PREDICTABLE WORLDS: ON WRITING, ACCOUNTABILITY AND OTHER THINGS

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(First received May 1994; accepted in revised form December 1994)

Abstract — The article examines the forms in which writing is entangled with the project of predictability and accountability, so essential to contemporary systems of production and administration. The analytic predisposition of writing helps in decomposing the synthetic totality of organizational tasks and thus in creating the requirements for their visibility and immediate inspection. Writing, together with the individual interiorization of its rules and procedures, helps to produce accountable versions of organizational actors. However, different systems of writing differ in their ability to help in the construction of predictable worlds. An attempt is made therefore to distinguish between numerical, verbal and pictorial or analogic systems of writing and notation, and to connect them with the construction of predictable worlds and the accountability of organizational actors. Copyright © 1996 Elsevier Science Ltd

Key words: Writing, representation, cognition, action, disjointness, verbal, numerical, predictability, accountability, electronic writing, hypertext.

Writing...initiated what print and computers only continue, the reduction of dynamic sound to quiescent space, the separation of the word from the living present, where alone spoken words can exist.

Walter Ong, Orality and Literacy

...time and the order of events control a man’s life more than the nature of such events.

Marc Saporta, Composition No. 1

OBJECTS, EVENTS, ORGANIZATIONS

Formal organization and the instrumental experience it generates are inextricably bound up with representation and with the ability of representation to produce limited and surveyable versions of the world and to transcend the inevitable context-embeddedness of human acts. Tied to bodies and things, action is by necessity context-embedded, it cannot but occur in a “here and now”. In contrast, representation is able to augment the spatio-temporal ability of human agents and to place their actions in extended, coordinated networks. Local and isolated actions and events become connected and coordinated by the capacity of representation to construct and sustain standardized and shared codifications of objects and of time and space (Kallinikos, 1995).

Examples abound: a balance sheet or profit and loss account, a marketing or strategic plan, a financial statement or verbal description, an organization chart, a population census, medical archives — they all recapture in their codified forms the spatial and temporal diversity of organizational events and create the requirements for inspection and control. The present article seeks to explore the implications of the world view that coincides with representation, focusing on the institutional web of assumptions and the very processes and techniques by means of which formal organizations are rendered predictable and manageable. Such a purpose is not triggered by a desire to produce predictable worlds, even less by a desire to generate normative principles for managerial action. The article neither condemns nor praises predictability but seeks rather to understand a fundamental condition of organizational worlds which, despite its centrality, remains largely unexplored and undefined (see e.g. Kallinikos, 1993).

Action and events are to the functional mind the raw materials of instrumental experience, the intrinsic instability of which needs to be tamed and placed in regulative networks that guarantee their functionality. The fundamental strategy of instrumental experience coincides with the effective separation of representation or cognition from action, and the subordination of the latter to the former. The very basic instrumental distinction between ends and means epitomizes the separation and hierarchization of the representation-action relationship, since it implies the conception of a set of relations projected or represented in an imagined future time, i.e. ends, and the selection and organization of means for the exclusive purpose of effectively achieving the stated ends. In the ideal instrumental world, local practices and materials always have to be tied and subordinated to encompassing schemata of functionality, from which they derive their utility and meaning. In view of widespread confusion and the revival of the old controversy regarding the primacy of cognition versus action, it is important to point out here that it is not the separation as such but rather the hierarchization of the cognition-action relationship that sustains the instrumental orientation of the contemporary world and its rational outlook (Cooper, 1989b). Hierarchization of the cognition-action relationship is a rule, a normative device or principle whose application constructs rather than reflects reality and truth.

Action, as opposed to mere motion, has always been connected with intention, a mental or psychological state that animates and sustains it (Burke, 1966). Yet, unless separated and stabilized by representation, such a connection remains of necessity obscure, labile and limited to local contexts. Intention is intrinsic to human action; it grows out of the many shifting circumstances that surround action, always accompanying but never controlling it. The evanescent, event-like and context-embedded character of action does not allow for the solidification and separation of the deliberate element that accompanies it, and the hierarchization of the intention-action relationship. These characteristics make action an unreliable partner for instrumentality. For if the world is to be approached from the horizon of intention (subject), as the instrumental experience always implies (March, 1976; Weber, 1947), then intention needs to be cut-off, as it were, from the molten world of action, solidified and given a privileged position. Formal organizations are social technologies that coincide with and safeguard the solidification of intention and the relegation of action to the status and subservient role of means. The institutionalized rule of planning and goal-setting mediates such an attitude and ensures, no matter how precariously, the conception and instrumentation of the world from the horizon of a set of solidified intentions. Note again that these are principles to be followed. No matter how important, the question of how far these principles are transformed into factual relations is a different one.

The subordination of action to intention (representation) is a fundamental strategy for coming to grips also with the second basic characteristic of action, i.e. its inherent unpredictability. As
opposed to mere motion, action is always capable of performing the “infinitely improbable” (Arendt, 1958, p. 178), of evading repetition and branching out in unexpected directions. The unpredictability of action is inextricably bound up with its social or communal constitution. Action, like speech, takes place among human beings (Arendt, 1958). In contrast to the involvement with inanimate things, the chain of reactions or effects that human interaction helps to set in “motion” tends always to evade predictability and to betray expectations. In the oral and communal world of immediate action, there is no way of calculating in advance the course of events. Anticipations can certainly be made, yet action appears recalcitrant to the dictates of predictability. “Men act, things but move” as Kenneth Burke (1966, 1978) suggestively remarks.

The detached and isolated world of representation holds considerable promise in this respect. Formal organizations represent the social technologies for arresting the unpredictability of action, and charting the future paths along which it will have to unfold. The institutionalization of intention enlarges the temporal frame of organizational tasks and places them in planned and prearranged sequences. Within this overall context, person-to-person interaction is curtailed and turned, as far as it is possible, to interaction with inanimate things, i.e. machines, materials, physical structures, etc. Action thus undergoes a profound mutation, being transformed into what Arendt (1958) calls making, a hybrid state between motion and action proper. In the activities of making and fabrication, intention already appears as anterior and exterior to means, dictating their selection and organization.

Organized or instrumental worlds thus implicate the separation of representation from action and the consequent conception and instrumentation of activities in accordance with the controlling, outcome-oriented schemata of representation (Kallinikos, 1995). However, these are complex accomplishments that need to be understood and analysed in their particular details and diverse manifestations. Apart from the superimposition of representation upon action, the realization of the instrumental vision makes even necessary, the detailed charting of the states and relationships to which organizational activities are supposed to succumb. Lacking the methods and techniques that are capable of producing such a detailed description of organizational tasks, roles and responsibilities, the hierarchization of the representation-action (goals-means) relationship cannot by itself generate the instrumental experience.

The construction of predictable worlds needs an extensive repertoire of representing techniques that segment and posit the world in a fashion allowing for detailed inspection, for the constant comparison and evaluation of local means-ends relationships and the continuous monitoring and control of organizational actors in terms that render them accountable. Within this wider context writing emerges as a basic medium that embodies the functional world-orientation of representation. The analytic predisposition of writing — alphabetic and alphanumeric — and its standardized procedures contribute, as we will see, towards constructing an organizational visibility, a permanent yardstick against which organizations are able to achieve the ongoing evaluation of their activities. It would be worth noting, in this context, that writing as a procedure needs to be distinguished from writing as an end product, i.e. a text or table. It is most notable as a procedure that writing accomplishes its coordinative and disciplinary effects.

It seems fairly evident that continuous monitoring and evaluation are fundamental requirements of large-scale systems in which multiple, dispersed and shifting interdependencies are involved. The minimum of mutual adjustments and accommodations which coordination under these conditions necessitate, is closely connected with the ability to achieve visibility in organizational relations. However, the widespread assumption that outcome control compensates for behaviour control — immediate supervision — in large and highly differentiated systems
tends to leave organizations as resembling black boxes (Chandler, 1977; Perrow, 1986). Outcome control achieves at best a discontinuous and posterior evaluation that needs to be sustained by a sensitivity to and knowledge of the minute details that make up the complex of accomplishment. The very interpretation and evaluation of results is inextricably bound up with the knowledge of the fabric of actions and relations out of which these results emerge. Furthermore, the distinction between outcome and behaviour control fails to differentiate between behaviour supervised and controlled by external forces on the one hand and on the other the subtle and discreet forms and techniques by means of which organizational relations become the target of a functional visibility that drives organizational actors towards their own continuous self-evaluation and control. Writing as a procedure offers an important insight into this process.

No wonder the very institutionalization of intention and the hierarchization of the representation-action relationship characteristic of the instrumental experience are inevitably involved in the reproduction and maintenance of an agonistic context. The representation-action asymmetry coincides with social hierarchy and stratification. Only a limited set of intentions or interests can be institutionalized, attended to and satisfied, leading to the differentiation and stratification of the organizational actors and to differential commitment to established priorities. However, formal organizations are social technologies constantly engaged in eradicating the social space that coincides with the presence and multiplicity of human actors in instrumental contexts, by transforming the agonistic and political structure of social relations into relations of functionality (Foucault, 1977); or, to use another terminology, to make technical and administrative questions out of political ones. It is intrinsic to the logic of functionality to demand insight into and control over the processes that make up the instrumental context. Rather than being periodic and externally imposed, control forms an intrinsic or integral part of the relations of functionality exercised in a permanent and continuous fashion.

It is in this light that the abundance of all forms of alphanumerical techniques in organizations could be understood. Accounting systems, financial models, tables, lists and graphs are attempts to explicate and render visible the complex tangle of organizational relationships and impose on organizational decisions a functional model. Neither the institutionalization of intention nor the hierarchization of the intention-action relationship are adequate to ensure the realization of the functional preoccupations characteristic of the instrumental experience, and thus need to be supplemented by the development and utilization of methods and techniques that are capable of effectively breaking down the totality of operations into minute and manageable tasks. The diffusion of writing and the growth of specialized techniques of notation, which construct an organizational visibility against which the continuous and unbroken evaluation and self-evaluation become possible, need to be placed and understood in this wider context of functionalization.

WRITING AND ORGANIZATION

It emerges, then, that the circumnavigation of the context-embedded and unpredictable character of action and the accomplishment of organizational visibility epitomize in a straightforward fashion the basic strategic orientations of the instrumental experience. Both these essential priorities find their embodiment and realization in the activities of writing and fabrication. Within the overall context established by the objectifying attitude of representation (Heidegger, 1977), writing and fabrication emerge as the principal techniques for dissolving the synthetic totality of operations into minute, itemisable and supervisable tasks, re-enhancing the
hierarchical relationship of representation to action and mastering the inherent unpredictability of human action by curtailing its social character. Both writing and fabrication produce detached and isolated arrangements from the ongoing stream of oral and context-embedded interaction (Arendt, 1958; Ong, 1982). Detachment and isolation obviously reduce the number of unexpected and animate interactions and achieve a kind of closure and inspection that is assumed to facilitate the generation of outcomes. Albeit not perhaps evident at first glance, writing — and indeed fabrication — implicates a set of goals which it is supposed to work on systematically in isolated and undisturbed settings.

The functionality of writing can perhaps be better appreciated if it is seen within the broader context implied by the very act of knowing. Human experience, perhaps the whole of human history, might be regarded as a gigantic exercise in the detention and preservation of the moment, the solidification of immediacy. The molten or evaporating world of intuitive involvement, of immediate perception and emotion must, if it is to persist, be caught up and turned into solid and durable artefacts. The fleeting impressions and associations that arise from immediate action must not be allowed to vanish, but have somehow to be transformed, become embodied into substances that withstand time and transference in space. All sorts of intellectual and material instruments have been contrived and employed in the service of this sustained enterprise. Phonic and graphic signs, words and numbers, constitute one cluster of examples, tools and machines another. Whatever the cognitive means and materials and the social processes involved in such an accomplishment, it is in this way that man steps beyond the horizon of instantaneity and transcends the limits of local and immediate contexts (Cassirer, 1955). Representation thus both enhances and marks a decisive turn in this project, by linking objectification with encompassing schemata of functionality which in turn implicate the institutionalization of intention. Writing, as opposed to speech, is inextricably bound up with the functionalization of action and its transformation into object. Once objectified in this way, experience can be stored and recalled, examined and acted upon, transmitted and re-encountered, and perhaps accumulated (Goody, 1977; Ong, 1982).

In general, writing and fabrication could be said to embody, express and re-enhance representation's orientation towards mastery and control. Both are outcome-oriented ensembles of activities that coincide with the separation and hierarchization of the representation-action relationship. Writing in particular forms an indispensable means for the solidification and institutionalization of intention into planning and goal-setting and the separation of planning from execution, so essential to the instrumental experience. It also allows for the reification and the easy retrieval of past events. Although essential, however, the extension and stabilization of the spatio-temporal coordinates of action epitomized by writing as an end product, i.e. a text, do not suffice to produce the detailed charting of goal-oriented activities, or the visibility necessary for the unbroken, continuous monitoring and control. The evaluation of activities in terms of goals achieves only a posterior and discontinuous evaluation. We need to know whether, and how, writing makes its contribution to organizational visibility and to the sense of continuous control thereby accruing.

Institutionalized and standardized, the experiences of writing and fabrication are transformed, in the context of organizations, into those of administration and production. Industrial technology has always been connected with the construction of predictable and recurrent worlds, and with the reduction of action into a set of reactions subordinated to a preconceived sequence of motions (Kallinikos, 1992a,b; Mumford, 1952). Writing, on the other hand, has only rarely and indirectly been related to the instrumental orientation of the modern world. There is, it would seem, something elusive in the humble technique of writing that easily escapes the examining gaze of critical interrogation. I will not at the moment make any distinction between chirographic writing,
printing and electronic writing. My purpose is not one of tracing the history and effects of
different technologies of writing, but to link the understanding of such effects with the
construction of predictable worlds.

However, as suggested above, writing emerges as a fundamental cognitive strategy that turns
events into objects which can be examined, handled and acted upon. It solidifies the moment, and
classifies, records and accumulates its codified versions. Written codification makes up an
ensemble of techniques and operations that “account for” the world by breaking up and
disentanglement its composite state into separable and minute details which can be inspected,
compared, controlled, reversed, etc. There is no way of writing down the world without recourse
to analytic procedures (Ong, 1982). Whether in numerical or verbal documents, writing recaptures
the world in the explicit and codified rule-based combinations of its elements or units — numbers,
accounts, letters, words — into greater wholes or discourses. Writing, to use Lotman’s distinction
(see Eco, 1976), favours grammar or rule-oriented cultures, i.e. cultures that rely heavily on the
explicitness of rule-bound behaviour. The analytic predilection of writing, then, is inextricably
bound up with opening up and disentangling the interior constitution of things, states and
processes. In this respect, it contributes towards constructing the detailed charting of roles and
relations that is essential to the continuous monitoring and evaluation of goal-oriented activities.

The explicit, dividing and classifying logic of writing and notation, then, imparts a visibility to
the world and, in so doing, enable the juxtaposition, comparison, examination and revision of
diverse states and processes that would had remained implicit and ambiguous had they been left to
the shadowy forms of the imagination. Writing and notation, these technologies of the intellect, to
use Goody’s(1977, 1986) words, objectify human knowledge and cognition. Such objectification,
however, does not remain an alien and exterior body but turns back, as it were, upon language and
cognition, and restructures and reconstitutes them. It would seem that the effects of writing practices
are not exhausted by the description and written documentation of the world. Certainly, writing
breaks up the composite state of the world and thus provides innumerable points of reference and
comparisons essential for the complex navigation towards goal accomplishment.

However, the very restructuring of cognitive habits effectuated by writing practices suggests
that writing is perhaps involved in a constitutive complicity with the very ideals of rationality and
the rational agent. Interiorized and appropriated, the very methods and procedures for breaking up
and accounting for the composite state of the world recede from the horizon and the supervision
of consciousness, and become standard ways of perceiving and making things. The proliferation
of numerical standards and techniques that characterize modern organizations, attests that writing
as a procedure coincides with the conception and institution of forms of actorship, whereupon
agents themselves become both the bearers (subjects) and the target (objects) of their own
evaluation and control (Foucault, 1977, 1980). Continuous control implicates not simply the
charting and segmentation of the world, but also an agent capable of, and prone to, the continuous
comparison and evaluation of his own position against the charted world.

THE SEMIOTICS OF PREDICTABLE WORLDS

The analytic predilection of writing and its relationship to rationality perhaps call for a more
detailed exposition. Acting in and on the world on instrumental premises implies a continuous
concern with the methods, techniques and practices by means of which the equivocal and event-
like character of context-embedded action is reduced in ways that produce predictable, singular
and functional worlds (Foucault, 1977; Weick, 1979a,b). Such a project is indissolubly bound up
with the institution and ongoing utilization of techniques of writing which exhibit an organization that I will subsume, following Goodman (1976), under the label of disjoint and unambiguous systems of notation. Numerical statements and paintings provide instances of inscription techniques which utilize widely differing principles of organization. Numerical statements can easily be decomposed into their constitutive units and can be built up again following the track of codified and unambiguous operations. In contrast, a painting represents a dense system that cannot be easily decomposed into its constitutive units (Goodman, 1976). It does not possess an alphabet, so to speak, allowing its synthetic totality to be broken down into well delineated units, which can be unambiguously recombined to reconstruct the system in question. Nor can its elements be cumulated. Verbal systems, it would seem, fall somewhere in between, for they are composed of discrete and well delineated units, the combination of which might nevertheless yield ambiguous sentences (semantic fuzziness).

The forms of organization displayed by different techniques of writing emerge, in this respect, as being of crucial importance to the instrumentation of recurrent and predictable sequences of acts. Different techniques of writing and notation differ in their ability to guide the construction of predictable worlds. The instrumental ideal coincides with the ambition to remove organizational activities from the hazy and improvising realm of pictorial and ostensive representation, usually associated with context-embedded action and communication, towards the transparency and standardization of numerical coding. Standardized and formalized patterns of action demand a cognitive technology that has the potential to segment and posit the world in identical ways, which can then be codified, taught and transferred. Deprived of these qualities, the armoury of accounting systems, financial models and databases that characterize contemporary systems of production and administration, do indeed become mystical exercises. Neo-institutional theory, which attempts to describe these characteristics in terms of imitative processes that are ultimately sustained by legitimate or accepted social and organizational practices, fails to account for their specificity. Numerical techniques represent forms of social control which have a greater potential for transmission across contexts without significant distortion (Hassebladh, 1995; Kallinikos, 1992a).

The social character of written codification implies that the operations and activities necessary to the instrumental experience can be detached from extraordinary individual abilities and assumed by any competent, i.e. average, member of a collectivity. In light of this, bureaucracy is inextricably bound up with writing and the codifying forms and techniques whereby predictable and recurrent sequences of acts are conceived and instrumented. In a sense, formal organization represents the incessant effort to dissolve action into its constitutive components — meaning, physical motion — and to achieve the unification of signification and sheer motion in the schema of recurrence and predictability (Kallinikos, 1992a). Such a task is significantly aided by the utilization of disjoint and unambiguous systems of notation. These claims need to be further clarified, however.

In any system of semiosis two aspects are of cardinal importance, namely the character and number of the signs in a system and the rules governing their combinability. Again, accounting and numerical reports differ from verbal documents, and both differ from models, maps, diagrams and pictures (Goodman, 1976, 1978). The forms in which these systems of signs and symbols are organized differ, and the differences have important implications for the conception and instrumentation of predictable worlds. I indicated above that a considerable part of the difference involved relates to the disjoint character of the signifying or syntactic elements — the physical embodiments or expressions — of these systems, and to the manner in which their semantic domain — the totality of notions or ideas — is segmented and structured. The old and venerable distinction between analogue and digital systems actually concerns the extent to which a system is organized by means of discrete, disjoint elements, i.e. by elements that are clearly and finitely
differentiated from one another. Arabic numerical notation and natural languages are examples of systems that rely on disjoint syntactic organization, whereas analogic representation does not as a rule have access to a well delineated system of such discrete and disjoint terms. It is perhaps worth noting here that despite similarities in spatial appearance, pictures and diagrams belong to entirely different semiotic systems. Diagrams are as a rule disjointly or digitally organized, whereas pictures obey an analogue organization. Although I will analyse some features of the forms whereby such systems of semiosis are organized, I cannot go into the detail here that a thorough analysis would require (see e.g. Eco, 1976; Goodman, 1976, 1978; Haugeland, 1981; Kallinikos, 1992a, 1993).

Evident as it may seem, the property of disjointedness appears somehow elusive and needs to be carefully analysed. As understood here, disjointedness is inextricably bound up with the conception and institution of the type. Particular signs are but instances, tokens of their corresponding types. A word, a letter, a number, all coincide with the institution of the type which antedates and outlasts particular occurrences or applications. The institution of the type is the institution of a class or form which means that signs — words and objects — are demarcated and distinguished on the basis of a selected set of properties. A class posits the identity or, to be more exact, the equivalence of all particular occurrences that belong to the class (Castoriadis, 1987; Goodman, 1976). Each letter, number or word recurs in different contexts without ceasing to be the same. No matter how it is spelled, provided that it is spelled correctly, a word is always the same — syntactically not semantically — and identical to itself.

The institution of the type links the notions of stability and recurrence with the concepts of identity and class or form (Kallinikos, 1993), since the retrieval and identification of a certain object, event or sign as being this and not that, as complying with a given label or type, necessitates the institution of the notion of a class or form whose members are indifferen or equivalent, i.e. freely exchangeable. In more formal language, instances of a class or type are reflexive, symmetric and transitive — true replicas, as Goodman (1976) wants them to be, of each other. The crucial property of combinability and the opportunity to rehearse, experiment and instrument are dependent upon the ability of these units or instances to ward off any infiltration of their boundaries, to keep their contours clear. For unless the notion of type is accepted, everything seems to melt into everything else, unit and identity are erased and the world returns to a state of undifferentiated chaos. The institution of the type also coincides with the ability to detach signs — or tools — from the particular contexts in which they have been engendered or used, and is thus inescapably bound up with the capacity of representation to transcend immediate contexts and the spatio-temporal limitations of context-embedded action. Mobility across different contexts is inextricably bound up with the ability to recognize tokens as instances of types (Castoriadis, 1984, 1987).

Alternative cognitive theories, revived by the recent advent of connectionist models of cognition, construe the perceptual activity of object recognition and categorization in a radically different fashion from the one implied by the type-token distinction described above. Rather than being identical occurrences or replicas, instances of a concept share a family resemblance emerging as more or less "representative" exemplars of a concept or sign, e.g. a mango tree is not perhaps as "good" an exemplar of the notion of tree as an oak tree or a redwood. Instead of the type-token distinction we have thus the notions of prototype and graded structure (see e.g. Bechtel and Abrahamsen in Fetzer, 1991). Such an understanding of perception and cognition has important implications, some of which I will attempt to explore later in this article.

Alphabetic writing epitomizes the cognitive strategy mentioned earlier. For it consists of a number of disjoint primary elements or types whose _ars combinatoria_ yields greater units and
discourses. Alphabetic writing (re)captures the world by recourse to a limited number of types — usually between twenty and thirty — that withstand transference in time and space. Letters are, no doubt, graphic transformations of disjoint sounds, i.e. phonemes. Yet, like action, sound remains context-embedded and, though it can be recorded and transferred, it cannot be handled and acted upon in the same way as alphabetic tokens. Alphabetic writing transforms sounds or events into things, objects which it reassembles and reallocates by recourse to a linear (parataxic) organization. Schematic forms of writing such as lists, tables, indexes, accounting statements, etc. take the functionality of writing a step further, as they break with the speech forms of writing, i.e. forms that duplicate the seriality and grammatical constitution of natural language (Goody, 1977). Schematic writing and notation exploit the spatial economy of rows and columns, where objects and events are divested of the last elements of action retained in speech forms of writing by their reliance upon the integrative power of the verb. The spatial or topographic arrangements of schematic writing enable immediate inspection and juxtaposition of information. They are deeply functional and closely linked with the desire to store, accumulate, retrieve and thus control past and future events. In its modern form of computerized book-keeping, alphanumeric writing is a technology without which the instrumental experience would hardly have been able to achieve any of its goals.

Strange as it might seem, the experience of mechanized production and automation recounts, in essential respects, the analytic steps that make up the cognitive technology of writing. Though not evident at first glance, the disjoint and classifying logic of alphabetic writing, enhanced and further standardized by print and electronic technology, epitomizes the very organization of mass production and the assembly line (Kallinikos, 1992b; Mumford, 1952). There is a logic of replica and duplication intrinsic to alphabetic writing in general and alphabetic letterpress print in particular, which seems to have been carried over and applied to mass production. The concept of type suggests that the products of mass production, like graphic tokens, emerge as true copies, replicas of one another. Tokens are often compound, i.e. they are made up of combinations of primary, separable tokens which are themselves replaceable and freely exchangeable — e.g. product components or letters into words. The analytic and disjoint strategy of the cognitive technology of writing has furnished, it would seem, the cognitive model for the construction of the assembly line. Re-echoing Mumford's (1952) and McLuhan's (1962) insights, Ong (1982, pp. 118-119) claimed that:

Alphabet letterpress printing, in which each letter was cast on a separate piece of metal, or type, marked a psychological breakthrough of the first order. It embedded the word itself deeply in the manufacturing press and made it into a kind of commodity. The first assembly line, a technique of manufacture which in a series of steps produces identical complex objects made up of replaceable parts, was not one which produced stoves or shoes or weaponry but one which produced the printed book. In the late 1700s, the industrial revolution applied to other manufacturing the replaceable-part techniques which printers had worked for three hundred years.

WRITING, ACCOUNTABILITY, BUREAUCRACY

It emerges, then, that the properties commonly attributed to writing coincide with the extent to which a system organizes its syntactic and semantic space by having recourse to disjoint and unambiguous terms. Within the confines implied by the instituted elements or types of a system of representation, a single or compound term cannot belong to two classes. A letter, a word, an account or an item in an account might, no doubt, fulfil other functions than those implied by
writing or accounting, but then we are within the domain of other representational systems. For as soon as a letter, or a word or an account unpredictably melts into others, i.e. belongs to two or more classes, then the principal purpose of writing or accounting is defeated or seriously impaired. Disjoint organization is also linked with the semantic requirement of unambiguity. This last implies that the notions or ideas "picked up" by significant — in the sense of having meaning — combinations of primary tokens — e.g. letters into words — are independent or clearly separate of one another. Obviously, notions and concepts always coexist with, and are not accessible except by recourse to syntactic or signifying terms — phonic and graphic signs. Unambiguous writing implies that each signifying term always refers to the same semantic unit (concept), and that no other signifying term refers to this semantic unit.

I have indicated several times that pictorial representation does not as a rule organize its elements in a disjoint and unambiguous fashion. It does not possess the counterpart, so to speak, of an alphabet that allows it to be decomposed into its constituting elements in the same way as a sentence can be decomposed into words, or words into letters or phonemes. The question of disjoint organization or decomposition takes us, by an unconventional route, to a series of crucial issues connected with the institution of bureaucracy, since it points to the complexes of motives and reasons that push formal organizations to strive to rely, as far as possible, on disjoint and differentiated inscription systems. For, since such systems are stable and well-differentiated units, their elements can be folded, unfolded, reshuffled and recombined in a way inconceivable to the constituents of dense and undifferentiated systems. Disjoint units do not run the risk of merging with other units or dissolving into their material substrata.

An accomplishment arrived at by means of a sign-organization that allows for its own decomposition into its constitutive parts, can always be released from its dependence on a single and indispensable actor — e.g. the creator — and, consequently, can be taken on by any competent, i.e. average, member of a group. Further, the steps or rules that lead to such an accomplishment can be recorded, codified and turned into systematic knowledge which can be taught and transferred. Viewed in this light, the whole question of standardization and formalization, cardinal properties of the institution of bureaucracy, take on a new meaning, for they emerge as particular manifestations of the socio-cognitive means and operations whereby organizations segment, manage and evaluate the complex texture of their activities. The disjoint character of writing and notation epitomizes in its very constitution the overall attitude towards codification, standardization and formalization.

An awareness of the instrumental involvement of writing systems which segment and order the world by means of disjoint, unambiguous and combinable units, opens up a new path for releasing the various approaches to bureaucracy and organization from the Weberian ghost, for it suggests that the objectification and accountability of human action is contingent on the extent to which the latter can be inserted into prearranged and codified sequences and aggregates of acts. And the conception and instrumentation of the latter are to a large extent the accomplishment of technologies of writing that rely on a disjoint and unambiguous organization.* Little wonder that predictable and accountable behaviour is a fundamental concern in Weber's (1946) theory of bureaucracy. Yet, like that of many after him, Weber's assessment of the means and operations by which accountability is produced never left the stage of scattered, vague and largely

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*I do not mean that the principle of disjointedness exhausts the issue of accountability. The recent controversy on Management Accounting, for instance, with respect to the methods that ensure the appropriate segmentation of organizational costs, attests that different methods do have effects on the construction of organizational visibility. Methods such as Direct Costing and Activity Based Costing differ in the way they conceive and segment their semantic domain. Such differences nevertheless develop within the cognitive territory defined by syntactic disjointness.
unsystematic reflection. True, in the section which Parsons translates as “budgetary management” (Haushalt) Weber explicitly discussed the central part played by numerical statements in the orchestration of rationally oriented activities. And yet, numerals represent only the adjacent or exterior elements, the substrata of the decisions, making their contribution to the rational allocation of resources (Weber, 1947, pp. 186-191). The very processes whereby actors are constituted and self-disciplined through the interiorization and application of writing techniques are left in the dark, as it were. Evaluation and control emerge only as being periodic and posterior.

The analysis undertaken here seems to suggest that standardization and formalization coincide with the attempt to segment, in a disjoint and unambiguous fashion, the molten character of human behaviour into relatively recurrent and equivalent sequences of steps. Disjoint and semantically unambiguous representations in general, and numerical representations in particular, help to disentangle the totality of instrumental tasks and to render it visible, inspectable and manageable. In providing the formal rules by which totalities are analysed and units are assembled into greater wholes, writing and notation serve to standardize and release accomplishment from particular idiosyncrasies and to allocate responsibility in terms that make it accountable. The division of labour is thus constituted and reproduced by the visibility of the labour of division (Cooper, 1989a). No wonder that, insofar as the province of human action is concerned, the conception of the type is destined to remain an unattainable ideal, a plan, a horizon to strive for but never to reach. Even physical motion sticks to the molten realm of iconic (ostensive) representation. And yet, inscription methods that rely on disjoint and unambiguous elements or terms can significantly aid the orchestration of human action along recurrent and predictable lines, for they provide the rules and the means of standardized ways of instrumenting and evaluating organizational activities. Conception and instrumentation, representation and action are connected by elusive but indissoluble links.

Hopwood (1987), Hoskin and Macve (1986) and Miller and O’Leary (1987) have retraced part of the chronological trajectory of book-keeping along lines that help to substantiate the argument advanced here. Exploring central Foucauldian themes in the context of accounting, Hoskin and Macve (1986) in particular noted that the emergence and spread of alphanumeric writing bear witness to the grand and ever-expanding project of the Western world: the proliferation of quantitative techniques and the production of huge amounts of documents that will gradually come to colonize, order and grid the minutest aspects of everyday life. Out of these techniques, procedures and documents is born an accountable and predictable version of man which is essential to the instrumental experience (Foucault, 1977; Hoskin and Macve, 1986): not a man of blood and flesh but a segmented, abstract and manageable entity held together by the intersection points, so to speak, of various series of documents constructed in accordance with the standards and norms of the different occupations and professions. Bearing the imprint of a utilitarian involvement, such documents are not any longer biographical notes, accounts of a personal life, but information units that enter or await entry into networks of functional applications and relationships.

The social visibility accomplished by the procedure and analytic predilection of writing allows for its link with the notion of continuous and uninterrupted control connected with panopticism. It is well-known that Foucault’s interest in accounting for the rationality and disciplinary nature of the organizations and institutions of the modern world is inseparable from the processes and the material and cognitive means whereby disciplinary power ensures the consent and complicity of the very individuals to whom it is applied. The control and accountability of human behaviour, as it appears in its modern version, is not a question of achieving compliance by means of a crude and external force, or of correcting behaviour on the basis of regular yet discontinuous outcome
evaluations. Disciplinary relations differ both from relations of sovereignty or domination and from consent or compliance arrived at through interpretation and the periodic evaluation of results.

Disciplinary power needs the active and unbroken complicity of the individuals it is seeking to discipline, so that, thanks to its omnipresence, its continuous and automatic functioning and its dissociation from particular individuals are assured. Such ongoing complicity and consent demand the interiorization of the panoptic gaze, i.e. the individual appropriation of a heterogeneous ensemble of methods and techniques put into circulation by different regimes of truth — professions, disciplines — and sustained by extensive networks of institutions and organizations. Individuals thus constituted through a multiplicity of forces, materials and practices, become the very “vehicles of power” rather than its passive recipients (Foucault, 1977, 1980, 1988). The categories, definitions and techniques that disciplinary power puts into circulation are not simply extrinsic and adjacent, the material of reflection and judgement; rather, they form interpenetrating networks of references by means of which the world is conceived, segmented and acted upon. “Discipline ‘makes’ individuals; it is a specific technique of power that regards individuals both as objects and as instruments of its exercise.” (Foucault, 1977, p. 170)

Placed within the overall context of disciplinary power, writing emerges as a minute yet pervasive technology underlying and sustaining a multiplicity of practices, goals and institutions. Embodied in different techniques, writing realizes the instrumental vision of modern organizations and institutions which Foucault connects with the advent of disciplinary relations. Writing assures, as noted, the constant solidification of action and its subordination to representation. In addition, it enables the recording and accumulation of observations and their organization into files and documents from which they can always be retrieved, related to the present, compared, juxtaposed, etc. Writing thus emerges as a basic instrument of administration, codifying and making visible the landscape of organizational relations. At the same time it becomes a fundamental medium of self-evaluation and control, a cognitive and ontological mirror in which the subjects confront themselves and their actions as objects. The individual interiorization of the procedures of writing and its analytic predilection constitute the very terrain upon which the subject and the object constantly change positions.

At an elementary level, writing appears as a technology of division, a representing technique whose analytic and objectifying nature has had, and still has, far-reaching effects upon the cognitive habits of individuals. As I indicated above, the procedures and spatial organization of writing restructures cognition in a functional fashion that is essential to the instrumental experience. The constitutive and disciplinary effects of writing upon the labouring identity can perhaps be connected, in a straightforward fashion, with the strategy of panopticism. I am suggesting that the disciplinary effects of the visibility of panopticism recount, in essential respects, the cognitive project of disjointness — since, like writing, the panopticon breaks up the complexity of multiplicity and reallocates it into separable and supervisable cells. Yet, disjointness as such is not enough to produce the effects of discipline. The unbroken disciplinary effects of panopticism, with all its economy, are achieved by the very interiorization of the supervising gaze sanctioned by the ideals of rationality and predictability and control. Interiorization inevitably implies that the subject and the object of supervision and control constantly change position, i.e. they coincide. In a similar fashion the interiorization of writing in general, and of specific techniques of writing in particular, seem to provide a basic means whereby individuals or organizational actors construct a set of objective relations against which they are able to evaluate and constantly reconstruct individual and collective intentions.
It is obvious that, within the context of Western culture, writing and behaviour are inextricably linked, and this is the overall framework within which I have tried to analyse and depict the effects of different techniques and procedures of writing. However, it is worth noting here that the construction of predictable and visible worlds, where behaviour can be inserted and rendered accountable, does not necessarily involve quantification. The cardinal example, the archetype so to speak of a notation that structures and arrests behaviour, is provided by the musical score and its disjoint and unambiguous syntactic and semantic organization. According to Goodman (1976), the syntactic and semantic organization of the notational system known as the score is an indisputable means, which offers the ultimate test for deciding whether a performance — i.e. a token, an act — complies with a given work — the type, the inscription. The principles and techniques implied by this notational system show how a series and an aggregate of acts can be arrested, and can consequently be prearranged and made to recur. The disjoint and unambiguous syntactic and semantic organization of the musical score, so Goodman insists, makes it the ideal system of notation whose essential elements are absorbed into the design and construction of computer software (Kallinikos, 1992a,b).

In opposition to these transparent systems of notation are ways of writing and representing — e.g. painting — which do not obey a disjoint organization. As I indicated above such systems are irrelevant to the instrumental experience because they cannot be decomposed, nor can their fuzzy elements be combined, accumulated or reshuffled in the same way as notes, numbers and words. Thus, tasks and methods that rely on knowledge which is codifiable and transferable, can be expected to produce recurrent and predictable or quasi-predictable patterns of behaviour. This is another way of saying that such a knowledge institutes its domain by recourse to disjoint, differentiated and relatively unambiguous sign-organization. By contrast, there are domains of human action and representation that rely on means and practices that do not exhibit a transparent and disjoint organization, and are thus neither easily accessible or retraceable. Leadership is an instance of such a domain. The means, operations or practices intrinsic to such domains cannot therefore be released from their dependence on a single actor; nor, consequently, can they be codified and transferred (Lindblom, 1981). The whole question of expertise and tacit knowledge also demonstrates that the domains of human action which are not amenable to codification are not restricted to those over which leadership is exercised.

A few reflections on technology help to provide a different context, relevant to the question of accountability and the orchestration of predictable and recurrent aggregates and sequences of acts. I indicated above that writing and fabrication emerge as basic domains, techniques and forms of knowledge which compartmentalize action and transform it into the hybrid of making. In this light, the progressive transition from the tool through the machine to the digital machine, essential to the instrumental experience of industrialism, could be interpreted as the movement from a dense and ambiguous to a disjoint and unambiguous system. For it attests to an increasing closure of the options left to the discretion of the user or operator (Mumford, 1952, 1963, 1970). Never specialized in the same fashion and extent as the machine, the tool remains an underdetermined object which can be used in many and diverse ways. No matter how standardized it is, it retains an element of openness imprinted, as it were, upon its very being. The functions and applications of the tool are animated by the tool-user, then making their way through his skills, preoccupations and goals — all of which will always combine in ways that evade total predictability. In the terminology used above, the tool remains always attached to a body and exposed to the exigencies of uncontrollable impulses and events which may reduce its functionality. The range of its possible applications, though certainly constrained by convention and design, knows no other definite limitation than a lack of imagination on the part of those who
use it. The interaction of the artisan and his tool, the sequences of steps involved in his achievements cannot be broken down, codified and taught. His shifting and complex involvement with things refuses to yield to the transparency of representing codification. Certainly, apprenticeship was designed to ensure the transference and continuity of skills, but note that apprenticeship relies largely on demonstration and observation. And these are ostensive or analogic modes of communication. They retain the strengths and the shortcomings of pictorial representation, i.e. they are rich in insights, or information as it is technically called, but they are imprecise and — more importantly — not amenable to codification. As in the case of art, much is contingent on the talent and intellectual integrity of the apprentice.

Human behaviour can certainly be made more predictable and accountable by imposing such external constraints as production rates and examination rituals, but the case of modern technology shows that other means can also be called into play. The machine, and even more the automaton, show that, after careful measurement and documentation, the skills of the artisan can be isolated, cut off as it were from the artisan himself and built into the machine or the automaton as recurrent and prearranged sequences of steps. Each of these steps is clearly delimited from the others, and implies in our own terminology the institution of a type or class. Considering the closed "discourse" of the movements that comprise the machine, one cannot fail to realize, once again, the obvious similarity between disjointness, Taylorism and the assembly line. The replaceability of spare parts is an obvious manifestation of the requirement of equivalence, and of the practical consequences of the institution of the type. "Ambivalence", as Baudrillard (1988, p. 69) noted, "is reduced by equivalence". The principles of disjoint and unambiguous organization are thereby brought to bear on the unfolding of human acts. In subordination to the iron discipline of the machine and the automaton, human behaviour is rendered predictable, and also accountable, by turning the labour process itself into a calculable, prearranged and repetitive sequence. Mechanized production epitomizes the superimposition of representation upon action and the transformation of the latter into a visible and continuously supervisable series of steps.

**ELECTRONIC CODIFICATION**

The analytic predilection of writing posited above and its bureaucratic-disciplinary effects, make it necessary to consider certain issues relating to the current mutation from typographic to electronic writing. The comprehensive electronic codification of organizational worlds which have been made possible by electronic technology, tends to submerge and superimpose writing upon the entire spectrum of organizational activity. Writing thus emerges as the universal code of organization (Zuboff, 1988). The effects of such comprehensive codification of instrumental worlds are not very well understood. On the one hand, electronic writing might be said to enhance the rationality of writing and expand its range of applications. It goes without saying that the formal nature and the algorithmic constitution of software demand the explication of the organizational tasks and relations which it renders visible and codifiable.

Electronic codification cannot but repeat, perhaps in a novel form, the old orality-literacy tension. Automated information processing demands the standardization of human action and experience, and their subordination to an unambiguously specified series of decontextualized operations performed upon disjoint symbols. It is in this sense that writing, in its electronic form, tends to become the universal formula of organization. It textualizes organizational action by transforming experiential, action-based skills into a kind of ability exercised upon the text of electronic, disjointly organized symbols (Zuboff, 1988). Electronic writing epitomizes the very
strategy of the instrumental experience as described in this article. The behavioural and bodily
skills of context-embedded actors are irreversibly transformed or replaced by the
decontextualized, disjoint and arrested (algorithmic) representations of electronic technology.

However, other characteristics of electronic writing have been interpreted as marking a break
with the rigid, linear and hierarchic organization of typographic writing (Bolter, 1991; Zuboff,
1988). Some of the recent developments in electronic technology seem to offer the promise of
overcoming the textual nature of typographic and early electronic writing, by the integration of
auditive and tactile elements of communication which could enlarge the scope of the man-
machine interaction. Subsumed under the labels of hyper- and multimedia and virtual reality,
these developments revive a number of issues relating to the tension between written and oral-
auditive worlds. However, they will not and cannot be dealt with in the present context (see e.g.
Benedikt, 1991; Heim, 1993; Queau, 1993). Suffice it to say, perhaps, that the electronically
mediated orality of virtual worlds and multimedia is of an altogether different order from the
orality that characterizes the exchanges of context-embedded actors. It is worth noting here that
the asserted effects of electronic orality are not new but go back at least to McLuhan’s work on
the effects of the electronic media on the linear and solely visual world of typographic writing
(McLuhan, 1962).

Other recent technological developments maintain a certain kinship with the tradition of
writing. Subsumed often under the label of hypertext, these developments tend to attribute to
electronic writing subversive and democratizing effects, which it is said would eventually lead
to liberation from the linear and unambiguous character of typographic writing and the social
hierarchy and predictability that it tacitly implies. The hypertext is an electronic device (a
program) that gives the user the possibility of moving freely among different portions of a textual
mass. Such free movement does not obey the linear and serial convention of typographic writing.
Rather, different pieces of the text are in the program linked together, allowing for the jump
between distant pieces or paragraphs and the reconstitution of the text in ways that reflect
personal inclinations. There are within the text multiple departure and destination points,
allowing for different journeys through it (Nielsen, 1990). Although they are more limited and
less flexible in their nature, the index and the footnote provide typographic antecedents of the
hypertext. Thus, the hypertext can be said to transform typographic texts from univocal lines to
multiple and shifting networks and is assumed to liberate the reader from the enslaving serial
rigidity of the typographic text and the authority of the author or text originator. For, by providing
the possibility of different textual paths, the hypertext enables the reader to reconstitute the
structural skeleton of a text and to undertake different interpretive journeys. In fact the hypertext
offers a possibility of intervening and superimposing one’s own writing upon the text, or even of
creating an entirely new text by combining pieces of diverse other texts. The interactivity of the
hypertext sharply contrasts with the fixed and hierarchical author-reader, design-execution
relationship that has been characteristic of the typographic age.

It is hard to deny the technical possibilities opened up by the hypertext. But does it imply that
the hypertext marks a decisive turn in the tradition of writing that overcomes its analytic, rule-
bound character and the associated disciplinary effects? On a closer scrutiny, the hypertext in fact
emerges not as writing but as a device for moving along the space already defined by a text. Its
composing words reveal that a hyper-text is, in a way, a meta-text, i.e. a series of operations
performed upon an antecedent textual body which can be dismembered, dissolved, decomposed
and recombined in many and possibly innovative ways, but which in the end altogether defines
the space of possible textual journeys. Further, these are operations performed upon a text, not
upon the actual procedure by means of which the textual body was composed. The hypertext is
concerned with the structural relations and affinities of text pieces, not with writing conceived as the process and rules whereby disjoint symbols are combined into larger units and wholes. The very conception and design (program) of the text-links also highlight a series of puzzling questions bearing upon the relationship between text, hypertext and end user. Why certain departure and destination points and not others?

Alphabetic and alphanumeric writing achieve their disciplinary economy not solely as bodies of text on the objectifying ability of which organizations are able to evaluate their activities. We have already noted that such an evaluation is periodic and posterior, imposed from the outside, as it were. Writing as a codified, taught and interiorized procedure offers a much more effective, albeit perhaps sinister, alternative. The hypertext may help to reveal the structural skeleton of a text, but is incapable of descending into the minute, symbolic operations whereby writing is accomplished. Its privileged spatial economy — a network, not a single arrow — which allows simultaneous readings and the juxtaposition and comparison of diverse segments of the text (Bolter, 1991) has been a central attribute of schematic, non-speech and utterly functional forms of writing, well epitomized in statistical and accounting records. Notwithstanding the facility to navigate in a text with an effectiveness that was inconceivable in pre-electronic worlds, non-electronic forms of hypertext have in fact existed since the beginning of writing (Goody, 1977; Kallinikos, 1992b).

Finally, the textual inspection and visibility achieved by the hypertextual decomposition and reconstitution of a text and even other pertinent electronic systems of codification, such as organizational and interorganizational databases, are two-edged. For despite the creation of conditions that can dispense with the asymmetries of writing-reading and designing-executing, such visibility can be employed in the service of regular periodic controls that could greatly re-enhance the predictability and governability of instrumental systems. As is always the case, novel technologies impinge upon the nexus created by the interplay of prior and sedimented technologies, and on the inherited systems of social relationships that structure — and are structured — by their current applications. Whether they are altered or not, such relationships define the matrix of technology’s perceived possibilities and applications. Despite a liberating rhetoric, hypertextual conventions seems to be firmly situated within the realm of predictable worlds.

CONCLUDING REMARKS

The above analysis suggests that writing constitutes a basic technology whose analytic and objectifying predilection largely contributes to the construction of predictable worlds and the rationalization of contemporary work contexts. The urge to construct rational and predictable worlds needs to be understood as a rule or norm, a guiding and socially sanctioned principle rather than a conclusive accomplishment. Rationality as a rule, a social technology, constructs rather than reflects reality and truth. It is a social institution that always proceeds to conceive and act upon the world from the horizon of abstracted and solidified human intentions. According to the instrumental or representational world view, the natural and social worlds exist and are relevant only insofar as they can be objectified and rendered amenable to mastery and control. It is within the framework of these broader institutional preoccupations that writing becomes a fundamental technique which embodies the rational or instrumental world orientation.

A crucial point which has deliberately been left in pending and which perhaps deserves some attention, in these concluding remarks, concerns the difference between the syntactic and
semantic dimension of writing. The infiltration of the boundaries of the cognitive constructions which we have referred to as types is inevitable in the case of systems other than the purely syntactic and their disjoint character is only a provisional, temporary accomplishment. The regime of ideas and conceptual units, or what linguists call semantic fields, is not organized in the form implied by identitary logic and the theory of logical types. Semantic units are always members of more than one “class” of the same level of generality or abstraction (Cassirer, 1955; Eco, 1976; Goodman, 1976), and though hard to see at first glance, it is such joint membership and the dense organization of many representational systems that make discretion and human agency possible.

The fuzzy and intersected organization of semantic fields helps to provide an explanation as to why formal organizations try to rely on writing systems with limited and unambiguous semantic fields. A limited number of conceptual categories, which are also amenable to quantification, is the remedy against the intrinsic instability of the “messy” world of ideas. Predictable worlds demand that individual interpretation be curtailed as far as possible, even at the risk of generating meaninglessness (Arendt, 1958). But even these transparent and conceptually unambiguous worlds cannot escape the orbit of interpretation. Brought back into the “messy” world of things, even the rational transparency of numerical statements tends to acquire an ambiguous dimension—not surprisingly, since numbers are always of some thing, developing as it were in the interior of concepts (Cassirer, 1955; Frege, 1950).

Human communication and action will never conform to the transparent and unambiguous ideal of rationality, and yet ironically they always proceed as though such an ideal actually existed or were possible. Organizing practices develop in this boundary area, the margin created by the will and vision of a recurrent and predictable world on the one hand, and on the other the reality of a molten universe that is always on the verge of fusing its elements. Neither absolute predictability nor chaos tolerates human purpose, and organizing practices are just one expression of this, however erratic and fragmented intention and action may happen to be.

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