‘For all that gives rise to an inscription in general’

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Of Grammatology, which history seems likely to confirm as Jacques Derrida’s most influential book, was published almost four decades ago. This book marked the beginning of my pathway into philosophy and it has accompanied me throughout my investigations of science and the history of science. I shall therefore begin these remarks with quite a long excerpt from the first section of Of Grammatology entitled ‘The End of the Book and the Beginning of Writing’:

For some time now, as a matter of fact, here and there, by a gesture and for motives that are profoundly necessary, whose degradation is easier to denounce than it is to disclose their origin, one says ‘language’ for action, movement, thought, reflection, consciousness, unconsciousness, experience, affectivity, etc. Now we tend to say ‘writing’ for all that and more: to designate not only the physical gestures of literal pictographic or ideographic inscription, but also the totality of what makes it possible; and also, beyond the signifying face, the signified face itself. And thus we say ‘writing’ for all that gives rise to an inscription in general, whether it is literal or not and even if what it distributes in space is alien to the order of the voice: cinematography, choreography, of course, but also pictorial, musical, sculptural ‘writing’. One might also speak of athletic writing, and with even greater certainty, of military or political writing in view of the techniques that govern those domains today. All this to describe not only the system of notation secondarily connected with these activities but the essence and the content of these activities themselves. It is also in this sense that the contemporary biologist speaks of writing and program in relation to the most elementary processes of information within the living cell. And, finally, whether it has essential limits or not, the entire field covered by the cybernetic program will be the field of writing. If the theory of cybernetics – H-JR] is by itself to oust all metaphysical concepts – including the concepts of soul, of life, of value, of choice, of memory – which until recently served to separate the machine from man, it must conserve the notion of writing, trace, grammè [written mark – H-JR], or grapheme, until its own historico-metaphysical character is also exposed. Even before being determined as human (with all the distinctive characteristics that have always been attributed to man and the entire system of significations that they imply) or nonhuman, the grammè – or the grapheme – would thus name the element. An element without simplicity. An element, whether it is understood as the medium or as the irreducible atom, of the arché-synthesis in general, of what one must forbid oneself to define within the system of oppositions of metaphysics, of what consequently one should not even call experience in general, that is to say the origin of meaning in general. This situation has always already been announced.1

Today, Derrida’s list could be supplemented by the addition of those gigantic writing-machines [Schreibmaschine] which now link research laboratories into a computerized network, coordinating large projects, managing scientific and administrative data and controlling the flow of production, goods and money; of armies; and, finally, the electronically armed offices of anyone and everyone who reflects on the phenomenon known as the information revolution. Even Jacques Derrida is shown seated at a personal computer – in a book that bears his name.2

And yet this situation is not new. As stated in the surprising twist at the end of the passage quoted, it ‘has always already been announced’. André Leroi-Gourhan in Gesture and Speech3 and Roy Harris in The Origin of Writing4 have convincingly argued that writing systems have their historical origin neither in a primal, pictorial-referential duplication of factual circumstances, nor in a primordial, notational-linear

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duplication of vocalizations of a speaking subject, but have emerged – independently of all impression and expression, independently of seeing and speaking – from the modalities of a graphic-tactile activity with its own characteristic imprint. As Leroi-Gourhan says, ‘Graphic representation [is] related to verbal language but independent from phonetic notation.’

The historically more recent coordination of writing and language and – at least, this is how philosophical tradition construes it – the ultimate subordination of writing to language were consequences of the functional polyvalency of writing, a consequence of its surplus, rather than its originating cause. The form of graphism is prior, not derived. What today occupies the space of the pictorial is due to the development of graphic conventions directed towards the pictorial. What is familiar to us as writing was drawn along in a trend towards the linear [Zug zum Linearen].

We are concerned here with the result of a historical differentiation between ‘tight’ [‘dichten’] and ‘articulated’ symbol systems based on a ‘grammar of difference.’ So far as archaeological conjectures can determine, the origin of written notation was based on practices of counting. Harris writes: ‘Almost certainly, homo sapiens mastered the use of numbers before mastering the use of letters ... the human race had to become numerate in order to become literate.’ He adds that it says a great deal about Western culture that the question of the origin of writing ... could not be posed clearly, until writing itself had dwindled to microchip dimensions. Only with this latest of the communications revolutions did it become obvious that the origin of writing must be linked to the future of writing in ways which bypass speech altogether.

From now on, what is in question is the discourse of the grapheme, which was, in fact, always already active, but has only now, finally, been brought to light.

Written being

Even if there are voices claiming that the ‘semiologico-technical turn’ – with which writing has, relatively superficially, been associated – has gone out of fashion, the topic of writing – as universal graphemathesis – thus remains on the agenda. Bruno Latour assures us that are no longer simple intermediaries or simple vehicles conveying meaning from Nature to Speakers, or vice versa.

And, explaining as much as disapproving, as if by way of proof for the enduring, rooted prejudice about an original linking of language and writing, Latour adds: ‘Texts and language make meaning; they even produce references internal to discourse and to the speakers installed within discourse.’ Over the last decades, in the aftermath of the semiological revolution described in this way, one variant of postmodernism has superseded the next. In view of such sequences and consequences, Latour has challenged us to realize at last that we have never been modern at all – Nous n’avons jamais été modernes.

Latour is right. It is not language games which constitute the contextual meaning of the world. [We] live in communities whose social bond comes from objects manufactured in laboratories. But we have also always already lived in a world of which the social bond comprises inscribed objects, or perhaps rather ‘formal sequences’ of things, as art historian George Kubler puts it, even if these did not originate from the beginning of time in laboratories, but initially from Paleolithic caves, then from Neolithic fields, from the smelting furnaces of the Bronze Age, the workshops and courts of the Renaissance. With regard to the becoming-human of the individual, we can, according to Kubler, imagine each personal history ‘as set into play on two wheels of fortune, one governing the allotment of its temperament, and the other ruling its entrance into a sequence’. History exists for us only because there are formal sequences of differentially reproducible branded articles, ‘prime objects’, ‘mutants’ and their further ‘replications’, this whole ‘genealogy’ of things. The prehistoric museum lives from the principle of series and swarms just as much as does the natural history collection. The task of historiography and especially the history of science is to investigate the local conditions of such genealogies.

Here, too, we must agree with Latour, who follows Michel Serres: ‘History is no longer simply the history of people, it becomes the history of natural things as well.’ But for us there are no things which are not also graphemes. As Dasein, all being is written being. From time out of mind, it is the property of this generalized writing, the grammatology of being in its materiality, which makes possible at all reiteration and recurrence, difference as difference, and thus history and meaning.
Rather casually and without returning to it in detail, Derrida has articulated one elementary reason for this. I refer once again to the passage quoted: ‘It is also in this sense that the contemporary biologist speaks of writing and pro-gram in relation to the most elementary processes of information within the living cell.’ Somewhat later, by the way, Derrida did not hesitate to use the biological phenomena of hybridization and grafting as metaphors to describe the work of interpretation – that is, the practice of reiteration of texts.15

So what binds me to writing? Nothing more but also nothing less than that, in a fundamental and at the same time contingent sense, our being machine is a writing-machine. When being finally comes to speaking, to the word, beneath which writing from Plato to Saussure had to subordinate itself, a biological inscription process, which has lasted some 3 billion years and which we continue to designate with the inappropriate term ‘evolution’, a ‘rolling out’ has already taken place. Even before any semantics of formal sequences, before any stratigraphy and genealogy of artefacts – be they arrowheads, cross-vaulting, coaches or adding machines – the semantics of being were based upon a stereo-chemical writing.16 The replication of molecule groupings, which Manfred Eigen has called a molecular ‘quasi-species’,17 originally in the primal soup, today in the test tube, is a process of multiplication of matrix swarms. Indeed, it could be said that molecules first become matrices precisely through their always only finitely accurate duplication. So, the adventure of writing is in fact bound, not necessarily to its striding-forth, its progress [Fortschritt], but always already and irrevocably to its writing-forth, its fore-scription [Fortschrift].18 This applies equally to the differential reproduction of organisms, to the multiplication of Michel Serres’s pragmatogonic ‘quasi-objects’19 and also to the reiteration, the propagation, of texts. There is no writing without palimpsest. The sketch book is the prerequisite for all history, and the first of all histories is difference. ‘The necessity for passing through that erased determination, the necessity of that trick of writing, is irreducible.’20 In it, what appears as difference becomes the generative movement for the next ‘written’ [Schriibs].21 In being drawn forward by its own movement, it proceeds towards a ‘historial’,22 brings to evidence what we experience as time and temporality.

In this sense, generalized writing and evolution, particularly ‘writtens’ and histories, are therefore not possible without one another. Graphemes and differences presuppose one another without having an ascribable origin. Their erased origin is itself the movement of duplication. Who could not know that from their own experience? From here, a path – experience – leads to the experiment as the sign and signal of the modern sciences, their characteristic manner of producing formal sequences of things, graphematic chains of events – that is, epistemic things.23 It leads to the formations which Gaston Bachelard once called the ‘new way of “reading” matter’,24 to the ‘engraving’ of the microcosm, which itself becomes legible only by being written. The physicist’s wax no longer comes from the beehive. It no longer smells of the flowers from which it was gathered, but of the sweat of the methods which have purified it. The purer it is, the more intense. It becomes the moment of that differential, interminable ‘way of rectifying knowledge’ which is played out at the frontier with non-knowledge,25 at which what we describe as thinking is busy ‘making’ and ‘doing’, as one dialect has it, still holding the imaginary reflections of the cogito in internal exclusion within its graphematic materiality. Here, we find ourselves at the place where the simple is still experienced as the simplified, where it still has about it the trace of its having degenerated from the complex. Here, we find ourselves at the place where science still ‘does-not-want-to-know-anything of the truth as cause’, that does-not-want-to-know-anything which, according to Lacan, endows it with its fecundity and its power.26 More is at stake in the experimental situation, as graphematic condition of knowledge, than a theory of semiotics: according to Serres, it is about the ‘pragmatogony’ of epistemic things, about their grammaticony, one might say, about adding one more to the arsenal [Zeughaus] of neographisms, which have within themselves to such an extent the engendering [das Zeugen] and the stuff of the technical [Zeug zum Technischen] that the two terms ‘science’ and ‘technology’ [Technik] have become almost synonymous.27 This therefore relates to the techno-sciences, among whose ranks the latest acquisition is genetic engineering. With genetic engineering, the laboratory, that privileged forge for epistemic things, is transcribed into the organism itself and thus becomes potentially immortal, and genetic engineering begins to write with its own writing-machine of being. Genetic engineering has engendered the largest decoding project of the century, the project of sequencing the human genome.28

But let us be careful with the concept of the techno-sciences. It is based on an identity of technology
and science which, precisely in its alleged evidence, distorts rather than illuminates the character and the process of the experimental sciences. Martin Heidegger also encouraged this misunderstanding when he maintained:

The furious pace at which the sciences are swept along today – they themselves don’t know whither – comes from the speed-up drive of method with all its potentialities, a speed-up that is more and more left to the mercy of technology. Method holds all the coercive power of knowledge. The theme is part of the method.

For Heidegger himself only ‘thinking’ preserves the uniqueness of blazing a trail into the landscape, so that it ‘gives its realm and free rein to what thinking is given to think’. But what does experimental thinking – that is, still evidently graphematic thinking – do other than to leave traces in a representational space, which precisely expose what there is to investigate? Engendering traces in the material representational space of a science is a writing game. Epistemic things are articulations of graphemes. Ultra-centrifuges, electron microscopes, gel-electrophoreses and radioactive tracing (leaving traces: in Heidegger’s language, the name names the ‘essence’ of method) engender those presentational spaces, those writing spaces, in which graphemes fit themselves together to form epistemic objects.

**Sequences**

This can be illustrated with a description of a sequencing gel from a molecular-biology laboratory. Sequencing gels show the form in which molecular biology handles and works with genes. A gel of this kind is presented as a thin, porous plate cast in synthetic resin into which DNA fragments of different sizes have penetrated over different distances subject to the application of an electrical voltage. After a preceding biochemical, enzymatic manipulation, a synthesis with statistical chain termination, the molecules are processed in such a manner that they each differ in length by one structural element. Because of the use of radioactive components for the synthesis, they are ‘marked’ and can therefore be visualized on a photographic plate as a sequence of black lines. Four columns represent the four different DNA bases G, A, C and T. Such a ‘written’ can be read from top to bottom, and this is how the so-called gene sequence is obtained. The writing of life is transposed into the writing space of the laboratory, made into the epistemic thing, brought into the world of average dimensions in which our organs of sense operate.

Research biologists do not work with the genes of the cell as such; they work with graphemes produced experimentally in a representational space. If they want to know what these mean, they have no option other than to interpret this one articulation of graphemes by means of another. The interpretation of one sequencing gel cannot be anything other than another sequencing gel.

In science, nothing can escape this permanent priority of presentation, this constant slipping of one representation under another, with which it simultaneously undermines its meaning as an image. Scientific problems engender representational chains, which do in fact exhibit a certain formal interconnection, which can be ordered at least into series or sequences, the links of which need not necessarily stand in a ‘relationship of cause and effect with one another,’ as Claude Bernard, the great nineteenth-century French biologist and experimental physiologist has remarked. Their sequence obeys neither a logic of deduction nor of physical causality. However, the process is organised according to the principle of engendering ‘cohesive’ differences. It is ultimately a representational process without a final reference point and therefore also without an origin. Paradoxical as it may sound, this is precisely the condition for the power of its oft-cited ‘objectivity’ [Objektivität], its specific objectivity [Gegenständlichkeit] and temporality. With regard to what counts as the truth in a given epoch, in a given discipline, within a given problem-horizon, only minimal conditions of coherence apply for a significant chain, which is furnished with the dignity of an object of science. The available representational space decides on the type of coherence; the arsenal of display technologies decides on the representational space. Accordingly, molecular biology is inconceivable without the high technologies of ultra-centrifuging, electron microscopy and X-ray structural analysis. But there could also be no molecular biology without the comparatively simple, modest methods of chromatography and bacterial genetics, which can be constructed using do-it-yourself equipment. What counts and what doesn’t count as technology is decided not by technology but by the epistemic process. On this point, we must agree with Heidegger that the essence of technology is itself not of a technical nature.

What happens in the ‘hyper-real’ spaces of the modern laboratory is closer to the productions of an artist’s studio than might be assumed. The movement which both obey is that of what Brian Rotman describes as ‘xenotext’, alien writing or other-text:
What it signifies is its capacity to further signify. Its value is determined by its ability to bring readings of itself into being. A xenotext therefore has no ultimate ‘meaning’, no single, canonical, definitive or final ‘interpretation’: it has signified only to the extent that it can be made to engage in the process of creating an interpretive future for itself.32

It is no accident that one of the co-founders of molecular biology, François Jacob, described the process of the experimental sciences as a ‘machine for making the future’.33 Future-generators are characterized by the fact that the events they engender can only be addressed and articulated in the future past. They draw their meaning from what they will have been. They are therefore pure signifiers – an unavoidable paradox which occurs when one is compelled to use terminology the very transcendence of which is in question. In this, they do not differ from living organisms. The events which assail the latter in their differential reproduction – biologists refer to them as mutations – have no meaning at the moment of their engendering. They are a-signified. They receive their meaning only from what they will have been, through their interpretative future. However, without them there would be no living organisms. The logic of the living and the logic of research obey related grammatologies, a related ‘play of the possible’.34 It cannot be handled from the outset in a targeted and selective manner. You either play it or you don’t. And if you do, the play is irremovable because of the peculiarity of its structure. For, in every case, in order to know what you have done, you must have gone on into the next round. This is not very different from Wittgenstein’s language games: ‘Our mistake’, Wittgenstein comments in the Philosophical Investigations, ‘is to look for an explanation where we ought to look at what happens as a “proto-phenomenon”. That is, where we ought to have said: this language-game is played.’35

Whether language games or writing games are involved, we will not grasp them other than through an unavoidable time lag. For artists as well as for scientists, it is therefore the case that, to the extent that they are busy ‘doing’, they cannot know what they are doing. This constitutive time lag coheres with the character of the trace, the grapheme.36 They must duplicate themselves in order to become what they have been. While we refer to the macroscopic effect of this microscopic structure with the concept of the unheard-of, the entire history of the sciences has consisted in the vain attempt to anticipate the unheard-of by bringing it about.

That writing is just another name for this structure and this movement constitutes the message of grammatology, as I see it today. Beyond the denunciation, beginning with Greek philosophy, that it is a mere substitute, a mere supplement to the spoken word, it arrives at its determination in the very movement of substitution. No sentence without substitution [Kein Satz ohne Ersatz]. Its entire efficacy consists in this.

It is time for us to wake up from the Cartesian dream of the One Way, the Discourse of Method, which takes as its starting point the quest for ontological certainty of the ‘thinking I’ and fulfills itself by reading ‘the book of the world’.37 This metaphor is as old as the book, at least as old as the printed book, and therefore as old as what we refer to as modern science. With regard to this metaphor, it should not be objected that the ‘scientifically real’ has not been construed graphically. I have spoken about nothing other than this here. But I have also maintained that there are infinitely many books and infinitely many authors. Above all, and the history of science shows this, they must first be written. And the reservoir of the grapheme is inexhaustible.

The elusiveness of graphematic links on the fluctuating horizon between knowledge and non-knowledge is construed in time in such a manner that it eludes the classical concept of causation, to which the concept of history has been tied in an alternating manner, but always in the name of the law. Only the trace which this will have left engenders – with a gesture of certainty-seeking which is as hallucinatory as it is unavoidable – what is named as its origin. So, there can also be no anticipation here, as François Jacob has unerringly argued in the section ‘Le temps et l’invention de l’avenir’ at the end of Le jeu des possibles:

But even if it is in our nature to engender future, the system is still constituted in such a way that our predictions must remain uncertain.... What we can suppose today will not become reality. There will be changes in every case, but the future will be different from what we believe. This applies particularly to science. Research is an endless process about which it can never be predicted how it will turn out. But this unpredictability is in the nature of the adventure of science. If anyone were to stumble on something really new, it would be something which, by definition, could not be known in advance. It is impossible to say where a given field of research will lead. And it is therefore not possible to select some aspects of science and reject others. As Lewis Thomas says, you either have science or you don’t.39
But would it not be better to speak of the sciences in the plural? As Isabelle Stengers emphasizes, there is not just one. And for that reason the game is still as open as ever, even if no more can be said about the sciences, or indeed about any of the arts, than: this game is played. In our time, it has become easier to grasp that what is in play here is less a context than a ‘xenotext’, even in xenophobic reactions to something which sits less and less comfortably under the unproblematic rubrics of ‘scientific progress’. Instead, perhaps greater xenophilia should be prescribed – let us say: a certain love of epistemic things.

Translated by David Charlston

Notes

6. [Rheinberger plays here on the multiple associations of the term Zug, which, at its most concrete, means ‘railway train’. As in the subtitle of the Liechtenstein collection from which Rheinberger takes his title phrase, Im Zug der Schrift, the noun Zug can also refer to the ‘stroke’ of a pencil on paper, or a ‘facial feature’, a ‘draught’ or ‘draft’ of air, a ‘course’ or an ‘action’. DC]
7. Nelson Goodman, Languages of Art: An Approach to a Theory of Symbols, Bobbs Merrill, Indianapolis, 1968. (The adjective dicht here suggests a ‘watertight’ or ‘airtight’ (wasserdicht/luftdicht) Symbol systems can be ‘tight’ in the sense that they are ‘sealed’ or ‘closed’ and leave no room for articulation. DC]
8. Harris The Origin of Writing, p. 133.
11. Latour, We Have Never Been Modern, p. 21.
13. Ibid., pp. 7, 39f.
14. Latour We Have Never Been Modern, p. 82.
18. [Rheinberger plays on Fortschritt (progress) – Fortschritt is a neologism suggesting a continuation of a writing process. DC]
21. I owe the expression to Norbert Haas. (The dictionary definition of Schrieb is an ‘official letter’ or a ‘wretched’ scrap of paper. I have taken it as a neologism and translated it as the noun ‘written’ to highlight its allusion to the past tense and the graphematic link with schreiben, to ‘write’. DC]
25. Ibid., p. 172.
27. [Rheinberger plays on the multiple associations of the term Zeug (stuff, material, equipment). Zeughaus is an arsenal containing military equipment. The verb erzeugen is to ‘produce’, ‘generate’, ‘engender’ in fields as diverse as farming, electrical engineering and biotechnology. I have translated it as ‘engendering’ here to highlight its genetic associations throughout this article. DC]
31. With regard to this concept, see Jean Baudrillard, Agonie des Realen, Merve, Berlin, 1978.
39. Jacob, Le jeu des possibles, pp.10f; translated here from the German: Jacob, Das Spiel der Möglichkeiten, pp. 93f.