

Sociality with Objects **Social Relations in Postsocial Knowledge Societies¹**

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In this paper, I begin to develop an analysis of object-centered sociality as a social form that constitutes something like the reverse side of the coin of the contemporary experience of individualization. Individualization, however defined, always focuses on human relationships. It implies that single human beings win dividends of modern freedoms at the price of the loss of the benefits which they used previously to accrue from their being embedded in communities of other human beings. This understanding of the disembedding of modern selves as exclusively a human relations issue ignores, I shall argue, the ways in which major classes of individuals have tied themselves to object worlds. It ignores the degree to which the modern untying of identities has been accompanied by the expansion of object-centered environments which situate and stabilize selves, define individual identity just as much as communities or families used to do, and which promote forms of sociality (social forms of binding self and other) that feed on and supplement the human forms of sociality studied by social scientists. Objects may also be the risk winners of the relationship risks which many authors find inherent in contemporary human relations (e.g. Coleman 1993). A strong thesis of "objectualization" would imply that objects displace human beings as relationship partners and embedding environments, or that they increasingly mediate human relationships, making the latter dependent on the former. Objectualization is the term I propose to capture this situation.

In what follows, I start from the notion of individualization and link it to the retraction of social principles and environments which we are currently experiencing. These "post-social" developments, I argue, have something to do with the dispersion of knowledge processes and knowledge structures in social life. Knowledge processes are heavily centered on objects of knowledge. I want to maintain that the rise of modern science has provided for and reinforced a form of object-relations which contrasts with the two major notions of object-relations available in sociology: those linked to commodities and to instruments. In the rest of the paper, I make a first attempt to characterize this form of object-relations and the notion of object involved in them. I should add that I do not view objectualization as being limited to objectual relationships as I describe them in the paper, drawing upon expert cultures. For example, the notion might easily be extended to human relationships to nature, as they might be experienced by some members of ecology movements, or to objectual relationships in certain physical activities, in which participation increases in contemporary life. Nonetheless, to get started I think we can learn much from situations where the engagement with objects tends to be long term, consuming, and in some sense reciprocal, as in expert cultures. To be sure, the notion of a sociality with objects requires an extension, if not a stretching of the sociological imagination and vocabulary. If the argument about the current postsocial transition is right, such extensions will be needed in several respects; to make them is perhaps the major challenge confronting social theory today.

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1. The Meaning of Individualization

The assessment that we live in a world marked by individualization is not all that new. 150 years ago, Alexis de Tocqueville, French visitor to the United States, identified and deplored as individualism the disposition (which he saw as an outgrowth of American democracy) of "each citizen to isolate himself from the mass of his fellows..." and the danger that he may, as a consequence, "be shut up in the solitude of his own heart" (1969(1840):506, 508). The thesis gained new meaning through the linkages forged by later authors between various individuating forces and ideals and the rise of a capitalist economy. One of the great legacies of classical social thought is the idea that the development of modern societies involves the transformation of traditional, group-based, kinship-dominated communities into systems characterized by the growing dominance of private ownership, profit motives, industrial production, mobility, large urban centers, and bureaucratic professionalism--all undermining the "embeddedness" of individuals in traditional communities (Macfarlane 1979). In recent years, this line of reflection has been renewed and imaginatively extended in a number of analyses which focus on the self and its processes in relation to technology, to the family, to justice etc.--works that flesh out the cumulative historical meaning and consequences of individualization.

Ideas revolving around the role of technology and science have played a major role in these discussions; these ideas tend to construe the impact of knowledge on social relations in a negative way. Berger et al.'s notion of the "homeless mind" (1974) sums up much of the discussion until then in associating individualization closely with the "abstractness" of technological production which carries over into daily life: "Everyday life in just about every one of its sectors is ongoingly bombarded," the authors say, "not only with material objects and processes derived from technological production but with clusters of consciousness originating within the latter" (1974:24,39). The cognitive style Berger et al. spell out rests on an understanding of reality in terms of decomposable and separately controllable components, on the possibility of using the components for a variety of ends (means-end separation) and on the "abstraction" implicit in the work process - a notion that resonates with what Bell (1973:14) calls the "centrality of theoretical knowledge" as the source of innovation in technological production. When carried into the area of social life, these features lead to a "componential" (divided) identity and anonymous social relations; Berger et al. call alienation the "symmetrical correlate" or "price" of individuation (1974:196). Add to this the pluralistic structure and social mobility of modern societies which confront individuals with the variability of truth and belief systems across contexts, and you get a situation where the plausibility and meaning-bestowing quality of these systems is undermined and they become useless as providers of certainty amid the exigencies of the human condition. As a result, Berger et al. maintain, we are not only "homeless" in society, but also in the cosmos (1974:184-85).

Berger et al.'s account is causally more ambitious than some later writings, in that it tries to pin down how an economic **and** technological civilization thwarts civility and produces what we now call the dis-encumbered and disembedded self, uprooting the person from the local context of interaction which once provided a stable framework for the process of self-formation(e.g. Sandel 1982; Walzer 1990; Etzioni 1994). Later writings place more emphasis on the kinds of minds and selves which correspond to individualization, shifting the focus from Berger et al.'s strong metaphors of homelessness to a more clinical and sociological language. Lasch's analysis of the current "culture of narcissism" (1978) shines the analytic torch on the psychological syndromes that undergird individualization in personal relations. Berger et al. still portrayed private life as a shelter, as the cave in which we seek refuge from the harsh reality outside-though they also

discussed "structural weaknesses" of the shelter, which expose private life to the "cold winds of homelessness" (1974:187ff). Lasch considers the private sphere "collapsed"; ravished by devastations which reflect the anarchic social order from which it is supposed to provide refuge. Lasch analyzes the familial and personal experiences of the "warlike conditions" which he identifies not only in society but also at home. At the heart of these conditions lies the narcissistic personality of our time-to which Lasch restores its psychological and clinical meaning, thus wresting the concept away from its popular use as simply the antithesis of humanism or socialism. The argument rests on the growing significance of diffuse character disorders in which narcissism is an important element. The narcissistic syndrome contains many features such as a child's inability to tolerate ambivalence or anxiety and its reacting to love rejected with intense rage, all of which are compensated for through an overly grandiose conception of the self, constant projections of "all bad" and "all good" self images, etc. These features and the resulting personality traits -- which include fear of emotional dependence and an exploitative approach to personal relations, yet at the same time a hunger for emotional experiences with which to fill an inner void-can be traced in the deterioration of marriage and parent-child relationships, in the flight from feeling in relations between the sexes and the recent intensification of sexual combat, in the dread of old age, in the degradation and commodification of education and so on.

On the more positive and sociological side, Berger et al.'s homelessness and Lasch's narcissism are rendered in terms of a changing status of tradition in contemporary life that involves a shift of authority "from without to within": individuals are thrown back on their own resources to construct a coherent life course, identity, and forms of togetherness for themselves (Beck and Beck-Gernsheim 1994; 1996; Giddens 1994a; Heelas 1996:2). Hage and Powers (1992) put this in the language of role theory, arguing that we undergo a process of complexification of occupational and family roles spurred by the demands of knowledge in production and consumption, with the consequence that these roles become more subject to the effects of human agency. Less scripted, more complex role sets require interaction skills, constant effort, the will to sustain a certain amount of emotional oscillation, ambiguity and social creativity. However, like previous authors, Hage and Powers also suggest that such requirements create havoc in the transitional generation not adapted to them (1992: 133f., 197f.); they result in widespread role failure, implying that individuals' resources in coping with current patterns are by and large inadequate. The demise of community and traditions also leaves the individual in the lurch-without the psychological means to deal with the great freedom of choice or the contingency of contemporary life as which this freedom rebounds (Bauman 1996:50f). This is where knowledge steps into the picture in yet another way-in the form of experts who inform choice, repair damage, etc., and produce what Giddens calls (e.g.1994b:92ff) "clever people." Clever people who rely on expert knowledge where the past lost its hold are not necessarily existentially better off than the narcissistic personalities Lasch described. Nonetheless, the focus on the makeability of a lifecourse and of communities (Lash 1994; Coleman 1993; Etzioni 1994) adds a constructive note to the otherwise bleak outlook on the moral and existential reliability of personal relations in our time.

2. Postsocial Transitions

The shift from viewing individualization in terms of alienation to understanding it in terms

of agency requirements is significant: it communicates something of the shift from an industrial society (still prevalent in Berger et al.'s imagery) to a post-industrial society, which later authors have in view. Radicalizing their assessments, one might argue that we are today not only confronted with specific and possibly new meanings of individualization, but with "postsocial" developments in a more general sense. What are postsocial developments? Current transformations involve forms of retraction of social principles beyond the collapse of community and tradition which underlie individualization. To see this, we must first recall that the regions of social structuring had originally not decreased but had actually expanded during the course of the 19th century and throughout the early decades of the twentieth. The advances were made in at least three connected areas: in the expansion of social policies and of the welfare state; in a shift in mentality through which social thinking came to replace traditional, liberal ideas; and in the area of corporate form. These are also the areas in which we currently experience retractions, over and above the "erosion of primordial social relations" (Coleman 1993) that lead to individualization.

First the expansions of the social. According to many authors, the expansion of social policies took shape as the attempt by nation states (which may themselves have been formed by such interventions) to deal with the social consequences of capitalist industrialization. Social policies as we know them today derive from what Wittrock and Wagner (1996:98ff) call the nationalization of social responsibility. What these authors mean is the formulation of social rights alongside individual rights and the positing of the state as the "natural container" and provider of labor regulations, pension and welfare provisions, unemployment insurance, public education and so on. A corollary of the expansion of social policies were new concepts of the forces that determine human destiny: they were now more likely to be thought of as impersonal, social forces. Rabinbach has argued that the idea of individual risks, poverty, and inequality as socially induced phenomena entailed a decisive break with preceding individualist liberal ideas (e.g. 1996). Rather than assuming that individuals automatically adapt to changing environmental conditions, these ideas focused on the prevailing imbalances and their social causes, for example on the social causes of occupational accidents/ The third area of expansion is that of social organization. The rise of the nation state implied the rise of bureaucratic institutions; of governments as multi-divisional and multi-layered administrations. The growth of industrial production brought with it the emergence of the factory and of the modern corporation; the rise of health care became embodied in the clinic, and modern science in the research university and the scientific laboratory. Industrial, nation-state societies are unthinkable without modern, complex organizations. Complex organizations are localized social arrangements serving to manage work in collective frameworks with the help of social structural means. In sum, if industrialization has propelled individualization, it has also given rise to forms of social insurance, social embedding, and social interpretation-mediated by the state, by workers' movements, and other sources.

Central to our experience today is that these expansions of social principles and of socially constituted environments have come to some sort of a grinding halt. In many European countries and in the United States the welfare state, with its many chapters of social policy and collective insurance against individual disaster, is in the process of being "overhauled," some would say "dismantled." In Bauman's words, the new constellation is one of nations divided between premium payers and benefit recipients in which the services for those who do not pay are resented by those who pay (1996:56). Social explanations and social thinking run up against, among other things, biological accounts of human behavior against

which they have to prove their worth. If Freud thought that the fixations and nervous ailments he studied resulted when individuals did not come to terms with a rigorous inner "censor" that represented society (Lasch 1978:37), today's psychologists are more likely to seek the cause of compulsive disorders in the expression of genes. The mobilization of a social imagination was an attempt to identify the collective basis for individuals' predicaments and dispositions to react. This collective basis is now more likely to be found in the similarity of the genetic make-up of socially unrelated members of the population. Most interesting, perhaps, is the phenomenon that social structures also seem to be losing some of their hold. When complex organizations are dissolved into networks of smaller independent profit centers, some of the layered structural depth of the hierarchically organized social systems that organizations used to represent gets lost on the way. When person-provided services are replaced by automated electronic services, no social structures at all need to be in place -only electronic information structures (see Lash and Urry 1994). The main arena and site of some global transactions such as stock or forex market trading appears to be the electronically mediated computer- or telephone-conversation. In these cases, the massive social resources of multinationally operating corporations are replaced by conversational and interactional microstructures which now bear the burden of the transaction. The expansion of societies to global societies does not imply, it appears, further expansions of social complexity. The installation of a "world-society" would seem to be feasible with the help of individuals and social microstructures, and perhaps becomes plausible only in relation to such structures (see Bruegger and Knorr Cetina 1997).

3. The Creolization of the Social: the Knowledge Society Argument

"Postsocial" transitions of this kind imply that social forms as we knew them have become flattened, narrowed and thinned out; they imply that the social is retracting, in all of the senses just described. We can interpret this to mean a further boost to individualization: it is plausible to assume that individuals rather than the state will increasingly be posited as responsible for the welfare and social security needs of the person, and that the person and not the large scale organization will serve as the unit to which the means of production and communication in a service society become more and more attached. This interpretation is not wrong in pinpointing subject-centered rather than collective structures as being on the rise in contemporary society. But it is nonetheless one-sided in looking at current transitions only from the perspective of a loss of received forms of the social. What I want to put forward against the scenario of simple "desocialization" is that the flattened structures, the narrowed principles, the thinned out social relations also coincide with, and to some degree may be propelled by, the expansion of "other" cultural elements and practices in contemporary life. The retraction of social principles leaves no holes, one imagines, in the fabric of cultural patterns. There has been no loss of texture for society, though what the texture consists of may need rethinking. If this view is correct, the idea of postsocial transitions no longer simply describes a situation where the social is shut out of history. Rather, it describes a situation where social principles and structures (in the old sense) become creolized by "other" cultural principles and structures to which the term social has not been extended in the past. In this **scenario, postsocial relations are not a-social or non-social relations. Rather they are relations specific to late modern societies, which are marked by the interweave of the social as it existed with "other" cultures.**

The alien culture relevant here and implicated in all previous accounts of

individualization is that of knowledge and expertise. There is a widespread consensus today that contemporary Western societies are in one sense or another ruled by knowledge and expertise. The proliferation of concepts such as that of a "technological society" (e.g. Berger et al. 1974), an "information society" (e.g. Lyotard 1984, Beniger 1986), a "knowledge society" (Bell 1973, Drucker 1993, Stehr 1994), a "risk society" or "experimental society" (Beck 1992) embody this understanding. The recent source of this awareness is Daniel Bell (1973), for whom the immediate impact of knowledge was on the economy, where it resulted in such widespread changes as shifts in the division of labor, the development of specialized occupations, the emergence of new enterprises and sustained growth. Bell and later commentators (e.g. Stehr 1994) also offer a great deal of statistics on the expansion of R&D efforts, R&D personnel, and R&D expenses in Europe and the United States. More recent assessments have not changed this argument so much as added further arenas of the impact of knowledge. For example, Habermas' argument about the "technicization" of the lifeworld through universal principles of cognitive and technical rationality attempts to understand the spread of abstract systems to everyday life (1981). Drucker (e.g. 1993) links knowledge to changes in organizational structure and management practices, and Beck (1992), speaking of the alliance between scientists and capital, depicts transformations of the political sphere through corporate bodies of scientists. Finally, Giddens, arguing that we live in a world of increased reflexivity mediated by expert systems, extends the argument to the self, pointing out that today's individuals engage with the wider environment and with themselves through information produced by specialists which they routinely interpret and act on in everyday life (e.g. 1990, 1994b).

The advantage of Giddens' use of the notion expert "system", is that it brings into view not only the impact of isolated knowledge items or of scientific-technical elites but implies the presence of whole contexts of expert work. These contexts, however, continue to be treated as alien elements in social systems, elements that are best left to their own devices. The received assumption here is that expert systems run on principles having to do with the technical content of expert work, and differing from those manifest in other spheres of social life. But transformation theories also simply tend to follow what Dennett (1987) calls the "design strategy" of interpretation in regard to knowledge. From the design stance, one ignores the details of the constitution of a particular domain, and, on the assumption that the domain is designed to produce a particular outcome, considers only its output and its particular relevance to one's purposes. Modernization theorists tend not to address the question of how the knowledge processes they incorporate into their arguments work, and which structures or principles adequately describe this working, as a problem to be solved empirically. What they are interested in, on the whole, are the transformative effects of these systems' outcomes. The key problem with many of these accounts is that they render knowledge (or technology) the independent variable--sometimes formulated to fit long-standing beliefs about science (an example is Bell's attempt to explicate knowledge in terms of theory; e.g. 1973:44) but in effect the last thing to be explained, and having no reality independent of an analyst's models. Thus knowledge contexts retain their aura of difference simply because they remain empirically uninterrogated--a fate they also encountered until recently in the specialty devoted to them, in science studies. However, if the argument about the expanding presence of expert systems and knowledge processes in contemporary Western societies is right, it is the design stance which defeats the intention of understanding this particular development. The expanding role of expert systems does

not only result in the massive presence of the technological and informational products of knowledge processes. It implies the presence of the processes themselves, and of knowledge-related forms of embeddedness and structures. A knowledge society is not simply a society of more experts, of technological infra- and information structures, and of specialist rather than participant interpretations. It means that knowledge cultures have spilled and woven their tissue into society, the whole set of processes, experiences and relationships that wait on knowledge and unfold with its articulation. This "dehiscence" of knowledge, the discharge of knowledge relations into society, is what needs to be rendered as a problem to be solved in a sociological (rather than economic) account of knowledge societies (see also Knorr Cetina 1996).

The traditional definition of a knowledge society puts the emphasis on the first term; on knowledge, seen as a specific product. The definition I advocate switches the emphasis to society—a society that, if the argument about the expanding role of expert systems etc. is right, is now more inside knowledge processes than outside. In a postsocial knowledge **society**, mutually exclusive definitions of knowledge processes and social processes are theoretically no longer adequate; we need to trace the ways in which knowledge has become constitutive of social relations. Exclusive definitions of sociality as an issue in human relations ignore the interstitchings of knowledge cultures and social structures. If there is one aspect of knowledge cultures on which received viewpoints on science and expertise and the newer studies of science and technology agree, then this is that knowledge cultures centrally turn around object worlds to which experts and scientists are oriented (for the new sociology of science, this has been emphasized particularly by Callon (e.g. 1986) and Latour (e.g. 1993)).² The argument I offer is that these object worlds need to be included in an expanded conception of sociality and of social relations. If this view is correct, the terms of reference of the individualization debate may need to be revised. Individualization then intertwines with **objectualization--with an increasing orientation towards objects as sources of the self, of relational intimacy, of shared subjectivity, and of social integration.**

4. What Notion of Object?

I have now located the theme of this paper in the individualization debate which I have tried to tear loose from its sometimes restrictive focus on community and tradition by reference to the larger nexus of postsocial developments. I have linked these developments to the advances of knowledge relations in contemporary social life, claiming that in a knowledge society, object-relations substitute for and become constitutive of social relations. I now need to sketch out what an expanded conception of sociality that includes (but is not limited to) material objects--which I will call an object-centered sociality--is about. The concept of an object-centered sociality attempts to break open such notions as that of an expert, of technical competence, of an expert system or of scientific-technical work. These notions often presuppose but do not unfold or interrogate the object relations on which expertise depends.³ In contrast, the concept of an object-centered sociality takes its lead from these relationships. But it also serves as a convenient gloss on the entire range of social forms that are governed or mediated by objects. For example, objects serve as centering and integrating devices for regimes of expertise that transcend an expert's lifetime and create

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the collective conventions and the moral order communitarians are concerned about. Object worlds also make up the embedding environments in which expert work is carried out, thus constituting something like an emotional home for expert selves. To understand the binding role of objects, personal object ties, object-centered traditions and collectives, and object-created emotional worlds, all need to be considered. Though the remainder of this paper is devoted to the first kind of object ties, I will have a little more to say on the wider nexus of objectual relationships in the last section of the paper.

When examining the kind of relationship that develops between experts and objects of expertise, the first question that arises is, what are objects of expertise? I will deal with the question by starting from a suggestion by Rheinberger (1992), who discusses scientific objects in a way that can be extended to all objects of expertise. I will then make two excursions to spell out how knowledge objects should not be conceived of (as instruments or commodities in the received sense), thereby hoping to bring us closer to what properties appear relevant. In the next section, I will say more about the structure of lacks and wantings that describes object relations.

Rheinberger refers to epistemic "things" as any scientific objects of investigation that are at the center of a research process and in the process of being materially defined (1992:310). He distinguishes these from technological objects, which are fixed; technological objects serve as stable moments of an experimental arrangement. Rheinberger here draws upon the classic distinction between the ready-to-hand, unproblematic, and often industrially produced technical instrument and the question-generating research object on the way to becoming a technological object. The equation of instruments with technological objects is highly problematic, however, in light of today's technologies, which are simultaneously things-to-be-used and things-in-a-process-of-transformation: they undergo continual processes of development and investigation. Computers and computer programs are typical examples; they appear on the market in continually changing "updates" (progressively debugged issues of the same product) and "versions" (items marked for their differences to earlier varieties). These objects are both present (ready-to-be-used) and absent (subject to further research), the "same" and yet not the same. In sum, technologies of this kind must be included in the category of epistemic things.

Instruments, on the other hand, should not be so included. The difference between objects of knowledge (technologies included) and instruments can best be illuminated, in my view, through Heidegger's analysis of thinghood and equipment, and the line he draws between our instrumental being-in-the-world and an orientation toward knowledge. Heidegger proposes that equipment (*Zeug*), the term he uses for instruments, has the property of being not only ready-to-hand but transparent: it has the tendency to disappear and become a means when we are using it. Equipment becomes problematic only when it is unavailable, when it malfunctions, or when it temporarily breaks down. Only then do we go from "absorbed coping" to "envisaging", "deliberate coping" and to the scientific stance of "theoretical reflection" of the properties of entities. Thus Heidegger characterizes objects of knowledge in contrast to instruments in terms of a "theoretical attitude" that entails a "withholding" of practical reason.

These last ideas do not, in my view, provide a good characterization of science in general,⁴ but they are suggestive with regard to how objects of knowledge should be conceived of--as continually unready-to-hand, unavailable, and problematic, and also as a

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possible stage in the career of anything. Instruments, on the other hand, are tools; available means-to-an-end within a logic of instrumental action. With regard to science later authors, for example Habermas, who approaches the issue more from the type-of- action angle, reach different conclusions from Heidegger. While Heidegger casts instrumentality virtually as the antithesis of knowledge and science, for Habermas it characterizes science-through the type of action that he calls instrumental action. In this scenario, instrumental action is rooted in means-end rationality and an interest in technical control and is to be distinguished from communicative or symbolic action. However, this proposal opens up a rift between the world of human beings (epitomized by communicative action and relationships) and the world of work and things (epitomized by instrumental labor) which was not present in Heidegger. Within a Habermasian universe, relationships in the latter world rest on a logic of technical control and exploitation, whereas those in the former world can and should rest on the enlightened logic of consensual dialog and agreement formation (see also 1970).

Object relations, whether with humans or material things, are not without elements of power and domination, a fact emphasized long ago by Freud and all analysts since. But they need to be more richly construed than the equation of a technical interest in things with control and exploitation allows for. Habermas' ideas are important here because they epitomize the notion of instrumentality which prevails today. Heidegger had included in the idea of our instrumental dealings with the world an--albeit ontologically understood--concept of caring and concern. This notion of a care-structure is useful, but it is lost on today's concept of instrumental action.

To probe this further I want to briefly consider another major category of object in social life that is in fact quite familiar to sociologists--that of the commodity. The corresponding process is commodification, the term under which the transition to a late stage of capitalism has long been discussed, bemoaned, challenged and argued against (e.g. Slater 1997). To understand commodities one might turn to Simmel's definition of these entities as things that "resist our desire to possess" them, and that must be acquired by the "sacrifice of some other object, which is the focus of the desire of another" (1978(1907)). Commodities tend to be defined within a logic of exchange; for Marx they were manufactured goods, by definition associated with the labor spent on their production and expressed in their value. In the recent literature, commodities are also seen as a means of symbolic expression and status announcement. As signifying objects, commodities play an increasing role in a society saturated with abundance and which no longer suffers a lack of goods. Nonetheless, neither the sort of conspicuous consumption and the exchange of goods as symbols which ensues from this abundance (Baudrillard 1968, 1970) nor the Marxian notion of a commodity defined by labor seem to entail the form of object relations found in expert cultures. According to the dominant understanding, a commodity by definition is not valued for its intrinsic properties, but rather for what it buys--status, relationships, other objects, and so on.

The notion of commodification also exemplifies this understanding. Commodification refers to a situation in which social phenomena become endowed with thing-like qualities and embedded in economic calculation (e.g. Marx 1968(I887):85ff.). For example, a student who asks what qualifications he or she needs to be successful on the job market (and who then pursues qualifications in which he or she has no intrinsic interest) treats him/herself like a commodity. From the perspective of human relationships, commodification entails

individualization; it refers to a situation where the self is stripped of the desire to partake in the other, for which it substitutes the calculation of its own value and the impersonal neutrality of economic relations (see also Levinas 1990). The force of the term lies in the explanation it provides for the experience of alienation that Marx and others identified with certain stages of industrialization. Yet the contemporary culture of "self-fulfillment" hardly seems to be reducible to the phenomenon of alienation. More importantly, what lies at the core of the Marxian notion of a commodity is the alienation from the products of one's labor. But the properties that characterize objectual relationships in expert work would seem to be exactly the opposite: non-alienation and identification. Thus the concept of alienation is a suspect one when applied to the relationship of an expert to the objects of expertise.

5. Objectual Relationships: A First Attempt to Characterize an Object-Centered Sociality

I now want to focus on these relationships more directly, while at the same time summarizing the discussion thus far. A starting point for conceptualizing object orientations as genuine ties can perhaps be the intrinsic nature of these orientations. Implicit in the discussion of commodities and instruments was the continuum between intrinsic valuation and extrinsic usefulness. Commodities and instruments lie more toward one end of the continuum; they appear extrinsic to our real interests, which lie elsewhere. Objects of knowledge, on the other hand, would have to be located more towards the other end of the continuum. They are the goal of expert work; and they are also what experts, scientists, etc. regularly profess themselves to be interested in, attracted by, seduced into and attached to. The next section will give some examples of such characterizations. However, talk about intrinsic connections, much as it may justify a relational vocabulary, may also give rise to the wrong connotations. We should be careful not to construe object relationships simply as positive emotional ties, or as being symmetric, non-appropriative, etc. The characterization one needs to look for must be more dynamic, allow for ambivalence, and account for the durability of people's engagement with objects. I suggest that we can theorize experts' relationships to objects more through the **notion of a lack, and a corresponding structure of wanting**, than through positive ties and fulfillment. The idea of a lack draws on Lacan; to make it clearer we need to return for a moment to Rheinberger's characterization of epistemic things, and extend it further.

Rheinberger's characterization of epistemic things entailed objects of knowledge being characteristically open, question-generating and complex. They are processes and projections rather than definitive things. Observation and inquiry reveal them by increasing rather than reducing their complexity. To continue now in my terms, objects of knowledge seem to have the capacity to unfold indefinitely; in this sense too they lie at the opposite end from the tools and commercial goods which are ready-to-be-used or traded further. These tools and goods have the character of closed boxes. Objects of knowledge, on the other hand, are more like open drawers filled with folders extending indefinitely into the depths of a dark closet. Since objects of knowledge are always in the process of being materially defined, they continually acquire new properties and change the ones they have. But this also means that objects of knowledge can never be fully attained, that they are, if you wish, never quite themselves. What we encounter in the research process are representations or stand-ins which compensate for a more basic lack of object. On the subject side, this lack corresponds to a structure of wanting, a continually renewed interest in knowing that appears to be never

fulfilled by final knowledge. As the study of science has shown, processes of inquiry rarely come to a natural ending of the sort that everything worth knowing about an object is considered to be known. Rather, interest turns elsewhere, in a meandering movement describable as a trail or chain of searches, led on by the lack of object.

I want to maintain that the open, unfolding character of knowledge objects uniquely matches the "structure of wanting" by which we can characterize the self I derive this idea from Lacan (e.g. 1975), but it can also be linked to Baldwin (1899:373ff.) and Hegel.⁵ Lacan derives this wanting not as Freud did from an instinctual impulse whose ultimate goal is a reduction in bodily tension, but, rather from the mirror stage of a young child's development. In this stage the child becomes impressed with the wholeness of his or her image in the mirror and with the appearance of definite boundaries and control--while realizing that s/he is none of these things in actual experience. Wanting or desire is born in envy of the perfection of the image in the mirror (or of the mirroring response of the parents); the lack is permanent, since there will always be a distance between the subjective experience of something lacking in our existence and the image in the mirror, or the apparent wholeness of others (e.g. Lacan and Wilden 1968; Alford 1991:36ff.). One can also attempt a rendering of lack in a representational idiom that is closer to the present concern (see Baas 1996:22f). Accordingly, wants are always directed at an empirical object mediated by representations--through signifiers, which identify the object and render it significant. But these representations never quite catch up with the object, they always in some aspects fail (misrepresent) the thing they articulate. They thereby reiterate the lack rather than eliminate it. To relate this now to knowledge objects, the point I want to stress is that the representations experts come up with in their search processes are not only partial and inadequate, they also tend to specify what is still missing in the picture. In other words they suggest which way to look further, through the insufficiencies they display. In that sense one could say that objects of knowledge structure desire, or provide for the continuation of the structure of wanting.

They provide for the structure of wanting not only of single scientists, but of whole collectives and generations of experts who assemble around particular objects such as the fruitfly *Drosophila* (e.g. Kohler 1994; Geison and Holmes 1993). I will return to the issue of collectivity later. Here I want to say a little more about what it is that the notion of a structure of wanting offers; one has some explaining to do when turning to a sociologically arcane language such as the one I choose. The Lacanian ideas I use serve to specify objectual relations, which I see as the touchstone of an object-centered sociality, as relationships based upon a form of mutuality: of objects providing for the continuation of a chain of wantings, through the signs (what Lacan calls signifiers) they give off of what they still lack; and of subjects (experts) providing for the possibility of the continuation of objects which only exist as a sequence of absences, or as an unfolding structure. What need not concern us further is Lacan's account of the lack of subjectivity as rooted in the child's narcissistic relationship to him/herself rather than to a lost person, or his explanatory trope of the mirror stage. One need not find the Lacanian account of the mirror stage persuasive at all in order to find the idea of a structure of wanting plausible. The latter is a convenient way to capture the way wants have of continually searching out new objects and of moving on to them--a convenient way, if you wish, to capture the volatility and unstopability of desire. With regard to knowledge, the idea

⁵ [11]

of a structure or chain of wantings brings into view whole series of moves and their underlying dynamic rather than isolated reasons, as the traditional vocabulary of motives and intentions does. It also suggests a libidinal dimension or basis of knowledge activities--which is ignored or denied when we conceive of science and expertise as cognitive endeavors. I strongly believe that the existence of such a dimension is borne out by the intensity and pleasurability of objectual relations as experienced by experts (see the next section). It is also "in tune with" ontological reorientations towards "experience" etc. in the wider society as diagnosed by some (Welsch 1996). The notion of a knowledge society is not at odds with, for example, that of an experiential society, or with a tum toward a more visual and visually simulated world--what it is at odds with is an arid and overly cognitively tilted notion of knowledge. The conduct of expertise has long harbored and nourished an experiential mentalite, if "experience" is defined, as I think it should be, as an arousal of the processing capacities and sensitivities of the person in some combination. Apart from the possibility of a deep emotional investment in objects of knowledge which the notion of a structure of wanting entails, it should be seen as an **open** dynamic: it is congruent with a variety of conceptions and implementations of objectual engagements. In what we call "romantic love", love, power and economic interests may co-exist. We should allow for the possibility that objectual relationships are held in place by a mix of attachments, and may in fact be sustained by their conjunction.

To conclude this section, I want to return once more to the notion of a knowledge object. The two major categories of objects familiar to social scientists and dominant in social life are those discussed before: commodities and instruments. The study of expertise in science and elsewhere brings into focus a third category, that of a knowledge object. The defining characteristic of this kind of object, from a theoretical point of view, is its changing, unfolding character-or its lack of "object-ivity" and completeness of being, and its non-identity with itself. The lack of completeness of being is crucial: objects of knowledge in many fields have material instantiations, but they must simultaneously be conceived of as unfolding structures of absences: as things that continually "explode" and "mutate" into something else, and that are as much defined by what they are not (but will, at some point, have become) than by what they are. They must also be conceived of as textual or signifying objects; most objects of knowledge produce, and are translated into, all manners of signs. Their special capacity as texts (and the problems of readability of the texts) raises questions I cannot go into here, but the phenomenon should be noted. Finally, knowledge objects exist simultaneously in a variety of forms, a point which becomes important in regard to their binding role for collectives. To foreground once more the temporal volatility and unfolding ontology of these objects, it is this which accommodates so well the structure of wanting, and binds experts to knowledge things. The idea that "every component of an organism is as much of an organism as every other part," uttered by a scientist to whom a particular plant had exploded in that way, can perhaps capture the idea of an unfolding ontology.

If the argument about the expanding role of knowledge and expertise in contemporary society is right, objects understood as continually unfolding structures which combine presence and absence will have to be added to the sociological vocabulary. These objects will not only be the ones experts are preoccupied with, but also the ones we are confronted with in

everyday life--where instruments and commodities take on aspects of knowledge objects (see section 8). What will also have to be added to the sociological vocabulary is the idea of a subject as bound to and identified with such objects. The psychoanalyst Fairbairn has argued that "the ego is unthinkable except as bound up with objects. It grows through relations with objects, both real and internal, like a plant through contact with soil, water and sunlight" (Greenberg and Mitchell 1983:165). Fairbairn, like object relations theory in psychoanalysis in general, referred mostly to human relationships. But there is no reason to limit the concept of object relations to persons; in fact many analysts identify the first object relationship an infant has as a relationship to body parts, for example to the mother's breast. Science, I want to argue, has long provided a niche for the notion of object I have outlined to thrive and develop in. It is plausible to assume that it has also provided an environment for objectual relationships that sustain individuals and situate selves. Such relationships have not emerged with the rise of science. But scientific settings may have nourished and enhanced this form of embedding of the self, while other contexts, for example the industrial settings that Berger et al. portray, may have resulted in the individual's alienation from objectual relations.

6. Object-Centered Sociality II: Mutuality and Solidarity

Sociality is very likely a permanent feature of human life. But the forms of sociality are nonetheless changing, and this poses recurrent challenges to received conceptions of the social. The challenge we face, with the present argument, is to dissociate the concept of sociality somewhat from its fixation on human groups. This "loosening up" of the concept of sociality need not start from scratch. Mead, among others, discussed communication with non-human objects, and before Mead James and Cooley (see Wiley 1994:32ff.). Mead's language of a conversation of **gestures** allowed him to combine animal and human communication; he also depicted the social act at times as the resultant of a relation between the gesture and accommodating response of two organisms (1934:80). Nonetheless, there is some adjusting to do if we want to win the concept of sociality over for the analysis of human connectedness to the material world.

Generally speaking, sociality is about forms of grouping, binding, and mutuality or reflexivity among humans. Grouping, or the sociality of collectives, will be briefly taken up in concluding; here I will again examine the sociality of person-object relations, but more systematically and by extending the attempt to understand these relations in terms of mutuality and the added dimension of bindingness. In the previous section I suggested a form of mutuality that can serve as a dimension or basis of an object-centered sociality and that rested on a particular conception of knowledge objects as a sequence of lacks. This form of sociality entails reflexivity: it occurs when the self as a structure of wanting is looping its desire through the object and back. In this movement, the self is endorsed and extended by the object which provides for (the continuation of) the structure of wanting through its lack in being, completeness and object-ivity. Sociality here consists in the phenomenon that the subject takes over the object's wants-as a structure of wanting, the subject becomes defined by the object. Conversely, the articulation of the object is looped through the subject: as a "structure of lacks," of the questions it poses or the things that "it" needs to become materially defined, the object receives the kind of extension that the subject determines (perspectivalism provides an analysis of this situation)⁶.

⁶ [12]

The formula of a "mutual providing" of self and object through the interweaving of wants and lacks specifies a kind of backbone of reciprocity for an object-centered sociality. But it is still an exceedingly formal characterization in that it glosses over the accomplished character of the mutuality involved. A mutuality of wants and lacks does not simply occur or turn up. Rather, it is usually laboriously and even fictitiously produced. Most of what is interesting happens during this labor, for example when a scientist tries "to make sense" of the signs given off by an object to determine what is further lacking, and what she should therefore be wanting to do next. Second, the characterization so far needs to be extended to a deeper level of the self's engagement with objects. To provide a sense of this level, I want to pick my way mostly through one expert's self-characterizations of her object-relations. The expert is the biologist Barbara McClintock, whose utterances in relevant respects are extensively quoted by her excellent biographer, Evelyn Fox Keller (1983). McClintock seems a particularly suitable subject, since her major discoveries in the early 50s, which were at the time at odds with the beliefs of the majority, left her somewhat of an outsider to the community of biologists. McClintock apparently was also a person who, even as a child, neither had nor felt the need for emotional intimacy in any of her personal relationships. This has the advantage, for the present questions, that the wider nexus of interpersonal (community or research group) relations does not enter the picture to the same degree as it might with other scientists. McClintock, born in 1902, worked alone; for central parts of her working life at the Department of Genetics of Cold Spring Harbor Laboratory on the north shore of Long Island. Her research in the cytogenetics of maize led her to discover the transposition of genetic elements--a discovery which, when the field of genetics finally followed her lead, brought her wide recognition and awards (Fox Keller 1983:X ff.). Fox Keller describes McClintock's "love affair with the world," manifest in a "feeling for the organism," as the mainspring of her creativity (1983:205). This feeling is manifest in how McClintock experiences organisms (1983:117):

"I found that the more I worked with them the bigger (the chromosomes) got, and when I was really working with them I wasn't outside, I was down there. I was part of the system. I was right down there with them, and everything got big. I even was able to see the internal parts of the chromosomes--actually everything was there. It surprised me because I actually felt as if I were right down there and these were my friends."

What McClintock saw "down there" among the chromosomes she tells us in technical language which can be looked up in Fox Keller's book. The important thing here is her reasoning, which has a second part. This second side comes across in quotes such as the following, provided a little later:

"As you look at these things they become part of you. And you forget yourself The main thing about it is you forget yourself"

I am inclined to summarize the first quote with the phrase "becoming the phenomenon"; in the words of one of McClintock's contemporaries, "if you want to really understand about a tumor, you've got to be a tumor" (Fox Keller 1983:207). Yet this leaves out how McClintock feels herself to be situated amidst the chromosomes she studies. She not only identifies with them, she enters their environment, in which she becomes situated as "one of them." In the second quote, it is the material which comes to the scientist. The point of the second quote is that the subject disappears into an "I am not there" state (Fox Keller 1983:118). My way to put this is to say that the object of knowledge has now become an internal object, an object situated within a person's internal

processing environment. It preoccupies the subject so completely that it becomes at times co-extensive with it.

If we now try a more analytic rendering, Mead's familiar "role-taking" formula, devised for an interpersonal sociality, offers itself for at least part of what is going on in such a situation. Mead's formula entails interpersonal reflexivity coming about through an individual taking the attitude of the other toward him/herself. This attitude then defines and structures the self, which is thus (through the other) socially constituted. The process is mutual and ongoing, and also operates for the daily apprehension of and communication with other people. The formula can be applied to McClintock's first quote by saying that what she describes is how she, as a scientist, takes the attitude (or the role, or the position) of her chromosomal objects, putting behavioral dispositions (Mead's "gestures"), if not words into their mouths and anticipating what they are about to do (Mead extended his formula to physical objects in this way; 1938:426ff; Joas 1980; Heintz 1998). What is missing in this scenario is the reflexive loop: it is not the objects' attitude or disposition toward herself McClintock takes over but their attitude or disposition toward each other, and toward their objectual environment. On the other hand, in the second quote, when the material comes to the subject "to live in it," we might perhaps say that the chromosomes, in doing that, do indeed take over McClintock's attitude (understood as her conceptions) toward them--after all, what they will find in her mind is her thinking, oriented toward them. But this formulation is stretching the role-taking concept and McClintock's self-description. What we can perhaps agree on, following Mead halfway, is that McClintock describes how she as a subject and scientist partakes in the object world, and how the object world she studies partakes in herself. The mutuality is there but it is somewhat skewed, since McClintock and the objects are not structurally doing the same thing (for example she observes them and puts herself in their position but they use her processing capacities).

Mutual "communicative" partaking of this sort, or the cross-over between subject and object I described (part of the subject entering or "becoming" the object and vice versa), takes us further than the mutuality of wants and lacks with which we started. Yet there is another angle from which to approach the above quotes, this time taking the lead from Durkheim rather than Mead. As Fox Keller emphasizes, correctly I think, the point about the disappearance of the self-conscious I in McClintock's second quote, and her requirement of "forgetting yourself", is that it brings out a state of subjective fusion with the object of knowledge. Fox Keller calls this a turning of object into subject (1983:118). In a more Durkheimian idiom, we might call it a feeling of unity, or sharing, or **solidarity**. Solidarity, with Durkheim and others, is not a univariate concept. First, the Durkheimian "force-field" (Wiley 1994:106,122; Durkheim 1964(1893)) of social solidarity is energized by feeling or sentiment; Durkheim assumed that the we-experience arises when a group becomes excited. Second, solidarity has a moral dimension: for example, doing the right thing builds up the solidarity of a relationship. Third, as mentioned before, solidarity entails the unity of something shared. With Durkheim, this something shared was either moral or semiotic, i.e. a unity of meaning.

The problem with the Durkheimian concept of solidarity (as used for example by Goffman 1967, Collins 1982 and Wiley 1994) for the present purpose is its excessive reliance on ritual and symbol as a generator of solidarity. Experts' relations to objects involve rituals, and this aspect of expertise requires more attention. Yet the kind of

solidarity entailed in the quotes so far and in others appears to also draw power from the sharing of a lifeworld (for example a scientist sharing in an object world) or from knowledge of a thing. For example McClintock, when she feels herself to be one with the chromosomes, not only takes their attitude to understand them better, she knows them already, which is what makes the feeling of unity possible for her. Thus, if the notion of solidarity is to be brought into the scenario of an object-centered sociality, it also needs to be epistemically grounded and not only ritual-derived. On the other hand, the excitement aspect and the moral side should not be missing from an object-centered solidarity. In fact, it is plausible to assume that the excitement of "breakthroughs," "discoveries" etc., along with those associated with the presentation of the expert self (e.g. the ritual of conferences), play a role in generating bondedness between experts and objects of expertise.

"Excitement," of course, can have different flavors, as illustrated by Einstein, who described it as "akin to that of a religious worshipper or of one who is in love." McClintock refers to her pleasure, and also mentions ecstasy (Fox Keller 1983:118,198,204):

"No two plants are exactly alike. They're all different, and as a consequence, you have to know that difference. I start with the seedling, and I don't want to leave it. I don't feel I really know the story if I don't watch the plant all the way along. So I know every plant in the field. I know them intimately, and I find it a great pleasure to know them."

"What is ecstasy? I don't understand ecstasy, but I enjoy it. When I have it. Rare ecstasy."

The moral aspect of an object-centered solidarity, to illustrate now the third dimension of the concept, is apparent from the way McClintock instructs us to deal with objects. Over and over again, Fox Keller reports, McClintock tells us one must have the patience to "hear what the material has to say to you," and the openness to "let it come to you" (1983:198). Above all one must have a "feeling for the organism" (1983:198ff.). This appreciation for organisms that are "fantastically beyond our wildest expectations" carries over into everyday life:

"Every time I walk on grass I feel sorry because I know the grass is screaming at me."

The notion of solidarity may be most plausible and most widely applicable to object relations when the moral dimension is foregrounded; when an object-centered sociality means human beings' altruistic behavior toward an object world. This sense of an object-centered sociality easily extends itself to human relationships to nature, to the environmental attitudes of social movements, etc. But what is or what should be the basis for such an altruism? Why, for example, does McClintock feel sorry for the grass on which she steps? The answer, it seems to me, lies not simply in the civility of her character or in her general love of nature (though she might have had both), but rather in her knowledge of plants and their "ingenious mechanisms" of responding to an environment. McClintock apparently made the above utterance within the context of a series of others in which she described these reaction mechanisms, their capacity to surprise her, and the degree to which she had come to know them. For example, she says: "I have learned so much about the com plant that when I see things, I can interpret them right away." Or:

"Plants are extraordinary. For instance,... if you pinch a leaf of a plant you set off electrical pulses. You can't touch a plant without setting off an electric pulse...There is no question that plants have (all) kinds of sensitivities. They do a lot of responding to their environment. They can do almost anything you can think of" (Fox Keller 1983:199f.)

If my interpretation is right, then we have again hit the above epistemic source of an object-centered solidarity. Relationship and knowing are interwoven in the case considered, the second part cannot be "defined out" of the first. I do not wish to argue that feelings of moral solidarity toward, say, nature, cannot also spring from, or be accompanied by, a lack of knowledge. But this process and the former are independent of each other, and they may even stand in contradiction to one another (see section 7).

Solidarity is a confusing notion that conceals several conceptual dimensions from which the solidarity-generating mechanisms are not always clearly distinguished. Nonetheless, the notion can be proposed to "fill in" what an object-centered sociality might mean: a sense of bondedness or unity (an identity feeling) with objects, a moral sense (the oughtness of approaching them in certain ways), and states of excitement reaffirming the bondedness. All this is somehow linked to knowing the object. It is with respect to this last process that the revised Meadean formula from before becomes important. It details some of the mechanisms of the epistemic takeover McClintock describes: of her becoming inserted into an object world (in laboratory science, this acquires a physical meaning as one stands at a workbench and manipulates things) and of the objects taking over her mind and herself. If this picture is correct, then an object-centered solidarity, in the present case, would be an upshot of the takeover process, though it might also be nourished by situations external to the relationship. One should say that the "upshot" view contradicts some of the literature (e.g. Wiley 1994:104 ff, Collins 1982), where solidarity and the Meadean mechanisms are treated as separate and independent processes. A takeover is an action sequence; perhaps the picture of a chain of wantings that loops its way through missing pieces of objects helps in bringing out the dynamic undertow of desire in a series of takeovers. I must immediately add that the three models I have used are best seen as metaphors or tools to try out on the problem at hand. They cannot be analyzed satisfactorily within the confines of this paper, but they can get us started on what an object-centered sociality on the inter-object-person level might mean and imply.

7. Sociality Versus Romantic Fusion

Having said how we might approach an object-centered sociality, I now want to add a short note on how we should not conceive of it. Consider again the sense of unity or "subjective fusion" McClintock professed to, the sense I have tried to capture with the notion of solidarity. I want to contrast McClintock's sense of sharing herself with concrete chromosomal objects with the more abstract longings to merge with the world which other scientists have expressed. Porter (1996) documents a case of these longings in an interesting paper about the statistician Pearson's earlier life and work, the time before Pearson, at about the age of 35, took up mathematical statistics and effectively became the founder of this field. During this earlier period, Porter writes, Pearson endured or fashioned an amazingly stormy career. Among other things he took a fancy to Goethe's *Werther*, traveled (and studied in) Germany, and wrote a *Schwärmerroman*, a gushing novel, published pseudonymously in 1880. Porter attributes the desire to disguise the authorship of the novel to the fact that it revealed too much about Pearson's self-understanding. In this novel, the hero first lives with, then renounces but at the same time pours his heart out to an "Ethel." Porter, tracing Pearson's relationships, identifies her not as a real woman in Pearson's life, but as a character representing his longing for nature, to which his longing for an Ethel in the novel is homologous. Pearson, Porter shows, was overwhelmed by a desire to merge with the world, to sacrifice himself, and at the same time to make nature

his own. "More even than most scientists, his career was driven by an urge to know, a *conatus cognitandis*." In a characteristic passage of the novel "Nature" is identified with ten or twelve village maidens. The hero, who is sleeping by a waterfall, wakes in the middle of the night to

"find the place transformed--ten or twelve village maidens, unconscious of my presence, ... had also come to enjoy the pleasures of an evening bathe! There they were, with loosened hair falling to their waists, splashing and sporting in the pool before me, as we fancy the nymphs did in the happy pastoral days of old! O Ethel, was it a sin for me to gaze on Nature in all her unveiled beauty?... Ethel, it could be no transgression, for the thought remained pure.

In his non-fictional writings, Pearson also expressed this longing. The following passage is from a letter to a friend:

"...Shall I tell you what I would wish my son to be? Not a man of the world, not a trader, not a lover of books, but a student of Nature herself and not thro' mathematical science...not for his own fame, nor with idea that he merely benefitted mankind, but because Art impelled, because she was his goddess." (Porter 1996:16ff.)

We might follow Porter in considering this sort of writing about nature "surprising, coming from one of the great champions of the quantification of practically everything" (1996:16-17). In the novel, the hero, like Pearson in real life, is driven to renunciation. Renunciation, Porter says, both fulfilled and yet frustrated Pearson's desire, reducing the merging of self with the world promised by the *conatus cognitandis* to a *conatus interruptus*, a painfully incomplete union that could never be made whole."... "For Pearson, and for many others, the soft, seductive path through a garden of delights had to be renounced in favor of a steep, rocky one that would never reach its goal." Porter proposes that this *conatus interruptus* is a suitable Latin translation of positivism (1996:23), which characterized Pearson's later work as a statistician.

These are perceptive remarks. They also describe Pearson's later work in mathematical statistics in a way that is compatible with the model of a structure of wanting, as a relationship marked and driven by a continually reiterated lack of fulfillment. What we should not do is confuse Pearson's romantic longings with the kind of objectual relationships McClintock professes to. The notion of an object-centered sociality and of objectual relationships I have in mind should in principle be rather more applicable to Pearson's later way of handling scientific objects than to his earlier passions. In other words, it should be compatible with someone striving for and displaying objectivity, sacrificing subjective wishes to the dictates of a rigorous method, and, whenever possible, counting and measuring. Sociality toward objects is not hopeless romanticism or rapturousness about the world. Though enthusiastic ravings might on occasion find their way into social relationships, nothing requires that they do so. It is in any case hard to imagine a laboratory scientist such as McClintock, mapping unknown genetic factors in long work days by streaking pollen from plants on the silks of a variety of other plants (Fox Keller 1983:129), developing a *Schwärmergeist* towards any of the organisms involved. What she did develop with these plants was a shared lifeworld, and the sort of mutualities and solidarities described. Later in his paper, Porter (1996:21f.) relates Pearson's "erotic quest to know nature herself" to a strong anti-individualism, painfully expressed in some of his correspondence. Pearson feared that he had inherited the domineering spirit of selfish individualism from his father, whom he perceived in these terms. In asking how Pearson

expressed his enduring opposition to individuality in his earlier life it may be instructive to turn to his outpourings of desire to merge with the world. But when asking if Pearson overcame the individualization he feared so strongly we should not immediately discount the world of mathematical statistics he created and lived in later in his life.

8. Concluding Remarks: The Wider Nexus of an Object-Centered Sociality

Knowledge and technology, many now believe, have become the dominant forces shaping society. But few social scientists have considered what this means on the level of the core concepts of the social, for example on the level of social forms of binding self and other. Many analysts, from Marx to Daniel Bell to contemporary authors, have offered important discussions of the impact of knowledge and technology in terms of industrial transformations, transformations of the work force or of the environment, and even of knowledge itself. They have also imaginatively discussed the transmutation of (traditional) life-worlds into reflexively constructed systems of individual and collective life (e.g. Beck and Beck-Gemshem 1994). The second line of thinking comes much closer to the present concern than the first. Yet the theories now available remain exteriorized theories of science and expertise; they look upon the functioning of knowledge and technology from the outside, taking the entities involved as cognitive products of one sort or another. The notion of knowledge is rarely explicated in these discussions; and when it is (as for example in Bell's ideas about a post-industrial society, see Stehr 1994), the features attributed to knowledge are not empirically derived but rather seem based on the traditional equation of science with theory and "abstract" systems (e.g. Giddens 1994a: 128), and of technology with the principles of (mechanical) machines. If the self is seen as implicated in these scenarios it tends to be conceived of as negatively affected; as alienated by technological production and a technologically changed environment from which risks ensue; as overtaxed by the complexity of a knowledge society, as estranged by the contradictory content and uncertainty of science.

In this paper, I have taken a different position. I have tried to supplement the above approaches by breaking open notions such as knowledge and expertise to bring to the fore the objectual relationships which I think define knowledge processes. The idea of an object that is relevant to understanding these relationships contrasts sharply with our received notions of an instrument, a commodity, or an everyday thing. I maintain that the libidinal, reciprocal, and in other ways binding components of experts' object ties make it plausible to construe these relationships as forms of sociality rather than simply as "work" or "instrumental action." The wider relevance of the shift in interpretation I propose lies with the assessment that object-relationships of the sort exemplified in knowledge cultures constitute a hidden and ignored side of the contemporary experience of individualization. Part of the epic character of the changes now in the making may have something to do with what I have called "objectualization," an increased orientation towards objects as sources of the self, of relational intimacy, of shared subjectivity and social integration. In the paper, I considered the spread of expert contexts and knowledge cultures throughout society (the discharge of these cultures into society) as a possible driving force behind the rise of an object-centered sociality. The pervasive presence of such cultures (of expert selves, of objects having the qualities of objects of knowledge, and so on) implies a reordering of social relationships around objects of knowledge.

There may be a second driving force behind processes of objectualization, which is the relationship risks that many authors find inherent in contemporary human relations. In this scenario, objects may simply be the risk winners of human relationship risks and failures, and

of the larger postsocial developments outlined in the paper. However, I also think that this situation and the previous one are not independent, and do in fact intertwine in many ways. For example, as objects in everyday life become high technology devices, some of the properties these objects have in expert contexts may carry over into daily life, turning an instrument or a commodity into an epistemic everyday thing. Perhaps some of the relational demands computers and computer programs make on their users, and some of the relational possibilities they offer (see Turkle 1984; 1995), can be interpreted in this way. If Heidegger's (1962) and others' analysis is right, typical instruments in the old sense did not offer such possibilities.

In the paper, I discussed an object-centered sociality, taking my lead from person-object relationships. I want to conclude by stressing the need to conceive of an object-centered sociality very broadly, also bringing into view aggregate levels of sociality that are object-centered. A starting point for the discussion can perhaps be the idea, implicit in the notion of an object-relationship, that a "referential whole" (Heidegger 1962) of such relationships may also function as an embedding environment for the self. The version of the individualization thesis which argues that the modern self is uprooted and disembedded foregrounds communities and traditions as relevant in understanding previous contexts of belonging (e.g. Heelas et al. 1996). The point which emerges from the argument in this paper is that objects may play a significant role in constituting such contexts. For expert selves, laboratories provide candidate environments; several recent studies offer empirical evidence in this direction (e.g. Traweek 1988; Knorr Cetina 1997a:ch.7; Todes 1997).

To push this further one can turn to the notion of integration, asking whether the idea of objectual integration may help understand a knowledge society. Integration in the social sciences is almost universally understood in terms of human bonds formed through normative consensus and shared values, a conception which dates back to Parsons and Durkheim. This form of integration has become highly problematic, given the increasing cultural and ethnic consciousness and diversity of nation state populations (e.g. Featherstone 1990). As common values are no longer the outgrowth of shared traditions and cannot just be imposed by some authority, integration via norms and values appears to be less and less effective. In fact, this sort of integration is imaginable today only as a socio-culturally engineered consensus (Etzioni 1994). Peters (1993) has argued that integration may also ensue from other factors, for example from the joint prosperity which binds large segments of the population into society. Joint prosperity significantly involves objects, whose role in bringing about integration may need to be spelled out. In expert contexts, the binding role of knowledge objects may rest on their multiple instantiations; for example on their ability to circulate as test materials, visual displays, maps, prototypes, substances etc. This form of objectual integration may create communities "in thought" (compare Hutchins 1995), collective obligations towards the lacks displayed by partial objects, and emotional affiliation through the concentration of feelings, images and metaphors on central objects. I assume that objectual integration plays a crucial role in the formation of research groups (Geison 1993) and experimental systems (Rheinberger 1992), across generations of participants.

The idea of objectualization assumes that we are experiencing a shift in forms of relatedness that points away from social and normative integration and towards objects as relationship partners of embedding environments. This idea does not neglect or deny the phenomenon that certain forms of relatedness with and through objects have always been with us; what I do maintain is that these forms are on the rise in postsocial knowledge cultures, and that our core concepts of the social need to become inclusive of such forms. The

development to which I am pointing needs to be articulated further through empirical studies of intimate objectual relationships in expert settings, and also in other areas. Leisure, for example, might be a particularly rich vein of sociality with objects, and on a very different level, international stock and forex market trading, which is characterized by the total engagement of traders (Abolafia 1996:238) with objects that are never fixed (e.g. the price of a commodity), and that have long been thought to be suffused with knowledge (Hayek 1945). Such inquiries might extend our idea of what constitutes sociality in ways needed to understand current transitions to a postsocial knowledge society and our increasing preferences for individualized lifestyles. They should also allow us to distinguish various types of sociality with and through objects, and to allow us to link them to the interpersonal variety of social forms.

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Notes

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2. See, for example, the recent volume by Rueschemeyer and Skocpol (1996) which brings together many recent interpretations of the history of welfare institutions. See also Giddens 1994b:134ff.
3. The sociological classics, and sociology in general, through its elaboration of a discourse on social causation, played an important role in bringing about the shift in mentality through which individuals came to be seen as the bearers of the personal costs of collective structures. Durkheimian sociology and its grounding of a theory of society in "social facts" exemplifies the turn toward the social as a distinctive layer of relationships with causal efficacy, for example for structuring cosmological beliefs (e.g. Durkheim and Mauss, 1963). A later example is Winch's plea for a "sociological imagination" (1957), illustrated by societal processes which individuals do not recognize but which affect and change their lives.
4. For example, most users of computers do not know, nor do they need to know, what physical and informational principles are responsible for the computer's behavior. If they know what a computer is designed to do they can predict its behavior and use it reliably for their purposes.
5. Bell elaborates the structural changes from an industrial society to a post-industrial society in terms of "the exponential growth and branching of science, the rise of a new intellectual technology (e.g. decision making based on decision theory), the creation of systematic research through R&D budgets, and, as the calyx of all this, the codification of theoretical knowledge." (1973:44)
6. This question should not be confused with the interest in the social foundation of knowledge. See Merton's analysis of the role of puritanism in the rise of science (1970) for a historical analysis of this sort, and recent analyses in the sociology of science for contemporary examples (e.g. Knorr Cetina 1981). What I am interested in in this paper are person-object relations as a particular structural form relevant to the understanding of knowledge societies.
7. For interesting attempts to work with these ideas by historians and sociologists of science see for example Pickering (1995), Wise (1993) and Dodier (1995). For an important study of individuals' attachment to computers see Turkle (1995). Thevenot's (e.g. 1994) concepts provide perhaps the most general sociological perspective on the issue. See also Simmel's (1923:236ff.) discussion of the tragedy of culture for an early attempt to capture the cultural dynamics of objects, later also addressed by Baudrillard in his book on the system of objects (1968). For an attempt to work toward a theory of object from the viewpoint of reflexive modernization see Lash (1996).
8. To facilitate the discussion and to take the possibly most controversial case, I am foregrounding material objects in this paper. I want to emphasize, though, that I do not exclude symbolic objects in the social, economic and other sciences (or, for that sake, human subjects treated as objects) from the claims I am making, though I cannot address the specific questions this raises within the confines of the present paper.
9. For example, the notion of "work," particularly when it is defined, within the Marxian legacy, as instrumental action directed toward the transformation of nature, raises questions of work organization, working conditions, work accomplishment and sequences, work-related cooperation and communication—a wholly different set of questions to those which are of relevance here.

10. Heidegger's analysis here must be understood in relation to his attempt to substantiate the existential a priori of our instrumental being-in-the-world, not as an empirical theory of knowledge. See for example Dreyfus (1991).

¹¹ Baldwin's and Hegel's notion of desire are summarized by Wiley 1994:33. See also Hegel 1979(1807) and Baldwin 1973(1899).

12. Mutuality is important here; according to the Lacanian formula, objects stabilize identities (and collectivities) just as much as identities (and collectivities) stabilize objects. Or, to put this in a more traditional terminology, while objects become embedded in particular practices and interpretive communities through the sequences of lacks they display, unfolding and receding objects would also have to be considered as binding the communities together and as extending their practices.

13. For example, the previous discussion of (Durkheimian) "excitement" can be compared with (Csikszentmihalyi's (1990) work on the "flow" experience, which would seem to support some of the claims I made from a more psychological perspective.