation is itself being re-evaluated
<i>Payment</i>	<ul style="list-style-type: none"> - Medium of decontextualized values that can be re-contextualised - Diversity and competition between currencies according to the type of transaction - Status: ex. creditor / debtor - Obligations: contracts, debts - Roles in transactions 	<ul style="list-style-type: none"> - Medium of decontextualized meanings that can be re-contextualised - Diversity and competition between types of discourse according to context - Status of addressees - Obligations : stylistic codes and genres - Actantial roles
<i>Circulation</i>	<ul style="list-style-type: none"> - Conversion of things into commodities and goods - Diversification of means of transaction (money, checks...) - Perception of flows (money, 	<ul style="list-style-type: none"> - Sharing of common experience structured in 'objects', 'actions', 'qualities' through naming and predication - Diversification of meaning (polysemy)

	commodity) by agents	and development of vocabulary - Perception of thematic genres by speakers
<i>Saving</i>	- Hoarding - Authorised institutions (States, banks) : warranties and norms - Standardization	- Vocabulary - Idiomatic phrases, proverbs - Authorised speakers - Canonical forms of discourse

This chart shows how precise the correspondence between money and language can be. From a philosophical point of view, it shows also in what sense language plays a fundamental role in the gradual differentiation of symbolic forms, since it remains the basis from which other forms emerge.

4. Conclusion

The comparison between money and language I just developed is just one point of view among many others from which Cassirer's conception of technical activity can be evaluated. I hope this example contributed to show that: (i) the general framework set up by Cassirer allows the progressive building-up of technical activity as a symbolic form; (ii) nevertheless, contrary to what Cassirer tends to do in *FormTech*, it is not possible to restrict the nature of technical activity to the notion of tool usage for it also involves the gradual constitution of technology based on semiotic interactions; (iii) more deeply, Cassirer tends to minimize the expressive dimension of technical activity, although this dimension is perceptible in the notions of style and norm. One reason which would explain this minimization is the fact that technical activity contributes to the objectivity of science in building up experiments deprived of any expressive dimension, science being acknowledged by Cassirer as one of the most fundamental symbolic directions taken by humans; (iv) however, it is possible to show that the interactions between technical and linguistic activities are deeper than one should think first, as the comparison between money and language has, it is hoped, revealed.

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Bibliography

M. Aglietta & A. Orlean (2002), *La monnaie entre violence et confiance* [Money between Violence and Trust], Odile Jacob, Paris.

J. Call, J. Braüer, J. Kaminski & M. Tomasello (2005), “Domestic Dogs (*Canis familiaris*) Are Sensitive to the Attentional State of Humans”, *Journal of Comparative Psychology*, vol. 117, n°5: 257-263.

E. Cassirer (1923-1929 / 1954), *die Philosophie der Symbolischen Formen*, Darmstadt, Wissenschaftliche Buchgesellschaft.

- (1925) *Sprache und Mythos ; ein Beitrag zum problem der Götternamen*, Studien der Bibliothek Warburg, Leipzig/Berlin, Teubner.

- (1929) in Heidegger M. (1976); *Kant und das Problem der Metaphysik*, Frankfurt am Main, Klostermann: 274-296.

- (1995) *Zur Metaphysik der symbolischen Formen*, ed. J. M. Krois, vol 1 of *Nachgelesene Manuskripte und Texte*, Hamburg, Felix Meiner.

Descat R. (2006), “Le marché dans l’économie de la Grèce antique” [The market in the economy of Ancient Greece], *Revue de synthèse*, t. 127, 5^{ème} série : 253-272.

E. A. Havelock (1982), *The Literate Revolution in Greece and Its Cultural Consequences*, Princeton University Press, Princeton.

M. Heidegger (1976); *Kant und das Problem der Metaphysik*, Frankfurt am Main, Klostermann: 274-296.

C. Herrenschmidt (1999). “Ecriture, monnaie, réseaux. invention des Anciens, inventions des Modernes” [Writing, Money, Networks; invention of the Ancients, invention of the Moderns], *Le Débat* n°106, Paris, Gallimard,: 37-65.

- (2007), *Les trois écritures; langue, nombre, code* [The three writings; language, number, code], Paris, Gallimard.

R. Hertz (1909), “La prééminence de la main droite; Étude sur la polarité religieuse” [The Preeminence of the Right Hand; A Study of Religious Polarity], *Revue philosophique*, LXVIII, July-December 1909 : 553-580, translated into English by R. Needham in R. Needham ed., *Right and Left. Essays in Dual Symbolic Classification*, The University of Chicago Press, Chicago and London, 1973.

F. Joulain (2000), « Techniques du corps et traditions chimpanzières » [Bodily techniques and traditions among chimpanzees], *Terrain*, n°34 - Les animaux pensent-ils ?. URL : <http://terrain.revues.org/index951.html>.

- W. Köhler (1921), *Intelligenzprüfungen an Menschenaffen*, Berlin, Springer.
- J. Lassègue (2007), “Introduction” in *Emergence de la parenté*, Editions Rue d'Ulm, Paris ; online pdf version:
[http://www.pressens.fr/cgi-bin/automaton2.pl?Automaton_State=PLUSINFO&Cata_Action=PlusInfo&PlusInfo=978-2-7288-0383-5]
- J. Lassègue, V. Rosenthal & Y.-M. Visetti (2009), “Économie symbolique et phylogénèse du langage” [Symbolic Economies and Phylogenetics of Language], to appear in *L'Homme*.
- C. Lenay (2005), *Ignorance et suppléance : la question de l'espace*, [Ignorance and Replacement : the question of space], Habilitation à Diriger des Recherches, Université de Technologie de Compiègne, Compiègne: 113.
- S. McBrearty & A. S. Brooks (2000), “The revolution that wasn't : A new interpretation of the origin of modern behavior”, *Journal of Human Evolution*, 39 : 453-563.
- M. Mauss (1936), “Les techniques du corps” [Bodily techniques] in *Sociologie et anthropologie* [Sociology and Anthropology], Presses Universitaires de France, Paris, 1950 : 365-386.
- G. Simon (1988), *Le regard, l'être et l'apparence dans l'Optique de l'Antiquité* [Look, Being and Appearance in the Optic of Antiquity], Paris, Seuil.
- A. Sohn-Rethel (1978) *Geistige und Körperliche Arbeit, Zur Theorie der gesellschaftlichen Synthesis* [Intellectual and Manual Labour], Suhrkamp, Frankfurt am Main, 1970, english translation by Martin Sohn-Rethel, Humanities Press, Atlantic Highlands, N. J., 1978.
- A. Testart ed. (2001), *Aux origines de la monnaie* [Money Origins]. Paris, Éditions Errance.
- M. Tomasello (1999), *The Cultural Origins of Human Cognition*, Harvard, Harvard University Press.
- (2004), “Why apes don't point ?”, Plenary talk at the 5th Evolang Conference, Leipzig 31 March - 3 April 2004.
- M. Tomasello & H. Rakoczy, H. (2003) “What makes human cognition unique ? From individual to shared to collective intentionality”, *Mind and Language*, 18 :121-147