

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** 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. **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.



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Veritas in dicto, non in re consistit

T. Hobbes, *Leviathan*

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 turn, 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 universalty can be **looked** upon as an attempt to anticipate and **deter** occasions for manipulation that is wilful, partial and unjust. Canying-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 opulation 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 entaihnng **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 materiahty 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 substances 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 tum 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 substructures and things. Representation recedes, as it were, from the world and accounts for it in a manner that reflects **representation's** own being and organization. Substructures, 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 animal 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 modern, 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).

Returning 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 **tum 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

1987; Levi-Strauss 1966). 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-seeing 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, normahzing 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 miniaturized 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 **trans-actions**. **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 miniaturized 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 stability. **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, organize 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** (stability) and **detachment** (mobility)

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 **combinable 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**, **book-keeping** 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 units. 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 units. 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 realize 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 biological 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** enfolded 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 temporality 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-logical approach to the issues and dilemmas posited by bureaucracy. The "**Principia Mathematica**" of logical types (Bateson 1972) or what Castoriadis (1987) **called** identity 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 generally 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 **demand**s 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 posed 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 axiomatization, 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. Pandy 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

- Adorno, T., and M. Horkheimer
1972 *The Dialectic of Enlightenment*. London; Verso.
- Barthes, R.
1967 *Elements of Semiology*. New York: Noonday.
- Bateson, G.
1972 *Steps to an Ecology of Mind*. New York: Ballantine.
- Bateson, G.
1979 *Mind and Nature*. New York: Dutton.
- Baudrillard, J.
1988 *Selected Writings*. Stanford: Stanford University Press.
- Beck, B. B.
1980 *Animal Tool Behavior: The Use and Manufacture of Tools by Animals*. London: Garland.
- Beck R. R.
1986 "Tools and Intelligence" in *Animal Intelligence*. R. J. Hoage and L. Goldman (eds.), London: Smithsonian Institution Press.
- Belkaoui, A.
1978 "Linguistic Relativny in Accounting". *Accounting Organizations and Society* 3/2: 97-104.
- Burke, K.
1966 *Language as Symbolic Action*. Berkeley: University of California Press.
- Burke, K.
1986 *Permanence and Change*, Third Edition. Berkeley: University of California Press.
- Burke, K.
1978 "Rhetorics, Poetics and Philosophy" in *Rhetoric, Philosophy and Literature*. D. Burks (ed.), 15-35. West Lafayette: Purdue University Press.
- Cassirer, E.
1955 *The Philosophy of Symbolic Forms*, Vol 1: Language. New Haven: Yale University Press.
- Castoriadis, C.
1984 *Crossroads in the Labyrinth* Sussex: Harvester Press.

- Castoriadis, C.
1987 *The Imaginary Institution of Society*. Cambridge: Polity Press.
- Churchman, W. C.
1975 "On the Facility, Felicity, and Morality of Measuring Social Change" in *Social Accounting*. L. J. Seidler and L. L. Seidler (eds.), 22-29. Los Angeles: Melville.
- Collins, R.
1979 *The Credential Society*. New York: Academic Press
- Cooper, R.
1983 "The Other: A Model of Human Structuring". in *Beyond Method*. G. Morgan (ed.), 202-218. London: Sage.
- Cooper, R.
1986 "Organization/Disorganization". *Social Science Information* 25/2: 299-335.
- Cooper, R.
1989a "The Visibility of Social Systems" in *Operational Research and the Social Sciences*. M. C. Jackson, P. Keys and S. A. Cropper (eds.), 51-57. New York: Plenum.
- Cooper R.
1989b "Modernism, Post Modernism and Organizational Analysis 3: The Contribution of Jaques Derrida". *Organization Studies* 10/4: 479-502.
- 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
1988 "Modernism, Post Modernism and Organizational Analysis: An Introduction". *Organization Studies* 9/1: 159-170.
- De Certeau, M.
1984 *The Practice of Everyday Life*. Berkeley: University of California Press.
- Derrida, J.
1976 *Of Grammatology*. Baltimore: Johns Hopkins University Press.
- Derrida, J.
1978 *Writing and Difference*. London: Routledge and Kegan Paul.
- Derrida, J.
1981 *Positions*. Chicago: The University of Chicago Press.
- Derrida, J.
1982 "Sending: On Representation". *Social Research* 49/2: 295-326.
- Derrida, J.
1988 *The Ear of the Other*. London: Bison.
- Eco, U.
1976A *Theory of Semiotics*. Indianapolis: Indiana University Press.

- Elster, J.
1983 *Explaining Technical Change*. Cambridge: Cambridge University Press.
- Foucault, M.
1970 *The Order of Things*. London: Tavistock
- Foucault, M.
1973 *The Birth of the Clinic*. London: Tavistock.
- Foucault, M.
1977 *Discipline and Punish*. London: Penguin.
- Foucault, M.
1980 *Power/Knowledge*. New York: Pantheon.
- Foucault, M.
1988 "Technologies of the Self" in *Technologies of the Self*. L. H. Martin, H. Gutman and P. H. Hutton (eds.), 16-49. London: Tavistock.
- Giddens, A.
1981 *A contemporary a Critique of Historical Materialism*. London: MacMillan.
- Goodman, N.
1976 *Languages of Art*. Indianapolis: Hackett.
- Goodman, N.
1978 *Ways of Worldmaking*. Indianapolis: Hackett.
- Hopwood, A. G.
1987 "The Archeology of Accounting Systems". *Accounting, Organizations and Society* 12/3: 207-234.
- Hoskin K. W. and R. H. Macve
1986 "Accounting and the Examination: A Genealogy of Disciplinary Power". *Accounting Organizations and Society* 11/2:105-136.
- Kallinikos, J.
1989 "Play and Organizations" in *Operational Research and the Social Sciences*. M. C. Jackson, P. Keys and S. A. Cropper (eds.), 709-714. New York: Plenum.
- Knights, D. and H. Willmott
1989 "Power and Subjectivity at Work: From Degradation to Subjugation in Social Relations". *Sociology* 23/4: 535-558.
- Latour, B.
1987 *Science in Action*. Milton Keynes: Open University Press.
- Levi-Strauss, C.
1966 *The Savage Mind*. London: Weidenfeld & Nicolson.
- Lindblom, C. E.
1981 "Comments on Decisions in Organizations," in *Perspectives in Organizational Design and Behaviour*. A. Van de Ven and W. Joyce (eds.), 245-248. New York: Wiley.
- McCloskey, D. N.
1985 *The Rhetoric of Economics*. Madison: The University of Wisconsin Press.

McCloskey, D. N.

1987 "The Dismal Science and Mr. Burke: Economics as Critical **Theory**" in *The Legacy of Kenneth Burke*. H. W. Simons and T. Melia (eds.), 99-114. Madison: The University of Wisconsin Press.

Manning, P.

1987 "Semiotics and Social Theory: The Analysis of Organizational Beliefs" in *Actions and Structure*. N. G. Fielding (ed.), 78-98. London: Sage

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

1976 *Ambiguity and Choice in Organizations*. Oslo: Universitetsforlaget.

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

1989 *Rediscovering Institutions*. London: Free Press.

Meyer, J., and B. Rowan

1977 "Institutionalized Organizations: Formal Structure as a **Myth** and Ceremony". *American Journal of Sociology* 83/2: 440-463.

Morgan, G.

1983 "Why We Cannot Control Tropes in Administrative **Science**". *Administrative Science Quarterly* 28: 601-607.

Morgan, G.

1986 *Images of Organization*. London: Sage.

Morgan, G.

1987 "Accounting as Reality Construction: Towards a New **Epistemology** for Accounting Practice". *Accounting Organizations and Society* 13/5: 477-485.

Mumford, L.

1952 *Art and Technics*. New York: Columbia University Press.

Mumford, L.

1963 *Technics and Civilization*. London: Harvest/HBJ.

Mumford, L.

1970 *The Myth of the Machine*. New York: Columbia University Press,

Pondy, L. R., P. Frost, G. Morgan, and T. Dandridge, editors 1983, *Organizational Symbolism*. London: JAI Press.

Seidler, L. J., and L. L. Seidler, editors

1975, *Social Accounting*. Los Angeles: Melville.

Van Maanen, J., and S. Barley

1984 "Occupational Communities: Culture and Control in Organizations," in *Handbook of Organizational Behaviour* 6. B. M. Staw (ed.), 287-365. London: JAI Press.

Weber, M.

1946 *The Theory of Social and Economic Organization*. London: Free Press.

Weick, K. E.

1976 "Educational Organizations as Loosely Coupled Systems". *Administrative Science Quarterly* 21: 1-19.

Weick, K. E.

1979a The **Social Psychology of Organizing**. Reading, Mass: Addison-Wesley.

Weick, K. E.

1979b "Cognitive Processes in Organizations" in **Research in Organizational Behaviour**. B. M. Staw (ed.), **41-74** London: JAI Press