In partial praise of a positivist

The work of Otto Neurath

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There is a tradition in socialist writing of rediscovering neglected socialist thinkers and showing how the recovery of their memory can contribute to the solution of contemporary problems in socialist theory and practice. This paper belongs to this genre of rediscovery.

The theorist with whom I am concerned was an Austrian Marxist. He played an active part in the German revolution that followed the First World War: some of his best work on socialist planning was written as addresses to the workers' councils of Germany, and he acted as director of the agency responsible for socialization during the soviet phase of the Bavarian revolution. Following the defeat of the Bavarian revolution he was brought to trial, during which Max Weber testified in his defence. His work on socialist economics formed one of the starting points of the socialist calculation debate, being an object of criticism in the arguments against socialism developed by Mises and Weber, and later Hayek. In the 1920s, '30s and '40s he continued to develop a defence of socialism which examined problems of socialist planning in a way that took seriously the ecological dimension of socialist thought, and recognized the problems of reconciling individual freedom and economic planning. He was also a major philosopher of science whose work in that area has continued to be influential. However, in the history of socialist thought he rarely gets a mention, and no standard survey of Western Marxism discusses his socialist ideas. Indeed, he tends to be known by two quotations, which might give the impression that his main concerns were boat-building at sea and the role of coffee drinking in the development of sociological thought.[1] The reason for the neglect is that my socialist philosopher, Otto Neurath, was a positivist and a leading member of the Vienna Circle.

Positivism has become a term of abuse in academic circles generally, and particularly amongst socialists. From the Frankfurt School the story has emerged that positivism is a conservative doctrine necessarily committed to existing social institutions and to a technocratic conception of politics.[2] Even the most scientistic orthodox Marxist is unlikely to announce that she is a positivist. Such is the disrepute into which positivism has fallen that to accept the title of positivist would amount to an admission that one's position was untenable. The picture of positivism that informs its use as a term of academic abuse is a caricature. Positivist philosophy was much more heterogeneous than recent thumbnail versions allow, and many of the doctrines ascribed to it were explicitly rejected by many of its proponents.[3] Neurath himself was unhappy with the term for the very reason that it suggested a systematic set of doctrines incompatible with the methodological pluralism he defended, although 'not being a pedant' he was willing to 'bear it'.[4]

It is a feature of fashion in intellectual history that one generation reduces the previous generation's orthodoxy to a few simple and easily criticizable slogans, only for the next generation to rediscover their grandparents' genius. No doubt the time for the positivist movement to be rescued from simplification will come. However, it is not my purpose to defend positivism, still less to resurrect it. Many of the epistemological, ontological and ethical doctrines Neurath himself defends are ones that I would reject.

My purpose in this paper is narrower: to show why his social and political thought remains worthy of consideration. It is of value for at least three reasons. First, while it was at the heart of the socialist calculation debate, Neurath's contribution to the defence of socialism in that debate has been forgotten. That it has been lost to memory has weakened the socialist case, and rendered that for the market stronger than it is. Second, his work on unified science, which also indirectly

addresses problems of planning and markets, raises problems of importance that have been lost in the caricature of the project for unified science. Third, Neurath made a contribution to the development of an associational account of socialism that took seriously the problems of reconciling socialism with both ecological ends and individual freedom. All three features of his work render it of particular relevance to current problems for socialist and Green theory and practice.

The socialist calculation debates

There is a received story about the socialist calculation debate that goes like this. In a paper published in 1920,[5] later incorporated into a book in 1922,[6] Mises presented an argument which asserted that rational economic calculation would not be possible within socialism. Hence, a socialist economy was not a real practical possibility. The core of Mises' argument was refined by Hayek as an epistemic argument against the possibility of a planned economy.[7] The socialist response to this position was articulated by Lange and Taylor.[8] The socialist calculation debate is then presented primarily as a conflict between Mises and Hayek on the one hand, and Lange and Taylor on the other, different sides being accorded the laurels of victory.[9] This story is unsatisfactory. First, this account of the debate is focused on the later English-speaking phase of the debate and underplays the initial German-speaking chapter which involved Neurath, Polanyi and others. Second, and more significant, it has given a mythical unity to the debate. There was no socialist calculation debate. There were at least two debates that concerned two independent objections to the possibility of socialism. The first debate, to which Mises' article was a contribution, was an argument about rational choice and commensurability – specifically the possibility of rational economic action in the absence of a single unit of comparison between alternative economic activities. Neurath's direct contribution to the socialist calculation debates was to this phase, and his arguments formed I believe a convincing response to Mises' objection to socialism. The second debate, instigated by Hayek's epistemic objection to socialism, concerned the possibility of planning, given the dispersal of knowledge amongst different actors in an economy. While Hayek presents his epistemic argument as a continuation of the first debate, it in fact forms a departure from it. Neurath made no direct contribution to the second debate. However, his writings in the 1930s on the unity of the sciences do have a bearing on that argument.

Mises' arguments against a socialist economy, understood as an economy without a market in production goods, turned on a point about commensurability: rational economic decision-making, beyond the most simple individual decisions, requires a single measure on the basis of which the worth of alternative states of affairs could be calculated and compared. Thus, for example, given the choice 'whether we shall use a waterfall to produce electricity or extend coal and better utilize the energy contained in coal',[10] we need some way of calculating the advantages and benefits of alternatives, and this in turn requires a common unit of measurement. The 'subjective use-value of commodities' provide no units for computation – 'judgements of value do not measure: they arrange, they grade'.[11] Hence such values cannot enter directly into comparisons between options. A common unit of measurement is provided by monetary prices in the market: 'calculations based upon exchange values enable us to reduce values to a common unit'.[12] It forms, indeed, the only adequate unit of comparison. Comparability between options requires monetary prices that measure exchange values such that one is able to have a determinate answer to the advantages of alternatives by way of simple rules.

In developing this objection to socialism, one of Mises' central targets was Neurath's 1919 report to the Munich Workers' Council, 'Through War Economy to Economy in Kind'.[13] Neurath had there argued that a socialist economy, since it was to consider the use-value of goods only, would have to be a non-market 'economy in kind', in which there would exist no role for monetary units to compare options:

> We must at last free ourselves from outmoded prejudices and regard a large-scale economy in kind as a fully valid form of economy which is the more important today in that any completely planned economy amounts to an economy in kind. To hold on to the split and uncontrollable monetary order and at the same time to want to socialize is an inner contradiction.[14]

In such an economy, while physical statistics about energy use, material use and so on would be required, there would be no need for a single unit of comparison.

> There are no units that can be used as the basis of a decision, neither units of money nor hours of work. One must directly judge the desirability of the two possibilities.[15]

There is no simple unit for decision-making. Rather, one requires direct comparisons of alternatives, and hence there is no possibility of excluding political and ethical judgements from even 'technical' decisions. In making this claim, Neurath is not only criticizing the market, but

also socialist alternatives to the market that employ single units in making decisions, be these labour hours or the energy units of earlier ecological economists such as Popper-Lynkeus and Ballod-Atlanticus. It is a position Neurath reaffirms in his later contributions to the socialist calculation debate. Thus in his 1928 article 'Personal Life and Class Struggle', Neurath takes up Mises' examples of choosing between alternative sources of energy and responds thus:

> The question might arise, should one protect coal mines or put greater strain on men? The answer depends for example on whether one thinks that hydraulic power may be sufficiently developed or that solar heat might come to be better used, etc. If one believes the latter, one may 'spend' coal more freely and will hardly waste human effort where coal can be used. If however one is afraid that when one generation uses too much coal thousands will freeze to death in the future, one might use more human power and save coal. Such and many other non-technical matters determine the choice of a technically calculable plan ... we can see no possibility of reducing the production plan to some kind of unit and then to compare the various plans in terms of such units...[16]

Rational practical thinking need not involve any single unit that reduces decision-making to a purely technical procedure. It requires ethical and political judgement.

The debate between Mises and Neurath turns on differences concerning the nature of practical rationality. For Mises any rational decision, beyond the most simple, requires the commensurability of different values. There needs to be a single common unit which reduces the choice between different options to a matter of calculation. Mises assumes an algorithmic conception of practical reason. Rational decision-making requires the application of mechanical procedures of calculation to arrive at a determinate answer to any question.[17] Neurath rejects this account of rational choice for both practice and theory. It exhibits what he calls 'pseudorationalism'. The basis of Neurath's objections to this view are to be found in two of his earliest papers, 'The Lost Wanderers of Descartes and the Auxiliary Motive' (1913) and 'The Problem of the Pleasure Maximum' (1912).

In 'The Lost Wanderers of Descartes and the Auxiliary Motive' Neurath criticizes the algorithmic view of reason, that one can give a set of rules that determine unequivocally a particular decision: 'in many cases, by considering different possibilities of action, a man cannot reach a result.'[18] Our knowledge that informs decision-making is uncertain and the rules of rationality rarely determine a unique answer given what is known. A rationalist who believes in reason must recognize the boundaries of the power of reason in arriving at decisions: 'Rationalism sees its chief triumph in the clear recognition of the limits of actual insight.'[19] It is a mark of the pseudorationalist to believe that there exist rules of insight that determine answers to all decisions. Pseudorationalism exists not only in the domain of action but also of thought, in the belief that there exist rules for the scientific method which if followed eliminate falsehood and lead to ever nearer approximations to the truth. What marks the philosophy of Descartes is a realization of the limits of rules of reason in action, but a failure to recognize similar limits in the rules for the direction of the mind. Just as in action, so in theoretical matters, reason underdetermines our theories.

It is on this basis that Neurath later criticizes Popper's philosophy of science in 'Pseudorationalism of Falsification' (1935b), and his arguments in that paper develop clearly his rejection of an algorithmic conception of reason. Popper's falsificationism exhibits pseudorationalism in the domain of thought: it is driven by the belief that valid scientific argument is fully capturable in a set of deductive rules that unequivocally eliminate candidates for the truth. Against that view Neurath notes the now much repeated observation that the historical development of the sciences required that some statements be regarded unfalsifiable.[20] Against both 'the absolutism of falsificationism ... and the absolutism of verificationism'[21] (and it is notable that he does not take verificationism to define positivism) Neurath defends a principle of methodological pluralism and tolerance:

> We believe we are doing the most justice to scientific work if, in our model construction, we set out from the assumption that always the whole mass of statements and all methods can come under discussion. ... Various factors determine the methodical scientist in his choice of a model. We deny that the encyclopedia preferred by the scientist can be logically selected by using a method that can only be generally outlined.
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> Together with this we not only deny that there could be general methods of 'induction' for the factual sciences, but also that there could be general methods of 'testing' – however, Popper advocates just such general methods of 'testing'.[22]

Neurath's critique of Popper deserves to be better known. It anticipates much of more recent post-Kuhnian philosophies of science. The rejection of falsificationism on the ground that it is inadequate to the history of science predates Kuhn. The belief in the impossibility of a simple general method for science predates

Feyerabend. Indeed, like Feyerabend, Neurath's tolerance extends even to the rules of deduction and the demands of consistency:

> I knew very well that in any consistent system of statements a single contradiction would 'infect', as it were, the whole body and would enable one to infer anything one pleased. I also knew that in the practice of scientific behaviour, occasional contradictions did not destroy the work. ... Our scientific practice is based on local systematizations only, not on the overstraining bow of deduction.[23]

However, unlike Feyerabend, Neurath recognizes that this position is quite compatible with a proper rationalism, since such rationalism is consistent with the recognition of the limits of rules of reason. It is pseudorationalism to believe that the rules of reason determine unique answers for us in the domains either of action or of thought. There are no algorithms that substitute for judgement applied in local contexts.

In his paper 'The Problem of the Pleasure Maximum' Neurath criticizes a second assumption that Mises was to make in his opening salvo against socialism, that values are commensurable – that is, that there is a scale of values according to which options can be uniquely ordered. Neurath rejects that assumption, somewhat surprisingly, from within a hedonist perspective. Neurath throughout his writings defends a utilitarian and Epicurean position which takes the good of social policy to be the maximization of happiness understood as pleasure. However, he rightly rejects the possibility of units of pleasure on which calculations could be made.[24] Even given the aim of pleasure maximization, there is no possibility of a purely technical ordering of states of affairs: pleasures are themselves incommensurable. In his work on planning this point has a more general significance. It follows that even on the simplifying assumption of a single evaluative category, no planner could ignore substantial value questions and treat a decision in ethically neutral technical terms.

The rejection of the pseudorationalism of algorithmic rules and of the assumption of value commensurability informs Neurath's conception of non-market socialism as an economy of kind, and lies at the basis of his arguments in the socialist calculation debate. Mises' attack on the possibility of socialism exhibits precisely the kind of pseudorationalism in the domain of practical reason that Neurath had attacked in his earlier writings. In so far as this first phase of the socialist calculation debate is concerned, Neurath's position is the stronger. He rightly allows that comparability need not assume commensurability, that there is not any rule that can be mechanically applied to produce a determinate decision as to which plan to adopt, and that there is an ineliminable role for non-technical judgement in the most technical of decisions.[25] Here the myth that there was a single socialist calculation debate gets in the way of seeing the strengths of socialist positions like Neurath's. Contrary to Hayek's accepted definition of the debate, Neurath's account of social and economic planning allowed for a role for non-technical judgements, which his Austrian opponent in the socialist calculation debate denied. It was not positivists like Neurath who had an algorithmic conception of practical rationality but their opponents.

The myth that there was a single debate has had other unfortunate consequences for socialists. The absence of subsequent discussion of Mises' original argument has meant that the commensurability assumption Mises defends has become an unquestioned dogma. The assumption that rational economic activity requires commensurability was accepted without question by Lange and Taylor in their contribution to the debate. It has also been largely assumed elsewhere in both Austrian and neo-classical economics and has re-emerged as an explicit assumption in environmental economics. Thus, for example, the attempt to shadow price all environmental goods for the purposes of cost–benefit analysis is founded on the claim that rational decision-making requires a single monetary unit of calculation. Typical is the comment in the influential Pearce report: 'CBA is the only [approach] which explicitly makes the effort to compare like with like using a single measuring rod of benefits and costs, money'.[26] Neurath's response to Mises has continuing significance for both socialists and Greens and deserves to be rescued from its undeserved obscurity.

The unity of the sciences

An examination of Neurath's papers of the 1930s suggests that in terms of quantity alone, the project of a unified science dominated all others.[27] The concern was related to his treatment of the problems of socialist planning. Planning raises not only problems of value commensurability, but also problems concerning the division of knowledge between different groups and individuals in society. Is rational social planning possible given the division of knowledge? This question forms the basis of the second phase of the socialist calculation debate instigated by Hayek. While Hayek presents his position as a development of Mises' position, it is so only if one puts heavy emphasis on some of Mises' passing comments and ignores the central arguments about commensurability. Hayek's position was a departure in the debate. His argument against planning is epistemic –

that the social division of knowledge, the dispersal of knowledge amongst different actors, rules out the possibility of rational plans in a socialist economy. While Neurath does not address that argument directly, the project of a unified science aims in part at showing that the divisions of knowledge could be overcome for the purposes of rational socialist planning.

Subsequent accounts of the project of a unified science have tended to oversimplify the programme. The project took one of four forms: (1) a reductionist project in which all the sciences would be logically derivable via bridge-laws from physics;[28] (2) a programme for a unified method which would be followed by all sciences; (3) a project for a unified language of science; and (4) a project that would integrate the different sciences, such that, on any specific problem, all relevant sciences could be called upon – a project for the 'orchestration of the sciences'.[29] All four doctrines were defended by positivists in different stages of its history. However, in subsequent critical accounts of the doctrine, the first has tended to be taken to define the project, and the last has tended to be ignored, or at least has been taken as a project of integration through reduction. This picture again ignores the heterogeneity of the positivist movement and of the arguments that it generated.

Neurath rejects the first reductionist project completely: 'would it not be preferable to treat all statements and all sciences as coordinated and to abandon for good the traditional hierarchy: physical sciences, biological sciences, social sciences and similar types of "scientific pyramidism"?'[30] Opposition to pyramidism runs through Neurath's work on unified science. So also does a rejection of the second doctrine, the possibility of a unified method for the sciences. As we have seen, that search Neurath took to form a part of pseudorationalism: hence his opposition to the absolutism both of falsificationism and of verificationism. On method Neurath was a pluralist. Indeed, the denial of pyramidism is based in part on this pluralism and his rejection of pseudorationalism. Given that there is no set of rules that determine a unique answer to either practical or theoretical matters, one cannot rationally expect to arrive at a deductively closed and consistent set of statements, in which statements in the 'higher' sciences are deduced from those below them. Hence his advocacy of 'encyclopedism': 'I thought it in accord with the historically given situation to acknowledge ... "localized" contradictions, and to think of an "encyclopedia as a model" as intentionally opposed to the "system as a model".'[31]

In defending the programme for a unified science, Neurath was concerned to defend the third and fourth projects, that of unifying the language of science and that of the coordination of the sciences. In the project of a universal language or 'jargon' for the sciences, Neurath appears in the guise that the later images of positivism have constructed. Neurath believed it basic to the movement for a unified science: 'The fundamental thesis of our movement is that terms similar to those employed in physics and everyday language are sufficient for constructing all sciences.'[32] In defending this thesis, Neurath expresses a more familiar positivist commitment to the elimination of 'metaphysical' terms for unified science. This physicalist version of the eliminative project is less dogmatic than others: for example, it makes no attempt to reduce either scientific or ordinary language terms that have a physical reference to some more basic observation language in the manner of earlier positivists. It includes in the universal slang the unreduced physical language of everyday folk. However, it remains true that it does entail that terms without a physicalist interpretation are to play no role in the sciences. The familiar consequences of the doctrine are apparent in Neurath's discussion of the social sciences, which advocates the elimination of intentional, ethical and metaphysical terms: hence the abolition of terms such as ' "existence", "entity", "reality", "thing", "fact", "concept", "mind", "mental world", "physical world", "meaning", "progress", "the beautiful", "the good" '.[33] Hence also Neurath's rejection of any interpretative component in the social sciences.

The unified language version of the unified science project is that which is most clearly positivistic in the sense in which the term has been used in later accounts of the movement. It is also, I believe, indefensible. It is not insignificant that Neurath continually uses in his papers vocabulary that fails his own physicalist sanitization programme. To state and defend that project he requires the use of such terms. As I noted at the outset, it is not my purpose in this paper to rescue positivism nor to defend its physicalist offspring. Moreover, while Neurath himself took the eliminative project to be at the core of the unified science programme, and while it might form a (misguided) route to the orchestration of the sciences, it is not a necessary condition for the project of orchestration. Just as the programme of orchestration does not require a unified method, nor does it require a sanitized language.

The aim of orchestrating the sciences was the most important but least discussed component of the programme for unified science. The intent of the other projects was the realization of the coordination of different disciplines.

The purpose of this work [the International

> Encyclopedia of Unified Science] is to explore the foundations of the various sciences and to aid the integration of scientific knowledge. The universe does not follow the division of departments of a university.

The aim was an encyclopedia in which all the different sciences would be coordinated and incompatibilities addressed, a project that represents a modern form of the Enlightenment's encyclopedic ambitions. The problem that it addresses is the way that questions about particular states of affairs draw on different sciences. This problem is central to any possibility of social planning that calls on a variety of forms of knowledge. Moreover, the raising of this problem need not have any scientistic or technocratic consequences. Rather, it is important in critically addressing the limits of the authority of scientists.

Consider, for example, the biochemist who claims that, since all biological processes are ultimately chemical, there can be no difference between the use of artificial and natural chemicals in farming, nor between inorganic and organic agriculture. The judgement appears to be one that the biochemist is able to make – it calls on knowledge of his field – and it is true that such knowledge is relevant to the merits of different forms of agriculture. However, the judgement he makes about their respective merits calls on fields beyond his authority. The abstract and general principles of biochemistry cannot of themselves deliver the more specific knowledge required to answer questions about different kinds of agriculture. It fails to allow that judgements about particular kinds of agriculture need to appeal to other disciplines – to biology and ecology, for example. It also needs to call on judgements which are not about the soil at all, but about the institutional and social context in which agriculture takes place. The introduction of fertilizers has economic and social implications on which no natural science would provide judgement. A fault of purely 'technical' solutions to economic problems in the past has been a kind of 'technical utopianism' which ignores such considerations. The programme of orchestrating the sciences, at least in the hands of Neurath, aimed at resolving just such problems.

The programme of orchestration is independent of the other projects that typically are taken to define the unity-of-science project. The version of orchestration that Neurath defends is explicitly distanced from the pyramidical programme of reducing social to biological to physical science. Moreover, as noted above, it is compatible with pluralism not just at the level of method, but also, against Neurath, at the level of languages. A physicalist language is not required to realize the coordination of disciplines that Neurath defends. The orchestration of human and physical sciences, for example, does not require elimination of the intentional language required to characterize human institutions properly.

The project of orchestrated science is neither technocratic nor scientistic as such. Rather, it highlights the limits of the authoritative judgements of any particular 'expert' in a single discipline about particular matters. However, it could not in itself solve the problems of moving from universal scientific principle to particular applications. Not all knowledge can be articulated in encyclopedic form; and, even in the case of a unified body of articulated knowledge, there is no reason to suppose that it can deliver 'authoritative' judgements on any particular case – some knowledge is practical knowledge embodied in skills and know-how that cannot be articulated in propositional form. For these reasons it fails to meet Hayek's challenge to socialism.

The claim that not all knowledge can be articulated in propositional form is the central assumption in Hayek's epistemic case against central planning. While Hayek frames the argument in terms of the division of knowledge in society, that does not form the key to his argument. It is rather the dispersal through society of that local knowledge that cannot be articulated or vocalized, and hence necessarily could not form an item that could be passed on to a central-planning body. Hence, any attempt to centralize economic planning decision-making reduces the amount of knowledge that is available. Hayek's argument against the possibility of complete centralized planning is sound and one need not accept his positive argument for the market to accept it.[34] The positive argument depends on the assumption that only the market can coordinate dispersed nonvocalizable knowledge. This is false: even the centralized firm of existing society must make use of local knowledge that is distributed within the institutional. Indeed Hayek's point is one that has been articulated within the history of socialist planning as an argument for democratic and decentralized decision-making and for a proper appreciation of the limits of scientific expertise.[35]

Individuals often have local practical knowledge relevant to the application of general principles – workers and peasants are sometimes quite properly sceptical about the self-confidence of the advice offered by newly trained university graduates; their own everyday knowledge of the materials and soils they work with often provides a useful corrective to scientific authority. For similar reasons, parents are properly wary of the latest manuals for child care; and teachers, nurses and

others in practical professions ought to hold a degree of scepticism about the latest theoretical offerings of academic disciplines that inform their practices. This is not to say that theory has no role, but that not all knowledge is theoretical and even the application of abstract theoretical knowledge is concrete contexts requires good practical judgement and needs to be corrected by practical experience.

Neurath's encyclopedic account of unified science does not address these problems. Moreover, his scientistic view of knowledge renders him blind to them. And here another concession to later critics of positivism must be made. While Neurath's position recognizes that there is no purely technical solution to economic choices, his own earlier writings nevertheless have a distinct technicist flavour. The orchestration of knowledge is seen in terms of the knowledge of experts. Thus he writes in his 1919 report to the Munich Workers' Council:

> Socialization ... is to be regarded as a trend towards technicism. Engineers, doctors and economists will have to collaborate and directly use all achievements of technology, medicine, and social organization, in order to further the happiness of all.[36]

Neurath's early technicism is also expressed in his reservations about the involvement of workers' councils in technical decisions.

> A democratization of firms that goes so far that technical direction is given by workers' councils and the administration of whole groups of firms by boards of higher rank, entails from the social engineering point of view a paralysis of production.[37]

Whatever the virtues of Neurath's encyclopedic version of the unified thesis, it was blind to the dispersal of practical knowledge and hostile to democratic participation in 'technical' decision-making.

It needs to be added, however, that this strand of his early work sits uneasily with his critique of a purely technical account of decision-making. If, as he claims, even the most technical of decisions involves non-technical considerations, the rationale for leaving such decisions to technical experts is considerably weakened. This theme is taken up in his later work in the 1940s which is more sensitive to the limitations of coordinated scientific expertise and an acknowledgement of the importance of democratic participation and decentralization. Thus the following memorandum on a visit of Neurath to the Borough of Bilston in 1945:

> Dr Neurath stated that ... within reasonable limits, there must be the greatest possible decentralization of administration.... With reference to the decentralization of administration, Dr Neurath stressed that participation is vital. The whole success of any plan involving the lives of human beings depends upon obtaining the assent, encouragement, and co-operation of those human beings.[38]

This move in his later work to a more decentralized and democratic image of the socialist commonwealth does in part reflect an awareness of the dispersal of local knowledge and the consequent limits of the competence and authority of scientific experts. It is also rooted in his own earlier critique of pseudorationalism, which, as noted in the last section, denies that unique solutions to practical problems can be arrived at by way of purely technical procedures. Thus Neurath opposes 'what is called the "technocratic" movement' which assumes there exists 'one best solution with its "optimum happiness", with its "optimum population", with its "optimum health", with its "optimum working week", with its "optimum productivity" or something else of this kind' and which 'asks for a particular authority which should be exercised by technicians and other experts in selecting "big plans".'[39] Against this scientific expert Neurath appeals to common knowledge shared by all citizens:

> Let us take an uncontroversial example. Assume the scientists tell the English people that their fireplaces waste calories – of course they do so enormously. But fireplaces as an element of our environment are not 'happiness-neutral' as it were, as is e.g., the cable below the surface of the street. Fireplaces are related to homely comfort. This and other conditions of happiness would be the subject of discussion and, finally, decisions would be taken based on common sense and influenced by the scientists' information.[40]

A decentralized and participatory politics is to be preferred to the pseudorationalism of technocratic politics.

Associational socialism, ecology and freedom

The later Neurath's advocacy of a decentralized and participatory account of socialist planning had its source not only in criticism of the technocratic account of politics, but also in concerns about freedom and ecological problems. In response to these Neurath was led to defend an associational conception of socialism. Given the revival of associational socialism,[41] his account deserves to be better known.

The existence of a variety of associations with power and functions distributed amongst them is defended as an institutional condition for freedom:

> [T]he 'freedom' of a democratic country might be described by the fact that each member is permitted to have more than one loyalty, e.g. to his family, to his local community, to his position, to his political party, to his church, to his lodge, to an international movement and to his country. One expects, in a democratic country, that a citizen shows how to handle these various loyalties and to assemble them in one way or another.[42]

The basis of dictatorial or totalitarian regimes lies in the 'tendency for one, and only one loyalty to "devour" all the others, and various loyalties are not permitted to grow up side by side'.[43] Recently that familiar account of totalitarianism which lies at the basis of the case for the associational model of socialism has often been stated in the language of civil society. What is significant about Neurath's version of the associational model is that it remains strongly anti-market and makes a clear distinction between the flourishing of associations and the flourishing of exchange relations, a distinction that many recent uses of the term 'civil society' have blurred.[44] He avoids the assumption, which has dogged much twentieth-century political thought and action, that we must choose either state planning of the 'internationalism of the "money-order"'.[45]

Neurath develops a picture of a socialist society as a 'societas societum' – a view in which economic life is not governed by market principles, but in which 'civil society' in the sense of thriving public association exists. Thus he rejects the centralization of powers and functions in the state in favour of dispersed overlapping planning authorities. While this is independent of the guild socialist model which forms the intellectual heritage of recent associational socialism, it shares the appeal to the structures, if not the content, of medieval Europe:

> We know from the Middle Ages how 'overlapping' authorities can work. There could be international organizations which would be responsible for the administration of the main natural resources, e.g. an organization dealing with iron, others with coffee, rubber, foodstuffs which could act as members of an international planning board – such organizations could be in action before a world commonwealth would be organized.[46]

Similarly, 'big rivers with their banks could be "internationalized"'.[47] More local units of self-government with powers of regional planning might exist alongside such larger functional units.[48]

A significant feature of the international functional units of planning that Neurath describes here is that they are of the kind required if global resources are to be used in an ecologically rational way, in particular to overcome international 'tragedy of the commons' problems. Neurath's associational model of socialism has a clear ecological dimension. Moreover, it is one that manages to avoid the narrow localism of some Green thinkers[49] and the authoritarian statism of others.[50] This ecological dimension runs throughout his work. His sensitivity to the issue is founded on his early familiarity with the tradition of ecological economics developed early in this century, which has been largely forgotten.[51] The work of theorists like Ballod-Atlanticus and Popper-Lynkeus attempted to base economic planning on the use of energy units. As I noted in the first section, the claim that one could rely entirely on energy units was one that Neurath rejected. No single unit of evaluation existed to order different alternatives. The use of the fireplace example against the technocratic conception of politics reflects the same critical attitude to any approach to planning that relied solely on energy units. However, the influence of these theorists on his work did mean that Neurath had an awareness of problems of sustainable development which has until recently been largely absent from socialist work on economic planning. As Bottomore notes in his survey of work on the socialist economy, 'Neurath's conception of "calculation in kind" ... in principle enables economic planning to take into account the use, as between generations, of non-renewable natural resources (raw materials and energy).[52] Hence the discussion of the impact of different uses of energy on future generations already quoted in the first section.

This sensitivity to ecological issues was heightened by Neurath's commitment to the orchestration of the sciences and his rejection of scientific pyramidism. Against the standard forms of reductionism, in which the social is reduced to more basic physical sciences, Neurath argues that sociological knowledge about human institutions needs to appear in full-blooded form in the putatively prior physical science. One consequence was an awareness of the relationships between human institutions and the physical and biological environment.

> We may say: 'Men are connected with alterations of geological structure like rain and rivers', and therefore we may get statements which speak of correlations between alterations of human institutions (connected with the construction of dams, plowing etc.) and the alteration of the surface of the earth and the climate. This implies

> that sociological statements enter the geological and perhaps also the astronomical departments in full dress. Let me anticipatively say that difficulties in making predictions on human institutions therefore enter the geological sphere, which does not remain watertightly separated from sociology.[53]

Neurath's ecologically informed account of the nature of the functional units for economic planning just noted reflects this appreciation of the relationship between human institutions and environmental change.

The central components of Neurath's social and political thought have a relevance today at least as significant as when they were originally written. The collapse of the dictatorships of Eastern Europe has highlighted the need to escape statist models of socialism. Neurath's associational model of socialism avoids statism without making the move, which has unfortunately become standard in recent socialist thought, of simply embracing the market. More than any other socialist theorist of this century, Neurath offers an account of socialism that is sensitive to ecological problems. He offers a vision of an ecologically rational society that allows for the representation of the interests of future generations in current decisions and that offers the basis for resistance to the attempt to resolve environmental problems by putting prices on environmental goods and harms. Given the particular relevance of Neurath's work for the contemporary problems facing socialists and Greens, it deserves more attention than it has received. It would be a tragedy if the positivist label attached to Neurath should mean that his contributions to socialist theory were to be forgotten.[54]

Bibliography of the works of Otto Neurath

(1912) 'The Problem of the Pleasure Maximum', in (1973).

(1913) 'The Lost Wanderers of Descartes and the Auxiliary Motive', in (1983).

(1919) 'Through War Economy to Economy in Kind', in (1973).

(1928) 'Personal Life and Class Struggle', in (1973).

(1935a) 'The Unity of Science as a Task', in (1983).

(1935b) 'Pseudorationalism of Falsification', in (1983).

(1936a) 'Individual Sciences, Unified Science, Pseudorationalism', in (1983)

(1936b) 'An International Encyclopedia of Unified Science', in (1983).

(1936c) 'Encyclopedia as "Model"', in (1983).

(1937a) 'Unified Science and its Encyclopedia', in (1983).

(1937b) 'The New Encyclopedia of Scientific Empiricism', in (1983).

(1937c) 'The Departmentalization of Unified Science', in (1983).

(1938) 'Unified Science as Encyclopedic Integration', in Neurath, O. et al. (1938) *Encyclopedia and Unified Science*, vol. 1, no. 1, Chicago, Chicago University Press.

(1939) 'The Social Sciences and Unified Science', in (1983).

(1941) 'Universal Jargon and Terminology Science', in (1983).

(1942) 'International Planning for Freedom', in (1973).

(1944) *Foundations of the Social Sciences*, Chicago, University of Chicago Press.

(1946)'The Orchestration of the Sciences by the Encyclopedism of Logical Empiricism', in (1983).

(1973) *Empiricism and Sociology*, Dordrecht, Reidel.

(1983) *Philosophical Papers 1913–1946*, edited by R. S. Cohen and M. Neurath, Dordrecht, Reidel.

'Memorandum of the Visit by Dr Otto Neurath to the Borough of Bilston; 24 July 1945', in (1973).

Notes

1. The two quotations I have in mind are:

   > We are like sailors who must rebuild their ship on the open sea, never able to dismantle it in dry-dock and reconstruct it there out of the best materials.

   > Empathy, understanding, and the like may help the researcher, but it enters into a system of science as little as does a good cup of coffee, which helped the researcher do his work.

   The first quotation has even made it into the *Oxford Dictionary of Quotations*; the second appears in a number of standard discussions of interpretation in social science (see, for example, R. Keat and J. Urry, *Social Theory as Science*, London, Routledge and Kegan Paul, 1982, p. 168).

2. See, for example, H. Marcuse, *One Dimensional Man*, London, Routledge and Kegan Paul, 1964; and J. Habermas, *Knowledge and Human Interests*, London, Heinemann, 1972. For a similar view from a very different tradition, see F. Hayek, *Counter Revolution in Science*, Indianapolis, Liberty Press, 1979. An account of the political radicalism of the positivists is to be found in J. Ravetz, 'Ideological Commitments in the Philosophy of Science', *RP* 37, 1984, pp. 5–10.

3. In the English-speaking world the reduction of the movement to a set of simple doctrines is in part the responsibility of A. J. Ayers' account of the doctrine in *Language, Truth and Logic* (London, Gollancz, 1936).

4. Neurath, 1946, p. 235.

5. L. von Mises, 'Die Wirtschaftrechung im Sozialistischen Gemeinwesen', *Archiv für Sozialwissenschaften*, 47, 1920, translated as 'Economic Calculation in the Socialist Commonwealth', in F. Hayek, ed., *Collectivist Economic Planning*, London, Routledge and Kegan Paul, 1935.

6. L. von Mises, *Die Gemeinwirtschaft: Untersuchungen über den Sozialismus*, Jena, Gustav Fischer, 1922. A later edition was translated as *Socialism: An Economic and Sociological Analysis* (Indianapolis, Liberty Press, 1981).

7. F. Hayek, 'The Uses of Knowledge in Society' and 'Economics and Knowledge', in *Individualism and Economic Order*, London, Routledge and Kegan Paul, 1949.

8. O. Lange and F. Taylor, *On the Economics of Socialism*, edited by B. Lippincott, New York, McGraw Hill, 1956.

9. See Hayek, ed., *Collectivist Economic Planning* and Lange and Taylor, *On the Economics of Socialism*. For different appraisals of the outcome of the debate, see A. Buchanan, *Ethics, Efficiency and the Market*, Oxford, Clarendon Press, 1985, ch. 4; D. Lavoie, *Rivalry and Central Planning: The Socialist Calculation Debate*

Reconsidered, Cambridge, Cambridge University Press, 1985; and D. Shapiro, 'Reviving the Socialist Calculation Debate: A Defense of Hayek against Lange', *Social Philosophy and Policy*, 6, 1989, pp. 139–59. D. Steele, *From Marx to Mises: Post-Capitalist Society and the Challenge of Economic Calculation*, La Salle, Open Court, 1992, and R. Blackburn, 'Fin de Siècle: Socialism after the Crash', *New Left Review* 185, 1991, pp. 5–67 both show more awareness of the earlier stages of the debate, although with different appraisals.

10. L. von Mises, *Socialism*, translated by J. Kahane, Indianapolis, Liberty Press, 1981, p. 98. The part of Mises' text from which I quote here is a reproduction of his first essay in the socialist calculation debate, 'Economic Calculation in the Socialist Commonwealth' of 1920. A translation of this essay by S. Adler appears in Hayek, ed., *Collectivist Economic Planning*.
11. Ibid., p. 98.
12. Ibid., p. 99.
13. Neurath's work also formed the main target of Weber's contribution to the prehistory of the socialist calculation debate. See the extended discussion of Neurath's work in M. Weber, *Economy and Society*, Berkeley, University of California Press, 1978, ch. 2, section 12, pp. 100–107. Weber's argument is more careful than that of Mises. He argues that some 'value indicators' (plural) must take the place of prices for rational planning, and he expresses some doubt as to what they might be. The objection is weaker than Mises' in the sense that it does not rule out the possibility of such indicators. However, it has more clout in that, unlike Mises, he makes no simple commensurability assumption.
14. Neurath, 1919, p. 145.
15. Neurath, 1919, p. 146.
16. Neurath, 1928, p. 263.
17. See L. von Mises, *Human Action*, London, William Hodge, 1949, p. 209.
18. Neurath, 1913, p. 4.
19. Neurath, 1913, p. 8.
20. Neurath, 1935b, p. 125.
21. Neurath, 1935b, p. 131.
22. Neurath, 1935b, pp. 122–3.
23. Neurath, 1946, p. 232.
24. Neurath, 1912, p. 119.
25. To appeal to the necessary role for practical judgements in decision-making is not to deny any role for general principles or technical rules. Neurath does not make either of these claims. One of the mistakes of defenders of practical judgement is to set up an opposition between moral and aesthetic judgement and the 'technical' rule-governed rationality of science. There is a necessary role for rules of thumb, standard procedures, and institutional arrangements that can be followed unreflectively and which reduce the scope for explicit judgements comparing different states of affairs. We cannot be exercising ethical and political judgements in a reflective way all the time. Rules and institutions can free us space and time for reflective judgements where they matter most. Such rules and institutions need, however, to be open themselves to critical appraisal.
26. D. Pearce, A. Markaandya and E. Barbier, *Blueprint for a Green Economy*, London, Earthscan, 1989, p. 57. For critical discussion of that assumption, see J. O'Neill, *Ecology, Policy and Politics: Human Well-Being and the Natural World*, London, Routledge, 1993, ch. 7.
27. See Neurath, 1935a, 1935b, 1936a, 1936b, 1936c, 1937a, 1937b, 1937c, 1938, 1939, 1941, 1944, 1946.
28. For a classic account of this programme, see E. Nagel, *The Structure of Science*, London, Routledge and Kegan Paul, 1961.
29. Neurath, 1946.
30. Neurath, 1944, p. 8.
31. Neurath, 1946, p. 232.
32. Neurath, 1937a, p. 176.
33. Neurath, 1944, p. 18. Compare the list in Neurath, 1941, pp. 217–18.
34. For criticism of the epistemic argument for the market, see J. O'Neill, 'Markets, Socialism and Information: A Reformulation of a Marxian Objection to the Market', *Social Philosophy and Policy* 6, 1989, pp. 201–10; and 'Property in Science and the Market', *The Monist* 73, 1990, pp. 601–20.
35. See, for example, P. Cardan, *Modern Capitalism and Revolution*, 2nd edn, London, Solidarity Publications, 1974, p. 45. H. Wainwright, *Arguments for a New Left* (Oxford, Blackwell, 1994) examines some of these parallels with Hayek's work.
36. Neurath, 1919, p. 147.
37. Neurath, 1919, p. 139.
38. Neurath, 1973, pp. 75–6.
39. Neurath, 1942, pp. 426–7.
40. Neurath, 1942, p. 247. Translation amended.
41. P. Hirst, ed., *The Pluralist Theory of the State: Selected Writings of G. D. H. Cole, J. N. Figgis and H. J. Laski*, London, Routledge, 1989; L. Martell, 'New Ideas of Socialism', *Economy and Society*, 21, 1992, pp. 152–73; W. Streeck and P. Schmitter, 'Community, Market, State – and Associations', in W. Streeck and P. Schmitter, eds, *Private Interest Government? Beyond Markets and State*, London, Sage, 1985; S. Yeo, 'Three Socialisms: Statism, Collectivism, Associationalism', in W. Outhwaite and N. Mulkay, eds, *Social Theory and Social Criticism: Essays for Tom Bottomore*, Oxford, Blackwell, 1987.
42. Neurath, 1942, p. 429.
43. Neurath, 1942, p. 429.
44. I develop this point at greater length in J. O'Neill, *Ecology, Policy and Politics: Human Well-Being and the Natural World*, London, Routledge, 1993, ch. 10; and 'Economy, Polity, Neutrality', *Political Studies*, forthcoming.
45. Neurath, 1942, p. 434.
46. Neurath, 1942, p. 433.
47. Neurath, 1942, p. 434.
48. Neurath, 1942, p. 435.
49. K. Sale, *Dwellers in the Land: The Bioregional Vision*, San Francisco, Sierra Club, 1985.
50. R. Heilbroner, *An Inquiry into the Human Prospect*, London, Calder and Boyars, 1975, especially ch. 4; and W. Ophuls, 'The Politics of a Sustainable Society', in D. Pirages, ed., *The Sustainable Society*, New York, Praeger, 1977.
51. Martinez-Alier, *Ecological Economics* (Oxford, Blackwell, 1987) does an excellent job in recovering that tradition.
52. T. Bottomore, *The Socialist Economy*, New York, Harvester Wheatsheaf, 1990, p. 26.
53. Neurath, 1944, p. 8.
54. My thanks to Chris Arthur, Russell Keat and the editorial board of *Radical Philosophy* for their comments on an earlier version of this paper.