Heuristic Mysteries –
Invention, Language, Chance

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To be able to make "change" happen in the lives of patients entrusted to his care, Watzlawick says he tried to produce a theory about it.[1] He was forced to acknowledge that the mechanisms of change resist systematization and, therefore, all wishes to elicit them as well.

Well-being is to therapy what discovery is to thought and the event is to History: the position – unforeseen, unforeseeable – in reality of what did not hitherto exist. And heuristics would be, if not a science, since there could be no science of change, then at least the name given to reflection on its mystery.

I would like to compare here two approaches – apparently completely opposed – to the connections between language and heuristic mechanisms: one wants to master heuristic mechanisms by manipulating language, the other acknowledges, with humility, their complexity. The first is that of Leibniz in his preliminary writings for the project of an artificial language that never saw the light of day, the *Characteristica universalis*; the second is that of Kleist in his famous short text *Über die allmähliche Verfertigung des Gedanken beim Reden*, 1805 (On the Progressive Elaboration of Thought in Language). The first works against natural language; the second makes natural language its ultimate horizon. But beyond these oppositions, or rather, from the very fact of their opposition, these two heuristic approaches respond to one another very exactly, mapping a consistent problematics.[2]

Last splendors of the classical utopia of mastery[3]

From his forthcoming *Characteristica universalis*, Leibniz expected an effective contribution to the progress of the sciences. He was

not the first to flirt with the project of a perfect language that would serve the needs of science better than natural, ambiguous, illogical and irregular language could. The critique of natural language, a common locus of linguistic reflection in the classical period, often led to the will to create an artificial language.[4] But there is no use dwelling here on the rudimentary and impracticable character of these attempts.[5]

Leibniz himself did not even get past the stage of preliminary reflections. But these reflections, which occupied him all his life, have the merit of seeking, without finding, a response to the difficulties raised by preceding attempts: Leibniz's ambition was to create a language that was not only exact, but also practicable, accounting for the real needs of usage – in a word, a *user-friendly* language, as we now say of computers that they are more or less *user-friendly.*

In the theory of cognition on which the project is based,[6] the discovery of a new truth would be the result of the interaction of three factors: invention, judgment and memory (A VI, III, p. 428).[7] Invention, also called *logica inventiva* or *ars combinatoria,* is the art of asking questions, of formulating hypotheses through the original combinations of two elements. Invention proceeds by synthesis. It is the moment of discovery. The *logica inventiva* or *combinatoria* comes, moreover, in a direct line from the old rhetorical concept of *inventio.*[8] A metaphor aptly borrowed by Leibniz from the physician Mariotte illustrates this "combinatory"[9] conception of invention: the scientist fills a bag with various ideas and he shakes it (p. 429).

Leibniz proposes metaphors of his own making to illustrate the second function, the *ars judicandi* or *ars analytica*: he compares understanding to a sieve that only allows good combinations to pass through it, as well as to the dissection process.[10] Judgment accepts or rejects the propositions of the combinatorial rules, according to its knowledge of first elements. It is then possible to manipulate concepts defined by means of mathematical methods.[11] Leibniz is not, however, explicit about the transfer of the mathematical method to fields of knowledge other than the exact sciences, such as morality or government.[12]

The third function that plays a role in heuristic mechanisms is memory, *the art of remembering at will and when needed what*

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one knows (GP VII, p. 82). Memory provides the concepts for other operations. We know that traditional rhetorical formation granted a great deal of importance to the development of the mnemonic function.[13] The richness of combinatory possibilities depends on it.[14]

Even if it is not clear how this language to be created might be used outside the field of mathematics, Leibniz is positive as to its effects: "And it might happen that errors in reasoning will only be errors in calculation that we could discover through proofs, as in arithmetic. Men would thereby find a truly infallible judge of controversies" (GP VII, p. 26). Leibniz dreams of resolving all conflicts and controversies caused by imprecise definitions and the incorrect manipulation of concepts.[15] The *characteristic* would be able to express only the truth, since it is constructed in a systematic way. It would even predict errors.[16] It is a linguistic tool whose structures themselves resist errors.[17] Leibniz hoped it would reinforce the capacities of the human mind just as glasses reinforce the sight organ: "*[the characteristic]* will provide the human race with a type of instrument as proper to perfecting the vision of the mind as glasses provide for that of the body" (p. 27). This metaphor points to the instrumental nature of this artificial language. What stands out behind the *characteristic* is the mirage of a sort of speaking and thinking automaton generated by a series of rules – the very definition of what we today call artificial intelligence. Leibniz flirts with the idea of an "automatic" science, a science without a subject and in which personal merit, natural gifts or inspiration would no longer have a role to play (A VI, III, p. 429 ff).

He thereby raises the challenge of constructing a practicable artificial language, of which the signs would be "*quam maxime naturales*" (*De arte combinatoria*, GM III, p. 50), modeled on the signs of natural language. That Leibniz, even while criticizing natural language, as did his contemporaries, cannot prevent himself from constantly referring to it, is worth noting. Natural language remains the model to be imitated, for it already possesses properties that promote heuristic mechanisms. The philosophic language will only have to perfect and systematize them.

To this effect, the first task of the language creator is to choose the right signs. This concern is the major difference between Leib-

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niz and his British predecessors.[18] Leibniz, moreover, could appeal to his success in the improvement of mathematical notation.

What is a good sign? According to Leibniz, the virtue already found in natural language signs was their motivation.[19] Some famous pages of the *New Essays* are devoted to the symbolism of sounds. Motivation, the relation of similarity between the signified and the signifier, is conducive to mental activity because the mind naturally works by means of analogies. Leibniz gives the example of tropes (NE, p. 314), which will serve, moreover, as models for the creation of new signs.[20]

How realize in artificial language what can be analyzed in natural language as a trace of motivation?

Leibniz, Derridean before the letter, suggests reversing the traditional hierarchy between oral signs and written signs in favor of the latter. The *characteristic* will be first a written language: "This writing or language (if the characters were rendered utterable) could be quickly adopted in the world because it could be learned in just a few weeks, and would provide the means for communicating everywhere" (GP VII, p. 26).[21] Language is here synonymous with writing. The oral realization might be added as a supplementary gadget to the principal machinery of writing. The force of the *characteristic* lies in its power of representation.

Leibniz questioned himself at length on the choice of the medium: aural (oral, musical) or visual?[22] The visual signs are said to foster intellectual activity.[23] Comparing different forms of memory aids in the *Nova Methodus*, Leibniz favors visual support. In the *New Essays*, whereas Philalethes (who represents the position of Locke) considers words the medium best adapted to the expression of thoughts, Theophile (Leibniz) retorts:

> I believe that still other marks could have this effect; [...] with time, everyone would learn drawing from youth, so as not to be deprived in any way of the convenience of the figured character, *which would truly speak to the eyes* and be very much to the liking of the people, as indeed the peasants have certain almanacs that tell them without speech a part of what they ask; and I recall having seen satirical prints, line-engravings, that retained something of the enigma, where there were *figures that signified by themselves* in combination with words, unlike our letters and Chinese characters, which are only signifiers by the will of men (*ex instituto*)[24] (NE, p. 314, my emphases).[25]

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Another advantage to visual information is that it allows simultaneous perceptions (as with tables, figures, etc.), whereas natural language is linear. Indirectly, Leibniz encounters the question that would so preoccupy the philosophy of language in the eighteenth century: how can language successively express thought, which is indivisible? A purely written language would in some way allow this difficulty to be skirted....

The sensorial properties of this hypothetical language are essential, distinguishing it from other artificial language projects of the period and from the most widespread conception of the sign. For Descartes, Bacon, Malebranche, the grammarians of Port-Royal, Dalgarno, Wilkins, et. al., signs are only an inevitable means of communication between pure minds. Content, thoughts, are valorized to the detriment of language, which is reduced to the status of a simple vehicle. The essential quality of signs fabricated at the hands of men, or more precisely, at the hands of philosophers, would therefore be their transparency, their neutrality; only by exerting no influence at all will they cease to be an epistemological obstacle. And no one, before Leibniz, had bet that if the materiality of signs could have a bad influence, it could also have a good one. His ideal sign will not, therefore, be transparent, disembodied, and arbitrary, but rather, being granted a discernible opacity and motivation, will be adapted – making it friendly – to the needs of its user.

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In conclusion to this rapid presentation of the philosophical language hoped and prayed for by Leibniz, I would like to underscore two points:

1) this dreamed-of language presents a certain number of similarities to artificial intelligence. Indeed, Leibniz looked to it to benefit not only the exact sciences but also human relations in general: the *characteristic* was to facilitate diplomatic relations and commercial exchange, establish peace between nations, and so forth.

2) this language would, as a product of conventions that was constructed by an intelligent being, be exact. And although

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exact, it is creative almost by itself, from the fact of its (artificial) motivation. It is a paradoxical creative machine.

Reevaluation of natural language

This is, of course, a contradiction in terms. Because *user-friendly* signs, founded on an analogy with reality, are open to interpretation as ontological judgments and not only as simple memory aids: "This universal writing will be as easy as it will be widespread. It will be possible to read without a dictionary and at the same time, it will be impregnated with the fundamental knowledge of all things" (*De Arte Combinatoria,* GM III, p. 50).[26] The knowledge of things will "impregnate" signs by reason of their resemblance to things. This ontological claim is, of course, suspect.

Furthermore, in an artificial language, which purports to avoid total arbitrariness, the degree of the signs' motivation remains arbitrary. As a logothete, I can decide that the concept of justice will be represented by a scale. But I could just as well have chosen a cake divided into equal parts. At this point things become difficult: if I choose the scale to denote justice, what would I choose to denote scales themselves? The cake and the scale are, moreover, rather tendentious signs for representing justice ....

If motivated signs have a greater heuristic power, they also have an influence on the concepts they denote. The inventor – and with him the potential user of the *characteristic* – thus risks being a manipulated manipulator. Leibniz wanted to manipulate signs in order to make them a source of discovery. However, he encounters only his own manipulation in the language he himself created. There is something tautological in the heuristic support that these motivated signs are supposed to provide. In the end, the Leibnizian logothete is caught up in the old trap of the sensible. In trying to master the goose that laid the golden eggs of discovery, the logothete kills it.

A last criticism formulated in opposition to the *characteristic* is that of Michaelis in his essay *Über den Einfluß der Sprachen auf die Meinungen der Menschen* (A Dissertation on the Influence of Opinions on Language, and of Language on Opinions).[27]

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According to him, the traditional reproach against polysemy is unfounded. It ignores an essential property of language: in an invented, learned language, "each idea should have its distinct type and character, incommunicable of any other ideas, which would at once put an end to any impropriety, figure and ambiguity" (p. 77).[28] If polysemy were totally abolished, it would be impossible to use one word for another, which is, however, the founding condition of the metalinguistic function, of definitions as well as tropes (which are called "figures of substitution" in traditional rhetoric). In the obligation to name each object individually, such a language would call for an infinity of signs (p. 82).

Michaelis's second objection bears on the essentially written nature of this language. Even if its signs were nice little figures, Michaelis refuses to call a system of signs deprived of any oral dimension a language. And if pronunciation were added to these written signs, it would certainly be "intolerable to the ear."[29] Michaelis insists on the absolute necessity of the oral dimension. It is the possibility of speaking that founds the possibility of thinking. We can, of course, have silent conversations with ourselves, but only if we can already speak. With Michaelis, interior discourse ceases to be an argument in favor of the autonomy of thought in relation to language.

His last objection is to the poor aesthetic and emotional quality of this system of signs. Even if the *characteristic* were pronounceable, it would be so disagreeable that it would offer no encouragement at all to heuristic mechanisms. From this point of view, the *characteristic* does not withstand comparison to natural language, which it wants to outdo. Leibniz was aware of the problem, since he noted that artificial languages did not fulfill their creators' ambitions. Michaelis has only to turn Leibniz's own argument against him.

Interestingly, Michaelis considered himself an intellectual heir to Leibniz. His conception of language places him in the tradition founded in Germany by the *Ermahnung an die Deutschen. Von deutschen Sprachflege*, 1683 (Exhortation to Germans to Better Practice their Reason and their Language) and by the *Unvorgreiffliche Gedancken, betreffend die Ausübung und Verbesserung der Teutschen Sprache*, 1697 (Thoughts Concerning the Use and Improvement of

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the German Language), that is, in the tradition of Leibniz the philologist, as opposed to Leibniz the logico-mathematician.[30] After all, not only did Leibniz try to create a philosophical language; he was also a philologist and an advocate of national languages and cultures. Michaelis describes languages, as did Leibniz, as a living memory, as archives (p. 27), libraries of the human mind. Leibniz already speaks of natural language as a "reservoir of science." Like him, Michaelis believes in the heuristic power of natural languages, especially if this power is stimulated by a conscious philological culture that maximizes its effects. Like him, he advocates the use of national languages instead of Latin in scholarship. In short, he combats the arguments of the logician Leibniz with those of the philologist Leibniz.

Leibniz's endeavor remains typical of seventeenth-century linguistic utopias. Leibniz is the last philosopher with the ambition of creating a language that would be as much a tool of communication as an intellectual tool. After him, the two aspects would be dissociated.[31]

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Kleist's *Über die allmähliche Verfertigung der Gedanken beim Reden* offers a reevaluation of language in heuristic mechanisms.[32] Language here is clearly presented as a source of inspiration rather than as an epistemological obstacle: "Then speech is not an impediment, a sort of brake on the wheel of the intellect, but like a second wheel running parallel with it on the same axle" (p. 44).[33]

The text enumerates six discursive situations that lead to discoveries. They are grouped in pairs, a principle situation calling forth a variant.[34]

The first pair proposes situations involving two people: in speaking with his sister, the narrator discovers the solution to a mathematical equation (a model of the enigma), or even the resolution of a judicial matter (a model of the "dispute" to be settled).

The second pair is devoted to political speech, where what is at stake is no longer knowledge, but action: Mirabeau, in a situation of conflict with royal protocol, improvises his speech "we are here by the will of the people and we will go away only by the force of bayonets." The phrase created an event, since it is supposed to

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have inflected the course of the Revolution. The variant is the plea of the fox in La Fontaine's fable, *Les Animaux malades de la peste* (The Animals Ill with the Plague).[35]

The third and final pair opposes the euphoria that animates salon conversation to the anxiety of the university examination room. Kleist therefore considers diverse forms of invention: intellectual invention, but also that particular form of invention that is action, which creates the event and History just as intellectual invention is an event for the history of thought.

We might add that the text, putting its object into infinite regression by its very form, also simulates a dialogic situation: the narrator addresses, albeit fictively, the friend to whom he dedicates the text.[36]

Unlike classical philosophy, which is concerned only with the solitary exercise of thought, Kleist's scenes of discovery are dialogues. Furthermore, most of them are urgent situations. A strong pressure is exerted on the speaker (Mirabeau expresses himself before the *Etats Généraux*, the fox has to save his life). This pressure superimposes itself on another form of constraint that emanates from language itself: the spoken chain forces the speaker to "give an ending to his beginning" (p. 42). An utterance demands to be finished. And the linearity of language is not necessarily an epistemological obstacle, as in classical language philosophy; it might have a heuristic virtue.

Commentators have wondered whether there is parallelism or conflict between language and thought in Kleist's view.[37] In reality, both are present. Kleist intuitively comes upon the old question of supposed conflict between the linearity of language and the indivisible order of thought. All the language philosophers of language since Port-Royal (Locke, Condillac, Diderot, Dumarsais, Beauzée, etc.) tried to answer this question. Beauzée, for example, remarks in his *Grammaire générale* that "we can only form [in speaking] a sensible, successive and divisible whole; this seems to prevent us from being able to represent thought, a purely intellectual and necessarily indivisible object."[38] Kleist does not answer the question of how thought and its expression might be linked, but he observes their relationship and expresses it with the axle metaphor. To conceive and to express are two acts that are connected but different, like two wheels on one axle. The wheel of

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language involves that of thought. Language forces thought to go beyond itself, forces the first moment of intellectual intuition to surpass itself in its expression.

But language also does violence to thought, because it springs from a different mold and must nonetheless slip into that of language. The opposite case, when the idea is already mentally conceived before the intervention of language, bears witness as well to the non-adequation of language and thought: "When an idea is expressed in a disorderly manner, it does not follow at all that it was also thought in a disorderly manner; rather it could easily be that the least clearly expressed ideas are even the most clearly thought" (p. 45).[39] Language here no longer participates in elaboration. The confusion, then, is the symptom of this tension between intellectual intuition and the structure of expression.

To illustrate this relation, which consists of both collaboration and tension between language and thought, Kleist uses a technique of commentary very similar to that which Nathalie Sarraute, describing her own narrative technique, calls *"la sous-conversation"* (underlying conversation). In the examples of dialogue (Mirabeau and Dreux-Brézé, the paraphrase of the fox's plea in the *Les Animaux malades de la peste*), each line of the original text (or the one presumed as such) is doubled by a reconstitution of mental processes that, according to Kleist, allowed it to come to light. The intervention of Kleist's commentary in the cited text is somewhat violent. It does not always respect punctuation and often cuts the text off in a surprising way with respect to grammar and rhythm. This violence reflects the tension of the mind, torn between its intuition and the necessity of giving it linguistic form.

Kleist does not complain here of the impossibility of expressing thoughts; he underlines, rather, the gap (formal and chronological) separating enlightenment from its expression: "In these cases, it is indispensable that language be easily available to us. Indeed, if we cannot express right away what we have just conceived, we must at least make the expression succeed the conception as quickly as possible" (p. 323).[40] In the game that consists in finding the right word, some are better armed than others. But as a general rule, it seems that to trust in language, it is enough to throw oneself in the water. No traces, in this text by Kleist, of his usual

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complaints regarding language, traitor to thought, powerless in the face of the ineffable. It is always possible to begin speaking, and Kleist is almost astonished by it: "While my speech progresses, my mind, in the necessity of giving an end to the beginning, is fashioning the confused idea and even giving it its clarity; in such a way that, to my great surprise, the discovery is made with the period's ending" (p. 320).

To systematize the mystery of the discovery is, on the other hand, a challenge. Save for the dialogic situation, common to all the examples, the catalysts of new thought are all very different. In certain situations, dialogue is mute: the other acts by virtue of his presence alone. The simple sight of a "human face", "a gaze that announces to us that a half-expressed thought was understood, often makes us a gift of the words necessary to express it in its totality" (p. 320).[41] The presence of the other is sometimes friendly (the sister, Molière's servant, worldly society, sometimes hostile, Dreux-Brézé, the lion, the examiner). The catalyst can be motivated (in the salon, for example, one can assume that mental enlightenment bears some relation to the general subject of conversation, although even this is not certain). But most of the time, it is completely arbitrary: the sister's activities are foreign to the solution of the equation or the judicial matter, since she knows nothing of law and mathematics; if Molière's servant is of some use, it is certainly not because Molière was interested in what she might have been thinking; the effect of a sleeve or the movement of the master of ceremony's lips has no semantic relation to the bayonets' force. Besides, the adjuvant is often without knowledge of the question to be resolved. Kleist goes so far as to recommend that he be ignorant of it.

Similarly, urgency sometimes constitutes a challenge, but not always. The same causes do not always produce the same effects and the range of examples given by Kleist clearly shows the impossibility of systematizing the catalyst of the click: the sister's activities help the narrator to find what he is looking for by distracting him, but timid youths similarly distracted by general conversation in the salon fail to express what they have conceived.[42] The fox succeeds in finding the right words, but the unfortunate examination candidate does not.

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The fact that heuristic mechanisms are not always motivated and appear without warning also means that they cannot be manipulated. One can express an intellectual illumination after it occurs by reconstituting the mental and linguistic work that led up to it, as Kleist did for Mirabeau and for the fox. But one cannot provoke it beforehand by choosing a certain semantic field or a situation that automatically proves to be productive. Invention is a question of grace, which means that it might just as well have not come about. For each thought born without injury, there are many still-born thoughts. To continue the obstetrical metaphor that runs through the whole text, we might say that the mortality rate of thought is fairly high.[43]

Kleist employs the old Socratic image of the birth of minds. But in his view, there is not always a Socrates, a well-intentioned midwife. Degree candidates are interrogated by insensitive professors who behave like common horse traders. The parturient is left alone with the baby. And in the best of cases, outside help comes from chance alone.[44]

Nevertheless, even if one cannot predict heuristic mechanisms, one might do better than to passively await the miracle. One must dare to try, put oneself in a situation of urgency, take the risk. The fox began to speak haphazardly; Mirabeau relied on chance.

If we cannot provoke enlightenment, we can at least encourage it. Kleist suggests a technique: "I interpose inarticulate sounds, draw out the connecting words, possibly even use an apposition when required and employ other tricks which will prolong my speech in order to gain sufficient time for the fabrication of my idea in the workshop of reason" (p. 42). This technique acknowledges the duration of cognitive mechanisms, the time necessary in order for the two wheels to adjust to one another.[45] Kleist gives advice that goes against the grain of the entire school of wisdom holding that *"ce qui se conçoit bien s'énonce clairement* (that which is well-conceived is clearly uttered)": pronounce empty words, speak to say nothing, but do not stop speaking.[46] He understood the heuristic role of hollow words, necessary for rhythmic reasons even though they lack meaning.

In the end – and this, in a sense, is what is remarkable in the work of Kleist – he recommends leaning on tradition, on common-

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places and shared knowledge. The proverb, *l'appétit vient en mangeant* (the appetite comes from eating), engenders the key phrase of the text, *l'idée vient en parlant* (the idea comes from speaking). Kleist lets himself be carried by rhyme and rhythm. This single transformation illustrates the text's full intention by showing to what point heuristic mechanisms are dependent on the manipulation of linguistic or cultural idioms. We might say the same thing of the numerous metaphors in the text (the axle, the birth, the electrical discharge, the minting of coins, etc.). They may not be original, but they are effective nevertheless. Here, Kleist's hatred of prefabricated knowledge and discourses does not exclude the recognition of the power of a common linguistic and cultural patrimony.

All this seems simple. And the text sometimes has triumphalist tones. However, even while it recounts successes, it is haunted by the fear of failure. The final "pair" of scenes describes failures, or at least potential failures: the scene of the salon is at least ambiguous; the examination is clearly a failure. Furthermore, the situation of the text's enunciation is curious, since it involves a fictive dialogue with an absent interlocutor, a written text extolling orality, and an installment that remained without continuation. The text did not reach its addressee or its public. It did not get the feedback that sometimes provokes inspiration or allows it to blossom.

We can also read it as an implicit reflection on the specificity of literary invention. The desire to write is paradoxically never strong enough to be sure of achieving its ends. There is always a more urgent, less solitary and less artificial speech than the discourse of literature. And yet, to persist in the strange intention to write, as Kleist did, one might nourish the secret desire that literature be one vast conversation. A conversation to be continued.

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XLeibniz believed an artificial language was needed. Kleist contented himself with natural language. Leibniz wanted to manipulate the tool of expression, whereas Kleist chose to let it manipulate him. Leibniz believed visual and motivated signs to be of greater heuristic value; Kleist notes that the catalysts of discovery are unmotivated and that the oral dimension of language

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is crucial. Leibniz was especially interested in thought as a solitary activity; Kleist was conscious of its dialogic dimension (even when the dialogue is merely virtual).

And yet, Leibniz is close to Kleist, at least if we compare him to all the other linguistic creators of the Classical period, in the importance he grants to the corporeal, sensorial foundations of cognition. It is ironic to think that, if his project of artificial language failed, it is because it was too ambitious. The *characteristic* was supposed to be at once a logical language and an instrument of invention. But this failure does not mean that Leibniz's reflections on the respective properties of oral and visual expression are devoid of importance. The difficulty is in the impossibility of grafting the properties of visual signs onto the structure of natural language. This Michaelis understood perfectly. The formulation of his title, "Whether it be possible to invent a language properly called learned," is prudent and explicitly recognizes that the problem is not so much the *characteristic* in itself as its claim to be a language in the linguistic sense of the term.

Translated from the French by Denise L. Davis,
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Notes

1. His work is based on a systematic reflection on the therapeutic experience of the cure and on interviews with "professionals" of change (salesmen, lawyers, politicians, etc.), whose skills consist in influencing or changing people's minds. See Paul Watzlawick, *Change: Principles of Problem Formation and Problem Resolution*, New York, 1974.
2. The leap from Leibniz to Kleist may seem acrobatic, since one cannot speak of a direct influence of Leibniz on Kleist. Even though Kleist, in the course of his studies in philosophy, must have heard of Leibniz, he certainly did not know his linguistic reflections, scattered throughout the correspondance and unedited manuscripts. This connection between Leibniz and Kleist is thus the fruit of a willful reading.
3. The first part of this article develops the main points of an article published in German, "Leibniz und Michaelis: Die Sprache als Instrument der Erkenntnis," *Jahrbuch 1990-1992 der Akademie der Wissenschaften zu Berlin*, 1993, pp. 551-580.

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4. See, to cite only a few, the *Ars signorum* by Dalgarno, London, 1661, and the *Essay Towards a Real Character or a Philosophical Language* by Wilkins, London, 1668.

5. Wilkins' great achievement is to have managed to write *The Lord's Prayer* in characters. U. Eco, in *The Search for the Perfect Language*, trans. J. Fentress, Cambridge, 1995, notes that the *Ars signorum* is full of errors, which says much about the practicality of the said languages.

6. See M. Dascal, *La Sémiologie de Leibniz*, Paris, 1978 and *Leibniz, Language, Signs and Thought*, Amsterdam/Philadelphia, 1987.

7. References to Leibniz are given in the text:
   - *Sämtliche Schriften und Briefe*, ed. by the Preußischen (later: Deutschen) Akademie der Wissenschaften zu Berlin, 1923, Leipzig, 1938, Berlin, 1950 (A).
   - Gehrardt, C.I. (ed.) *Leibnizens mathematische Schriften*, 7 vols., Halle, 1849-1863, repr.: Hildesheim, 1967 (GM).
   - Gehrardt, C.I. (ed.) *Leibnizens philosophische Schriften*, 7 vols., Berlin 1875-1890, repr.: Hildesheim, 1967 (GP).
   - *Nouveaux Essais sur l'entendement humain*, Paris, 1990 (NE)
   Translations from Latin and German into French in the original version of this article are the author's. English translations are the translator's in collaboration with the author, except where noted.

8. In classical rhetoric, however, *inventio* does not designate creation in the sense that we understand today. *Inventio* consists, rather, in finding the adequate expression at will from the repertoire of diverse possibilities. But Leibniz already uses the word invention in its modern sense and this usage probably marks a semantic turning point from the opportune rediscovery of what was virtually available to the discovery of what did not exist.

9. Besides the rhetorical origin of the concept of invention, the *Ars magna* of Ramon Lull must be mentioned as a source of the "combinatory."

10. In a letter to Gallois dated December 1678, Leibniz writes: "A keen squire must have knowledge of the fetlocks, otherwise he will tear the flesh instead of cutting it," GP VII, p. 2f. The preceding lines are an attack on Descartes' "method": "Those who have given us methods no doubt give us fine precepts, but without the means to observe them. It is necessary, they say, to understand everything clearly and distinctly; one must proceed from simple things to complex things; we must divide our thoughts, etc. But that does not help much if we are not told anything more. Because when the division of our thoughts is not done properly, it clouds more than it clarifies: A keen squire..." Leibniz, anticipating the Hegelian critique, reproaches the Cartesian method with being an empty shell. No method is valid before entering into knowledge. Method and knowledge are one and the same thing.

11. "If we had characters as I conceive them in metaphysics and morality, and thereby for all that depends upon metaphysics and morality, we could make very assured and important propositions in these subjects; we could line up the advantages and the disadvantages side by side in matters of deliberation, and we could estimate the degrees of probability, somewhat like the angles of a triangle. But it is impossible to achieve our end without this characteristic," GP VII, p. 22.

12. Dascal points this out in *La Sémiologie de Leibniz*, p. 175, and we can naturally call into question the interest of similar definitions: "Wisdom is none other

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than the science of happiness, which teaches us to attain happiness." Or again: "Happiness is the state of lasting joy [...]," GP VII, p. 86.

13. Not of the least importance is the art of arranging things into genres and species, which serves for judgment as much as for memory, NE, p. 226.

14. Leibniz knew the Roman classics on mnemonics and their technique of *loci*, consisting in the visual organization of information. He is also the author of a manual on memory aids intended for the study of law, the *Nova Methodus discendae et docendae Jurisprudentiae*, 1667, in which he analyzes phonetic mechanisms (such as rhymes) or visual mechanisms (figures, tables, diagrams, etc.). See Dascal, *La Sémiologie de Leibniz*, p. 90 and 146 ff.

15. Cf.: "One must imitate the geometricians, who are neither Euclideans nor Archimedians. They are all for Euclid and all for Archimedes, because they are all for the common master that is divine truth," GP VII, p. 158. See as well the *Discours touchant la Méthode de la certitude et l'art d'inventer pour finir les disputes et pour faire en peu de temps des grands progrès*, GP VII, p. 174 ff.

16. "This writing will have great advantages, among them one that seems to me important: the chimeras, which are not even understood by those who put them forth, will be impossible to write in these characters," Letter to Gallois, GP VII, p. 2.

17. "Someone ignorant will not be able to use them, or endeavoring to do so, he will become learned by it," Letter to Gallois, p. 23.. The *characteristic* will thus have virtues that are in some way pedagogical.

18. Leibniz himself notes in the *De connexione inter Res et Verba* that artificial languages have never withstood the test of usage, GP VII.

19. For Leibniz, the linguistic sign is not completely arbitrary, but is partially motivated, or at least it was once so:."I know that we have the habit of saying in schools and everywhere else that the significations of words are arbitrary (*ex instituto*) and it is true that they are in no way. determined by natural necessity; but this is so for reasons sometimes natural, where chance has some role, sometimes moral, where choice enters,". NE, p. 216.. Signs will bear the trace of an original connection between the signifier and the signified.

20. This is the reason for which Leibniz, against the entire tradition of Bacon, Descartes, Locke and other adepts of the *nuda veritas*, defends a certain aesthetics of discourse.. The aesthetic properties of language play a determining role in invention.. In the *New Essays*, Theophile (Leibniz) defends the virtues of eloquence against Philalethes (Locke).

21. See also:. "This *characteristic* consists of a certain writing or language (because he who has one can have the other). that perfectly renders the narration of our thoughts, letter to Gallois, GP VII,. p. 22.

22. Leibniz considered the possibility of using musical sounds, NE, p. 213.. The role of music as a mirage of linguistic perfection in certain utopias or imaginary voyages is known (Cyrano de Bergerac, Godwin).. For Dalgarno, in the *Didascalopholus* (a treatise on the education of deaf-mutes dated 1680), the five senses are apt to transmit information, although two of them, sight and hearing, are, in his opinion, privileged for communication.. The superiority of the visual will also be the argument of Frege in favor of the *Begriffsschrift*.

23. As classical rhetoric also believed:. memory "was entirely entrusted to the visual.". See. H. Weinrich, *La Mémoire linguistique de l'Europe*, Inaugural lesson at the Collège de France, 1990, p. 12 ff.

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24. Leibniz's opinion varied.. Here, he considers Chinese characters arbitrary.. Sometimes, on the contrary, he goes so far as to make of them the model of motivation that should be imitated by artificial language. (see following note).. With the notable exception of Bacon and Wilkins, who refuse the idea of an analogy between signified and signifier in ideograms, it was believed, on the faith of the Jesuits' testimonies, that Chinese writing directly depicted things and concepts in a more or less stylized way.. Moreover, Chinese writing was supposed to allow communication between peoples speaking different dialects.. See M. David, *Le Débat sur les écritures et l'hiéroglyphe aux XVIe et XVIIe siècles et l'application de la notion de déchiffrement aux écritures mortes*, Paris, 1965.

25. Elsewhere Leibniz proposes "little figures in place of words, which represent visible things by their features and invisible things by the visible ones that accompany them." He also proposes inspiration from *"litteras, figuras chemicas, astronomicas, chinensus, hieroglyphicas, notas musicas, steganographicas, arithmeticas, algebraicas,"* GP VII, p. 204.

26. See also those "little figures that represent visible things by their features and invisible things by the features that accompany them," as well as the "figured character, which would truly speak to the eyes" and the "figures signifying by themselves," NE, p. 314.

27. The text was written in 1759 in response to a question by the Berlin Academy on the reciprocal influence of language and thought. Michaelis took first prize. A paragraph of his text, "Improvement of Language," is dedicated to searching for remedies to the imperfections of natural language. Michaelis's essay contains, among other ideas, the first formulation of the question proposed by the Academy at the contest of 1770, which would earn Herder first prize: "Left to their own faculties, could men invent language?" In 1762, when the essay was translated into French (by Mérian), Michaelis added a long digression entitled "Whether it be possible to invent a language properly called learned." Although Leibniz is not explicitly mentioned, this addition is clearly a critique of the *characteristic*.

28. Mérian's French translation was the source for an anonymous English translation dated 1769. Citations refer to the reprint of this English version, Berkeley, 1973.

29. This was already one of Descartes' objections in the project of artificial language submitted to him by Mersenne: since there is no consensus among nations on what is agreeable to the ear, universal language will always be disagreeable to some people.

30. A distinction made by K.-O. Apel, *Die Idee der Sprache in der Tradition des Humanismus von Dante bis Vico*, Bonn, 1963, p. 301 ff.

31. Plouquet, Lambert and especially Condillac would invent logical languages. Later, attempts would be made to try to create universal languages of communication (the pasigraphies of the end of the eighteenth century, the auxiliary languages of the nineteenth), but logical languages and international languages remain distinct. Henceforth, it is on natural language that heuristic reflection is concentrated, as with the rest of nascent linguistics.

32. Vico, Condillac, and Humboldt are, before him, forgers of this evolution.

33. Citations refer to the English translation by M. Hamburger in *German Life and Letters*, vol. v (1951-52), p. 42-46 The text was probably written in 1805, in the

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period that Kleist lived with his sister Ulrike in Königsberg. It is dedicated to a close friend, Rühle von Lilienstern, who shared Kleist's literary interests. It must have been published in installments in a review, as the mention of "continued" seems to suggest, but it was never finished or published during Kleist's lifetime. It is not even certain that its addressee, the friend, ever received it. Moreover, this text is marginal in relation to Kleist's oeuvre. It is always published in the collection of minor works, where its importance is obscured by the most important of Kleist's short texts, *Über das Marionettentheater* (On the Theatre of Puppets). It occasioned little commentary and seems equally marginal in relation to Kleist's usual linguistic preoccupations, which focus on the impossibility of language and adequate expression.

34. I refer to the commentary on the text by J. Schlanger, "Kleist: l'idée vient en parlant," *Litterature* 51 (1983), pp. 3-14.

35. Commentators have noted that in both cases Kleist alters somewhat the original texts of La Fontaine and Mirabeau in order to mold them to the needs of his demonstration.

36. For an analysis of the situations of communication in the text, see S. Itoda, "Die Funktion des Paradoxons in Heinrich von Kleists Aufsatz "Über die allmähliche Verfertigung der Gedanken beim Reden," *Kleist-Jahrbuch*, 1991, pp. 218-228.

37. For parallelism, see H. H. Holz, *Macht und Ohnemacht der Sprache. Untersuchungen zum Sprachverhältnis und Stil Heinrich von Kleists*, Frankfurt/Main, 1962, pp. 27-28; for the conflict, see H. Turk, *Dramensprache als gesprochene Sprache. Untersuchungen zu Kleist's* Penthesilea, Bonn, 1965, p. 35.

38. Cited by A. Scaglione, "The Eighteenth Century Debate Concerning Linearity or Simultaneity in the Deep Structure of Language: From Buffier to Gottsched," in K. Koerner (ed.), *Progress in Linguistic Historiography*, Amsterdam, 1980, p. 150.

39. This is equally a refutation of the old Cartesian principle that "*ce qui se conçoit bien s'énonce clairement*" (that which is well-conceived is clearly uttered). To the exact correspondance between a "finished" thought (inherited or learned by heart, or even produced fully formed by the brain of its author) and a clear expression, Kleist opposes the living process of thought and language being made.

40. This is sometimes a question of quantity, as in war: "He who, equal in clarity, is faster than his adversary, has an advantage over him because he puts, so to speak, more troops on the battlefield," p. 323.

41. The translation Payot proposed here, "*nous dispense des mots ...*" (releases us from words...) is misconstrued: the other's understanding enables, on the contrary, finding the right word, which is anticipated by understanding.

42. "At social gatherings where minds are continually fertilized with ideas by a lively conversation, one can often see persons who as a rule are reticent, because they feel they have no command of language, suddenly break out with a jerking movement, take hold of speech and five birth to something unintelligible. Indeed, now that they have attracted everyone's attention, they seem to intimate by their embarrassed gestures that they are no longer quite sure what it is they want to say" (p. 45).

43. Rousseau also notes at the end of book IV of the *Confessions* how great is the gap between the ideas that bubble up in his mind in the course of his walks and what remains of them when he tries to write them down.

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44. Judith Schlanger points out as well that the history of the sciences is triumphalist, that it is written from the victors' point of view. She underscores the difficulty of a "history of the negative dimension," in "Novation et histoire," *Les concepts scientifiques*, pp. 103-108 and 115. Yet, what Kleist outlines in this text is, above all, an accounting for, if not a history of, this negative dimension.

45. In fact, upon reflection, the axle metaphor is not consistent with the idea of a gap between thought and expression. The coordination of the two wheels sustains no delay at all; otherwise, the axle would break. If Kleist, against the evidence of the delay, is fond of the axle metaphor, it is because it is a metaphorical guarantee of success: each wheel cannot but carry the other one along. The axle metaphor is a triumphalist version of the fabrication of ideas by language.

46. "I see you opening your eyes wide and replying that in the past you would have been advised to speak only of what you understand" (p. 319). Kleist here revolts against all scholarly methodology.

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