The Evolution of Scientific Knowledge

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NEW HORIZONS IN INSTITUTIONAL AND EVOLUTIONARY ECONOMICS

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9. Must spontaneous order be unintended? Exploring the possibilities for consciously enhancing creative discovery and imaginative problem-solving

Mathew Forstater

The conventional view has it that spontaneous order is unintended. Drawing on Hayek’s distinction between *cosmos* and *taxis* — and Michael Polanyi’s parallel distinction between spontaneous order and corporate order — most scholars identify *cosmos* or spontaneous order as the result of ‘human action but not of human design’, and *taxis* or corporate order as the result of intentional design or planning. Some have explored combinations of the two, a number of examples of which have been offered by Allen (1998, pp. 188ff).

There are arrangements that are *taxes* in their inception — deliberately established futures markets, for example — but that are allowed to operate in many respects spontaneously once the rules have been laid down. Other *taxes*, such as some unsupervised work groups, are organised to meet specified goals, but operate without command and are permitted to develop based on ‘spontaneous mutual adjustments’ (Allen 1998, p. 189). Other corporate associations — many households and social clubs fit this category — are not conceived to meet (though they themselves may set) specific goals, but also mutually adjust in a spontaneous manner. There are also *taxes* within the *cosmos* — Coase long ago characterised the firm within the larger market as such.

But Allen describes Hayek’s ‘Great Society’ as ‘a cosmos without any element of taxis’ (Allen 1998, p. 187), and planning is depicted as the polar opposite — pure command. Moreover, Allen characterises Polanyi’s notion of science as a *cosmos* model for a ‘free society’, though he notes that there are
aspects of *taxis* in Polanyi’s vision of a ‘republic of science’ (Allen 1998, pp. 190–1). A crucial task in this type of approach is thus focused on finding the right mix of *cosmos* and *taxis*, both in terms of the proportions of each and the character of the constituent parts.

My point of departure is the position that virtually the whole conceptual framework regarding – and epistemological approach to – the discussion of ‘orders’ is fraught with problems. At the root is the dichotomous and oppositional treatment of dualistic categories – *taxis* vs. *cosmos*, intuition vs. logic, market vs. state, spontaneity vs. design, tacit vs. explicit knowledge, and so on. Rather than trying to replace the terminology, I want to attempt to treat the categories differently. If successful, there will be greater fluidity among the oppositional and the dichotomous dualisms would instead appear as interrelated aspects. All this is important because the standard treatment has somewhat severe implications. For example, Allen’s treatment overstates the order-beswowing power of the price system and its associated incentive structures; under-emphasises the impact of changing historical contexts; considers the desire for social justice – and even ‘face-to-face’ relationships, solidarity, and working together for common purposes – as deriving from a nostalgia for pre-capitalist communities; and more (Allen 1998, pp. 155–6; 185–7).

I want, then, to focus on a slightly different interplay of *taxis* and *cosmos*. First, I want to argue that it is not simply a matter of a ‘mix’ of differing orders. Such an exercise, while useful and perhaps even necessary, still treats the different orders in a dichotomous manner. Rather, I want to argue that, on the one hand, there are intentional aspects to the processes associated with spontaneous order, that are difficult to separate from the unintended or spontaneous aspects of *cosmos*, and the relation is not simply ‘additive’. On the other hand, I want to argue that spontaneity can, does, and should play a role in *taxis*. Related to this are Polanyi’s notions of tacit and explicit knowledge. I want to argue that both tacit and explicit knowledge are vital to both spontaneous and designed orders. Furthermore, as Polanyi points out, tacit knowledge can become explicit, and this is important for understanding the interplay of intended and unintended aspects of spontaneous and designed orders.

Crucial to both spontaneous and designed orders are creative discovery and problem-solving, and I want to explore the possibilities for the conscious enhancing of both. Are there methods and strategies for enhancing the powers of creative discovery and problem-solving? I think there are and elsewhere (Forstater 1999) I have catalogued some of them, drawing on the work of Polanyi, the mathematician George Polya, and also pragmaticist philosopher Charles Sanders Peirce. Both Polya’s heuristics and Peirce’s abduction or retroduction are methods of problem-solving and creative discovery, and both are related to the method of working backwards. Other notions with family resemblances to some of the ideas of all these traditions – Schutz’s common-sense, C. Wright Mills’s sociological imagination, Lowe’s instrumental analysis and spontaneous conformity, Vygotsky’s free play, and others will also be considered.

Dewey (1916) said that experience is ‘pregnant with connexions’, that experience is ‘full of inference’ and ‘experience in its vital form is experimental, an effort to change the given’. I want to explore inference in science (that is, *inquiry*), inference in everyday life, inference in participatory democratic associations, inference in planning and policy, inference in education. In his *Democracy and Education* Dewey wrote that ‘A democracy is more than a form of government; it is primarily a form of associated life, of conjoint communicative experience’ (Dewey 1916, p. 101). I want to explore “the method of free and effective intelligence” in all human experience and association, and the emancipatory potential of inquiry. I also want to explore the subtle interplay of spontaneity and intentionality in both social inquiry and social life, and in spontaneous and designed associations.

In his discussion of ‘Genius in Science’, Polanyi explicitly noted the outwardly contradictory interplay of intentional and spontaneous elements in scientific discovery:

> Genius is known for two faculties which may seem incompatible. Genius is a gift of inspiration, poets back to Homer have asked their muse for inspiration, and scientists back to Archimedes have acknowledged the coming of a bright idea as an event that suddenly visited them. But we have ample evidence of an opposite kind; genius has been said to consist in taking infinite pains, and all kinds of creative pursuits are in fact extremely arduous. How can these two aspects of genius hang together? Is there any hard work, which will induce an inspiration to visit us? How can we possibly conjure up an inspiration without even knowing from what corner it may come to us? And since it is ourselves who shall eventually produce the inspiration, how can it come to us as a surprise? Yet this is what our creative work actually does. It is precisely what scientific discovery does: We make a discovery and yet it comes as a surprise to us. The first task to us the use of a theory of creativity, and of scientific discovery in particular, must be to resolve this paradox. (Polanyi [1972] 1997, p. 268)

The key to the solution, as Polanyi had earlier argued elsewhere ([1966] 1997), is to be found in ordinary perception, and in fact he argued that science is an extension of perception, a Gestalt-like ‘integration of parts to wholes’ that is intentional and yet ‘in an important sense’ spontaneous; that is experienced as an inspiration, itself ‘evoke by the labours of the thrusting imagination’ (Polanyi [1972] 1997, pp. 268–9). The ability to perceive the coherence of the working whole, the organism as it were, and the joint functioning of its parts begins with the identification of a problem and the
conscious decision to pursue it. For Polanyi, this entails personal judgement as to the importance of the problem and one’s ability to solve it, which he considers to constitute a guess. Polanyi’s view, as he often noted, bears close resemblance to that of Peirce, who has done much to outline the strategies for creative discovery and imaginative problem-solving (Forstater 1999). It also has important connections to Peirce’s abduction or retrodiction, which, unlike deduction or induction, is capable of producing new knowledge.

Retrodictive inference or heuristic seems beset by the contradiction: on the one hand, word such as ‘guess’, ‘instinct’ and ‘imagination’ are invoked to discuss the process, while on the other hand it is insisted that there is a ‘logic’ of scientific discovery. Some light may be shed on this topic, as well as the difficulty of dealing with these issues in abstract terms, through Michael Polanyi’s distinction between two different types of knowledge (1958; 1959; 1966). By ‘explicit knowledge’ Polanyi refers to knowledge that is articulate, that which is usually intended by the word ‘knowledge’, that is written words, mathematical formulae, maps, and so forth (1959, p. 12). But Polanyi identifies ‘tacit knowledge’ as the ‘dominant principle of all knowledge’ which ‘at all mental levels ... [is] decisive’ (1959, pp. 13, 19). Tacit knowledge is ‘unformulated’; it is the ‘knowledge we have of something we are in the act of doing’ (1959, p. 12). Explicit knowledge can be critically reflected upon, which is an advantage that it has over tacit knowledge (1959, pp. 15–18). Yet tacit knowledge concerns discovery, which is the basis for explicit knowledge. As Polanyi puts it, a traveller with a detailed map enjoys superiority over the explorer who first enters a new region: ‘yet the explorer’s fumbling progress is a much finer achievement than the well-briefed traveller’s journey’ (1959, p. 18). Or, put another way: ‘Even if we admitted that an exact knowledge of the universe was our supreme mental possession, it would still follow that our most distinguished act of thought consists in producing such knowledge’ (1959, p. 18). Key, also, for present purposes, is that Polanyi argued that methods can be devised by which ways of knowing that are tacit can be made explicit.

Because of its nature, the ‘way of discovery’ (Gelwick, 1977) is difficult to explicate. Polya has thus identified the ‘first task’ as that of ‘collect[ing] and classify[ing] such problem-solving procedures’ and to ‘develop a repertory of problem-solving techniques’ (Polya [1971] 1984, p. 590). Even so, this will not solve the issue comprehensively, because there remains the issue of choosing from among the available techniques, a decision which will require that the investigator ‘use personal judgement, as Polanyi would say’ (ibid.). This is similar to Adolph Lowe’s discussion of choosing among alternative hypotheses: ‘there are no binding rules, according to which a researcher could decide in favour of one among many possible hypotheses. Which one he chooses in the end, adopting ... Einstein’s “free creation of the mind”, is neither a strictly determinable nor an arbitrary decision’ (Lowe 1992, p. 327).

Polya and Polanyi have both contributed to the challenge of explicating the procedures of the inexplicable. Whereas Polya’s efforts have been more along the lines of taking an inventory of tools, Polanyi has explored the tacit fringes of these procedures. For Polanyi, appreciation of a problem is itself part of the act of discovery (Polanyi 1958, p. 121). Seeing a problem ‘is a definite addition to our knowledge’, and ‘to recognise a problem that can be solved and worth solving is a discovery in its own right’ (1958, p. 120). In the process of grappling with a problem, a ‘heuristic stress’ builds, which is akin to an emotional strain on the part of the investigator. Discovery leads to a release, such as running through the streets crying ‘Eureka!’ (1958, p. 122).

One heuristic tactic noted by Polanyi is to continuously reorganise the problem ‘with a view to eliciting some new suggestive aspects of it’ (Polanyi 1958, p. 128). This is reminiscent of C. Wright Mills’s suggestion that ‘the re-arranging of the [researcher’s] file ... is one way to invite the [sociological] imagination’ (Mills 1959, p. 212):

Imagination is often successfully invited by putting together hitherto isolated items, by finding unsuspected connections ... As you rearrange a filing system, you often find that you are, as it were, loosening your imagination. Apparently this occurs by means of your attempt to combine various ideas and notes on different topics. It is a sort of logic of combination, and ‘chance’ sometimes plays a curiously large part in it. In a relaxed way, you try to engage your intellectual resources ... Of course, you will have in mind the several problems on which you are actively working, but you will also try to be passively receptive to unforeseen and unplanned linkages.

Both Polanyi and Mills relate this ‘reorganising’ tactic to another, what Polanyi refers to as ‘ransack[ing] our memory for any similar problem’ (Polanyi 1958, p. 128) and Mills calls ‘get[ting] a comparative grip on the materials’ (Mills 1959, p. 215, original emphasis). This is actually what Polya refers to in his story about a person trying to cross a creek when he states that ‘the man may recall he has crossed some other creek by walking across a fallen tree’ (Polya [1943] 1957, p. 145) and also what Hobbes points to when he writes that ‘from desire ariseth the thought of some means we have seen produce the like of that which we aim at’ (Polya [1952] 1981, p. 2, emphasis added), in other words, we are familiar with an analogous problem that has been solved: ‘Any conjecture, of course, must have been suggested ... by somehow related ideas (special cases, analogies, etc.), although, perhaps, at the moment of conceiving the conjecture those ideas were not clearly and explicitly present’ (Polya [1948] 1984, p. 474). Polya distinguishes ‘similarity’ from ‘analogy’ as two related but distinct heuristic tools.
The evolution of scientific knowledge

In the course of the heuristic search, we must look for ‘favourable signs’, which of course must not be mistaken for ‘proof’, but which encourage ‘further investigation’ (Polya [1949] 1984, p. 490). Lowe as well cautions that the findings of heuristic analysis can be accepted only provisionally (Lowe 1992, p. 327). Polanyi invokes the notions of the ‘bright idea’ and ‘feeling we are “on the right track”’ to get at the seemingly intuitive aspects of the discovery procedure. For Polanyi (1958, p. 128), ‘success depends ultimately on the capacity for sensing the presence of yet unrevealed logical relations between conditions of the problem, the theorems known ... and the unknown solution...’. Polanyi invokes the ‘common experience(s) of groping for a forgotten name’ and searching for a name or word that is said to be ‘on the tip of the tongue’ to illustrate the ‘sense of growing proximity to the solution’ that guides discovery (Polanyi 1958, pp. 128–9). As Lowe puts it, the ‘researcher “senses” a structural relationship between the hypothesis he chooses and the problem he wants to solve’ (Lowe 1992, p. 327).

Equally important is Polanyi’s suggestion that self-awareness of the capacity to sense the ‘accessibility of a hidden inference’, as well as of the ability to ‘invent transformations of the premises which would increase accessibility’ is a ‘foreknowledge’ which itself ‘biases our guesses in the right direction’ (Polanyi 1958, p. 129). The discovery-enhancing effects of our awareness of our ability to discover is also related by Polanyi to the fact that ‘a set purpose may automatically result in action later on’ as when we go to bed resolved to wake up at a certain hour, and then actually do. These factors also help explain the ‘self-accelerating manner of final stages of solution’, in other words, the closer we get the faster we progress. These aspects of discovery are not treated lightly by Polanyi, who takes the position that ‘the whole process of discovery and confirmation ultimately relies on our own crediting of our own vision’ (Polanyi 1958, p. 130).

Peirce also believed that abductive reasoning was ‘a skill that could be improved by practice or discipline’ (Ochs 1993, p. 61). Like Polya, Polanyi, and Mills, Peirce sees a vital role for ‘common-sense’, a view that has points of contact with Schutz as well (Schutz [1953] 1967). To this must be added the value of imagination in making discoveries.

It must be emphasised again that all the authors referred to here are of the opinion that these processes are complementary to the generally recognised procedures of scientific practice. But the point is that these processes are crucial and indispensable, and recognition of this increases their power.

What unites the detective, the physician, the scientist, the artist? The quest, the discovery process, following clues, imaginative guesswork, seeking to solve the mystery, to find the coherence among the parts, searching for solutions – by any means necessary. Polya reports solving proofs through dreams, and he once identified a mathematical problem and a found a clue to its solution when he by ‘chance’ encountered twice in one afternoon an acquaintance and his friend on a series of winding, connected footpaths in a park. Are there ways of consciously increasing one’s ability to ‘guess’ correctly? Indeed, among the kit of tools of discovery are included means of increasing one’s ‘luck’.

Austin (1978) has identified different ‘personality traits’ associated with various kinds of luck or chance, and that thereby ‘facilitate discovery and invention’ (Accardo 1987, p. 67). Hotson has put forward a similar argument with respect to serendipity, and while the particular application is with regard to literary research, the strategies for serendipity-enhancement may be applied in other areas as well. Hotson reports that Walpole coined the term ‘serendipity’ after hearing a story about the ‘Three Princes of Serendip’, in which the Royal Trio continuously made favourable discoveries by accident as they travelled around. Hotson, like Austin, identifies curiosity as one of the traits inviting good fortune. Quoting Simon Flexner:

Curiosity, not utility, is the master key to human knowledge; curiosity which may or may not result in something useful. And the less that curiosity is asked to justify itself day by day, the more likely it is not only to contribute to human welfare, but to the equally important satisfaction of the human mind. (Hotson 1942: 80)

Echoing Accardo’s summary of Austin to the effect that ‘chance favors those in motion’ and the ‘Kettering Principle: I have never seen anyone stumble onto something sitting down’, Hotson also emphasises that:

When all is said, the essential to bear in mind about serendipity – whether you call it happy accident or lucky chance – is that the Princes had to travel; and travel means labor. The searcher has to go into them that hills, and then take out of them and dig at twenty to the dozen. You don’t strike devilish good luck without weevilish hard work. (Hotson 1942: 81)

Persistence is likewise mentioned by both Austin and Hotson, the latter ending by quoting Shakespeare to the effect that: ‘Tomorrow I intend to hunt again’ (Hotson 1942: 94), determined to follow the right ‘clues, out of the mass ... most likely to lead to the lucky spot’ (ibid.: 87). Once more, or many times over, we return to the delicate tapestry of intention and spontaneity, chance and design.

Elsewhere (Forstater 1999), I have argued that the strategies and tactics for the enhancement of the powers of creative discovery described herein might also be employed in the sphere of economic policy; that Adolph Lowe’s instrumental analysis may best be thought of as a kind of policy discovery procedure, and that this opens up the way for another kind of potential hermeneutic Austrian contribution to public policy. I also argued that an
overly dichotomous treatment of market vs. state in some Austrian writings constitutes an obstacle to realising this potential. And this chapter started out by challenging the related overly dualistic or dichotomous treatment of spontaneous vs. designed orders, intentional vs. spontaneous processes within both cosmos and taxes, and, more generally, reason vs. imagination, intuition vs. inference, and so on. Instead, we are arguing for a more subtle and combinatory treatment. Continuing along these lines, I want now to present another concept of Adolph Lowe's – that of 'spontaneous conformity' – along with his and others' related thoughts on freedom, education, and socialisation, that get to some of the other issues at stake in the discussion of spontaneous orders and related ideas, which in turn brings us back to the issues of social and economic life with which most of us are concerned.

Lowe was a colleague of Michael Polanyi's at Manchester in the 1930s, where they were engaged in discussions around these and related themes, and during which time Polanyi first developed his concept of spontaneous order and Lowe first developed his idea of spontaneous conformity (Lowe 1937a; 1937b; 1940). Lowe returned again and again throughout the course of his life to what he referred to as the great 'riddle': 'how is freedom of [individual] choices compatible with integral [social] order?' (Lowe 1942: 445). Clearly, the problem of freedom and order is ultimately what the whole 'spontaneous order' theme is all about. Given the behavioural requirements necessary for determinate economic outcomes, Lowe (1935, p. 62; 1951: 413) notes that the only alternative to the authority of a command system is voluntary restriction of goal-inadequate behaviours and the obeying of a general code of conduct. If determinate behaviour is not just any behaviour (in other words, if what is sometimes called 'licence' is unlikely to be compatible with socioeconomic order) and if determinate behaviour is not to be imposed from without, then such a code must be internalised, and ideally 'experienced as ... spontaneous decision' (Lowe 1942: 439–40). Lowe refers to this process as 'spontaneous conformity', which Clary (1998, p. 276) has defined as 'the spontaneous consensus among the members of society to a social code of conduct, the standards of which are accepted and obeyed by the individual members of society'. Such self-restriction is 'the price of political and economic freedom' (Lowe 1935, p. 71; cf. 1937a and 1942: 440).

In fleshing out these issues, Lowe identifies 'education in the widest sense of the term' as crucial to the socialisation processes necessary to reconcile freedom and order in liberal society (1988, p. 128, original emphasis). Lowe refers here not merely to intellectual training or information necessary for comprehending the social implications of individual behaviour in the more technical sense. Rather, he associates successful education in this broad sense with 'integrating the rational with the moral' and 'commitment to a life-ordering principle' (1988, p. 130, original emphasis).

Like his writings on economic theory, history, methodology, policy, and political philosophy, Lowe's writings on education span his career. What is probably his least-known book, The Universities in Transformation, was published in 1940, but already Lowe had anticipated that work with an article, 'The Task of Democratic Education', comparing university education in pre-Hitler Germany and England (1937b), as well as a related discussion of education in The Price of Liberty, published the same year. Lowe spoke on the topic of education often between the 1940s and 1970, when he addressed the question 'Is Present-Day Higher Learning Relevant?' both at Columbia University's 'Seminar On the Nature of Man' and the General Seminar at the Graduate Faculty of Political and Social Science at the New School for Social Research, subsequently publishing the paper in Social Research in 1971. Education is a central theme once more in Lowe's last book, Has Freedom a Future? (1988).

Writing after four years in exile and with World War II imminent, Lowe makes clear in 'The Task of Democratic Education' that it will no longer be adequate merely to profess the traditional postulates of democratic education: 'intellectual freedom and personal responsibility. We have to prove that these liberal principles ... are superior to the new gospel of indoctrination and enforced conformity' (1937b: 381, emphasis added).

Lowe then immediately turns to an issue which forms a crucial part of his life-work, the social basis for individuation. Far from denying the importance of individual freedom and personality, he refers to their role as serving a 'leavening function, working on a dough which is composed of very different material ..., the pre-liberal heritage of attitudes and life patterns'. For Lowe (1937b: 382), the disintegration of this communal base threatens the survival of free society:

If this proves true, the task of democratic education extends far beyond the cultivation of freedom and personality. For the preservation of these liberal values modern democracy will have to undertake a much bigger task: that of reviving, or even creating, the substance of a new social and economic order.

Lowe goes on to compare the pre-Hitler German university system, characterised by a very high degree of academic freedom and independent research, with the English system, which Lowe views as 'rearing grounds for a social type' (1937b: 385). In the first half of the 19th century, 60 per cent of the students in Germany were the children (sons) of civil servants, teachers and clergy, which meant that socialisation was the province of the 'feudal and military standards of the Prussian tradition' (ibid.: 383). But this
division of labour' continued right up to World War I, by which time 50 per cent of the students were now from the business classes.

The German system produced some excellent scholars, but the majority of students, Lowe laments, were not up to the challenge of self-guided education, and submitted to a 'dull, though well-organised, cramming system' (1937b: 383). Such a system was unable to shape and encourage a social consciousness in the students, who received their real education – social and physical –

... in their fraternities and student corps. There, however, not the humanistic ideal of free thinking, but the Wilhelminian parody of Prussian tradition was instilled in them ... This dualism was much decried as a sin against the true spirit of the German University. But as this university refused to do anything but train scholars and satisfy the desire for personal self-refinement, some other body had to step in to give the student masses human guidance and social drill. It was on this residue of the feudal and absolutist ages on which the leaders of the nation actually lived. (Lowe 1937b: 383–4)

The universities became overcrowded following World War I, and the unemployment of the inter-war period rose, with 50,000–70,000 unemployed graduates up to 1932 forming the basis of the 'propagandists and the officers of the counter-revolution' who were to turn 'an economic disaster into a general social upheaval' (Lowe 1937b: 384).

For Lowe, the German university failed at mass education, the fundamental challenge of modern democracy. England's success, on the other hand, Lowe attributes to its ability to meet the needs of the average student and 'produce a social character' (ibid.: 385). Though English universities experienced similar demographic trends to those in Germany, the English system fulfilled its function of shaping 'a general character pattern through the daily experience of a group life' (ibid.: 385).

As Lowe reiterates in The Universities in Transformation, from early on in life the socialisation of the individual is intimately linked to societal institutions, in particular educational institutions. This is as true in a totalitarian society as in a democratic one. But in the latter, the socialising forces must forge not a numbing, mindless uniformity; while still involved in the production of a 'definite human type', social institutions such as the educational system must be 'flexible enough to enable, and even encourage, the type to develop “beyond the type”' (Lowe 1940, p. 2, emphasis added).

For Lowe, the socialised individual of a democratic society must be 'dynamic', and he points to two crucial aspects of such a view: 'It recognises ... the “incompleteness” of human history, and points to the significance of cultural evolution.... [and] it by no means involves the uncritical acceptance

... of the actual ideas and standards prevailing at any given moment' (Lowe 1940, p. 2).

As such, Lowe points out that while England produced no great 'intellectual rebels against tradition' such as Marx, Nietzsche, and Freud, it produced 'the Friends, the Radicals, and the Fabians, that is, an intelligentsia whose members used the ruling social code for the most daring offensive against what they regarded as abuses of the true meaning of tradition' (1937b: 386–7). For Lowe, the characterisation of 19th century England as 'a liberal society' applies as a description of the economic system, but it must not be permitted to disguise the importance of voluntary associations and the underlying social fabric, which would not properly be described as 'atomistic' (1940, p. 6).

Lowe argued that the success of the English university system lay partly in the fact that its task was not as great: for Lowe, the English university had only to develop 'existing attitudes which are pre-formed by family tradition and daily experience [and] permeate the social conduct of the whole nation' (1937b: 386). Whereas in Germany: the humanistic education and the Prussian socialisation were socially and substantively separate, in England Lowe found an amalgamation of pre-liberal tradition and liberalism into 'one homogeneous life pattern: spontaneous conformity' (ibid.: 386).

This idea of 'spontaneous conformity' is a central thread in Lowe's work from the 1930s through the remainder of his life. His exile in England provided him the opportunity to observe English society in a detached manner, and he quickly became impressed with the apparent contradiction between individual freedom on the one hand and fairly strict social conformity on the other. Lowe's The Price of Liberty is dedicated to this phenomenon, and his conclusions had a significant influence on his writings from that time onward, regaining a central place in his last major work, Has Freedom a Future?

Such a socialisation process instilling conformity in individuals may be thought of as the antithesis of 'spontaneity' or 'freedom'. More recent evidence regarding the socialisation process in young children demonstrates that far from being the result of strict and rigid 'training', the acquiring of social norms is a rather spontaneous process and the 'natural' outgrowth of free play and the imagination. Important contributions in this area may be found in the work of Vygotsky ([1934] 1962), an early 20th century psychologist who theorised about the way in which conceptual development occurs in children based on social practices. Vygotsky's ideas may provide leads for better understanding Lowe's seemingly paradoxical notion of 'spontaneous conformity', as well as extending the focus on education to a variety of levels and areas.
To the outside observer, ‘free play’ (as opposed to organised, structured activities) appears as ‘free’ and ‘spontaneous’. But, as Berk (1994: 33) notes in her overview of Vygotsky’s ideas, ‘free play is not really “free”’: ‘[I]nstead, it requires self-restraint — willingly following social rules ... By enacting rules in make-believe, children come to better understand social norms and expectations and strive to behave in ways that uphold them’. For Vygotsky, a fundamental aspect of all imaginative or representational play is that it ‘contains rules for behaviour that children must follow to successfully act out the play scene’ (Berk 1994: 31, emphasis deleted). Thus, free play ‘supports the emergence of the ... capacity to renounce impulsive action in favour of deliberate, self-regulatory activity’ and so has a crucial role in development and socialisation (ibid.: 32). Dramatic and imaginative play therefore prepares young children for the more formal games with overt rules of middle childhood, ‘which provides additional instruction in setting goals, regulating one’s behavior in pursuit of those goals, and subordinating action to rules rather than to impulse — in short, for becoming a cooperative and productive member of society’ (ibid.: 33). Far from being an idiosyncratic or utopian notion of Lowe’s, ‘spontaneous conformity’ may be seen as being at the foundation of human socialisation and societal functioning. The work of Vygotsky and his followers demonstrates that there is no need for strict enforcement of conformity, which would be authoritarian and dehumanising. Quite the contrary: socialisation occurs naturally from early on in life as the outgrowth of imaginative play activities. In the context of Lowe’s political economics, however, a question immediately arises. Vygotsky’s theory describes the process of socialisation, of rule-following behaviour, but not the content of the rules themselves. The socialisation that takes place from early childhood in a given society reflects the already-existing social codes of conduct in that society. But at the core of Lowe’s thesis is the idea that social codes are not universal and timeless, instead they are historically contingent and context-dependent. Historical social, technological, and environmental transformations alter the efficacy of what Lowe’s colleague at the New School, the phenomenological sociologist Alfred Schutz ([1943] 1970), called social ‘recipes’. On the one hand, if social codes become rigidly fixed, they may be continuously passed on as tradition from generation to generation even after socioeconomic change has diminished their goal-adequacy. On the other hand, negative anti-social and otherwise goal-inadequate habits will also be imitated and adopted by children in socialisation processes.

One of the tasks of Lowe’s instrumental analysis is to discover the suitable behaviours for setting the system on a goal-adequate path (Lowe [1965] 1977). A variety of methods may be employed in order to try to induce goal-adequate behaviour, ranging over context-making, moral suasion, public education, and ‘enforcement’ of varying degrees of severity and formality. Often, goal-attainment may require that rigidly ingrained habits be altered or broken, and replaced by new practices.

As Lowe emphasises, external controls will be unnecessary to the extent that self-control is employed: voluntary adherence to a social code will eliminate the need for direct government control. Eventually, new practices will be established which will then become part of the socialisation process. While there will be ‘violations’, the viability threshold will not be crossed.

The key, then, becomes the ability of society’s members to alter their practices when necessary. Political economics thus requires a theory of self-control, which itself entails habit-change. We have already seen above that Lowe considers ‘education in the widest sense’ as key to self-control. Thus, the social function of education must not be limited merely to the process by which society’s members become socialised to fixed behavioural codes: the very ability to alter one’s own habits, that is, self-control, and the skill of adapting one’s behaviour in the face of changing circumstances and in the light of social necessities, must itself be part of the content.

Peirce explicitly addressed these issues, which are not unrelated to his theory of abduction, a concept Lowe believed to be closely related to his own ‘instrumental inference’.

Peirce invented the term ‘abductive reasoning’ to refer to the ‘inquiry we undertake to generate hypotheses about how we might reform what we already do. He believed this mode of reasoning was a power as well as a skill that could be improved by practice and by discipline’ (Ochs 1993, p. 61, emphasis added). Peirce believed that in practice we use ‘guiding principles’, habits that, not unlike Schutz’s social recipes, ‘structure our behavior and experience’ (Neville 1992, p. 29). Peirce was at first interested in the process of habit-formation, but soon after became interested in the question of what could be done if our habits prove faulty (Ochs 1993, p. 68). Peirce’s investigations (1931–35, pp. 478–81) identified a number of sources of habit-change, the most important of which he considered to be ‘efforts of the imagination’:

[O]n the one hand, if social codes become rigidly fixed, they may be continuously passed on as tradition from generation to generation even after socioeconomic change has diminished their goal-adequacy. On the other hand, negative anti-social and otherwise goal-inadequate habits will also be imitated and adopted by children in socialisation processes.

Thus the role of imagination in the creative construction and reconstruction (in the face of changing circumstances) of social norms is in no way limited to young children. Such a process continues into adulthood, and becomes
increasingly self-determined. In addition, this is increasingly so in modern society. As Lowe (1988, p. 2) put it: ‘From now on, the future will have to be more and more the result of our deliberate choices, at every level of human activity’.3

For Lowe, voluntary adherence to social codes of conduct eliminates the need for externally imposed controls. The family resemblances of Lowe’s codes of conduct to Peirce’s ‘guiding principles’ and Schutz’s social ‘recipes’ have already been noted. It may be useful, then, to briefly examine Gorman’s sharp critique of Schutz’s notion of freedom, since it may also serve as an implicit critique of Lowe’s similar conception of freedom associated with spontaneous conformity.

According to Gorman (1977, pp. 71–2), if social recipes are what determine behaviour:

... then there is little more than hypocrisy in contending that we are free, self-determining, meaning-endowing actors. [In this conception] the action we freely choose to perform is identical to the behaviour we would exhibit if this were impersonally determined by social typifications ... In the common-sense world, I am free only to obey.

If codes of conduct are prescribed by society, and we are socialised to obey the codes of conduct, then how is our choice to obey them ‘freedom’? Gorman claims that in the Schutzian framework it is ‘freedom’ simply because that is how it has been defined; freedom here is defined as voluntarily obeying the rules.

Gorman’s analysis cannot be easily dismissed. But Schutz is susceptible to the critique because he claims that individuals will choose to act in a way that coincides with objective necessity. Such an imposed coincidence of subjective and objective necessity is not to be found in Lowe, however. For Lowe, individuals must decide whether or not to follow the social rules. In fact, continuous critical evaluation of our habits is necessary in order to prevent perpetuating those which are no longer workable or desirable. Because Schutz does not adequately consider structural change and the impact such change has on the efficacy of social recipes, there is little space given to (or necessity for) critical self-consciousness.4 But in a dynamic, transformational context, such critical self-consciousness is central to the adaptations required for societal functioning.

Gorman’s depiction (1977, p. 83) of the Schutzian actor as ‘naive [and] unquestioning ... automatically responding to internalised social dictates’ is somewhat reminiscent of C. Wright Mills’s ‘cheerful robot’ (Mills 1959, p. 171). Mills believed that in what he called the ‘post-modern period’,5 the individual suffers from Münheim’s ‘self-rationalisation’, conforming to the rules and regulations of the rational ‘alienating organisation’ (Mills 1959, pp. 166ff). Under such rationalisation, ‘the guiding principles of conduct are alien to and in contradiction with all that has been historically understood as individuality’:

The society in which this man, this cheerful robot, flourishes is the antithesis of the free society – or in the literal and plain meaning of the word, of a democratic society. The advent of this man points to freedom as trouble, as issue, and – let us hope – as problem for social scientists. Put as a trouble of the individual – of the terms and values of which he is uneasily unaware – it is the trouble called ‘alienation.’ As an issue for publics – to the terms and values of which they are mainly indifferent – it is no less than the issue of democratic society, as fact and as aspiration. (Mills 1959, pp. 170–2)

Gorman (1977, p. 83) contrasts the Schutzian actor with another who is ‘self-consciously aware’ and ‘critically consider[s] and evalua[te] the circumstances (including social recipes) he or she acts in’. Such a conception is closer to that of Lowe. As discussed above, Lowe explicitly rejected mindless conformity, arguing that socialisation must be flexible enough to permit the ‘type to develop beyond the type’. The socialised individual of democratic society must be recognised as ‘dynamic’, meaning ‘incomplete’ (that is, still growing, changing, developing, learning), and the individual must never uncritically accept society’s prevailing standards and ideas.

Lowe recognised the potential drawbacks even of ‘too much’ spontaneous conformity: ‘the emancipatory goal must not be conceived as a macro order from which all frictions are removed. Some degree of disorder is the price of autonomous individuation, and thus genuine emancipation’ (1988, p. 13). The key is to not cross the threshold beyond which there exists a threat to the viability of society and thus the basis for individual self-actualisation. Peirce likewise noted that a considerable amount of what he termed ‘chance’ and ‘novelty’ is tolerable. For Peirce, system flexibility permits continuous ‘reordering’ allowing increasingly greater internal variation (Neville 1992, pp. 40–1). In fact, such flexibility is indicative of the robustness of a system.

For Lowe, the feasible maximum of individual autonomy is an ever-present goal. But it must be reconciled with ‘quasi order’, in other words, ‘admitting some degree of disorder and instability, so long as the critical threshold, below which the persistence of society is in danger, has not been overstepped’ (Lowe 1988, p. 13). The purpose of political economics, with its instrumental analysis, is to serve human society toward these ends:

We study the structural limits of human decision in an attempt to find points of effective intervention, to know what can and must be structurally changed if the role of explicit decision in history-making is to be enlarged ... We study history to discern the alternatives within which human reason and human freedom can now make history. (Mills 1959, p. 174)
This issue to which Mills refers — the enlargement of 'the role of explicit decision in history-making' recalls Lowe's earlier remark to the effect that 'From now on, the future will have to be more and more the result of our deliberate choices, at every level of human activity,' analogous to the tendency in the development of the individual from childhood to adulthood for processes of habit-change and norm-adoption to become increasingly self-determined. I want to also relate it to another phenomenon emphasised by Lowe cited earlier regarding 'the incompleteness' of human history, and ... the significance of cultural evolution'.

Lowe often expressed the view that the determinism in the socioeconomic systems portrayed by the classical economists (here meaning the classical political economy of Smith and Ricardo, not neoclassical economics), exemplified by 'laws' — the 'iron law of wages', the 'law of population', the (classical) law of diminishing returns — that were seen to govern relations between such factors as population (labour supply), subsistence (wages), natural resources, employment, and technical change, was rooted in the fact that the social economy of the classical era was characterised by 'impersonal forces or "laws" which might be observed or interpreted, but which could not be altered' (Lowe 1971: 568). But scientific and technological advancement later transformed most of these law-like relations into variable ones, capable of human control: 'That which once "happened", can now be made to happen, or prevented from happening' (ibid.: 568). Furthermore, having created the technological potential to both induce and prevent disaster, humankind has 'no alternative to accepting the challenges of the new era':

In the face of this tremendous enlargement of human capabilities, there is no possibility of turning away. Even doing nothing, or outlawing the advance of further capabilities, would be as much an act of intervention as exploiting our newfound capabilities to the utmost. (Lowe 1971: 368)

I want to argue that this all has relevance for the issues of spontaneity and intentionality, and of cosmos and taxis, with which we are concerned. First, there may have been a time when, relatively speaking, there was little we could do about the negative unintended effects of our socioeconomic system. This is no longer the case, or at least much less so. With our new capabilities come new responsibilities from which 'there is no possibility of turning away'. In confronting the challenges of poverty and unemployment in the 21st century, we not only can draw on the tools of new technologies and new knowledges — we can also utilise the strategies and tactics for creative discovery outlined herein to devise innovative approaches to policy formulation and implementation. Furthermore, the enhancement of the powers of creative discovery and imaginative problem-solving are possible not only for entrepreneurs, scientists, physicians, detectives, and policymakers, but for all citizens and members of the community, and should be part of the educational curriculum. The extension and expansion of the realm of creative discovery and imaginative problem-solving is also part of a transition in the evolutionary process from one of unconscious evolution to conscious evolution of the human species, and not just conscious evolution, but the evolution of consciousness (Roszak 1975). Thus, much of what was once 'spontaneous' is becoming increasingly intentional, can become increasingly intentional, and must become increasingly intentional, while conscious efforts for individual and social betterment — rooted in individual and social responsibility — can be increasingly experienced as 'spontaneous' decision as the result of conscious emphasis on empathetic understanding and the creative process in education and other sites of socialisation. In this way, the communal basis for individuation and self-actualisation can be strengthened, and the capacity for individual and social freedom enlarged.

NOTES

1 Of course, the voluntary adoption of social codes or rules of conduct is by no means isolated to England, a point that Lowe emphasises: 'It is true I have spoken of England. But in the last resort I am not concerned with the unique historical phenomenon of a particular country and people and their future fate, but with the general pattern of a society whose mode of life is spontaneous collectivism' (1937a, p. 40).

2 For more on Vygotsky and Lowe, see Forstater (1997: 161).

3 For relevant discussions of Lowe and Schutz, see Forstater (1997; 2001).


5 The interpretation given here of 'spontaneous conformity' as related to imaginative self-control in the context of social interaction may be related to the creative responsibility entailed in the individual musician-ensemble relation in improvisational music, for example, in the African Continental and Diasporan traditions. The ability of musicians to play 'free' and yet 'together' has been attributed to the 'inner pulse control' of the individual performers (Thompson 1983, p. xiii). The greater the musicians' ability to keep the inner pulse, the freer they are to explore the farthest edges of the organising principle of the composition without things 'falling apart'. In the case of spontaneous conformity in social life, the greater the commitment to community, the greater the individual autonomy possible without social disruption.

6 Schutz takes social structure as pre-given and fixed ('imposed relevances' in his terminology), concentrating instead almost exclusively on the determination of human action within that context. Although Schutz recognises the institutionalisation of action in social settings, the objectification of human intentions in sign systems and language, as well as the objectivised results of human acts, he appears to consistently avoid analysing their objective basis, viewing the latter as not a vital part of his investigation (Smart 1978, pp. 98–9).

7 And now our basic definitions of society and of self are being overtaken by new realities. I do not mean merely that never before within limits of a single generation have men been so fully exposed at so fast a rate to such earthquakes of change. I do not mean merely that we feel we are in a kind of epochal transition, and that we struggle to grasp the outline of the new epoch we suppose ourselves to be entering. I mean that when we try to orient ourselves — if we do try
REFERENCES


10. The laboratory and the market – on the production and interpretation of knowledge

Hans Siggaard Jensen and Lykke Margot Richter

Scientific knowledge is becoming increasingly important economically. Knowledge about science is also. There is a long tradition of understanding science under the auspices of philosophy, and a shorter tradition of viewing science as a social activity. Science has been made into a model for the rational, the quintessential creation of modernity. But is science a creation like a building, a construction, or is it, like language, the market or artistic styles, a result of action but not of design? What kinds of order are produced in science and what are the relationships between ways of producing knowledge and different types of orders – if any? These are questions we will discuss in the present chapter.

1. SCIENTIFIC DISCIPLINE

For a very long time the ideal order of a scientific theory has been the order of a deductive system. Euclid's Elements have been seen as the first good example (Heath 1908). A database can give us information, and we can know what type of information is contained in it, but is it knowledge? In the history of philosophical thought the question regarding knowledge has been seen as the problem of defining the necessary and sufficient conditions for a proposition; furthermore, also to draw a distinction between what is believed to be true and what is actually proven to be true belief, the latter in order to call it knowledge. And so scientific knowledge is about theories and explanations, which involves at least deductions, or is it?