Towards the idea of information science as an interscience

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The purpose of this article will be to emphasize the role of the core aspect of the scientific endeavour that is fundamental to any good science, but that is currently largely neglected, namely reflection, or the intellectual activity in science. The focus will be on the challenges posed by some contemporary situations and developments to the intellectual activities of the scientific endeavour. The assumption is that science is first and foremost an intellectual activity, an activity of thought. The question to be addressed then will be: How do we, as Information Scientists, respond intellectually to what is happening in the world of information and knowledge development and work, given the context of new socio-cultural and knowledge landscapes.

The emphasis will be on the rethinking of human thinking, as our unique human ability that enables us to cope with the world in which we live with its dynamic, challenging and ever changing circumstances and demands, in terms of the commitments characteristic of the very unique science we are involved with. Different approaches to the establishment of a new scientific spirit will be explored, the demands these developments pose for human thinking will be highlighted, and the implications for Information Science regarding its proposed functioning as a nomad science, and its proposed responsibility of focusing on informatization and inventiveness, will be specified.

Keywords: Science, Information Science, Interscience, Nomad Science, Discipline, Paradigm, Interconcepts, Thinking, Knowledge, Information, Intellectual Responsibility, Meaning, Informatization

Introduction

Over the past number of years, much has been written about Information Science as a science and a number of important authors have made valid and valuable points during this time (Belkin 1978; Kochen 1983; Vakkari & Cronin 1992; Wersig 1993a&b; Vakkari 1994; Ingwersen 1995; Saracevic 1999 – to mention only a few). No one came up with a final viewpoint acceptable to all. This is, however, the case with all sciences; as a matter of fact, it is true of science in general. There are always new points to be made and different perspectives from which to make them. New developments encourage and allow us to take a new and fresh look at things.

New developments are always frightening. This is why people are inclined to stick to things they know and consider valuable, or of ultimate importance, or as coming from the right perspective, or as the best way of looking at things, etc. It gives them some security, at least. On the other hand, this approach can easily lead to stagnation, to intellectual starvation, and to boredom and monotony. That is why debate is important and will always be important. Debate brings in new and different and sometimes, for many, even unacceptable views that must be considered and reconsidered.

The purpose of this article will be to emphasize the core aspect of the scientific endeavor that is currently largely neglected, or, at least miniaturized owing to the sole focus on research and research methods. What has been forgotten is that reflection, that is, the intellectual activity in science, is fundamental to science, including Information Science. Indeed, it is even present and active, although most of the time, in research methods, it is hidden and not articulated. What method to choose, how to apply the chosen method, and what to infer from its findings are all reflective, or intellectual, activities.

This article will therefore focus on the challenges posed by some contemporary situations and developments to the intellectual activities of the scientific endeavour. The assumption is that science is first and foremost an intellectual activity, and the term 'intellectual' is understood in a way closely related to its etymological sense. In other words, it reflects the ultimate in human rational and thinking ability, the ability to read between the lines and to establish links in a comprehensive sense. The question then will be: how do we, as information scientists, respond intellectually to what is happening in the world, especially in our world of information and knowledge development and information and knowledge work, given the context set by the events that are currently taking place? It seems as if drastically new sociocultural and knowledge landscapes are in the process of being constructed.

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Changes in landscape

A double change in this landscape poses dramatic challenges to human intellectual activities which include, of course, scientific intellectual activities.

In the first place, under the impact of developments in the field of electronic media, and information and communication technologies in particular, there has been a radical change in *the sociocultural landscape*. Globalization, which no one can escape any longer, is a good example of this change: the opening up of our boundaries. This process is comprehensive and leaves almost nothing untouched; as we have said, nobody can escape it. Bougnoux (1993: 9-19) gives a number of telling examples: the rapid extension in the western world of information apparatuses; the decline of the religious; the decline of the rural world; the extension of the markets; the penetration of production by information; the decline of war and the growing ideology of dialogue; the emergence of an ecological conscience; the division of the labour of knowledge that divides the culture which was, until recently, structured in terms of the humanities, the sciences and the mass media.

These three cultures ignore and even scorn each other. The idea of an encyclopedia makes people laugh today. Nevertheless, periodically, several voices emerge accusing these mutilated knowledges of producing barbarisms (Steiner 1999). Here the themes and problems of the information sciences have a role to play, and our discipline, following the example of philosophy, could propose some useful links in order to combat imprisonment. This opening is also somehow a turn. Information is not an object, the contents of which one can simply calculate, as many would claim. It cannot be limited to a place. It establishes links, and maintains itself in *the inter* of the media and the disciplines.

What globalization signifies is the transgression of boundaries, that is, the opening up of new comprehensive territories to be explored. What must be emphasized is the role and place of information and communication technologies in this regard. This impact is fairly dramatic, but it needs to be emphasized that these developments should not be viewed as deterministic. In the process dogmatisms, reductionisms, culturalisms and ideologies that usually set boundaries and close up domains become relativized and are sometimes rejected and even fall away.

The other change is a change in *the contemporary knowledge landscape*. Over a number of decades, a new knowledge dispensation, in terms of which knowledge is understood and articulated differently from that described before, has emerged (see De Beer 1996, 2001, 2003). The notion of 'rhizome' developed by Deleuze and Guattari (1988), 'the network idea' of Latour (1987) and Callon (1989) that developed into 'the actor-network theory', as inspired by the work of Michel Serres, the philosopher of science and mathematician, are both efforts to articulate these developments in the complex field of knowledge and information. The idea of thinking of knowledge in terms of knowledge networks has gradually been established (Serres 1994; Parrochia, 2001).

Knowledge can no longer be understood as something fixed and final, and as something that can rigidly be determined along thanatocratic lines; knowledge is dynamic, flexible, living and liberating and capable of being opened up to new avenues, perspectives and futures. The intriguing question of the relationship between knowledge and information emerges time and again, and is certainly influenced by, and should get new dimensions in, these terms. It has not been settled by anyone despite numerous efforts of a more or less epistemological nature. This relationship still needs further exploration. The suggestion here is that attention be given to the views of Rainer Kuhlen (1990), who writes that 'information is knowledge in action' and Gernot Wersig (1993a), who supported and followed Kuhlen. Both of them accept that information is knowledge for action. Knowledge should be transformed into something workable and applicable that is called information. I think this view frees us from stagnation.

When Pierre Lévy (1993:165-168) articulates the nature of 'cognitive ecology' with specific reference to the impact of electronic media on our encounters with knowledge (which cannot be ignored), he emphasizes the following: in a very fundamental way, the knowledge boundaries have shifted, or even opened up. A number of significant openings have been emphasized and highlighted by him and these views deserve serious attention. The two most important opening principles emphasized are the following: one principle states the idea that an intellectual technology must analyze itself as a multiplicity that is indefinitely open: "the principle of branched multiplicity". The other emphasizes the fact that the sense of a technique or technical development is never ever given at its conception, neither at any particular moment of its existence, but that it is a matter of contradictory and contingent interpretations of social actors: "the principle of interpretation".

Rethinking human thinking

These changes and emphases put high claims on human thinking. In the last analysis, this thinking is our unique human ability, an ability that enables us to cope with the world in which we live. The less developed this ability, the less able we are to cope with our circumstances and challenges. There is, in other words, a call for a new and different way of thinking, not a way of thinking foreign to humans, but a way of thinking shamelessly neglected by humans. This mode of

thinking is comprehensive thinking inspired by values, rather than reason and truth, a noological thinking which takes humans far beyond the rational and rationalistic mode of thinking. At the same time it must be understood, especially at the present time, that human thinking is not merely the activity of a solitary and independent individual – even understood in the noological sense. Certainly it is human persons who think, but only because a mega cosmopolitical network thinks in them. "It is an immense, extremely complicated network that thinks in multiple ways and in which heterogeneous parties participate. The actors of this network never stop translating, repeating, cutting, and inflecting in all senses of the word what they receive from others.... When we stop accepting the individual consciousness as the centre, we will discover a new cognitive landscape that is richer and more complex. The role of these interfaces and connections in the widest sense acquires a capital importance. It really implies the rethinking of our image of the human person." (Lévy 1993: 196).

When this re-emphasis and re-contextualisation of human thinking, according to a newly described image of the human person is neglected, this is very much to our detriment. What is meant by this? Let Pierre Lévy help us. He writes: "Either we cross a new threshold, enter a new stage of hominization, by inventing some human attribute that is as essential as language but that operates at a much higher level, or we continue to communicate through the media and think within the context of separate institutions, which contribute to the suffocation and division of intelligence. ... But if we are committed to the process of collective intelligence, we will gradually create the technologies, sign systems, forms of social organization and regulation that will enable us to think as a group, concentrate our intellectual and spiritual forces, and negotiate practical real-time solutions to the complex problems we must inevitably confront." (Lévy 1997:xxvi-xxvii)

How and where can this comprehensive and value-driven thinking be accommodated, promoted and accomplished? As Castoriades (1984:ix-x) writes:"To think is not to get out of the cave; it is not to replace the uncertainty of shadows by the clear-cut outlines of things themselves ... To think is to enter the Labyrinth; more exactly, it is to make be and appear a Labyrinth ... It is to lose oneself amidst galleries which exist only because we never tire of digging them; to turn round and round ... until inexplicably this spinning round opens up in the surrounding walls cracks which offer passage." The accomplishment of this thinking is probably yet to be discovered, at least in the milieu of what has been referred to as the new knowledge dispensation. This new knowledge dispensation emerged out of the reflecting activities of the sciences and philosophies committed to knowledge and to the scientific endeavour. It is self-evident that these changes will influence scientific approaches and approaches to science.

A new scientific approach

A new knowledge dispensation, in a new milieu, not only goes hand in hand with a new scientific approach but has, to some extent, been created by this new approach. Momentum is gained for this renewal by the effective workings of the new media (as this will become clear later on).

The notion of 'a new scientific spirit', developed and promoted by Gaston Bachelard, in his book bearing this title (1985) immediately comes to mind. Bachelard investigated the ways in which traditional modes of thinking, both within and outside the sciences, have been radically transformed by what he called 'the new scientific spirit'. What is at stake in the struggle between traditional modes of thought and the increasing number of intellectual practices that can no longer easily be assimilated to that tradition or comprehended by it, is nothing less than the idea and ideal of knowledge based on a notion of truth conceived in terms of 'correspondence (adequation intellectus et rei). The adequation conception of truth presupposes both the separation of thought from its object and the priority of the latter over the former. It is this separation, or distinction itself that the operations of the new scientific spirit have rendered increasingly problematic. What is increasingly being questioned today is the notion of intellectual and scientific autonomy – a tradition that still dominates vast areas of academic activity and academic institutions – this notion presupposes a field that is self-contained, subject to its own laws, to principles and rules that are, in essence, independent of all that surrounds them. This is also the attitude that unfortunately inspires the ambitions of many information scientists.

It is precisely this desire to establish impenetrable frontiers and unshakable foundations, Bachelard argues, that distinguishes the old from the new scientific spirit. The practices of contemporary science entail a 'diversification of axiomatics' (p 41) and the recognition of an 'irreducible multiplicity of basic hypotheses' (p 116). The complexity of the manifold reality of contemporary science renders the idea of autonomy inoperative. What has changed is the relation of identity to nonidentity, of inclusion to exclusion. The concepts and constructs of the new scientific spirit are relational rather than substantial and, as such, irreducibly heterogeneous. His famous notion of an 'epistemological break' is hereby demonstrated.

Along similar lines, Bohm and Peat (1989) have made some remarkable observations regarding this 'new spirit'. The very important question they ask is the following: "How can this new order ever get started?" They answer: "Both

individually and socially, consciousness is rigidly conditioned by a host of assumptions that lead to their own concealment through false play. In the resulting confusion and illusion, the mind is not even able to be aware of these assumptions, or to give proper attention to them. Various ways have already been suggested in which the mind may be able to 'loosen' some of these assumptions. The essential point, however, is that any kind of free movement of the mind creates the opportunity for revealing and loosening the rigid assumptions that block creativity." (p 267)

A further formidable contribution has been made by Prigogine and Stengers (1986), with their idea of "a new alliance". The significance of this contribution is emphasized by the fact that it comes from a chemist who has won the Nobel Prize for Chemistry, and from a philosopher of science of some considerable standing in Europe. The new alliance they wish to promote is the alliance between the human sciences and the natural sciences, on the basis that there are more things that link the two than that separate them. These links should be articulated constructively. They have subsequently published another book, in which they address the problem of time and eternity and in which they discuss 'the new place of the human being in the natural sciences'. Their dealing with determinism and indeterminism brings us very close to the focus of this article. They emphasize that the world of classical science, in terms of which the world is fully understandable, precisely reflects the nightmare announced by Kundera, Huxley and Orwell according to whom this same world is an irreducibly multiple world (Prigogine & Stengers 1989:80-81). These two notions and the way they are understood are self-evidently relevant to our field from the perspective of knowledge and information, but even more so from the perspective of Information and Communication Technologies and the way these technologies are sometimes related to 'technological determinism'.

The notion of "the instructed third" was developed by a member of the French Academy, Michel Serres (1989; 1997). This idea is constantly intriguing in terms of its vitality, exuberance and inventive possibilities, and is an additional significant effort to work out and establish the inevitable, but also fruitful, connections between knowledges. Serres's emphasis is on the linkages, so difficult to identify, but necessary and of vital importance to be pursued and promoted between the sciences, the humanities and philosophy, especially in view of the ways in which they complement and enrich each other. His famous statement is: "There is more fiction in science and more science in fiction than we are inclined to admit." This approach, perhaps more than any of the others, opens the way to inventiveness – the issue that enables people to move forward as individuals, but also as groups and societies and communities by inventing new worlds, new meanings and new futures. And it is in full compliance with the alternative articulation of human thinking emphasized earlier. This brings me close to the dream I have for both Information Science and information work.

Two possible approaches to science emerge if we follow carefully the argument of Isabelle Stengers (2000). From the above discussions it is clear that a new scientific spirit is embraced and actively promoted by some, with the implication of a choice between two approaches: deterministic versus indeterministic, stagnate versus creative, royal versus ambulant or nomadic. With reference to Deleuze and Guattari (1988), we can distinguish between a royal science and an ambulant science: "Royal science is inseparable from a 'hylomorphic' model, implying both a form that organizes matter and a matter prepared for a form." Royal science does not make the 'ambulant' or 'nomad' sciences that preceded it disappear. The latter do not link science and power together. Nor do they destine science to an autonomous development, because they were in solidarity with their terrain of exploration, because their practices were distributed according to the problems provoked by a singularized material, without having the power to assess the difference between what, from singularities, refers to 'matter itself' and what refers to the convictions and ambitions of the practitioners. "Royal science mobilizes the ambulant process. In the field of interaction of the two sciences, the ambulant sciences confine themselves to *inventing problems* whose solution is tied to a whole set of collective, non-scientific practices but whose *scientific solution* depends, on the contrary, on royal science and the way it has transformed the problem by introducing it into its theorematic apparatus and its organization of work" (Stengers 2000:154-155). What we do find here is a 'demobilization' of the positive sciences and this has to be linked to the question of complexity (p156).

These insights should be taken seriously by all scientists and by information scientists in particular.

Challenges to Information Science

These challenges are comprehensive. Our first and very natural question is: what are the implications of such a new or different approach to science for Information Science? Can Information Science remain satisfied with a traditional or classical scientific approach, or does it need some drastic and thorough rethinking? If this is undoubtedly required of the sciences, due to the landscape changes, it is in a similar way, but much more intensely required of Information Science, in view of its specific focus and activity.

The option is open: stay as you are, keeping as closely as possible to the classical tradition and run the risk of stagnation, or, renew and rethink in order to become the culmination point of inventiveness!

My suggestion is that these changes pose, in turn, such serious and comprehensive challenges with such enormous opportunities that we owe it to our subject field to respond with as much intellectual input as we can. This consequently requires a radical rethinking of the place, focus, role, and responsibility of the information sciences if we want to give an adequate account of the exciting prospects facing our science and if we want to actively participate in the project of inventing the future (Hannah & Harris 1999).

What does this imply?

It implies that the previously described developments and emphases should be taken seriously and explored further in the context of Information Science.

The first step would be the rethinking of Information Science along the lines suggested for the sciences in general by people such as Bachelard, Bohm and Peat, Castoriades, Morin, and Prigogine and Stengers (to name but a few). Information scientists should give an account, for themselves, about these dramatic events in the field of science that force us to explore to the full the new scientific spirit, indeterminism, creativity and the approach proposed by nomadism. We as information scientists should give account for ourselves of these dramatic events in the field of science that force us to explore to the full the implications of the new scientific spirit for ourselves while taking heed of the importance of the continuous commuting between the royal and the ambulant aspects of our science. These views are on the table for us all to review as a matter of urgent necessity; they are complementary to the rethinking of human subjectivity, and to the rethinking of thinking itself.

It would make sense to link the response to this challenge to the notion of 'paradigm' as developed by Edgar Morin (1983). What this means is that we should take the activity of reflection by the active mind seriously, with the full input of our intellectual capacity, without losing sight of the fact that this active mind is inserted into a dynamic network with powerful implications for its activity. We have to grasp and articulate the human depth of the paradigm, covering the idea of the Gordian knot and of the noological dynamics as the scene of the link between the sciences, human and natural while, at the same time, keeping in mind the fact that the notion of paradigm represents much more than simply a switch in methodical approach or philosophical direction or personal preference. As Morin himself puts it: "(W) e have sought grounding for human science in the science of nature. ... But that led us to the conclusion that the science of nature must be based on a science of knowledge which is that of the knowing mind. That science, therefore, takes us back to the science of man, because the human mind, the human subject, must be understood as anthropo-social-cultural realities; that is, the science of nature calls for a fundamental anthropology... In this encounter, the science of mind gives rise to a noology which itself bursts open in a complex way: on one hand, a branch that calls for a noological science and in which noo-organization refers us back to the theory of auto-eco-organization; on the other hand, a branch which is logical, ideological, semiotic, linguistic ... We are thus back to the real complexity of an unheard of interpenetration, via the sciences of mind or noology, between natural sciences and human sciences; at the same time we are led to a kind of arrangement, a mutual dependency and a dual, reciprocally satellite rotation between natural sciences and human sciences, one the servant-mistress of the other, one the epistemologization of the other, but on the understanding that they be hoisted to the meta-level of complex epistemology. From then on, we will have to conceive of epistemology as a circuit, but we will also be required to consider that there is likewise a Gordian knot, where everything is tied together. ...The direction of our thinking can be considered as a sort of parade review of the multi-determined character of knowledge. The latter always have determinations which are individual,; bio-anthropological, noo-logical, ie. linguistic, logical, and ideological; socio-cultural; and one could and should add other determinations which overlap the above, such as: psychoanalytical, material. ... These determinations ... coagulate and agglomerate in any field of knowledge and thought inquiry ... are also, in a certain way, fundamentally related in deep structure, and that the Gordian knot of these multiple interrelations between various insistencies which govern knowledge, also conceal an underlying nucleus where ... strong forces are at work. Here the notion of paradigm steps in at the very heart of the idea of knowledge and of scientific theory ... Science is not purely and simply the accumulation of factual knowledge, but is structured by theories which, in order to structure the knowledge, bring to bear inherently ideological structurations." (Morin 1983:11-12)

The next step would be to look at the contributions of information scientists themselves.

Contemporary scientific approaches to Information Science, such as the rational, the socio-behavioral, the cognitive, the sense-making and the hermeneutic, as summarized by Peter Ingwersen (1992:306-309), may be a starting point because they offer us a significant opening. The "argumentation for abandoning the rationalistic tradition and the reasons for moving into a human-based hermeneutical attitude to information design and processing problems" have been reiterated. He further emphasizes that every phenomenon, domain, or dimension studied in Information Science can be approached from one of these scientific views or approaches while, at the same time, illustrating their complementary

nature. An obvious consequence, as highlighted by Ingwersen, would be that a methodological pluralism be adopted for most investigations in our field.

This view is reinforced by Bougnoux (1993) with reference to a number of disciplines relevant for the Information and Communication Sciences. His work on 'the birth of an interdiscipline' is arranged around the following eight fields: philosophical approaches; the empire of signs or semiotics; speech act theories; the dreams of the masses; the mechanization of the mind; mediological openings; the logic of transmissions; and the embodiment of communities. The implications of the interconnectedness between these fields and Information Science and work need to be worked out and explored in full. These emphases, with the implied nomadic movement between the diverse disciplines, nevertheless make of Information Science, as an interscience or interdiscipline, one of the most exciting, rich and highly relevant intellectual and scientific exploratory endeavours thinkable in our contemporary and very challenging times.

Gernot Wersig's views about a number of things need to be explored because of their relevance for reflection in our context. His articulation of the difference between 'calculus' and 'aesthesis', in which it is emphasized how the human being is much more than a mere calculating being, but also a being with the potential of aesthetics that go far beyond rational calculations, adds a worthwhile dimension to the place of humans in our scientific and professional context that is too easily neglected. Wersig's suggestion is that the situation should be reversed from the suppressing rationalization of the sciences with a focus on information for calculi, to a liberating opening up to the provision of 'more knowledge for humans, which finds expression in his proposal of 'a back to knowledge' direction' (1990:184-187). Another article, in which he sketches "a weaver bird's perspective" for Information Science (1992), emphasizes that the main focus of Information Science should be the interweaving of the scientific approaches highlighted by Ingwersen, the broad intellectual fields demarcated by Bougnoux, and the inter-concepts that are present and relevant to all intellectual work in all domains or disciplines. This extensive establishment of connections and links between knowledges paves the way for the idea of a postmodern science (1993b) to the displeasure of many, or, in the context of this study, it may be interpreted as an effort towards the birth of an interscience or an interdiscipline. The idea of the role of interconcepts (1992, 1993a) provides the means by which the interscientific activity can really proceed and make progress.

Related to and valuable for the views above, although not himself an Information Scientist, is the work done by Pierre Lévy. His contributions to collective intelligence (1997), virtual reality (1998), a world philosophy (2000) and cyberculture (2001) have a remarkable relevance to the intellectual and knowledge work to be done by information scientists and information professionals in the context of a newly shaped interscience focus. The wealth of his contributions offers hope for the future of humankind, despite the many arguments that claim a hopeless future.

Information Science: its functioning and responsibility

The explication of the relevance of these insights for Information Science, with a view to its *functioning* and its *responsibility*, is now required.

Regarding its functioning:

1. All sciences are engaged in thinking. So is Information Science. A difference in thinking, as well as our understanding of human thinking, is required – not different in terms of the thought potential of humans, but different in terms of the restrictive and reductionistic conceptions of thinking. This reductionistic conception of human thinking is particularly influential in the field of science and needs to be eradicated. Information Science, unfortunately, fits too easily into and complies much too easily with this reductionistic approach and these restrictive strategies, probably as a result of a lack of sufficiently clear and thorough reflection on its position.

2. A number of examples that stress, from different perspectives, clear irreductionistic approaches to thinking, need to be explored. The revision of what is understood by human subjectivity goes together with these views and adds some special dynamics to this whole issue of thinking. The views of Baudrillard (1989), Lévy (1993), Wersig (1993b), Hayles (1999) and Fukuyama (2002) offer excellent guidelines in this regard. Unless we can manage to develop an adequate understanding of the human being (the being who is the thinker, the scientist, and the knowledge worker), we will, in view of recent developments and landscape changes, probably not be able to comply with the demands of this century and the challenges facing South Africa.

3. In terms of the tradition of defining the sciences in terms of object and method, it seems as if Information Science may encounter difficulties in being defined as a science. At the same time, because of its positioning between or "in the inter of the media and the disciplines", it qualifies as a unique kind of scientific and intellectual endeavour that can be called an interscience. As an interscience, it should adopt, as its final ambition, the overcoming of the divorce and distrust between disciplines and sciences. Its position reminds one of the positions taken up by, and also given to, philosophy. It should be

working within and between the sciences, applying and utilizing interconcepts with the full capacity of human thinking in an irreductionistic way, thus weaving insights and knowledges together into significant networks.

4. What is really at issue is the consideration of Information Science not only as an interscience, but as *a nomad science* in the true sense of the word. Deleuze and Guattari (1988) offer an exemplary characterization of a nomad science. Lévy (1997:xxii-xxiii) is equally explicit and borrowed from them when he writes: 'We have again become nomads. By this I am not referring to pleasure cruises, exotic vacations, or tourism. Nor to the incessant come and go of businessmen and harried travelers ... Movement no longer means traveling from point to point on the surface of the globe, but crossing universes of problems, lived worlds, landscapes of meaning. ... The nomadism of today reflects the continuous and rapid transformation of scientific, technical, economic, professional, and mental landscapes. Even if we remain rooted to one spot the world will change around us. Yet we move. And the chaotic mass of our responses produces a general transformation.'

If René Thom, the well-known French mathematician, can speak of a 'nomadic mathematics' (Stengers 2000:156), how much easier would it be to speak of 'a nomadic informatology'. The vocation is not to reduce multiplicity of sensible phenomena to the unity of mathematical or informatological description, but to construct an intelligibility of qualitative differences within which to move.

5. The establishment of connections and links with a variety of 'disciplines' such as semiology, mediology, psychoanalysis,philosophy, speech act theory, artificial intelligence, pragmatics, cybernetics, etc. are at issue here because of the importance of all these matters for the consideration of information and the possibilities of its application. Information Science, given its unique position in the gallery of sciences and intellectual exercises, could play a decisive role in the establishment of these necessary connections. The fragmentation of knowledge, and the animosity between knowledges and their suspicions of each other are, to a great extent, responsible for the many failures in knowledge work and knowledge applications. Commitment in the Information Sciences to overcoming these barriers and facilitating connections and links can contribute to overcoming many of the obstacles blocking the road to knowledge use.

Regarding its responsibility

In more than one respect the information scientist, together with the information professional, have a number of challenging and unique responsibilities.

The first is to firmly reject dishonesty *in science,* by which is meant the reductionistic dispositions that we inculcate and shamelessly promote amongst our students and among information workers. This approach misleads everybody: students, researchers and teachers. See Marcel LaFollette's article (1998) on 'scientific misconduct' in this regard, although her article has a somewhat different focus.

The elaboration of *meaningful information* (what counts) and not merely information as such. Strategies for finding and promoting meaningful information are among our most important responsibilities given the immense information overload we have to face.

The cultivation of *a culture of knowledge.* Who will and can do this if we refuse to do it? Wersig (1990) and Bonaventura (1997) write convincingly about this responsibility.

The promotion of *comprehensive literacy,* since this is the only guarantee for adequate reading and for the engagement in comprehensive, interscientific, nomad thinking, which is desperately needed if we take what is entrusted to us seriously. De Beer (1999), who writes about different modes of reading and Burnett (2002), who writes about rhizomorphic reading as ergodic literacy, are worth consulting. When Michel Serres, the acritical reader, states that "reading is a journey", he certainly expresses the true spirit of the interscientific, nomadic activity.

The focus of the Information Sciences and information work and services should, in the last analysis, be *informatization.* As Wersig puts it: informatization becomes known as the process in which the megatrends are indicated by the three key terms 'application explosion', 'integration' and 'mass distribution'. As this process increases the information derived from knowledge structures can be represented by multiple media.

The most unique feature of establishing links and building connections within the framework of knowledge networks, as spelled out earlier, is the potential this offers for *inventiveness* on a grand scale. It should never be forgotten: inventiveness is an intellectual endeavour par excellence. In the final analysis, it depends on the imagination of teachers and researchers in the field to give this interscience the place it deserves.

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Declaration

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