

Forstater, Mathew

**Working Paper**

## Policy Innovation as a Discovery Procedure: Exploring the Tacit Fringes of the Policy Formulation Process

Working Paper, No. 221

**Provided in Cooperation with:**

Levy Economics Institute of Bard College

*Suggested Citation:* Forstater, Mathew (1997) : Policy Innovation as a Discovery Procedure: Exploring the Tacit Fringes of the Policy Formulation Process, Working Paper, No. 221, Levy Economics Institute of Bard College, Annandale-on-Hudson, NY

This Version is available at:

<https://hdl.handle.net/10419/186895>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

**Policy Innovation as a Discovery Procedure:  
Exploring the Tacit Fringes of the Policy Formulation Process**

**by**

**Mathew Forstater\***

**Working Paper No. 221**

**December 1997**

**\*Visiting Scholar, The Jerome Levy Economics Institute and Assistant Professor of Economics, Gettysburg College**

Is there a methodology of economic policy formulation? It is understandable that the pressing demands of immediate economic challenges should normally prevent there from being great amounts of attention devoted to such a meta-question. Yet certainly the discipline could benefit from at least some systematic reflection on the subject. Nevertheless, one searches in vain for extended treatments or new explorations of economic policy innovation.

The work of Adolph Lowe (1893-1995) remains an important exception in this regard. Lowe's "instrumental analysis" is a greatly overlooked and underexamined alternative methodological approach to economic theory and public policy. Lowe's "instrumental analysis" is a greatly overlooked and underexamined alternative methodological approach to economic theory and public policy. Rather than taking only the initial conditions as given and addressing theory to predicting outcomes, Lowe proposed also taking as given a pre-determined end-state: a vision of the desired outcomes. The task then becomes the derivation--the discovery--of the technical and social path(s) by which those outcomes might be achieved, the behavioral and motivational patterns capable of setting the system onto a suitable path, the environmental context(s) capable of encouraging or inducing these patterns, and policies shaping or creating the environmental contexts. The instrumental method is thus a regressive procedure, beginning from where we want to go and working backwards to our present state, or a state within our present reach (Lowe, 1977[1965], pp. 143-44). Such is the role for economics: not determining the ends--the macro goals--but rather contributing to the discovery and actualization of means for their attainment.

Lowe briefly mentions in several places the affinity of his instrumentalism with certain ideas of others. In particular, he cites the pragmatist philosopher Charles Sanders Pierce's concept of "retroduction" (and especially Norwood Hanson's elaborations of that concept), the mathematician George Polya's work on heuristics, and physical chemist and philosopher of

science Michael Polanyi's explorations of "tacit knowledge" as all having strong areas of kinship with aspects of his instrumentalism.<sup>1</sup> These references are never elaborated or explored by Lowe, amounting to no more than a sentence or a footnote in most cases. In addition, these hints have been all but entirely overlooked or ignored in the secondary literature, earning only a passing reference from Oakley (1987, p. 15), while Hagemann and Kurz (1990, pp. 746-47) at least follow-up the connection to Polya's work, albeit *very* briefly (one paragraph).

This paper will thus attempt an investigation of the relation of these concepts to Lowe's instrumentalism. It is hoped that an exploration of these ideas will constitute a first step in the project of evaluating the prospects for Lovian Instrumentalism contributing to the formulation and implementation of effective practical policies as we enter the next century. It will also be argued that such an elaboration of instrumentalism is relevant to some recent discussions concerning markets and planning that have taken place in the aftermath of the demise of the Soviet Union, in particular the new Austrian re-interpretation of the old socialist calculation debate in terms of the 'knowledge problem,' and attempts to formulate a nonessentialist approach to economic policy and planning.

## II

Polya devoted much work to heuristics, whose aim he states is to "study the methods and rules of discovery and invention" (1957[1945], p. 112). Central to heuristics is the regressive procedure Polya refers to as "working backwards." Polya notes that the Greek geometers, who called the procedure "analysis" (meaning "solution backwards" in Greek), attributed its discovery to Plato (Polya, 1984[1958], pp. 575-76). Polya has found knowledge and use of the method in

---

<sup>1</sup> See Lowe, 1969, pp. 183-84 and n24; 1976, p. 13n15; 1977, p. 332; 1992, pp. 326-27.

Euclid, and a remarkable report on the topic by Pappus, as well as remarks by Proclus (1984[1971], p. 587). Consider Polya's translation of a passage from the seventh book of Pappus' *Collectiones* concerning "*analyomenos*," which Polya translates as "Treasury of Analysis," "Art of Solving Problems," or "Heuristic" (Polya, 1957[1945], p. 141):

In analysis, we start from what is required, we take it for granted, and we draw consequences from it, and consequences from the consequences, till we reach a point we can use as a starting point in synthesis. For in analysis, we assume what is required to be done as already done (what is sought as already found, what we have to prove as true). We inquire from what antecedent the desired result could be derived; then we inquire again what could be the antecedent of that antecedent, and so on, until passing from antecedent to antecedent, we come eventually upon something already known or admittedly true. This procedure we call analysis, or solution backwards, or regressive reasoning (*ibid.*, p. 142).

This procedure is contrasted with synthesis:

[I]n synthesis, reversing the process, we start from the point which we reached last of all in the analysis, from the thing already known or admittedly true. We derive from it what preceded it in the analysis, and go on making derivations until, retracing our steps, we finally arrive at what is required. This procedure we call synthesis, or constructive solution, or progressive reasoning (*ibid.*).

Polya uses an example of a "primitive man" wishing to cross a creek to demonstrate both the use of the regressive procedure in everyday circumstances as well as to elaborate the notions of "analysis" and "synthesis" in a direction quite relevant for Lowe's instrumentalism. Getting across the creek is the desired end result. The man recalls having crossed a creek sometime before by walking along a fallen tree:

He looks around for a suitable fallen tree which becomes his new unknown... He cannot find any suitable fallen tree but there are plenty of trees standing...; he wishes that one of them would fall. Could he make a tree fall across the creek? There is a great idea and a new unknown; by what means could he tilt the tree over the creek? This train of thought ought to be called analysis [in] the terminology of Pappus (*ibid.*, p. 145).

After stating that if the "man succeeds in finishing his analysis he will be the inventor of the bridge and the axe," Polya then asks the question: "What will be the synthesis?" (*ibid.*, p. 145). The

answer is crucial: “*Translation of the ideas into action*. The finishing act of synthesis is walking along a tree across the creek”(ibid., p. 145, emphasis added):

The same objects fill the analysis and the synthesis;...the analysis consists in thoughts, the synthesis in acts. There is another difference; the order is reversed. Walking across the creek is the first desire from which the analysis starts and it is the last act with which the synthesis ends....Analysis comes naturally first, synthesis afterwards; analysis is invention, synthesis, execution; *analysis is devising a plan, synthesis carrying through the plan* (ibid., pp. 145-46).

Polya cites Hobbes:

From desire ariseth the thought of some means we have seen produce the like of that which we aim at; and from the thought of that, the thought of means to that mean; and so continually, till we come to some beginning within our own power (Thomas Hobbes, *Leviathan*, Chapter III, quoted in Polya, 1981[1962], p. 22).

We begin from where we want to go. We want to arrive at A. B would be a suitable means for attaining A. How might we get to B? C would be a suitable means for attaining B, and so on, until we arrive at “some beginning within our own power,” E. Employing the regressive procedure, we have worked backwards from our goal to our present state. This was the analysis, the plan. Now the execution of the plan may commence, *working forward* from our present state along the path we have outlined via our analysis. Thus, in “translating the ideas into action” we begin from where we are at, E, moving to D to C to B and finally to A, arriving finally at the desired end-state, the place in which we began our analysis, and completed our synthesis.

“Observe,” Polya urges, “*planning and execution proceed in opposite directions*” (Polya, 1981[1962], p. 23, emphasis added). In planning, we begin with A and end with E; in executing the plan, we begin with E and end with A: “the aim is the first thing we thought of and the last thing we laid hands on” (Polya, 1981[1962], p. 23).

The question arises in the context of Lowe’s instrumentalism: what if there is no path connecting A, our goal(s), back to E, our present state? The answer depends on where the snag

arises. We recall that in Lowe's instrumentalism, we begin with an independently given vision of the desired end-state: some politically stipulated goal or set of goals. "Instrumental inference" or "instrumental analysis" refers to the regressive procedure by which we "work backwards" from that vision. First, the technical means by which such a state may be achieved must be identified. If this is where the snag is, i.e., if the goal is not technically or physically possible given present technology and knowledge, then it will be necessary to substitute A' for A. Long term strategies might include diverting or encouraging the diversion of resources into research and development for finding technical means for attaining A.

Once a technical means has been identified, however, the next step is that suitable behavior for the setting of such a technical process in motion must be discovered, followed by the uncovering of suitable motivations capable of inducing that behavior. Technical feasibility implies behavioral feasibility in the physical sense, i.e., if there were an insurmountable obstacle in terms of human labor in physical terms, this would show up at the previous level. The only obstacle at the behavioral level then would concern social acceptability. However, since Lowe posits individual freedom as a necessary member of any set of goals, socially unacceptable behavioral requirements would be ruled out as inconsistent with any imaginable A (where  $A = \{A_1, A_2, A_3, \dots, A_n\}$ , and  $A_i = \text{individual freedom}$ ). Likewise, reasonable conceivable suitable motivations for inducing suitable behaviors would be limited only by their social acceptability.

We now reach the point of considering the environmental and institutional context(s) capable of eliciting suitable motivations. If this context is not E, i.e., the presently existing state, then policies must be implemented which would transform E into E', where E' = suitable environmental and institutional context(s) capable of inducing the suitable motivations. It may be determined that there is no path connecting E to A, but we are presently at E and we must get to

A. Thus we find a path connecting A back to E', where we may transform E into E' through some policy or set of policies.

### III

Though Polya has probably done the most to unearth the historical use of the regressive method, he does not appear to be aware of Peirce's work in this area, nor Aristotle's contribution. Peirce's terms "abduction" and "retroduction" are his translations of Aristotle's "απαγωγή," a third type of inference other than deduction and induction, discussed in the 2nd Volume of *Prior Analytics* (Hanson, 1958, pp. 85, 200n4; Fann, 1970, p. 30).<sup>2</sup>

Peirce believes there are three types of inferences: deduction, induction, and retroduction. For Peirce, retroduction is the only kind of inference that actually can create new knowledge. Hanson (1965, p. 46) finds the following distinction useful:

- 1) reasons for accepting some hypothesis H
- 2) reasons for entertaining some hypothesis H

Retroduction concerns the second; it is about hypothesis formulation and selection, rather than about rejecting or accepting some already formulated hypothesis. Retroduction is complementary to deduction and induction, but retroduction "is the first step in scientific reasoning."<sup>3</sup> Once an hypothesis is adopted, the next step for Peirce is "to trace out its necessary and probable...

---

<sup>2</sup> Peirce's writings are voluminous and fragmentary and there is some relatively minor disagreement over whether Peirce meant precisely the same thing by abduction and retroduction. Some use the terms "retroduction" and "abduction," as well as terms Peirce used in his earlier work such as "presumption," "hypothesis," and "hypothetic inference," to mean roughly the same thing (Fann, 1970, p. 5n19). Others make a distinction between abduction and retroduction (e.g., see Rescher, 1978, p. 3; Tillers and Schum, 1991, pp. 986ff.).

<sup>3</sup> See Fann, 1970, p. 35.



consequences. This step is deduction” (Peirce, 7.203)<sup>4</sup>. The next step is to compare the actual results with what was expected, that is, induction.

Likewise, Lowe also sees a role for deductive and inductive reasoning as complementing instrumental reasoning. And likewise, deduction and induction must necessarily follow from the instrumental procedure. It is through instrumental reasoning that suitable policies are discovered, policies that will recreate the conditions under which deductive reasoning may take place. It is this to which Lowe refers when he speaks of the “restoration of deduction” (1992, p. 326). But Lowe calls this instrumental-deduction because the conditions are not given but must be encouraged through policy. Lowe states that just as in the case of induction, instrumental findings are only accepted provisionally, remaining plausible until empirically confirmed (1992, p. 327).

Peirce and Hanson disagree with the common view that there is no “logic of scientific discovery.” For Peirce, retrodution is not bogged down by rules, but it does have a logical form (5.189):

The surprising fact C is observed.  
If A were true, C would be a matter of course.  
Hence there is reason to suspect that A is true.

Peirce refers to retrodution as reasoning from consequent to antecedent, or inferring a cause from its effect.<sup>5</sup> Lowe’s instrumentalism similarly works backward, but from an desired future to the present, rather than from an observed present to the past.

Hanson, following Peirce, has investigated the difference between retroductive and

---

<sup>4</sup> Peirce scholarship uses this form for citation. The number to the left of the period indicates the volume number in Peirce’s *Collected Works*; the number to the right indicates the page number of that volume.

<sup>5</sup> See Fann, 1970, p. 15. Recent investigations of abduction in work on artificial intelligence and computer-based logic may also assist in elaborating the potential contributions of the notion to policy-formulation generally, and Lowe’s instrumentalism in particular. See, e.g., Boutilier and Becher, 1995; Eiter and Gottlob, 1995.

deductive reasoning to highlight both that there is a logic to retrodution, and that its logic is distinctive. One scientist argues from premises A, B, C and hypothesis H to conclusion D. Another encounters the anomaly D, and “cojoins this statement with A, B, and C so as to ‘corner’ an hypothesis H which, when bracketed with A, B, and C will possibly ‘explain’ D. Both scientists have been arguing, both have been using their brains. Differently!” (1965, p. 64).

Whether one works the problem from the bottom up or from the top down, the question is whether there is a route connecting A,B,C with D. The logical form of the argument once we have worked backwards to the beginning looks the same: some logical route connects A, B, C, H with D. We can state this regardless of whether we have arrived at this state via progressive reasoning from A, B, C, H to D or regressive reasoning from D back to A, B, C, H. Likewise, Hanson argues, if no route connects A, B, C, and H to D then neither retrodution from D nor hypothetic deduction from A, B, C, H will be forthcoming (1965, p. 58). But, he insists, the “de facto conceptual development within the problem solving context...are different” in the two cases “and not only psychologically so!” (1965, p. 61).

These are issues which are crucial for Lowe’s instrumentalism. They also address the criticisms of those, like Machlup (1969) and Nagel (1969), who reject Lowe’s claim that Instrumental reasoning cannot be reduced to conventional procedures. Nagel, for example, writes:

Except for the fact that the sequential orders in which statements are derived in regressive and progressive procedures are generally different, it is not evident that the logic of the two procedures is different. A similar remark applies to instrumental and hypothetico-deductive reasoning in economics (Nagel, 1969, p. 64).

Insight into a key difference is provided by Hanson:

From...A, B, C, H, any two result[s]...(e.g.,  $D_1$  and  $D_2$ ) *must* themselves be consistent. Whereas, given any two sets of premisses- A, B, C, H as against A', B', C', H'- either of which may resolve...D, it is not the case that these need be mutually consistent (1965, p.

61).

The point is to get to D. Working backward from D, we may find a number of routes, say A, B, C + H<sub>1</sub> or H<sub>2</sub> or H<sub>3</sub>, *where there is no need for the alternative Hs to be mutually consistent- they are alternative suitable paths*(Hanson, 1965: 60-61). Working forward from A, B, C + H, all the members of the attainable set D<sub>1,2,3...n</sub> must be mutually consistent; there may be better paths, but we will not find them working forward: we may not find a suitable path, or we may not find the best suitable path.

Moreover, Lowe stresses that *it is through the Instrumental procedure that we discover the Hs themselves*:

If it is true that engineering rules are indispensable data for instrumental analysis, why bother with a regressive derivation of the suitable path instead of deducing them in the usual fashion from the knowledge of these rules and the initial conditions? The answer is simple. Once we *know* which members of the total set of engineering rules are goal-adequate, we can indeed deduce the path in the conventional manner. *The first step of instrumental analysis is to provide us with precisely this knowledge* (1969, p. 183).

It is to this issue that we now turn, continuing to mine the insights of Peirce and Polya, as well as those of Michael Polanyi, to elucidate and elaborate the “search procedure” of instrumental inference.

#### IV

Lowe often stressed the difficulty of expressing the “procedure of instrumental analysis in abstract methodological terms”(1977[1965], p. 145). The difficulty stems partially from the fact that, according to Lowe, there are no “formal precepts” of regressive inference (*ibid.*). Instrumental inference is characterized by Lowe as a “search procedure” and “a mental technique of problem-solving” in which solutions are “discovered” or “hit upon...through what Polanyi calls

a logical ‘leap’” (*ibid.*)<sup>6</sup>: “But they are not leaps in the dark...[O]ur search is guided by past experience, analogies, and other clues. Yet it remains true that our ultimate insight springs from a non-rational act of ‘imagination’” (1992, p. 327).

Retroductive inference or heuristics 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. Lowe believed that although “no one has as yet worked out the detailed steps,” his work on instrumental inference “in action” was a contribution toward “elaborat[ing] the logic of the procedure” (Vickers, 1991, p. 60). The remainder of this section will attempt to elaborate the search procedure at a more abstract methodological level. We have seen that Lowe did believe the overlooked work of Polanyi, Polya, Peirce, and Hanson were important contributions in the area. Thus aspects of their work may be mined, with the intention of highlighting the potential contributions of Lowe’s instrumentalism to the practical activity of policy formulation.

In Lowe’s view, heuristic principles “are really the source of all scientific knowledge, and are unlikely to be displaced by even the most sophisticated computer” (1969, p. 184). 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, etc. (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.

---

<sup>6</sup> See also 1977: 332; 1992: 327.

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).

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” (1984[1971], p. 590). This will not solve the issue comprehensively, however, 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 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 (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 recognize 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, e.g., running through the streets crying “Eureka!”(1958, p. 122).

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

Imagination is often successfully invited by putting together hitherto isolated items, by finding unsuspecting connections...As you re-arrange 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 (1959, pp. 201, 212).

Both Polanyi and Mills relate this “reorganizing” tactic with another, what Polanyi refers to as “ransack[ing] our memory for any similar problem” (1958, p. 128) and Mills calls “get[ting] a *comparative* grip on the materials” (1959, p. 215, original emphasis). This is actually what Polya was referring to in the story about the person trying to cross the creek when he stated that “the man may recall he has crossed some other creek by walking across a fallen tree” (1957[1945], 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, 1981[1962], p. 2, emphasis added), i.e., 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, 1984[1948], p. 474).

Polya distinguishes “similarity” from “analogy” as two related but distinct heuristic tools(1984[1948]). Thus we can begin to appreciate what Lowe means when he writes that in

seeking to discover the suitable path or paths to the realization of a given macro goal or goals, “our search is guided by past experience, analogies, and other clues” (1992, p. 327).

In the course of the heuristic search, we must look for “favorable signs,” which of course must not be mistaken for “proof,” but which encourage “further investigation”(Polya, 1984[1949], p. 490). Lowe as well cautions that “the findings of heuristic analysis can be accepted only provisionally”(1992, p. 327). Polya 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(*ibid.*). For Polanyi, “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...” (1958, p. 128). 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 (1958, pp. 128-29). As Lowe puts it, the “researcher ‘senses’ a structural relationship between the hypothesis he chooses and the problem he wants to solve” (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 premisses which would increase accessibility” is a “foreknowledge” which itself “biases our guesses in the right direction” (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 (1958, p. 129). These factors also help explain the “self-accelerating manner of final stages of solution”, i.e., the closer we get the faster we progress (1958, p. 129). 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” (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, 1967[1953]). To this must be added the value of imagination in making discoveries.<sup>7</sup> The difference is that in Lowe’s instrumentalism, it is not a mathematical proof that is being sought, but suitable paths to desired macro-outcomes and suitable policies for creating contexts capable of steering the system onto such a path.

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

## V

In a sense, then, instrumentalism is not “new”: Lowe describes implicit procedures and tactics of problem solving that are “taken-for-granted.” To the extent that these general tendencies are not explicitly taboo, Lowe’s call is for making these procedures conscious and recognizing their potential contribution to enhancing the power and success of the planning and policy-formulating processes.

Lowe’s proposition that instrumental inference may greatly improve the efficacy of policy and planning is relevant to recent discussions that have taken place in the post-Soviet era. First, it

---

<sup>7</sup> Cf. Lowe, 1992, p. 327.



is relevant to the recent Austrian emphasis on the “knowledge problem” as the basis for understanding both the collapse of Soviet-style systems and the theoretical issues regarding the “socialist calculation debate” (Lavoie, 1985). Specifically, understanding and elaboration of Lowe’s method for policy and planning precisely addresses some of the key Austrian arguments against government intervention. Second, and relatedly, the interpretation of instrumentalism being offered here has points of contact with and may contribute toward the project of formulating an alternative approach to ‘rational planning.’

The socialist calculation debate was not about capitalism versus socialism: it was about whether neoclassical general equilibrium analysis could be the basis of socialist central planning.<sup>8</sup> Lange and Lerner said yes; Mises and Hayek said no. The Mises and Hayek argument has been developed into what is now referred to as the “knowledge problem” (Lavoie, 1985, ch. 3). Interestingly, Polanyi’s notion of “tacit knowledge” is used to make the argument against the efficacy of planning (Lavoie, 1985), whereas here we are viewing Polanyi’s work, in its usefulness in explicating and elaborating Lowe’s instrumental inference, as a potential *contribution* to planning.<sup>9</sup>

The Austrians are right to emphasize issues of knowledge. They are wrong--logically inconsistent--in singling out policy formulators as uniquely exempt from employing “tacit powers” in their own work. Why is it that everyone, including scientists, have tremendous powers of creative discovery...everyone, that is, except planners? As Lowe has demonstrated, the policy-formulator and planner as well--or even especially--may draw on the great resources provided by

---

<sup>8</sup> See Kirzner, 1988; Ruccio, 1992.

<sup>9</sup> Donald Winch, writing in his review of *On Economic Knowledge* that “the charges of ‘scientism’ used originally by Hayek and others to attack planning are here inverted to provide support for a *dirigiste* position,” is apparently the only person who has commented (and that in passing) on this general aspect of Lowe’s work (1967, p. 861).

regressive inference.

Lavoie (1985, p. 51), opens his chapter on the “Knowledge Problem” quoting Lachmann:

The business man who forms an expectation is doing precisely what a scientist does when he formulates a working hypothesis. Both business expectations and scientific hypotheses serve the same purpose; both reflect an attempt at cognition and orientation in an imperfectly known world, both embody imperfect knowledge to be tested and improved by later experience (Lachmann, 1978, p. 23, quoted in *ibid.*).

This describes the same world recognized by Lowe as that which the instrumental analyst faces.

Why then cannot the tasks of policy formulators and planners be described in a similar fashion?

Why may scientists employ these creative implicit powers in their invention, but not those who formulate policy? What about scientists who are employed by the government? Are scientists employed at private universities capable of tacit powers of discovery that those at State schools are not?<sup>10</sup>

Will planners be wrong sometimes? Of course, just as “entrepreneurs” and “scientists” are often wrong. As Robin Blackburn has recently pointed out, the Austrian argument about “dispersed knowledge” can be used to argue that only workers and not capitalists could effectively manage production (1991, p. 36). Are the impacts of entrepreneurial mistakes slight relative to those of planners? By no means. Some entrepreneurial mistakes are very costly to society, as are some entrepreneurial *successes*. There is simply no logical reason to exclude planners and policy formulators from the rest of humanity. Is there corruption? Of course, just as

---

<sup>10</sup> Elsewhere, Lachmann calls the “concept of ‘plan’...a fundamental hermeneutic notion”, and states that it “will have to be introduced into the theory of consumption”, asking: “If firms can make plans, why not households”(1991, p. 145). And why, we must ask, not other social groups, such as neighborhoods, communities, cities, states, nations, or regions? As Vietorisz reminds us, planning, as an “exercise of social intent...shares the characteristics of all deliberate action...all deliberate human action aims in part at social effects” (1983, pp. 473-74). The Austrian dichotomous treatment of “market” and “state” activities on these grounds simply does not hold up.

there is corruption in the private sector.

The Austrian emphasis on the knowledge problem is a valid and important critique of planning based on a narrow view of “rationality.” But Lowe’s work suggests that planning, or policy formulation, can be thought of as kind of discovery procedure as well. In fact, Lowe is not alone in this regard. A number of alternatives to “rational” or “optimal” planning have been developed which criticize the essentialist and technocratic nature of traditional central planning. Aspects of “mixed-scanning,” “general systems,” and “learning-adaptive” approaches provide a number of helpful insights into strengthening the ways in which collective problems requiring meaningful attention may be addressed.<sup>11</sup> Many in the Marxian/socialist tradition have also rejected the dichotomous “market vs. plan” view.<sup>12</sup>

Not surprisingly, “postmodern planning” can also be located, though (equally unsurprisingly) the term is used by different authors to express a wide variety of views.<sup>13</sup> Amariglio and Ruccio reject the “totalizing promise of rational centralized planning” as “modernist” (1995, p. 22). Postmodern planning explicitly acknowledges uncertainty, and that the planning process “will always be marked by the mediation of different knowledges and subjectivities”; its results are expected to be, and so are treated as, provisional and contingent (*ibid.*). The points of contact between aspects of these alternative approaches to planning and instrumentalism are evident. These attempts may gain much from the work begun by Lowe, just as extensions and elaborations of instrumentalism may benefit from these recent explorations.

---

<sup>11</sup> See, e.g., Wilson, 1980; Los, 1981.

<sup>12</sup> See, e.g., Ruccio, 1992.

<sup>13</sup> See, e.g., Dear, 1986; 1989; Ryan, 1982; Cooper and Burrell, 1988

## VI

This paper has attempted to take a first step in elaborating some aspects of Lowe's instrumentalism that have not received much, if any, attention. It is clear that Lowe believed instrumentalism to be a distinct approach to policy formulation with significant advantages over traditional approaches. While Lowe made passing references to the ideas of others which he believed had family resemblances to his conception of instrumental inference, he did not himself explore these connections in any detail. Further work along these lines may assist in elaborating Lowe's hints in ways that may prove constructive in the task of refining and improving the effectiveness of policy formulation and planning.

### **Bibliography**

- Amariglio, Jack, and David F. Ruccio, 1995: "Postmodernism, Marxism, and the Critique of Modern Economic Thought," in A. Callari, S. Cullenberg, and C. Biewener (eds.): *Marxism in the Postmodern Age*, New York: Guildford Press.
- Blackburn, Robin, 1991: "Fin de Siècle: Socialism after the Crash," *New Left Review*, No. 185, pp. 5-66.
- Boutilier, Craig, and Verónica Becher, 1995: "Abduction as Belief Revision," *Artificial Intelligence*, 77, pp. 43-94.
- Cooper, Robert, and Gibson Burrell, 1988: "Modernism, Postmodernism, and Organizational Analysis: An Introduction, Part I," *Organizational Studies*, 9, 1, pp. 91-112.
- Dear, Michael, 1986: "Postmodernism and Planning," *Environment and Planning D: Society and Space*, 4, pp. 367-84.
- , 1989: "Privatization and the Rhetoric of Planning Practice," *Environment and Planning D: Society and Space*, 7, pp. 449-62.
- Eiter, Thomas, and Georg Gottlob, 1995: "The Complexity of Logic-Based Abduction," *Journal of the Association for Computing Machinery*, 42, 1, pp. 3-42.

- Fann, K. T., 1970: *Peirce's Theory of Abduction*, The Hague: Martinus Nijhoff.
- Gelwick, Richard, 1977: *The Way of Discovery*, New York: Oxford University Press.
- Hagemann, Harald and Heinz Kurz, 1990: "Balancing Freedom and Order: On Adolph Lowe's Political Economics," *Social Research*, 57, pp. 733-53.
- Hanson, Norwood, 1958: *Patterns of Discovery*, Cambridge: University of Cambridge Press.
- , 1965: "Notes Toward a Logic of Discovery," in R. J. Bernstein (ed.): *Perspectives on Peirce*, New Haven; Yale University Press.
- Kirzner, Israel M., 1988: "The Economic Calculation Debate: Lessons for Austrians," *Review of Austrian Economics*, 2, pp. 1-18.
- Lachmann, Ludwig, 1991: "Austrian Economics: A Hermeneutic Approach," in D. Lavoie (ed.): *Economics and Hermeneutics*, London: Routledge.
- Lavoie, Don, 1985: *National Economic Planning: What is Left?*, Cambridge, MA: Ballinger.
- Los, Marc, 1981: "Some Reflexions on Epistemology, Design, and Planning," in M. Dear and A. J. Scott (eds.): *Urbanization and Urban Planning in Capitalist Society*, London: Methuen.
- Lowe, Adolph, 1977[1965]: *On Economic Knowledge: Toward a Science of Political Economics*, Enlarged Edition, Armonk: M. E. Sharpe.
- , 1969: "Economic Means and Social Ends: A Rejoinder," in R. L. Heilbroner(ed.): *Economic Means and Social Ends: Essays in Political Economics*, Englewood Cliffs: Prentice-Hall.
- , 1976: *The Path of Economic Growth*, Cambridge: Cambridge University Press.
- , 1977: "Political Economics in the Late Twentieth Century," in *On Economic Knowledge: Toward a Science of Political Economics*, Enlarged Edition, Armonk: M. E. Sharpe.
- , 1992: "A Self-Portrait," in P. Arestis and M. Sawyer(eds.): *A Biographical Dictionary of Dissenting Economists*, Hants: Edward Elgar.
- Machlup, Fritz, 1969: "Positive and Normative Economics: An Analysis of the Ideas," in R. L. Heilbroner (ed.): *Economic Means and Social Ends*, Englewood Cliffs: Prentice-Hall.
- Mills, C. Wright, 1959: *The Sociological Imagination*, New York: Oxford University Press.

- Nagel, Ernest, 1969: "Method in Social and Natural Science," in R. L. Heilbroner (ed.): *Economic Means and Social Ends*, Englewood Cliffs: Prentice-Hall.
- Oakley, Allen, 1987: "Introduction: Adolph Lowe's Contribution to the Development of a Political Economics," in A. Lowe: *Essays in Political Economics: Public Control in a Democratic Society*, ed. Allen Oakley, Brighton: Wheatsheaf Books.
- Ochs, Peter, 1993: "Charles Sanders Peirce," in D. R. Griffin, *et al.*: *Founders of Constructive Postmodern Philosophy*, Albany: SUNY Press.
- Peirce, Charles S., 1931-60: *Collected Papers*, C. Hartshorne and P. Weiss eds., Cambridge: Harvard University Press.
- Polanyi, Michael, 1958: *Personal Knowledge*, Chicago: University of Chicago Press.
- , 1959: *The Study of Man*, Chicago: University of Chicago Press.
- , 1966: *The Tacit Dimension*, Garden City: Doubleday.
- Polya, George, 1957[1945]: *How To Solve It: A New Aspect of Mathematical Method*, Princeton: Princeton University Press, 2nd ed.
- , 1984[1948]: "On Patterns of Plausible Inference," in G.-C. Rota (ed.): *George Polya: Collected Papers*, Volume IV, Cambridge: MIT Press.
- , 1984[1949]: "Preliminary Remarks on the Logic of Plausible Inference," in G.-C. Rota (ed.): *George Polya: Collected Papers*, Volume IV, Cambridge: MIT Press.
- , 1984[1958]: "On the Curriculum for Prospective High School Teachers," in G.-C. Rota (ed.): *George Polya: Collected Papers*, Volume IV, Cambridge: MIT Press.
- , 1981[1962]: *Mathematical Discovery: On Understanding, Learning, and Teaching Problem Solving*, New York: Wiley & Sons.
- , 1984[1971]: "Methodology or Heuristics, Strategy or Tactics?," in G.-C. Rota (ed.): *George Polya: Collected Papers*, Volume IV, Cambridge: MIT Press.
- Rescher, Nicholas, 1978: *Peirce's Philosophy of Science*, Notre Dame: University of Notre Dame Press.
- Ruccio, David F., 1992: "Failure of Socialism, Future of Socialists," *Rethinking Marxism*, 5, 2, pp. 7-22.
- Ryan, Michael, 1982: *Marxism and Deconstruction*, Baltimore: Johns Hopkins University Press.

- Schutz, Alfred, 1967[1953]: "Common-Sense and Scientific Interpretation of Human Action," in M. Natanson (ed.): *Collected Papers*, Volume I, The Hague: Martinus Nijhoff.
- Tillers, Peter, and David Schum, 1991: "A Theory of Preliminary Fact Investigation," *U.C. Davis Law Review*, Vol. 24, No. 4, pp. 931-1012.
- Vickers, Jean (ed.), 1991: *Rethinking the Future: The Correspondence Between Geoffrey Vickers and Adolph Lowe*, New Brunswick: Transaction Publishers.
- Vietorisz, Thomas, 1983: "Planning and Political Economy," *Social Research*, 50, pp. 469-84.
- Wilson, David E., 1980: *The National Planning Idea in U.S. Public Policy: Five Alternative Approaches*, Boulder. CO: Westview.
- Winch, Donald, 1967: "Review of *On Economic Knowledge*," *The Economic Journal*, December, pp. 860-861.