Abstract

Techniques of Notation and Behaviour: Remarks on Elementary Forms of Organization

by

Jannis Kallinikos

The paper accords signification or representation a decisive role in the context of instrumental action. It is argued that the diverse practices subsumed under the notion of organizing are but varied manifestations of the basic operative schema of representation: something for something else. Representation is thereby posited as “consubstantial” with the mundane notion of organization. Both representation and organization imply the institution of diverse systems of notation whose mobile, stable and combinable elements enable the making, and by the same token, also the unmaking and remaking of the world. The vicarious and rehearsable character of the representing elements renders the world manipulable in the sense of imposing on the sheer flow of experience its contrived schemata of temporality and distance and its encoded versions of objects, states and processes. It establishes the proto-conditions of social differentiation, and hierarchy as it appears in its modem version, by creating in a bipolar fashion differences in perspective and knowledge between a centre, i.e. those that encode, accumulate and control combinations of these encoded versions of the world, and a periphery, i.e. local sources of knowledge that are being encoded or controlled. However, these ways of worldmaking obey, at least partly, the logic enfolded in the forms by means of which a representing universe organizes and structures its elements. An attempt is made to reveal this logic by distinguishing different organizing principles falling within the categories of numerical, verbal and pictorial representation, and to connect these principles with the bureaucratic ideal of accountable and calculable behaviour.
Introduction

Formal organizations rely heavily on systems of notation organized by means of numbers. A considerable part of instrumental activities is orchestrated by using criteria supplied by a dissection of the world in terms of numerical signs. Critical decisions of a social, environmental, economic and medical nature, to name just a few categories, are often made on the basis of comparisons rendered possible by the sweeping homogenization inherent in the translation of complex qualitative states and processes into magnitudes. The social and cognitive tasks and operations involved in transformations of this kind, i.e. transformations implying the leap from numerical signs or any type of sign whatsoever to social and physical events and vice versa, form a central part of modern life and run through the whole gamut of activities of contemporary organizations and institutions.

And yet the idea that the ensemble of activities subsumed under the notion of organizing is concerned with substances and the manipulation of sheer objects (as opposed to the production and organization of signs, images, abstractions and symbolic artefacts) represents a deep, quasi-forgotten and for that reason surreptitiously operating belief in the discipline we call organization theory. Bearing the traces of the discipline's "pragmatic" origins and of a skewed and largely obsolete academic division of labour, such a stance has cunningly excluded from the realm of theorizing the complex networks of signs and
symbolic artefacts - those systems of representation and notation by means of which materials and objectified configurations of acts (roles) are conceived, posited and instrumented. The order of production, so to speak, has been privileged both ontologically and practically at the expense of what we shall here call the order of signification. The former has very often been equated with the real, whereas the latter has been looked upon with suspicion as if it were the mark of illusion, whim and deception. Contrary to the sign and the symbol, the tool, the machine and the object have been seen as tending to produce, as Veblen put it long ago, an objectivity, a matter-of-factness that counteracts man’s susceptibility to hallucination and the whimsical, uncontrollable play of imagination (Mumford 1952: 51). The critical question of whether the task of assigning numbers to social events represents a description of aspects of a world exterior and anterior or whether such a task involves the conception and positing of a world, has been consigned to oblivion or relegated to other disciplines. The resulting unproblematic attitude has tended to look upon signs, when they are given the chance to occur, as nothing but the transparent copies of an unambiguous world.

Some twenty years ago West Churchman (1975) commented on a paper of Stafford Beer (unpublished at that time) dealing with the central question of measuring social change. The issue at stake is exemplified by the embarrassing task of assigning numbers, i.e. to estimate in financial terms the value of the seven hundred years old Norman church of St. Michael of Stewkley for a cost-benefit analysis of a proposed third London airport whose runway would collide with the indifferent immobility of this cultural monument. The commission in charge cut the Gordian Knot by using as a base for its estimate the extant fire insurance policy, thus provoking infuriated reactions from antiquarians who, in tum, suggested an alternative method consisting of the application of a ten per cent annual discount rate to an initial investment of a hundred pounds, coming up with an impossible numeral ending in thirty three zeros. Quite obviously, culture and tradition do not easily lend themselves to quantification. Values can be juxtaposed with instrumental achievements, potential or actual, through the medium of numbers but quantification is a complex operation whose accomplishment relies on a network of values and assumptions hidden, unfortunately all too often, behind the apparent simplicity, objectivity and innocence of the numbers. The assumptions enfolded in the socio-cognitive operations of the numerical translation (and any other translation whatsoever) of social states and processes impinge on and construct central aspects of social life. Numerical together with verbal and pictorial documents do not simply form the
material substratum of instrumental reflection and judgement. Rather than being something extrinsic and adjacent to the task of organizing, they “make” this task in that they form the very stuff by means of which collectivities conceive, posit and instrument their activities. Extending Kant’s claim for the universal application of moral laws, Churchman states that the principles that serve as the base for the construction of those numerical documents that provide the evaluation criteria for policy-making, have to be universal. If we understand him correctly, then the requirement of universality can be looked upon as an attempt to anticipate and deter occasions for manipulation that is wilful, partial and unjust. Caning-over the logic of the Commission and the counter-argument of the antiquarians into other contexts, he constructs an absurdity worthy of quotation (Churchman 1975: 24):

The commission’s policy, if universalized, would neatly solve the problem. There is surely a social value in not having all the people which the demographers predict will be here in the year 2000 if nothing is done to prevent it. So-merely calculate the benefit of eliminating X and compare it with X’s life insurance. The result is that only the best will survive—the Kennedys and the Onassises. Mr. Osbom’s (the antiquarian’s) principle, on the other hand, is very nice for old criminals and professors; the investment in their birth for hospitals, nurses and doctors discounted to age 70 would make the decision to execute or retire unthinkable.

It certainly takes the perspicacity of a Churchman to penetrate, in such a shrewd way, the ostentatious objectivity of numbers, and reveal, by means of such constructed absurdities, the network of values and assumptions on which instrumental indices and magnitudes very often rely. Be all that as it may, the aim of this short introduction is not so much to signify an ambition to discuss the colonization of social and economic life by numbers per se, but to use numerical constructions as an instance of the wider questions relating to signification and representation. Numbers are highly abstract, i.e. conceptual entities that homogenize the world in accordance with a project that can be shown to have a very particular preoccupation: the order of progression (Cassirer 1955). In the context of instrumental action, however, numbers melt in with verbal and pictorial techniques to form complex and multidimensional representational matrices through which organizations conceive and posit, rather than copy, a domain of reference and act upon it. And it is, among other things, on the basis of the embarrassment caused by the task of non-routine quantifications that we experience a mute and recalcitrant world that does not speak for itself but is constructed by means of techniques which are but the embodiment of a selected and frozen array of conceptual operations.
These introductory notes reveal both the preoccupation of this article and its point of departure: instrumental realities are inevitably enmeshed in webs of signification and the means, techniques and practices through which such significations are given form and conveyed. Sober reflection on the role played by the frozen or quasi-frozen significations enfolded in accounting and financial records, in other organizational texts and documents as plans, and even on the rules and procedures by means of which behaviours are assembled into those sequences known as planning and decision making processes, reveals a different picture. Organizing activities are not concerned with tools and materials per se but are principally directed towards constructing and sustaining the representational networks, the socio-cognitive matrices through which acts, tools and materials or, more correctly, images of acts, tools and materials will have to pass in order to become transformed and liquidated. Budgets, financial records and plans are instances of representation; they are displays depicting the articulation and arrangement, often in quantitative terms, of a selected (socially constructed) array of images of objects and acts. The assumptions and abstract relationships hidden in these screen or paper worlds (Latour 1987, Mumford 1952, 1963, 1970) engrave and arrest the paths that will come to mark the itineraries of resources and enacted or gestated intentions. Such assumptions and relationships, which we will subsume under the label of signification, are, if not more, at least equally important as the crude materiality of machines and sheer objects. Technology might, in a similar fashion, be construed as an arrested or quasi-arrested selection of the combinations which materials, tools, acts and signals can enter, a recurrent order that cannot be achieved unless a detached and frozen signification system, i.e. a series of fixed notions, assumptions and relationships, is imposed on the infinite array of possible combinations (entropy). No wonder that the selected combinations are constrained by the nature of materials and tools themselves, but such constraints are re-cognizable and instrumented by humans. To constrain is actually to impose an order based on an instituted and hierarchized system of differences (Bateson 1972, 1979; Eco 1976). Technology, then, can be viewed as the ensured recurrence of a conceived, realized and imposed pattern of means-ends or signifier-signified relationships, a series of operations and significations that unfold as a prearranged and predetermined sequence of steps (Lindblom 1981).

Some years ago, and as a means of stressing the indissoluble link connecting conception and instrumentation, cognition and action, Weick (1979b: 42), in his characteristically evocative way, claimed that an “organization is a body of
thought thought by thinking thinkers”. Such may happen to be the case, and yet if such a dictum is to make sense, then it has or at least must attempt to answer or reflect on the following interrelated set of questions: 1) what does such a body of thought look like? 2) what is it that it thinks about? and 3) how has it been thought of or arrived at? In its originator’s own language the dictum posits an obvious need to study organizations and collectivities as Bodies of Thought, Objects of Thought and Thinking Practices. Weick (1979a,b) constructs his answer along lines drawn primarily from cognitive psychology and some elements of phenomenology. Important and evocative as his attempt is, it leaves us much to wonder about. It is not our purpose to review Weick’s work here. Let us, however, say that his work, likewise the work of another group of pioneers with relatively similar preoccupations in the field of organization studies, that of James March and his colleagues (March and Olsen 1976, 1989), exhibits a number of limitations consequent upon the paradigmatic terrain within which it has chosen to operate. While highly respectful of their contribution, we will, nevertheless, argue that both Weick and March lack a comprehensive framework that would enable them to reflect, in an adequate way, on the notions of representation and signification in collective contexts and the complex and often obscure ways through which representation relates to action, the image to the object.

Let us refer again, as a means of exemplifying our postulates, to those ubiquitous representational systems in organizations and institutions that are constructed following the principles of accounting. It is well-known that prospective representations, e.g. budgets, represent, actually construct in quantitative terms, the intended flow of goods and services for a certain period of time. Budgets are frozen significations or, if you like, consensually validated, sedimented and quasi-arrested bodies of thought. As already noted, budgets, plans, financial records and any documents of this kind are charts or maps that mark the prospective or retrospective trajectories of acts and resources. Simulating time and space, acts and objects, and their assumed interrelationships, these systems of notation project or reconstruct the world in the ordered and gridded fashion of rows and columns, texts and lines, figures and equations. In making representation and signification the focus of attention we seek to orient the line of our inquiry towards the constitutional structure and the logic, the grammar and the syntax (or the lack of a grammar or a syntax) so to speak, by means of which budgets, and any representational system whatsoever, conceive and posit a domain of reference. What are the elementary significant units, the signs (words) of such a system? What are the rules by means of which they are combined into chains and
“meaningful” sentences, or are there any such sentences? How are the significations or the assumptions enfolded in such systems transformed into actions and things? What are the rules of correspondence or, to be more precise, the coding terms by means of which a domain of reference, e.g. the actual flow of goods and services, gets crystallized into representations, e.g. accounts? The same or a similar set of questions can be brought to bear on other groups of central organizational representations such as plans, manuals entailing descriptions of roles, rules and procedures, language, abstractions and artefacts of any kind.

Signification and representation are central human faculties and we accord them a decisive role in the context of instrumental action. For, if the latter is to be understood in all its range and complexity, then it cannot but be studied in close connection with the socio-cognitive schemata and operations by means of which social actors conceive, posit and instrument their actions. Recent attempts to reconceptualize economic and organizational issues along lines drawn from rhetoric and semiotics (Manning 1987; McCloskey 1985, 1987; Morgan 1983, 1986) reveal that signification and the study of tropes are not the exclusive domain of linguistics and literary criticism. Semiotics and rhetoric provide a powerful conceptual arsenal and a rigorous methodology for approaching issues relating to the organization of instrumental activities. A close examination of the role played by the coding procedures and the rules by means of which different domains of action and realms of knowledge are conceived and posited, related and transcribed into one other, shows the notions of signification and representation as conflating, being largely coextensive with the mundane notion of organization. In attributing signification and representation a central role in the context of instrumental action we do not wish to simply reverse the naive copy view of representation, positing instead the domain of reference as the unproblematic reflection of ideas. Following Baudrillard (1988: 77) we will claim that both the materiality of objects and the ”ideality” of ideas operate from the horizon of a substantivist vision of the world in that both ignore, though in different way, questions of form. Contents treated as positive entities are instances of such a substantivist view of the world. Organizing processes proper are concerned with the methods, techniques and practices, i.e. the forms by means of which equivocality and multiplicity are turned into unequivocality and singularity, an incessant project indissolubly bound with the institution and ongoing utilization of techniques of writing which exhibit an organization that we will later subsume under the label of disjoint and unambiguous systems of
notation. The road to these hidden affinities passes through the consideration of the concept of representation and its basic operative schema.

However, before proceeding to this latter task it would seem appropriate to note that the terms signification, representation and notation will be used largely interchangeably. Signification is a term of linguistic origin conventionally deployed to refer to the end product of a significant unit (that has meaning) seen as consisting of a notion (signified, semantic unit) and a vehicle (signifier, syntactic unit) conveying that notion. Representation and notation, on the other hand, have been used both in linguistic and other diverse contexts and may refer not only to the end product but also to the processes and techniques through which such a product is arrived at. Representation in particular has a clear pictorial undertone whereas notation has been employed to refer to techniques of inscription and writing that may or may not posit a semantic domain. Language and accounting, for example, belong to the former group whereas symbolic logic is usually seen as belonging to the latter (Eco 1976). Without denying actual or potential differences, we simply say that they are not relevant in the context of this article. Some of them occasionally appear in the present text, but more as the result of contextual differences rather than as a matter of choice and deliberate strategy.

Representation and its Basic Operative Schema

Productivist or substantivist (sheer objects, bodies, substances) metaphors, wittingly or unwittingly, suppress and exclude the issues and questions raised by signification and representation. When such issues are dealt with, they are attributed the secondary and derivative character of something that embellishes or legitimates an actuality that exists out there on its own (Morgan 1983). As a matter of fact, issues of signification or symbolism, as they are sometimes called, are inconceivable within that intellectual space embraced by substantivist metaphors; they lie beyond their cognitive horizons. And yet social organization is itself inconceivable without the socio-cognitive faculties presupposed by signification and representation. For the latter always imply the cognitive ability to present one thing in terms of another (Castoriadis 1987), as when goods and economic trans-actions are encoded and represented in money and accounts, or
when intentions and desires and economic policies are transformed into plans or sequences of actions etc. Man’s capacity for abstracting and signifying, and the central yet forgotten role representation played in shaping the conditions that gave rise to the industrial era, have been portrayed by Mumford (1963: 24-25) as follows:

Men were more at home with abstractions than they were with the goods they represented. The typical operations of finance were the acquisition or the exchange of magnitudes. "Even the day dreams of the pecuniary day-dreamer," as Veblen observed, "take shape as a calculus of profit and loss computed in standard units of an impersonal magnitude." Men became powerful to the extent that they neglected the real world of wheat and wool, food and clothes, and centered their attention on the purely quantitative representation of it in tokens and symbols.

Inscribed in the social convention by means of which money represents value is the basic operative schema of representation: something for something eke. Money is exchanged for value and vice versa. Let us notice here that we will throughout leave in suspense the formal homologies drawn between exchange, labour and representation, consumption and production: Baudrillard (1988), for example, underscored the structural affinities between exchange and use value on the one hand and signifier and signified on the other, while Castoriadis (1987) noticed that exchange and use value find their counterparts in metaphor and metonymy respectively. Suffices here to say that it is on the basis of the series of substitutive relationships mediated by the basic schema of representation that the refractory state of the world is overcome (Cassirer 1955; Foucault 1970). For the representational vehicle or sign is not any longer bound to the indolence of substarmes and things; it has left the latter’s corporal constitution to enter the flexible and often disembodied world of representation. Money, words, numbers, accounts become the mobile other of substances and things. Thus, far from being a paradox Mumford’s passage construes the material welfare of modern society as being sustained by the ability of its institutions to turn upon the fabricated and immaterial world of representations, and through the humble means of verbal, numerical and pictorial notation to organize life upon the flat and disembodied surfaces of paper and computer screens. In particular, the abstract artefacts known as numbers offer highly abbreviated versions of the world that can be immediately surveyed, reshuffled and recombined in a fashion inconceivable in the case of things and substances. True, the concept of number and its linguistic and numerical embodiments preceded the advent of industrialism. However, the very fashion by means of which numbers and other abstract artefacts were brought into instrumental contexts to orchestrate sequences and aggregates of
acts by excising equivocality and creating predictable and accountable versions of human behaviour is what seems to characterize the advent of those stable and recurrent configurations known as formal organizations (Cooper 1989a, b; Foucault 1977; Giddens 1981; Hopwood 1987; Hoskin and Macve 1986).

We shall bracket, for the time being, the examination of the consequences of industrialism’s obsession with number and quantity, for at this stage we are mainly concerned with pointing to the common thread that runs through signification and organization, conception and instrumentation. In a work reconstructing aspects of the same period to which Mumford’s passage refers, Foucault (1973) showed, in an amazing degree of detail (see particularly the Chapter 6 of his Birth of the Clinic), that medical practice and institutionalized care established themselves as organizations by managing to institute a particular corpus of significations whereby observable biological functions and symptoms were rendered as signs of health or pathology that might effectively be traced, followed and treated within the circumscribed space of the hospital’s walls. Discipline and Punish took the argument a step further by describing and analyzing the amazing and expanding network of scriptory and documentary methods by means of which different aspects of reality are constructed along lines dictated by the requirements of the file and document production that is characteristic of the organizations and institutions of the modern world. An incredible amount of writing constructs ordered versions of the world by instituting categories and definitions conveyed by representational elements that can be combined, restructured and cumulated in ever-expanding cycles (Foucault 1977).

Let us, however, not lose sight of our main concern here, i.e. the basic operative schema of representation (something for something else), implicated in this wide array of social practices. For it is on the basis of this cardinal ability to envisage and present one thing in terms of another and on the capacity to instrument such a relationship in abstract and cumulative terms that the scope and amount of organizing practices characteristic of the modern world are rendered possible. Without this basic schema and the associated detachability, mobility and cumulative character of the representational vehicles the organization of the world would have to follow the bulky and almost refractory transformations of substarmes and things. Representation recedes, as it were, from the world and accounts for it in a marmer that reflects representation’s own being and organization. Substarmes, bodies and things enter the regime of representation as
notions and definitions, i.e. as conceptual and cultural units arrived at by selection, abstraction, deflection and ignorance, interests and ideology (Burke 1966; Cassirer 1955; Eco 1976).

The ramifying network of technical and social consequences that is associated with the ability to represent and signify leaps to the fore once it is recognized that the word and the tool, language and technique, rely on the same cognitive operations (Castoriadis 1984, 1987). Following the pioneering work of Leroi-Gourhan on language and technique, Castoriadis (1984) claimed that the word and the tool imply the institution of a type or a form of which they are just particular occurrences, i.e. instances or tokens; both are mobile in the sense that they can be detached from the contexts in which they have been engendered and both imply an organization of time that is superimposed on that of nature. Similar claims have been made by Eco (1976). More recent empirical data on animal play and ammal tool behaviour seem to suggest that the basic operative schema of representation is active at the subhuman level. The ability to systematically move objects out of sight and use them as a means to an end (which, it should be noted, is not yet present but located somewhere in the imaginary future) seems to suggest that the elementary tool behaviour exhibited by certain species is sustained by vicarious mental constructions, however rudimentary, that allow for the simulation of spatio-temporal relationships (Beck 1980, 1986; Elster 1983). These arguments may well seem abstract and fairly distant from the reality of organizations, yet they reveal the common thread that runs through the dispersion and heterogeneity of the concrete technical manifestations and the complex processes at work behind techniques and instrumental actions.

All this might seem obvious (see e.g. Giddens 1981), and yet a different picture emerges when we systematically pursue this line of thought. For the schema something for something else should imply that organizing practices are involved in the active search for the terms that encode and represent selected aspects of the world and permit the combination and cumulation of the elements of different systems of representation. In more encompassing terms, organizing practices might be said to be concerned with bridging the gap that results from an attempt to juxtapose different realms of experience, to make different orders of being gaze at and speak to each other. The central instrumental issue of means versus ends is very often entangled in such a problematic; though productivist metaphors and the accompanying copy view of representation scarcely leave room for such a recognition. Social reforms very often fail just because they fail to
retrace the trajectory of assumptions that the transition from ends to means involves, to realize that such a trajectory slips surreptitiously from one state of being to another, often from quality to quantity though the reverse might also apply. The issues and problems posed by representation, and consequently by the human effort to organize and control, exhibit striking similarities to those puzzles and dilemmas faced by translation (Cassirer 1955; Derrida 1981, 1982). For if the correspondence between the terms of different languages, between the artefacts of alien cultures were fixed and stable, then quite obviously translation ought to be a frictionless and smooth enterprise. But it is not. An instance of this problematic is reflected in the history of the representational system of double-entry book-keeping known as a technique for some centuries but delayed in full-scale implementation until the nineteenth century. Among the principal reasons for such a delay according to Hoskin and Macve (1986: 124) was:

the absence of a full disciplinary technology which could be brought to bear on (and so create) an analysis of both financial and human value, i.e. which could render the interrelated but separable values of products and persons calculable.

Organizing practices posit the dilemmas of translatability and representation in one and a single stroke. On the one hand, they bring together diverse professions, occupations and sociolects. On the other, at a more crucial and elementary level, the same problematic is involved within single regimes of signification that encode or map selected aspects of reality as when assigning numbers to or verbally describing economic and social events. The leap from events, objects and acts to numbers and words and vice versa is, it would seem, more radical than that implied by the transition from one regime of signification to another. The significations and codified practices of a single profession or group bear witness to how a quasi-instrumental domain is singled out and demarcated by segmenting the world along the lines of an instituted system of terms and categories. To describe a patient either in economical or medical terms is a complex task and a major accomplishment that involves the profound transition from life to the breathless reality of numbers or medical categories. In any case and at both levels an incommensurability is involved that relies on a silent element of cognitive violence and arbitrariness. No sheer necessity and no single way can arrest, determine or exhaust the terms of the translations or the transformations involved (Bateson 1979; Goodman 1976). Whatever is made, there will always be a different way of doing it. No wonder that habit, conventions, the stiff character of social structure are among the factors that help to stabilize these inherently
arbitrary and cognitively labile constructions. So obviously not every aspect of reality lends itself to negotiation and resegmentation everywhere and at all times.

From a certain point of view the picture of organizing practices painted so far might appear as abstract and without value. For numbers and words, particularly the latter, exist from time immemorial, while professional concepts and categories are not exactly the subject of organization theory. Organizations and institutions draw on them, but it is not our task to analyze them. Fuelled by the power of convention, such a stance may acquire a degree of reasonableness and appear persuasive. However, it can be shown, upon close examination, to amount to no more than a circumnavigation of the main issues involved. Numbers and words are underdetermined entities, i.e. they can be used in a variety of ways. They form but the substrata of those systems of notation by means of which organizations conceive and instrument their activities. Obviously, the freedom with which they can be used increases as one passes from the lower substrata of language and numerical systems (phonemes, numbers) to larger units (sentences, verbal and numerical discourses). Once more, Churchman’s (1975) example testifies to how arbitrary the quantification of objects, states or processes might happen to be. Also the proliferation of issues of social accounting, together with a rising environmental awareness (Seidler and Seidler 1975), bear witness that the world can be conceived and segmented in ways that do make a real difference. Professional categories on the other hand posit a different set of issues, but there exist studies brilliant enough to suggest that the issues of professions and organizations are, in a large part, coextensive (Collins 1979, Foucault 1977; Van Maanen and Barley 1984).

The picture of organizing practices that begins to take shape by using representation and all that implies as a major theoretical vehicle provides enough of an incentive for pursuing the line of thought advanced so far. We will therefore argue that it is there at the crossroads, at the interface of separate and alien realms that organizing processes are principally located. The transformation of materials and acts into products and services is just a particular case of the overall logic and practice of transformation confronting modem, highly differentiated societies. Indeed, such a transformation is inconceivable without a vast number of other silent transformations which it presupposes and on which it relies. To make use of the well-known topographic metaphor, organizing practices are concerned with the rules or terms by means of which the territory (e.g. transaction, intention, symptom) is transformed into a map (e.g. account,
plan, category of pathology and cure) and different maps transcribed into one other. What is entailed in and what is lost by such series of transformations? What is the territory or is there any territory? (Bateson 1972; Baudrillard 1988).

Retturing to Weick’s (1979b) terminology, the rules of transformation might now be considered as homologous to thinking practices, whereas the territory is what the map, i.e. the body of thought, “thinks” about. But what is the map? The topographic metaphor suggests that cartography entails the selection of sets of differences (hydro, altitude, vegetation, population etc.) constitutive of the territory and possessing an elementary syntax; i.e. the map is arranged in a metonymic fashion as a chain sustained by contiguity. The critical issues then centre around the language of instrumental representations and this entails two broad and interrelated sets of questions: 1) what are the coding relations involved between the vehicles and embodiments of representation and those aspects of the world which they supposedly address? and 2) which combinatorial rules apply to these representational embodiments? Is there a grammar and syntax? Or does such a "language" possess only a vocabulary, being asyntactic, a simple classificatory schema similar to that which Baudrillard (1988) detected in the case of consumer goods? Partly because of the complexity and encompassing character of the task, and partly because such a repertoire of questions cannot be settled at the theoretical level alone, we do not have any illusion that we might fulfil that promise here. No wonder that accounting, statistical tables and methods of forecasting, charts and documents and any representation of this kind can be analyzed semiotically, irrespective of the empirical contexts in which they are encountered. However, our purpose, in the present context, is both more modest and at the same time more elementary, in the sense of being more fundamental. For if signification or representation is the sine qua non of organizing practices, then there appears an obvious need to retrace the central socio-cognitive operations and activities implicated in the construction of representational matrices in instrumental contexts and try to assess the reverberations that accompany such an accomplishment. Such an “archeological” project casts into new light dominant themes in organization theory and bureaucracy, such as control, hierarchy and supervision, repetitive and predictable behaviour, the relationship between technology and structure and many others.
Jouneys of Vision: Time and Space Reconstituted

The statement *the map is not the territory* might appear today as an outworn metaphor on the verge of becoming a platitude. Yet, proclaimed some seventy years ago by the semanticist Korzybski this evocative distinction was employed to suggest a relationship which language and representation might bear to the objects they describe or depict (Bateson 1972, 1979). Used in diverse contexts this topographic metaphor has proved powerful and yet it might turn out to be simplifying and even misleading. For it implicitly asserts or may be interpreted as asserting the existence of a territory prior and exterior, an assumption that is difficult to sustain when one enters the socio-cultural realm. Language, and that holds true for any representation, posits a world as much as it describes one. Without entering in any detail into the problems involved let us just draw attention to the following issues. It is well known that not only imaginary (Pickwick, God) but many other significations as well (true, mentality etc.) while possessing meaning, lack referent or extension (Castoriadis 1987; Eco 1976; Goodman 1976). Also, impressive evidence in the contemporary world might be taken to suggest that social representations do not bear semblance to any reality exterior and antecedent, but are rather concerned with positing a spectacular vision of the world - what Baudrillard (1988) called hyperreality. Besides, as noted by Bateson (1972, 1979), primary (unconscious) processes do not succumb to such a distinction. There, the map is the territory. Dreams represent the typical case. Furthermore, it might be fruitful, as Weick (1979a,b) suggested, to investigate how actors behave once they have made the “mistake” of equating the map with the territory. Thus the metaphor, as any metaphor, is not innocent. However, it is instructive, evocative and highly relevant for the issues posited in this work and we will, as a consequence, attempt to follow its slippery track for a while.

Thus, turning to the map as the archemodel of representation and assuming for the time being that a territory does exist out there, what do we achieve by constructing a representation of it, by literally mapping it? It would seem that the usefulness and instructive character of the map derives from its abridged, concise representation of the territory, an accomplishment that allows actual or potential users with knowledge of few rules and conventions to instantly reconstruct and monitor central morphological features of the depicted landscape. The map gives itself unobstructedly, as it were, to the immediate supervision of the eye, a task that becomes realisable by means of an enormous reduction both in scale and the number of properties that might be thought as constitutive of the territory (Latour
A vast number of objects, events, and morphological and demographic conditions are disregarded, whereas others are selected and scaled down. Size, space and time are mastered as the eye can run over them in a few seconds. A simple glance is enough to supervise the constitution of terrestrial and in other cases subterrestrial and celestial worlds.

The reduction of scale and in the number of properties that results in the contrived and abridged spatio-temporal arrangement of representation might be construed as relying on two seemingly simple socio-cognitive operations that will here be subsumed, for a lack of better labels, under the names Coding and Sampling. Sampling in this case implies the vicarious selection and weighting of properties (differences) constitutive of the domain of reference (e.g. the territory), whereas coding involves the rules and conventions by means of which these properties are ordered and transformed into socially-recognizable and readable expression units. Coding in other words, is concerned with how the territory “gets” into the map, i.e. how conceptual or perceptual units are turned into material, in this case, graphic expressions. From inside this world of cartography we can now look upon the vast potential of the results accomplished by the systematic application of the basic schema of representation and the socio-cognitive operations of coding and sampling. For it is just through the vicarious products of these operations that the world can be rendered manipulable and that action at a distance, such a central feature of modern institutions and organizations, can be established (Cooper 1990; Latour 1987; Mumford 1970).

Before pursuing the exploration of these affinities further, let us recall Mumford’s account, where the spread of the “organization society” inaugurated by industrialism is portrayed as partly contingent upon man’s capacity for abstracting and signifying (symbolizing), and the ability of vision to supervise and control these disembodied and miniaturized worlds. Vision is turned, in and through these operations, into the “all-seing eye”, a controlling centre (Mumford 1970: 274-276). The central place of vision in shaping patterns of thinking and acting from the Enlightenment onwards and its decisive importance for the emergence of modern organizations and institutions echo, as is well known, right through Foucault’s work. Let us just simply note here that the hospital and the prison are construed by Foucault as exemplary forms of controlling, normalizing and coordinating (enabling) institutions that rely heavily on the dominance of the Gaze and the significations sustaining it (Foucault 1973, 1977). The controlling and supervisory role of vision and its decisive contribution to the fashioning of
central organizational practices and documents, such as accounting and economic and statistical tables, is a theme that recurs in the work of a number of scholars (e.g. Cooper 1989a,b, 1990; Hoskin and Macve 1986; Latour 1987).

Though not explicitly recognized, the seemingly humble task of constructing a graphic representation of the territory, and any realm of reference whatsoever, may have had consequences that equal or even surpass those that characterize man’s great technical moments in history. In the introductory chapter of his classic work Technics and Civilization, Lewis Mumford (1963) discusses the cultural and socio-cognitive requirements that lie behind the advance of capitalism and industrialism. This cultural preparation, as he calls it, involves the means and techniques through which discipline and predictable behaviour were conceived and socially forged including the contribution made by the clock in this direction, the effects of social regimentation, the step beyond animism, and the reversal and construction of artificial spatial and temporal coordinates, among others. A particular position among them is occupied by the definite advance that took place in pictorial representation which revealed a novel conception and treatment of time and motion. The arrangement of objects into spatio-temporal patterns and the “unification” of the picture that occurred with the appearance of perspective are developments whose significance are easily overlooked. Perspective was not always there as one tends to assume; rather, it represents a radical and decisive breakthrough marking the advance of vision ahead of the other senses together with a new sense of space, temporality and order, and an urge for precision and quantification:

In the older pictures, one’s eye jumped from one part to another, picking up symbolic crumbs as taste and fancy dictated... Perspective turned the symbolic relation of objects into a visual relation: the visual in turn became a quantitative relation. In the new picture of the world, size meant not human or divine importance, but distance. Bodies did not exist separately as absolute magnitudes: they were co-ordinated with other bodies within the same frame of vision and must be in scale. To achieve this scale, there must be an accurate representation of the object itself, a point for point correspondence between the picture and the image (Mumford 1963: 20).

Advances in pictorial representation and cartography and the elevation of vision into the dominant sense have played a literally decisive role in preparing the conditions for the appearance of industrialism and modern bureaucratic organizations. However, we are not concerned, at least not here, either with writing a history of cartography and pictorial techniques of representation or with their detailed impact on social and economic life. The reconstruction of these
historical paths would be an exciting and meaningful enterprise, but what we are principally concerned with in this context are the lessons we can learn from the exploration of the cardinal mode of representation suggested by the cartographic metaphor: the networks of cognitive, epistemological assumptions together with the social relations that the advances in pictorial representation and cartography suggest. For, as we soon shall see, the map in particular and representation in general insinuate the social differentiation of the world into a controlling or acting centre and a controlled or acted upon periphery. It is just through the operative schema of representation, i.e. something for something else, and the accumulation of knowledge that it permits, that social differentiation and control and action at a distance are rendered possible. Along with the ability of vision to monitor action in the miniatuarized world of representation, the mobility and the detachable character of representing or signifying elements permit their permutation, rehearsal and accumulation, central requirements for the accomplishment of organized worlds (Cooper 1990). A map can be improved, revised, manipulated, even destroyed, much more easily than the territory it depicts. Figures, numbers and words lend themselves more easily to rehearsal and recombination than those aspects of reality which they supposedly address. As so suggestively put by Latour (1987: 226) “many things can be done with this paper world that cannot be done with the world.”

The topographic metaphor, then, seems to suggest that the conception and instrumentation implied by what we refer to as organizing practices are governed by those semiotic operations that we here attempted to subsume under the names of coding and sampling. Quite obviously, these socio-cognitive operations do not pertain solely to the techniques of pictorial representation. A balance sheet is an instance of numerical, or more correctly alphanumerical, representation that summarizes an incredible number of temporally and spatially dispersed transactions. Based on selection and coding, it crystallizes the diachronic flow of events in a synchronic fashion and in quantitative terms available to the controlling eagerness of the eye, that can, with knowledge of a few rules, envision or reconstruct part of their trajectories along the unambiguous traces of numbers. As repeatedly noted, the task of assigning numbers to objects, events and actions is neither an innocent nor a value-indifferent enterprise. Numbers posit and construct a world in the two senses mentioned above: i.e. they establish skewed correspondences between numbers and social events; and, while such an encoding might happen to be a reflection, it is also to use Burke’s (1966) words a
selection and deflection of reality. Obviously, not all aspects of the world are susceptible to numeration.

In a work tracing the origins of modern accounting, Hopwood (1987) showed how the development of cost and accounting procedures in eighteenth century industrial England imparted a certain view of the world and helped to establish what he referred to as a particular regime of economic, and we might add numerical, visibility and control at a distance (see also Cooper 1989a, 1990; Hoskin and Macve 1986). The unequivocal displays of accounting, and any other representational system whatsoever, are based on, presuppose a network of socio-cognitive operations that give priorities, select, accentuate, encode, in short construct a world. And it is the task of critical social science to unveil the nature and consequences of these abstractions and transformations. No wonder that such a task draws us away from a concern with the myriad details relating to the organization of production and pulls us towards the basic issue of the production of organizations (Cooper and Burrell 1988), i.e. to those fundamental conditions that make possible the very act of organizing and the modalities by means of which such organization is expressed and realized.

The map and any representation, together with the accumulation of knowledge and information which they imply, are among the principal means creating the decisive differentiation of human activities into those conceived and pursued by a controlling centre and those carried out by a controlled periphery, together with all the asymmetries that thereby ensue (Latour 1987; Mumford 1963). Latour’s (1987: 224) reconstruction of scientific achievements captures, in a sharp and evocative way, the primary conquest of representation, pictorial or not: Instead of having the mind revolving around the world, representation makes the world revolve around the mind. The institution of the controlling centre is accomplished: it is consubstantial with representation and its basic operative schema, i.e. something (map) for something else (territory). Through the superimposed coordinates implied by the segmentation of the world in terms of a contrived and constructed time and space and as the result of the coding procedures, things and actions travel back and forth following their engraved trajectories on the miniatuarked and disembodied world of representation. Archiving, refinement, re-representation, central activities and cornerstones of any modern organization, further enhance the dominance of the centre as they create new cycles of accumulation and enlarge the differences between the knowledge, vision and
perspective of the centre and those of the periphery (Cooper 1990; Foucault 1977; Latour 1987).

Requirements of Representation

We have by now, in one way or another, mentioned or alluded to the operations and tasks involved in the accomplishment of representation. In order to have things and places, events and people, or to be more precise the encoded versions of things and places, events and people, revolve around the mind (this is what representation is all about) and travel back and forth, it is necessary to institute a representing universe whose elements must satisfy, according to Latour (1987: 223), the following requirements:

- **mobility**, so that they can be brought back and forth;
- **stability**, so that can be moved back and forth without distortion, corruption or decay;
- **combinability**, so that whatever stuff they are made of, they can be cumulated, aggregated, or shuffled like a pack of cards.

Stability, mobility and combinability thus appear as central properties of the means through which collectivities conceive, posit and instrument their activities. Though Latour (1987) is principally interested in positing the conditions that sustain collective action, his account bears witness to the indissoluble link connecting notation and behaviour, conception and instrumentation. Whether by accident or design, one is tempted to associate his requirements for collective action with the necessary conditions for signification and representation (Burke 1966), and particularly with what linguists and semioticians have referred to as the principle of double articulation. Very briefly, the structure of language has been posited as evolving in two planes: one being constituted by significant units (composite units that have meaning, i.e. words, sentences) and the other by discriminant units (stable units that lack meaning, i.e. phonemes). The latter form the necessary substratum for meaning since it is their combinations that yield signification (Barthes 1967; Eco 1976). Numerical discourses can certainly be approached in this fashion (Belkaoui 1978), but our attempt here will be mainly directed towards connecting these insights with the central organizational issue of the predictability and accountability of human behaviour. Before proceeding to this task, however, we need a more detailed exposition of the requirements for representation and signification. Modern philosophy and semiotics have been
concerned with questions that bear on these issues and we will try, as a consequence, to explore the opportunities for building a bridge between the different terminological worlds involved. As we will be able to ascertain, such a step inscribes a new circle in pursuit of the affinities that seem to underlie notation and behaviour, signification and organization.

We referred earlier to Castoriadis’ (1984) claim that the word and the tool imply the institution of the type and that is another way of positing the issue of stabilny. Particular words, tools, objects might be looked upon as instances, occurrences, tokens, to use the terminology introduced by Peirce, of their corresponding types. A word, a letter, a number are all types that cannot be exhausted in particular occurrences. The institution of the type is the institution of a class or form which means that 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 (see also Castoriadis 1987; Goodman 1976). Each word or tool 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), identical to itself. No matter how big or small or how they have been constructed see-saws, wheels are always see-saws, wheels. This is a more rigorous and sensitive way of positing the issue of stability for it provides a link to the concepts of identity and recurrence and those of class and form. The retrieval and identification of a certain object, event or sign as this and not that, as complying with a given label or type, necessitates the institution of the notion of class (or form) whose members are indifferent 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. Note how much combinability and the opportunity to rehearse, experiment and instrument are dependent upon the ability of these units or instances to avert the infiltration of their boundaries, to keep their contours clear. For if everything melts into everything else, then unit and identity are erased and the world returns into the state of undifferentiated chaos. Also, viewing stability in these terms alludes to the idea of the social character of the sign and the tool. For even though their invention might be an individual accomplishment, their continuous utilisation presupposes their social institution, their intersubjective agreement or negotiation.
The issue of mobility refers to the ability to detach signs and tools from the particular contexts in which they have been engendered or used (Castoriadis 1984, 1987). All that we have said thus far connects in a decisive way with this cardinal mark of representation, i.e. its ability to release its elements from their attachment to and embeddedness in their immediate contexts. The basic operative schema or representation implies the institution of a conceptual unit and a physical vehicle (sound or figure) that conveys this unit. And such a cognitive accomplishment releases the representative element from its detachment to particular objects, for the object leaves behind its sheer materiality and enters representation in the elastic cast of a notion. Imagination and representation rely on identical cognitive faculties though representation is indissolubly bound with the presentification, the material embodiment of the notion, the conceptual unit. It is well known now that representation can be instrumented by means other than marks, figures and sounds. Buildings, bridges and other not easily manipulable bodies can be used as representing vehicles but they are not particularly mobile. It should therefore be clear that, in this context, we refer principally to notational systems and, more specifically, to those organized by means of letters, numbers and figures. But notice that even buildings may become mobile and manipulable once they are scaled down or mapped onto a paper.

Finally, combinability refers to the rules or conventions by means of which the stable and mobile elements of one or more systems of representation enter into relationships that create sequences or aggregates of signs and tools. As a rule, not all combinations are permitted. If that was the case, our ability, say, to combine letters to write prose would be rather limited and the effort too laborious. Constraints provide the recipe that imparts order, thus counteracting the state of equiprobability (entropy) (Bateson 1972; Eco 1976). Only certain combinations are permitted and the actual or potential combinations of the units or terms comprising a system are a subset, and often a very small one, of the entire range of possible combinations (Castoriadis 1987). Combinability is the principal means through which representation shows its flexible and non-torporal constitution and its almost infinite capacity to produce new versions of the world. For though internal and external constraints may together considerably delimit the range of possible combinations, there is only one definite limit to the improvisation, reshuffling and recombination of representing elements, i.e. a lack of imagination.
We have repeatedly noted that the logic, or at least an essential part of the logic, by means of which the world is constituted or "accounted" for is enfolded in the particular ways through which a representational system has been fashioned and instituted. Two aspects are of cardinal importance in this respect, namely the character and number of the signs of a system and the rules governing their combinability. Accounting and numerical reports differ from verbal documents, and both differ from models, maps and diagrams (Goodman 1976, 1978). It is by means of these basic forms of social cognition (conception and perception), i.e. verbal, numerical and pictorial, that organized worlds are erected. The forms through which these systems of signs and symbols are organized differ, and it is on these differences that an important part of our knowledge of organizing practices hangs. Though we will analyse some features of the forms by means of which such systems of semiosis and representation are organized, we cannot here go into the details that a thorough analysis requires (see e.g. Eco 1976; Goodman 1976). Let us notice in this context that a considerable part of the differences involved relates to the degree of disjointness characterizing the signifying or syntactic elements (the physical embodiments or expressions) of these systems and the manner through which their semantic domain (the totality of ideas and nations) is segmented and structured. The old and venerable distinction between analogic and digital systems refers to how far a system is organized by means of discrete, disjoint elements, i.e. by elements that are clearly and unambiguously differentiated from one other. Arabic numerical notation and natural languages are examples of systems that rely on disjoint syntactic organization, whereas pictorial representation does not, as a rule, have at its disposal a well delineated system of such discrete and disjoint terms. It would seem therefore necessary to look somewhat more closely at the consequences of the varying forms by means of which different systems of representation organize their elements.

Forms of Organization

It seems quite evident that the properties of stability, mobility and combinability are all influenced by the extent to which a system organizes its syntactic and semantic space by means of disjoint, differentiated and unambiguous terms. This is a different way of positing the issue of equivalence or, which amounts to the same thing, the issue of type or class. For in order to be identified, recalled and detached from an indistinguishable background, from the raw and
undifferentiated flux of sensations, an "object" or "event" must, so to speak, renounce its singular character and enter into an alliance of common properties that we here designate as a type or class. By the same token and within the confines implied by the instituted elements (types) of a single system of representation, a term cannot belong to two classes. A letter (a type), a word (a type) or an account (a type) might, no doubt, fulfil other functions than those implied by writing or accounting, but then we are within the domain of other representing 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. Pictorial or iconic representation does not, as a rule, organizes its elements in this way. It does not possess an alphabet, so to speak, 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 phonemes.

The issue of decomposition, largely coextensive with Latour’s (1987) requirements of mobility, stability and combinability, takes us by an unconventional route to the central issues of bureaucracy. For it shows or, at least, alludes to the complexes of motives and reasons that push organizing practices and those configurations known as formal organizations to strive to rely overwhelmingly on disjoint and differentiated inscription or action systems. For, being stable and well-differentiated units, the elements of such systems can be folded, unfolded, reshuffled and recombined in a smoother and more flexible way than the constituents of dense and undifferentiated systems. Disjoint units do not run the risk of dissolving into their material substrata. But the degree to which a representing system is disjointedly organized determines not only the degree of combinability of its elements but also its dependence on a single actor. An accomplishment arrived at by means of a sign organization that allows for its decomposition into its constitutive parts can always be released by its dependence on a single and indispensable actor (i.e. the creator) and, as a consequence, can be assumed by any competent member of a group. Also, the steps that lead to such an accomplishment can be recorded, codified and turned into systematic knowledge that can be taught and transferred. Viewed in this light, the issue of standardization and formalization, cardinal properties of any bureaucracy, take on a new meaning, for they are revealed as but particular manifestations of the socio-cognitive means and operations through which collectivities conceive, posit and act upon the world. It would seem that Elliott Jaques (1976) somehow sensed this, for he used the notions of permanence (stabilny) and detachment (mobilny)
as basic criteria for differentiating bureaucracy from other types of collective action though he never entered the logical or semiotic details of what these concepts imply.

An awareness of the instrumental involvement of representing systems that segment and order the world by means of disjoint, unambiguous and combinatorial units opens a new path for releasing approaches to bureaucracy and organization from the Weberian ghost. For it suggests that the objectification and accountability of human action is contingent on how far the latter can be inserted into prearranged and codified sequences and aggregates of acts. And the conception and instrumentation of the latter is, in large part, the accomplishment of representational methods that rely on a disjoint and unambiguous organization. To be fair, Weber (1946) clearly indicated bureaucracy's intent to arrest and render human behaviour accountable and calculable. Yet, like many after him, his assessment of the means and operations by which accountability is produced never left the state of scattered, vague and largely 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. But as everywhere in his "economic sociology" so even here numerals represent but the substrata of the decisions, making their contribution to the rational allocation of resources (Weber 1947: 186-191). Their constitutive aspect and the details of how accountability of human behaviour is achieved and what it implies are left, as it were, in the dark.

The analysis undertaken here seems to suggest that standardization and formalization might be looked upon as an attempt to segment, in a disjoint and unambiguous fashion, the erratic and molten character of human behaviour into relatively recurrent and equivalent sequences of steps. 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, an horizon to strive after but never to reach. Physical acts stick to the molten realm of pictorial or, more correctly, iconic (ostensive) representation. 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. Once again, conception and instrumentation, communication and action are connected by elusive but indissoluble links.
Hoskin and Macve (1986) 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, they noticed that the emergence and spread of alphanumeric writing (from the introduction of Arabic numerals in place of clumsy Latin ones to double-entry book-keeping) bear witness to the grand and ever-expanding project of the western world: the proliferation of quantitative techniques and the production of huge amount of documents that will come gradually to colonize, order and grid the most minute aspects of everyday life. Out of these techniques, procedures and documents is born that accountable and predictable version of man that Foucault so suggestively called the calculable man (Foucault 1977; Hoskin and Macve 1986): not a man of real blood and flesh but a segmented, abstract and manageable entity held together by the intersection points, so to speak, of 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 informational units that enter or await entry into networks of functional applications and relationships. However, by contrast with Weber, Foucault’s interest in accounting for the rationality of the organizations and institutions of the modern world is inseparable from the processes and the material, cognitive and physical means through which individual identity is constructed. Accountability of human behaviour, as it appears in its modern version, is a question neither of achieving compliance by means of a crude and external force nor of translating, following the track of rational calculations, internal and external constraints into sequences of actions. At least not solely. The lifeless documents constructed by the professions and disciplines of the modern world are ego technologies in the sense that they furnish the very material and methods out of which identity is built (Foucault 1977, 1980, 1988). Rather than being something extrinsic and adjacent, simply the material of reflection and judgement, the categories and definitions of professions form interpenetrating networks of references by means of which the world is conceived, segmented and acted upon. The document is the very terrain upon which the subject and the object constantly change positions. "Discipline 'makes' individuals; it is a specific technique of power that regards individuals both as objects and as instruments of its exercise." (Foucault 1977: 170).

And yet accountability is not simply the result of the sheer production of documents but also of a whole arsenal of methods and techniques that specify
how they are to be transcribed and cumulated (Foucault 1977; Giddens 1981; Latour 1987). The analysis undertaken by Hoskin and Macve (1986) marks a definite step towards the clarification of the accountability argument. True, their approach, however insightful and aware of the importance of quantifying human behaviour, lacks encompassing and detailed reflection on the requirements and consequences accompanying the institution of notational systems that are organized by means of disjoint, unambiguous and combinable elements. In this respect, they fail to see that quantification is but a specific expression of the principle of disjointness and unambiguity, and that, as we will attempt to argue below, accountability can be produced by disjoint but not necessarily numerical notation. Nevertheless, they are clearly aware that the accountability of human behaviour has been rendered possible by the carry-over of the mathematical mark into the context of education, and therefrom to other contexts of social life including the organization of instrumental activities. As already noted, bookkeeping provides another context in which a notational system attempts to bring together and quantify object and human values. Obviously, the mathematical mark or more correctly a notational system instrumented by means of numerical marks, is a disjoint and unambiguous system composed of mobile, stable and combinable urrits. And the critical point behind the introduction of the mathematical mark is the more or less explicit postulate that human behaviour and human values can be translated into numbers. Human behaviour and accomplishment is thereby rendered accountable, calculable and comparable. Let us make it clear at this point that we are by no means claiming that the coordination and organization of human instrumental activity is totally colonized by numbers and quantitative relationships. Rather, we posit that the instrumentation of prearranged and predictable sequences and aggregates of acts, the standardization and formalization of human behaviour is an issue of how far organizations and institutions approach their tasks through systems of representation organized by means of disjoint, unambiguous and combinable urrits. That organizing practices escape the total determination of transparent and unambiguous systems of representation ought to be quite clear (de Certeau 1984; Kallimkos 1989; Knights and Willmott 1989).

Accountability of behaviour 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 transparent (disjoint, 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 that delivers the **ultimate** test for deciding whether a performance (i.e. an instance, a token) **complies** with a given work (the type). The principles and techniques implied by this method of **inscription** or notation shows how a series and an aggregate of human **acts** can be **arrested** and consequently prearranged and made to **recur**. Painting on the other hand cannot be said to rely on a homologous organization. It cannot be decomposed, nor can its **fuzzy** elements be combined, accumulated or reshuffled in the same way as notes, numbers and words, though, to be sure, an enormous distance may happen to separate different paintings, **such** as those of Van Gogh and Mondrian. Tasks and methods, then, relying on knowledge that 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 detached from their dependence on a single actor nor can they, as a consequence, be **codified** and transferred (Lindblom 1981).

Viewing technology along the lines alluded to at the **beginning** of this **article** provides a different **context** relevant to the question of the accountability of human behaviour and the **orchestration** of predictable and recurrent aggregates and sequences of **acts**. The progressive transition from the tool through the **machine** to the automaton might be interpreted as the movement from a **dense** and ambiguous to a disjoint and unambiguous system. For it **bears witness** to an increasing **closure** of the options left to the **discretion** of the user or **operator** (Mumford 1952, 1963, 1970). The tool remains an underdetermined **object** that can be used in many and diverse ways. No **matter** how standardized, 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 and make their way through his skills, preoccupations and goals that **will always combine** in ways that **evade** predictability. 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. In the terminology used above, the interaction of the **artisan** and his tool, the sequences of steps involved in his accomplishment cannot be broken down, codified and taught. Certainly, apprenticeship was designed to ensure the **transference** and continuity of skills,
but notice that apprenticeship largely relies on demonstration and observation. And these are ostensive or iconic modes of communication. They return 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. As in the case of art, very much is contingent on the talent and intellectual integrity of the apprentice. Now, accountability of human behaviour can certainly be increased by imposing production rates and examination rituals but the case of modern technology shows that there exist other means to rely on. The machine and, even more, the automaton show that the skills of the artisan can, after careful measurement and documentation, 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 are clearly delimited from the others and imply in our own terminology the institution of a type or class. Considering the closed “discourse” of the movements that make up the machine, one cannot fail to realise that the replaceability of spare parts is an obvious manifestation of the requirement of equivalence and the practical consequences of the institution of type. "Ambivalence", Baudrillard (1988: 69) noted, “is reduced by equivalence”. The principles of disjoint and unambiguous organization are thereby brought to bear on the unfolding of human acts. Subordinated to the iron discipline of the machine and the automaton human behaviour is rendered accountable by turning the labour process itself into a calculable, prearranged and repetitive sequence. The instrumentation of human activities by the digital computer is the apotheosis of what disjoint and unambiguous representation can bring to the processes of organization. To be sure, the relationship of technology to the principles of disjoint and unambiguous notation is much more complex than this short account seems to suggest. Certain of the limitations inherent in such a formal-logical mode of analysis will emerge in the section that follows.

The Expedients of Coding and Transcription

What has been said thus far attributes a central role to signification and representation in instrumental contexts. For without the ability to represent and signify we are brought back from the realm of symbolic action to that of inanimate or, more correctly, nonsymbolic motion (Burke 1966, 1978). Human effort has the distinguishing mark of always implying an organization that is
superimposed or at best simulates that of nature, and such an accomplishment is inconceivable without the invention and institution of signs and systems of signs or symbols together with the rules by means of which they are combined to posit, construct or reconstruct versions of the world. It is by and through such a contrived and superimposed organization that the rigid unfolding of natural and biogomal occurrences can be counteracted, categorized, moulded, transformed, stored, in short manipulated. Hence, rather than discussing particular problems caused by the collective human effort to organize, order and control, we have ventured to explore the conditions that make human organization possible and give some clues that might contribute towards circumscribing the socio-cognitive space within which it unfolds.

Let us, as a means of recapitulation, try to follow the common thread that runs through our argument. Signification or representation has been posited as "consubstantial" with the mundane notion of organization. Both imply the institution of a representing universe whose mobile, stable and recombinable elements enable the making and, by the same token, also the unmaking and remaking of the world, an incessant reconstruction that nonetheless obeys the logic enfolds in the forms by means of which such a representing universe organizes and structures its elements. The vicarious and rehearsable, so to speak, character of these representing elements renders the world manipulable in the sense that it imposes on the sheer flow of experience its contrived schemata of temporal and distance and its encoded versions of objects, events and actions; it establishes the proto-conditions of social differentiation, and hierarchy as it appears in its modern version, by creating in a bipolar fashion differences in perspective and knowledge between a centre, i.e. those that encode, accumulate and control combinations of these encoded versions of the world and a periphery, i.e. the local sources of knowledge that are being encoded or controlled. In particular, the control and accountability of human behaviour, the accumulation of knowledge and the concomitant hierarchical differentiation of social action have all been posited as contingent upon the capacity of a centre to implant, conduct and monitor a considerable part of its activities by means of a disjoint and unambiguous sign organization.

It should be clear by now that the analysis undertaken so far bears the unequivocal imprint of a formal-logital approach to the issues and dilemmas posited by bureaucracy. The "Principia Mathematica" of logical types (Bateson 1972) or what Castoriadis (1987) called identitary logic cannot obviously solve the
entire range of intricate questions that relate to social action and representation. This is not only because such an approach ignores the social dimension (cleavage of interests, power and coercion, norms and the mobilization of actors) and what has been construed as the non-rational (cognitive or psychoanalytic) element of instrumental action. Even within the exclusive realm of the cognitive alliances we referred to as types, there is a one-sided stress on static and logical aspects, positing types as relying on the selection and highlighting of certain properties at the expense of others. But ought not that to imply that types reveal by concealing? What is thereby hidden or absent contributes to the constitution of the type as much as what is assumed as present. Actually, types and what might be construed as positive entities are constituted by the sustained friction between selected (plus) and repressed (minus) properties. The ontological and epistemological significance of this dynamic and ramifying play of differences has been brought to the fore by such thinkers as Bateson (1972, 1979) and Derrida (1976, 1978, 1988), and reconsidered, in the context of organizational analysis, by Cooper (1983, 1986, 1989b). Consequently, there is no need for us to embark on such a discussion here, particularly in the light of the drastic reconsideration of the basic premises of Western thinking that such a task implies.

The crucial point to make in this respect is that the infiltration of the boundaries of the cognitive constructions we referred to as types is inevitable, and their disjoint character only a provisional, temporary accomplishment. Quite obviously, if this was not the case then the unfolding of the world should have been a finished project. The regime of ideas and conceptual urrits, 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 very hard to see at first glance, it is such joint membership and the dense organization of many representational systems that render discretion and human agency possible. The world lends itself to ensemblization, Castoriadis (1987) noted, but the universe of significations is not structured like sets (see also Cassirer 1955). Such, it would seem, is the state of art. Nevertheless, human action and representation inevitably rely, though only partly, on an identitary framework (Castoriadis 1987). The latter might therefore proved to be a powerful means for approaching part of the repertoire of questions posited by organizing practices. Its potential within the context of instrumental action remains largely unexplored. Human communication and action will never conform to the transparent and unambiguous ideal of identitary
logic and yet in an ironic way they always proceed as if 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, as it were, on the verge of fusing its elements. Neither absolute predictability nor chaos tolerates human purpose and agency, and organizing practices are just one expression of the latter, however erratic and fragmented they might happen to be. It goes without saying that each particular cluster of tasks demands or posits its own blend of the predictable and recurrent and the unpredictable and erratic. Our attempt to discuss the different forms by means of which various systems of notation and representation are organized has the aim of sketching the contours of a discourse that might penetrate these intricate questions.

Quite obviously, organizing practices thus viewed divert attention away from the issues covered by productivist and substantivist metaphors. The organization of material flows becomes subordinate to the subtle and often obscure ways by means of which the world is bracketed or sampled and a domain of reference is established. To relegate material flows to a subordinate position by no means implies that we should discard or ignore them. After all, they are the "object" of representation. What we have sought to do is to outline some intellectual paths along which the relationship between instrumental representations and material flows, between signs and tools can be studied in a fashion that might enrich our understanding of processes of organization. What are the coding terms that establish the skewed correspondences between objects, states and properties on the one hand and the elements of representation on the other? What are the rules and conventions that govern their combinability? The church of St. Michael of Stewkley, or any other object, might be out there in what is often conceived as its sheer objectivity, but the way it enters the representations of an addressing body (a commission) does make a difference. For such a way may initiate series of actions, with one direction or another, that have to be understood not by studying either the physical constitution of the object or even its cultural value, but the assumptions of the commission or any other body whose involvement might have had a decisive impact. Also, and central in this respect, would be an attempt to explore the forms by means of which different regimes of signification or representation interact, and imply or negate one other (Hopwood 1987; Hoskin and Macve 1986). How, for instance, do accounting systems influence the more qualitative and open regime of policy and strategy or other separate realms of knowledge and behaviour in organizations?
Beside the above mentioned authors there are some sporadic attempts in the literature to establish certain relationships between the representations and rules of accounting and other aspects of cognitive behaviour (Belkaoui 1978; Morgan 1987), but the overall picture is far from encouraging. In any case, the ways by means of which different regimes of signification, different realms of knowledge are brought to bear on each other to form cumulated bodies of knowledge are among the distinguishing characteristics of modern institutions and organizations. This coupling of different regimes of signification might be looked upon as an attempt to provide the terms for second-order combinability: for, by contrast with first-order combinability which refers to combinatorial rules within a single regime of signification, it is primarily concerned with the rules, conventions and mechanisms that bridge and cumulate different forms of knowledge. And, as noted earlier, it is at the nodes or the crossroads of the multiple paths or networks connecting different realms of experience and knowledge (economic, medical, biological, geological, aesthetic etc) that an important and highly critical part of modern organizing practices is directed (Latour 1987).

No doubt there are important problems posited by the incommensurable character, the different rationalities, so to speak, that are enfolded in such different forms of experience and knowledge. But, as repeatedly noted, the logic of industrialism and of modern institutions knows very well how to use the cold procrustean bed of number and quantity. It "excises the incommensurable," (Adorno and Horkheimer 1972: 12). The task of assigning numbers to social events, people, situations, services is one of the principal modes of coding and transformation and not without reason. Numbers are, no doubt, stable, detachable (mobile) and combinable elements often used as the ultimate criteria for judgement and evaluation, criteria justified not simply by their susceptibility to axification, transference and reshuffling, but also by an uncontested transparency that sweeps away the elements of ambiguity inherent in richer and more complex but imprecise forms of signification. Numbers homogenize the world by emptying it of all its intrinsic content, by turning all its qualitative attributes into numerical values (Cassirer 1955). But can such a quantification exhaust the puzzling questions involved in the transcription of one regime of signification to another? The answer must be sought in the negative. For apart from the trick of loose coupling (Meyer and Rowan 1977; Weick 1976), formal organizations reveal instances of qualitative transformations, as when working-life experiences are turned into norms, values, ideologies or any other kinds of symbolic artefacts (see e.g. Pondy et al. 1983). And yet qualitative
transformations of this kind are mainly concerned, it would seem, with the
turning of denotative into connotative structures. However important such
transformations might happen to be, they are but a part of a more encompassing
series of transcriptions, involving among other things the neglected issue of how
one denotative order is turned into another.

References


Castoriadis, C.

Churchman, W. C.

Collins, R.

Cooper, R.

Cooper, R.

Cooper, R.

Cooper, R.

Cooper, R.
1990 *Formal Organization as Representation: Remote Control, Displacement, Abbreviation, *mimeo*, Department of Behaviour in Organizations, University of Lancaster.

Cooper, R. and G. Burrell

De Certeau, M.

Derrida, J.

Derrida, J.

Derrida, J.

Derrida, J.

Derrida, J.

Eco, U.


McCloskey, D. N.  

Manning, P.  

March, J. G., and J. P. Olsen  

March, J. G., and J. P. Olsen  

Meyer, J., and B. Rowan  

Morgan, G.  

Morgan, G.  

Morgan, G.  

Mumford, L.  

Mumford, L.  

Mumford, L.  


Van Maanen, J., and S. Barley  

Weick, K. E.  

Weick, K. E.  

Weick, K. E.