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Neurath on Political Economy

John O'Neill

While Neurath's contributions to the philosophy of Vienna Circle continue to be influential, his contributions to political economy, the discipline in which he trained, are less well known. This is the case despite their theoretical and practical significance. Theoretically, his proposals for socialisation formulated after the First World War formed a starting point for the socialist calculation debates. Mises' contribution starts from criticism of Neurath, as does Weber's contribution on the subject in *Economy and Society*. Neurath's criticisms of monetary valuation, his theory of well-being and his physicalist understanding of the economy contributed to the development of ecological economics. His account of well-being is a precursor to more recent multidimensional theories of well-being. Neurath's work also had a practical significance. His socialisation proposals were developed partly in his role as director of socialisation in the Bavarian revolution. He was deeply engaged with what he characterised as the "communal economy" of the Viennese settler movement which led to further work in urban planning and housing in Red Vienna. He was involved in experiments in urban planning in the UK after the Second World War. He created the Social and Economic Museum in Vienna. His work on isotypes, the visual presentation of social facts, had a major impact in the presentation of social statistics. Given this significance and influence, why has his work in political economy not been more widely recognised?

Part of the answer to that question lies in the reception of logical empiricism which created influential misunderstandings of Neurath's political economy. From very different

political positions, both the Austrian school of economics and the Frankfurt school take logical empiricism generally, and Neurath in particular, to be committed to a technocratic politics, grounded in a scientific understanding of the social sciences. The lens of the Frankfurt school has had a particular influence on accounts of the place of the Vienna Circle in histories of Western Marxism. It appears as a foil to mainstream Western Marxism that is taken to be marked by the influence of philosophical idealism, a shift from concern with economy to the superstructure, in particular culture, and critical distance from emphasis on the scientific nature of socialism. The commitment to empiricism and scientism is claimed to lead to a social science that is incapable of criticism of the existing social order and a political practice that is conservative and technocratic. The actual history of Western Marxism before the Second World War is more complex than this standard history allows. Central figures in the Western Marxist tradition were closer to the Left Vienna Circle than the account suggests. Karl Korsch was associated with the Berlin Group of logical empiricists and Bertold Brecht's notebooks show the influence of Neurath's social behaviourism.

More recently, logical empiricism's contribution to economics has been criticised from another direction for being responsible for the conceptual and normative impoverishment of modern neo-classical economics. Sen's revival of a critical and descriptively rich welfare economics is taken by Putnam and Walsh to involve excising the influence of logical positivism on neo-classical economics (e.g., Putnam 2002, Putnam and Walsh 2014). The claims are similarly problematic. Neurath's political economy was critical of neo-classical approaches. His multi-dimensional account of well-being, like that of Sen, employs vocabulary that is rich in its characterisation of the different dimensions of well-being and the social, biophysical and environmental conditions required for their realisation (Lessman 2007, O'Neill and Uebel 2008). A prevalent founding myth of recent political philosophy is that Rawls revived political philosophy that the influence of logical empiricism

had silenced. The result is the loss from view of political and social thought of the left Vienna Circle which is marked by an economic radicalism and an understanding of the environmental dimensions of economic and political institutions that was absent from much liberal political philosophy after Rawls.

A central aim of this chapter is to correct some of these mischaracterisations of Neurath's political economy and its relationship to logical empiricism. To do so is not to say that his position is without problems. The intent is rather to reveal something of the richness of Neurath's political economy that shows that more detailed critical scrutiny is warranted. The source of many of the misconceptions about the political economy of Neurath stem from the very different traditions of Austrian economics and the Frankfurt School. Correspondingly, this chapter focuses on Neurath's debates with Mises and Hayek in the Austrian tradition and with Horkheimer in the Frankfurt tradition.

Socialist calculation and the limits of monetary valuation

Central to Neurath's political economy are arguments about the limits of monetary measures and a defence of measures in kind—*in natura*—that employ physical and social measures of the conditions for and dimensions of human well-being. Neurath makes a number of claims that need to be distinguished. The first concerns economic theory. Against standard economic theory which characterises economic activity through “monetary and credit relations” (1916/2004: 301) Neurath defends the tradition of political economy, typified by work of Aristotle through to Smith, and later of Marx and of Popper-Lynkeus and Ballod-Atlanticus, in which the concept of real wealth and the analysis of social relations are central. The second claim concerns the rationality of decisions in kind and calculations in kind. Decisions in kind using a multiplicity of measures of value are contrasted with decisions with some single measure of value be this money or any other single unit. The third claim is about economies

as institutional orders. An economy in kind is an “institutional order of a society” (ibid.: 304) with a distinctive mode of resource allocation to be contrasted with the institutional order of market economies: “We should suggest looking at markets and finance and at the whole reckoning in money as an institution like any other” (1944a, 39).

Economies in kind feature in two distinct ways in Neurath’s work. First, they are an object of study. Neurath’s early empirical work in economics examined the functioning of various non-monetary economies in the ancient world and during periods of war (1909, 1910). Second, Neurath’s contributions to the socialisation debates advocated a radical in-kind economy of associations in which in-kind measures replaced monetary measures. While physical and social statistics would be required to make choices of resource allocation, no single unit of comparison would be adequate for decision making: “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.” (1919/1973: 145). Neurath’s arguments turn on claims about commensurability. Choices between alternatives require a multi-dimensional understanding both of productive inputs and of well-being. In making this claim, Neurath was critical not just of monetary valuation, but of any alternatives that used some single unit of comparison, such as labour time or energy units.

Neurath’s arguments were the occasion for Ludwig von Mises’ contribution to the socialist calculation debates. Mises argues that in the absence of a single measure of value, rational choice about the use of higher order productions goods is impossible (1922/1981: 13). Without a single cardinal measure of value for production goods, no rational choice is possible between the alternative uses of “the bewildering mass of intermediate products and potentialities of production” (1920/1935: 103). Monetary exchange value provides a common unit of measurement of the relative worth of different productive factors for comparing their employment: “calculations based upon exchange values enable us to reduce values to a common

unit” (1922/1981:99). Market exchange makes possible the imputation of the relative worth of productive factors on the basis of consumer valuations. Market prices in the factors of production in turn require the private ownership of the means of production. Hence, rational choices between the alternative uses of productive resources are not possible in a socialist economy (1922/1981: 15).

The debate between Neurath and Mises raised questions about the inter-generational valuation of goods, the measurement of human well-being and the nature of practical rationality. Consider the question of inter-generational valuation of goods. A problem with monetary valuation that Neurath’s arguments highlighted is that market choices by current consumers fail to capture the relative values of different uses of productive factors for future generations. The value of productive resources for future generations cannot be directly captured in current market exchange. Intergenerational comparisons also raise problems for socialist alternatives to the market that employ single units in making decisions, such as labour time or energy-units. Using labour time alone allows for no consideration for the effects of the use of energy and resources for future generations (Neurath 1925/2004: 468) and the use of energy units alone could not capture the impact on the quality and quantity of labour time undertaken within current generations (1928/1973: 263). Intergenerational choice in the use of productive resources requires multi-criteria decision procedures and judgements.

A second problem that Neurath raises against single unit measures of value is their failure to capture changes in well-being. The rejection of the existence of a cardinal measure of welfare is already to be found in Neurath’s early work (1912). In his contributions to the socialist calculation debate, the argument turns on the “multidimensional” nature of welfare concepts, (1937a/2004: 520). While Neurath’s account of the “quality of life” is hedonic, it is measured indirectly through objective “conditions of life, i.e. housing, food, clothing, working hours, etc.” (1920-21/2004: 356) The conditions of life include social goods such as quality

of personal and institutional relationships. Calculation in kind links these plural conditions of life with the various external conditions required for their realisation, including different uses of productive resources. Single measures of value cannot capture either the plural dimensions of well-being or their external conditions (1925/2004: 426-27).

Thirdly, the argument between Neurath and Mises turns on differences about the nature of practical rationality. Mises assumption that rational choice in the use of productive goods requires a single cardinal measure exhibits what Neurath characterised as “pseudorationalism.” Reflective rationalism recognises the boundaries of reason in decision making: “Rationalism sees its chief triumph in the clear recognition of the limits of actual insight.” (1913/1983: 8) In particular, one cannot capture the different value dimensions of options by a single measure and reduce choices to a matter of calculation. To employ an environmental example he uses, consider alternative sources of energy such as coal, hydraulic power and solar energy: a variety of ethical and political judgements come into play, for example around inter-generational impacts and the distribution of risks. It is not possible to arrive at a single optimal outcome through some computational procedure using a single cardinal metric, either monetary or non-monetary.

Mises’s arguments against Neurath can be contrasted with those of Weber which are more careful in their claims about the rationality of choices in the absence of a monetary metric. Weber distinguishes two concepts of rationality, formal and substantive. The “formal rationality of economic action” refers to “the extent of quantitative calculation or accounting which is technically possible and which is actually applied” (1921-22/1978: 85). In contrast, “substantive rationality” refers to “the degree to which the provisioning of a given group of persons ...with goods is shaped by economically orientated social action under some criterion ... of ultimate values...” (ibid.). Weber argues that formal rationality is best realised through monetary calculations based on exchange values and that economies in kind lack in this type

of rationality. Thus far his position parallels Mises'. However, Weber does not identify formal rationality with rationality as such. Economic systems can still be judged in terms of their substantive rationality with respect to some ends where “‘purely formal’ rationality of calculation in monetary terms is of quite secondary importance or even is fundamentally inimical to their respective ultimate ends...” (ibid.: 86). Weber’s contrast recognises different dimensions of rational choice that are absent in the work of Mises.

These early exchanges between Neurath, Mises and Weber involved dimensions of argument that were lost in mainstream socialist calculation debates. The contributions of Lange and Taylor shifted the debate. Lange’s neo-classical model of socialism accepts Mises’ argument that rational economic action requires prices and rejected Neurath’s proposals along with those of Marx (1936-7/1964: 135). The debate narrows on whether prices on productive resources should be determined by actual market transactions as Mises claims or whether shadow accounting prices could be employed to determine their use. The earlier arguments about the limits of monetary valuation disappeared in the subsequent exchanges in the socialist calculation debates. The arguments about the incommensurability of values, the intergenerational impacts of economic decisions and the nature of rational economic decision making were largely lost. Where they had a continuing influence is in the tradition of ecological economics, particularly through the work of K. William Kapp (1974: 38) who drew on the debate initiated by Neurath (Martinez-Alier 1987; Uebel, 2005, 2018; O’Neill and Uebel, 2015; O’Neill, 2019). With the failures of market-based approaches to environmental policy making, and to public policy making generally, Neurath’s work has taken on new significance (O’Neill, 1998; 2016; Martinez-Alier et al. 1998).

Science, knowledge and planning

Arguments about rationality are also evident in Neurath's exchanges with Friedrich Hayek whose contributions to the socialist calculation debates shifted the ground to epistemic questions. Hayek's arguments against Lange and other defenders of socialist planning turned on the limits of knowledge available to any central planning board (1937/1948, 1942-44, 1945/1948). The source of these limits lies in "the division of knowledge" in society. The argument appeals not just to the dispersal of knowledge, but to the nature of knowledge dispersed. Hayek contrasts the universal, generic, explicit and propositional knowledge of the scientist with the particular, local, tacit and practical knowledge of social actors. The latter forms of knowledge cannot be articulated in a form that could be passed on to a central planning body. The project of socialist planning is founded on the scientific illusion that identifies knowledge only with the generic, explicit propositional knowledge of the sciences. It fails to recognise the particular, practical knowledge of actors and hence the limits in the knowledge available to any planning board. The rationalist illusion of the omniscient social planner fails to recognise the limits of reason: "it may ... prove to be far the most difficult and not the least important task for human reason rationally to comprehend its own limitations" (1942-44: 162).

For Hayek Neurath's work exhibits these scientific illusions: "The most persistent advocate of ... *in natura* calculation is, significantly, Dr. Otto Neurath, the protagonist of modern "physicalism" and "objectivism" (ibid.: 170). Neurath's commitment to replacing calculation through prices with *in natura* calculation is taken to have its foundations in his "physicalism," understood as a programme to eliminate all concepts from the social sciences that cannot be characterised in physical terms: given this elimination, economic decision making can take place solely in terms of physical inputs and outputs. Against this physicalist "objectivism," Hayek defends a form of "subjectivism" that denies the possibility of characterising the objects of social science in purely physical terms without reference to a mental vocabulary (ibid.: 53).

Neurath responded to Hayek's criticisms in unpublished notes (1945a) and correspondence with Hayek. He affirmed his commitments to physicalism and *in natura* calculation but disputed their characterisation by Hayek. Physicalism is not a form of eliminativism of mental and intentional vocabulary from the social science, but the claim that the statements of the social science are controllable by statements containing "spatio-temporal expressions" or "when, where how terms": "what Professor von Hayek and others call 'mental' appears manifestly in my language as 'speech behaviour' or 'arguing' etc., i.e. a good where, when, how item." (Ibid.) Likewise, Neurath is not committed to planning that uses only physical units. The social and institutional conditions of human welfare also matter: "often a change in a man's food and shelter is of less importance than a change in his state of being bullied or humiliated by certain institutions." (1942/1973: 425).

Hayek's criticisms miss their target. Neurath's work is concerned with the institutional conditions of well-being. Indeed, as Neurath stresses in his reply, he shares Hayek's scepticism of planners with complete knowledge able to arrive at some optimal outcome. Hayek's comment that about the need for "human reason rationally to comprehend its own limitations" (1942-44: 162) parallels his own early rejection of "pseudorationalism" (1913/1981: 8). Neurath invoked his version of empiricism about the sciences to question the claim that there exist rules or methods able to determine a single optimal decision: the holism of theory and its underdetermination by observational evidence; the provisionality and uncertainty of empirical evidence given the revisability of observation statements; the principle of methodological pluralism and tolerance against "the absolutism of falsificationism ...and the absolutism of verificationism" (1935/1983: 131). Neurath takes this pluralist understanding of science to have implications for decision making, since they undermine the assumptions underlying technocratic planning. The model of the social engineer offered by Hayek, an agent with complete knowledge aiming at some "technical

optimum” (1942-44: 170), is rejected for this reason. Hence Neurath’s criticism of “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’” (1942: 426-27). While there are parallels between Neurath’s and Hayek’s criticisms of the assumptions underpinning technocratic planning, there are clearly important differences (O’Neill 2006). Hayek’s argument starts from the contrast of generic, explicit, scientific knowledge with local, practical and tacit knowledge. Neurath grants the significance of local and practical knowledge, but argues that unpredictability and incompleteness are features of scientific knowledge itself.

Hayek’s arguments for markets and against planning appealed to two contrasts. First the possibility of planning within enterprises is contrasted with its impossibility between them in an economy as a whole: the epistemic problems of dispersed knowledge require markets to solve them (1945/1948, 77-78; 1976, 107-08). Second, organisation based on a common “hierarchy of ends” (1944/2014: 101) is contrasted with the pluralism of ends of agents fostered within markets. The market is a condition for people with different ends to coordinate action and live together: “The discovery that by substituting abstract rules of conduct for obligatory concrete ends made it possible to extend the order of peace beyond the small groups pursuing the same ends, because it enabled each individual to gain from the skill and knowledge of others whom he need not even know and whose aims could be wholly different from his own.” (1976: 109; see also 1944/2014: 100-06, 125-33).

Neurath’s response was to turn Hayek’s position back on itself (1945a, 1945c/2004). First, the epistemic problems that Hayek raises against socialist planning already arise within the spheres of planning Hayek grants (1945a). Since the epistemic problems are ubiquitous,

appeals to the necessity of markets as a solution to them fail (O'Neill, 2007). Second, markets undermine pluralism, while planning can foster it. Neurath was committed to pluralism about the variety of ways in which a good life could be led. However, he had deep differences with Hayek about the conditions in which such a pluralism could be realised (O'Neill 2007, Whyte 2020). Already in his early work Neurath argued that, far from encouraging a diversity of different ways of life, market economies were inimical to such diversity: "it was the tendency to organise the economy in all civilisations after the same pattern which made the free market society so much hated" (1920/2004: 402). The aim of planning in contrast should be to acknowledge and foster variety: "within a socialized economy a far greater multiplicity of ways of life can be made possible than in a free trade economy" (1917/1973: 145). This defence of planning that fosters pluralism and variety in ways of life is developed in his later work on "planning for freedom" (1942). In his review of Hayek's *The Road to Serfdom* Neurath thus argues, against the picture of planning as necessarily leading to totalitarianism, that it is possible for planning to be consistent with social plurality and freedom. Representative bodies could distribute goods "based on an orchestration of the various wishes of its members," with "safeguards of the rights of smaller groups in matters which vitally affect their happiness" where groups could develop their own "types of settlement or even types of work" (1945c/2004: 546). He concludes by rejecting the choice of the "painful market society of the past" and "dictatorial planning."

Debates with the Frankfurt school

The standard mischaracterisation of logical empiricism as necessarily committed to a technocratic form of politics has its origins not just in Hayek's work, but also, from a different political direction, in that of the Frankfurt School (O'Neill and Uebel 2004). As with Hayek, this commitment to a technocratic politics is taken to follow from a commitment to

scientism. However, where for Hayek scientism is associated with post-capitalist socialisation and planning, for Max Horkheimer, in virtue of the identification of knowledge with the sciences, logical positivism cannot criticise the existing capitalist order. In particular it cannot capture the role the sciences play in legitimising the existing social order: “In view of the fact that the ruling economic powers use science as well as the whole of society for their special ends, this ideology, this identification of thought with the special sciences, must lead to the perpetuation of the status quo.” (1937a/1972: 179). Subsequently Horkheimer argued that scientific knowledge is constituted by an interest in “the manipulation of physical nature” which “at least in...the current period” serves the capitalist order: “The technological advances of the bourgeois period are inseparably linked to this function of the pursuit of science.” (1937b/1972: 194) A mark of “traditional” as against “critical” theory is the absence of self-reflection about this role of science. It takes a particular form of scientific knowledge as given and thus serves “the conservation and continuous renewal of the existing state of affairs” (ibid., 196). Logical positivism is a traditional theory and a conservative ideology.

In his response to Horkheimer Neurath rejects the claim that his account of the sciences ruled out the possibility of critical reflection on the social role of the sciences. While expressing scepticism about the possibility of philosophical reflection beyond empirical control, rational reflection on the individual sciences is still possible from within a naturalistic perspective: “Whatever is claimed with one scientific discipline can be criticised by a more comprehensive scientific standpoint, without regard to any divisions between the disciplines, but *we know of no court of appeal beyond the science that judges science and investigates its foundations.*” (1937b/2011: 20-21, trans. revised). Neurath’s perspective on the sciences contrasted with the more formal perspectives of logical empiricism associated with its post-World War II orthodoxy in drawing on the history and sociology of science.

This allowed for a sociologically informed conception of scientific self-reflection which also acknowledges a role for the social determination of scientific belief.

Historical changes do not only alter that which we call “theoretical formulations” or “constructions” but also the stock of protocol sentences. ... Some of our observations prove themselves to be very stable, but in principle nothing is certain — everything is flux. It is plain that a consistent thinker will seek to apply these considerations, which are based on experience, to his own life and will ask himself how he would act, how he would argue if he would be positioned differently. He will realise that decisive changes in the pursuit of science are not only determined by intensive reflexions of a generation of scholars, but also what happens in social life generally, which the scholars are part of. (Ibid.: 16, trans. revised)

Naturalistic reflection on the special sciences appeals not just to wider empirical inquiry in the history and sociology of science, but also to wider everyday empirical knowledge. Neurath’s naturalistic perspective on the sciences, rather than grounding a technocratic politics, underpinned a participatory model of planning. This recognised both the dependence on science that is a feature of modern decision making, and the need for decisions to answer to the voice of ordinary citizens: “Our life is connected more and more with experts, but on the other hand, we are less prepared to accept other people’s judgements, when making decisions.” Democracy is “the continual struggle between the expert... and the common man” (1945b/1996: 251).

Neurath’s responses to Hayek and Horkheimer reveal the relationships between the theoretical and practical dimensions of Neurath’s work. His arguments for participatory forms of planning that recognised pluralism in the ways a good life could be lived informed,

and were informed by, his own involvement in urban planning and housing. From his work in Vienna through to his engagement with urban planning for post-war Britain, he defended a pluralist perspective that allowed for different kinds of housing and settlement that recognised local habits, traditions and ways of life, against the “a totalitarian undercurrent, pressing forward some way of life” (1945c/2004: 247) which he detected in much city planning and modernist architecture. The role of the architect, planner and “social engineer” was not to offer some optimal single design or state of affairs, but to offer alternatives open to democratic deliberation of affected citizens (Blau 2006, Hochhäusl 2011). His work on visual education aimed to humanise knowledge, to foster public participation in which informed citizens could engage in the planning process (Nemeth 2019). Far from fostering a form of technocratic planning, Neurath’s empiricism grounded arguments for planning shaped through the participation and deliberation of ordinary people.

References

- Blau, E. (2006) “Isotype and Architecture in Red Vienna: The Modern Projects of Otto Neurath and Josef Frank,” *Austrian Studies* 14: 227-259.
- Cat, J. and Tuboly A. (eds.) (2019) *Neurath Reconsidered. New Sources and Perspectives*, Cham: Springer.
- Hayek, F. (1937) “Economics and Knowledge,” *Economica* 4: 33-54. Repr. in Hayek 1948, pp. 33-56.
- (1942-4) “Scientism and the Study of Society,” *Economica* 9-11. Repr. in Hayek, *The Counter-Revolution of Science. Studies in the Abuse of Reason*, Indianapolis: Liberty Fund, Indianapolis, 1979, pp. 17-182.
- (1944) *The Road to Serfdom*, Chicago: University of Chicago Press.

- (1945) “The Uses of Knowledge in Society,” *American Economic Review* 35. Repr. in Hayek 1948, pp. 77-91.
- (1948) *Individualism and Economic Order*, Chicago: University of Chicago Press.
- (1976) *Law, Legislation and Liberty, Vol. 2*, London: Routledge and Kegan Paul
- Hochhäusl, S. (2011) *Otto Neurath - City Planning: Proposing a socio-political Map for Modern Urbanism*, Innsbruck: Innsbruck University Press
- Horkheimer, M. (1937a) “Der neueste Angriff auf die Metaphysik,” *Zeitschrift für Sozialforschung* 6: 4–53. Trans. “The Latest Attack on Metaphysics,” in Horkheimer 1972, pp. 132–87.
- (1937b) “Traditionelle und Kritische Theorie,” *Zeitschrift für Sozialforschung* 6: 245–94. Trans. “Traditional and Critical Theory,” in Horkheimer 1972, pp. 188–243.
- (1972) *Critical Theory. Selected Essays*, New York: Seabury Press.
- Kapp, K. W. (1974) *Environmental Policies and Development Planning in Contemporary China and Other Essays*, Paris: Mouton.
- Lange, O. (1936-7) “On the Economic Theory of Socialism,” *Review of Economic Studies* 4. Repr. in B. Lippincott (ed.) *On the Economic Theory of Socialism*, New York: McGraw-Hill, 1964, pp. 55-143.
- Lessmann, O. (2007) “A Similar Line of Thought in Neurath and Sen: Interpersonal Comparability,” in Nemeth et.al. 2007, pp. 115-130.
- Martinez-Alier, J. (1987) *Ecological Economics*, Oxford: Blackwell, 2nd ed. 1990.
- Martinez-Alier, J., Munda G., and O’Neill, J. (1998) “Weak Comparability of Values as a Foundation for Ecological Economics,” *Ecological Economics* 26: 277-286.
- Mises, L. v. (1920) “Die Wirtschaftsrechnung im sozialistischen Gemeinwesen,” *Archiv für Sozialwissenschaft* 47. Trans. “Economic Calculation in the Socialist

- Commonwealth” in F.A. Hayek (ed.), *Collectivist Economic Planning*, London: Routledge and Sons, 1935, pp. 89-130.
- (1922) *Die Gemeinwirtschaft*, Jena; Fischer. Trans. *Socialism*, Indianapolis: Liberty Press, 1981.
- Nemeth, E. (2019) “Visualizing Relations in Society and Economics: Otto Neurath’s Isotype-Method Against the Background of his Economic Thought,” in Cat and Tuboly 2019, pp. 117-140.
- Nemeth, E. Schmitz, S. and Uebel T. (eds.) (2007) *Neurath's Economics in Context*. Dordrecht: Kluwer.
- Neurath, O. (1909) *Antike Wirtschaftsgeschichte*. Leipzig: Teubner. Excerpts trans.
- “Economic History of Antiquity,” in Neurath 2004, pp. 120-152.
- (1910) “Die Kriegswirtschaft,” *Jahresbericht der Neuen Wiener Handelsakademie* 16: 5-54. Trans. “War Economy” in Neurath 2004, pp. 153-199.
- (1912) “Das Problem des Lustmaximums,” *Jahrbuch der Philosophischen Gesellschaft an der Universität Wien 1912*. Trans. “The Problem of the Pleasure Maximum” in Neurath 1973, pp. 113-122
- (1913) “Die Verirrten des Cartesius und das Auxiliarmotiv,” *Jahrbuch der Philosophischen Gesellschaft an der Universität zu Wien 1913*, pp. 45-59. Trans. “The Lost Wanderers of Descartes and the Auxiliary Motive,” in Neurath 1983, pp. 1-12.
- (1916) “Die Naturalwirtschaftslehre und der Naturalkalkul in ihren Beziehungen zur Kriegswirtschaftslehre,” *Weltwirtschaftliches Archiv* 8: 245-258. Trans. “Economics in Kind, Calculation in Kind and War Economics,” in Neurath 2004, pp. 299-313.
- (1917) “Das umgekehrte Taylor System,” *Kunstwart und Kulturwart* 1. Trans. “The Converse Taylor System,” in Neurath 1973, pp. 130-135.

- (1919) *Wesen und Weg der Sozialisierung*, Munich: Callwey. Trans. “Character and Course of Socialisation,” in Neurath 1973, pp. 135-150.
- (1920) *Vollsozialisierung*. Jena: Diederichs. Trans. “Total Socialisation,” in Neurath 2004, pp. 371-404.
- (1920-21) “Ein System der Sozialisierung,” *Archiv für Sozialwissenschaft und Sozialpolitik* 48: 44-73. Trans. “A System of Socialisation,” in Neurath 2004, pp. 371-404.
- (1925) *Wirtschaftsplan und Naturalrechnung*, Berlin: Laub. Trans. “Economic Plan and Calculation in Kind,” in Neurath 2004, pp. 405-465.
- (1928) *Lebensgestaltung und Klassenkampf*. Berlin: Laub. Trans. “Personal Life and Class Struggle,” in Neurath 1973, pp. 249-298.
- (1935) “Pseudorationalismus der Falsifikation,” *Erkenntnis* 5: 353-365. Trans. “Pseudorationalism of Falsification,” in Neurath 1983, pp. 121-131.
- (1937a) “Inventory of the Standard of Living,” *Zeitschrift für Sozialforschung* 6: 140-151. Repr. in Neurath 2004, pp. 513-526.
- (1937b) *Einheitswissenschaft und logischer Empirismus. Eine Erwiderung*, ms., Otto Neurath Nachlass, Wiener Kreis Archiv, Rijksarchief Noord-Holland, Haarlem. Trans. “Unified Science and Logical Empiricism,” in J. Symons, O. Pombo, J.M. Manuel (eds.) *Otto Neurath and the Unity of Science*, Dordrecht: Springer, 2011, pp. 15-30.
- (1942) “International Planning for Freedom,” *New Commonwealth Quarterly*. Repr. in Neurath 1973, pp. 422-440.
- (1944) *Foundations of the Social Sciences*, Chicago, University of Chicago Press.
- (1945a) “Physicalism, Planning and the Social Sciences: Bricks Prepared for a Discussion v. Hayek, 26th July, 1945,” ms. 202 K.56, Otto Neurath Nachlass, Wiener Kreis Archiv, Rijksarchief Noord-Holland, Haarlem.

- (1945b) “Visual Education: Humanisation versus Popularisation,” in E. Nemeth and F. Stadler (eds.), *Encyclopedia and Utopia*, Dordrecht: Kluwer, 1996, pp. 245-335
- (1945c) “Alternatives to Market Competition,” *The London Quarterly of World Affairs*, January issue: 121-122. Repr. in Neurath 2004, pp. 546-548.
- (1973) *Empiricism and Sociology* (ed. by M. Neurath and R.S. Cohen), Dordrecht: Reidel.
- (1983) *Philosophical Papers* (ed. by Cohen R.S. and Neurath), Dordrecht: Reidel.
- (2004) *Economic Writings* (ed. by T. Uebel and R.S. Cohen), Dordrecht: Kluwer.
- O’Neill, J. (1998) *The Market: Ethics, Knowledge and Politics*, London: Routledge
- (2006) “Knowledge, Planning and Markets: A Missing Chapter in the Socialist Calculation Debates,” *Economics and Philosophy* 22: 55-78.
- (2007) “Pluralism and Economic Institutions,” in E. Nemeth et.al. 2007, pp. 77-100.
- (2016) “Markets, Ethics and Environment,” in S. Gardiner and A. Thompson (eds.), *Oxford Handbook of Environmental Ethics*, Oxford: Oxford University Press, pp. 40-50
- O’Neill J. and Uebel, T. (2004) “Horkheimer and Neurath: Restarting a Disrupted Debate,” *The European Journal of Philosophy* 12: 75-101
- (2008) “Logical Empiricism as Critical Theory?” *Analyse & Kritik* 30: 379-398
- (2015) “Analytical Philosophy and Ecological Economics,” in J. Martinez-Alier and R. Muradian (eds.), *Handbook of Ecological Economics*, Cheltenham: Edward Elgar, pp. 48-73.
- Putnam, H. (2002) *The Collapse of the Fact/Value Dichotomy and Other Essays*, Cambridge, Mass.: Harvard University Press.
- Putnam, H, and Walsh V. (eds.) (2014) *The End of Value-Free Economics*, Abingdon: Routledge.

- Uebel, T. (2005) “Incommensurability, Ecology, and Planning: Neurath in the Socialist Calculation Debate, 1919-1928,” *History of Political Economy* 37: 309–342.
- (2018) “Calculation in Kind and Substantive Rationality: Neurath, Weber, Kapp,” *History of Political Economy* 50: 289-320.
- Weber, M. (1921-2) *Wirtschaft und Gesellschaft*, Tübingen: Mohr (Siebeck). Trans. *Economy and Society*, Berkeley: University of California Press, 1978.
- Whyte, J. (2020) “Calculation and Conflict,” *South Atlantic Quarterly* 119: 31–35.