Epistemology

A: ibīstīmūlūğīya. – G: Epistemologie. F: épistémologie. – R: epistemolgija. – S: epistemología. – C: renshilun 认识论

1. Epistemology is a neologism derived from the Greek *epistéme* [knowledge]. 'It translates the German concept *Wissenschaftslehre*, which was used by **Fichte** and **Bolzano** for different projects before it was taken up again by **Husserl**' (**Fichant** 1975, 118). J.F. **Ferrier** coined the word on the model of 'ontology', to designate that branch of philosophy – affirmed to be the latter's 'true beginning' – which answers the general question 'What is Knowledge?' (1856, 48 et sq.).

It passed into French as *épistémologie*, with, however, a generally narrower meaning than the original (the import of which is covered by 'theory of knowledge [*theorie de la connaissance*]'. Thus Émile **Meyerson** opened his *Identity and Reality* (1908) with the remark that the word 'is becoming current' as equivalent to 'the philosophy of the sciences [*philosophie des sciences*]'.

However, it is not always clear whether the latter expression is meant to cover (like the English 'philosophy of science') not only (1) 'second order' questions about scientific knowledge, both 'formal' (e.g. about the nature of scientific theories in general) or 'categorial' (e.g. about causation) but also (2) 'first order' ones about the content of specific theories (e.g. regarding the concept of time in statistical mechanics).

In German, the meaning of epistemology is conveyed by *Erkenntnistheorie* (or, less commonly, *Erkenntnislehre*) – literally, 'theory of knowledge' – a word whose wide philosophical use was initiated by E. **Zeller** in a lecture (of Kantian inspiration) in 1862. The uncertain status of *Epistemologie* in German is attested to by the fact that it is not treated either in **Ritter**'s *Historisches Wörterbuch der Philosophie* or **Mittelstrass**'s *Enzyklopädie Philosophie und Wissenschaftstheorie*. However, fairly recently, the term has gained currency, its proximate source having been apparently *épistémologie* and the vehicle more recent French trends in the philosophy of knowledge, especially scientific knowledge.

Uncertainty about the scope of the French word is also associated with its German offering, there being currently little clarity about the nature of the province of the latter, beyond thinking of it as having a certain special concern with philosophical questions regarding specifically scientific knowledge, evidenced by the fact that it seems to be often regarded as an alternative for the older *Wissenschaftstheorie* (or *Wissenschaftslehre*), literally 'theory of science'. This entry will follow the current English practice of using epistemology and 'theory of knowledge' synonymously, with preference given to the former.

Is it possible to demarcate the province of epistemology rather more clearly than was done in the opening quotation from **Ferrier**? The following will propose that it is in general de facto defined by a 'deep structure' or 'problematic', which determines what in general counts as a problem in that field and what means are available for answering it (whether or not people using the term have always been aware of this). A single problematic is consistent with an in principle unlimited number of different particular answers to the general question(s) it constitutes, answers which are thus variant doctrines within the same field of discourse.

The problematic of epistemology is presented in the definition of the province of *théorie de la connaissance* in A. **Lalande**'s *Vocabulaire technique et critique de la philosophie* as: 'Study of the relation which holds between subject and object in the act of knowing [*connaitre*]. In the oldest form of the problem: to what extent does what men represent to themselves resemble what is, independently of this representation? – In the modern form: given that the knowing subject, as such, has a determinate nature, what are the laws of this nature in the exercise of thought and what is their contribution

Historical Materialism, volume 14:3 (331–345)

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to the representation? But this second form of the question is itself always considered as having to end up by determining, like the first, what science and representation are *worth* [valent]' (1129). Thus the basic elements of this problematic consist of two terms, namely (1) 'subject' and (2) 'object', and (3) an 'act of knowing' in which a *relation between these terms* arises through a 'representation' by (1) of (2). The *problem* which grows out of this set-up, in both its ancient and modern forms, is (4) normative: the evaluation of the 'representation' involved in (3), of which (1) is the vehicle, with respect to its fidelity to (2), by reference to criteria of *justification* of claims to knowledge. In its modern form this 'problem of knowledge' is supplemented by (5) that of the nature of the laws by which (3) arises, and, in particular, that which satisfies (4).

There are endless variants of the elements of the above basic schema. For example: (1) may be individual or supraindividual (e.g. **Descartes**'s subject or **Hegel**'s 'Geist'); (2) may be materialist or idealist (e.g. **Hobbes**'s 'motion of bodies' or **Plato**'s 'eidos'); the representation in (3) may be abstract or iconic (e.g. **Leibniz**'s or **Locke**'s 'ideas'); (4) may be given sceptical or non-sceptical answers (e.g. **Sextus Empiricus** or **Descartes**); (5) the 'laws' in accordance with which (3) allegedly arises may be conceived in naturalistic or in rationalistic terms (e.g. **Hume**'s associationism or **Kant**'s transcendental synthesis).

The problematic of 'philosophy of science' in the first of the two senses distinguished above is in general embedded in the same basic schema. Thus (1) may be individual or collective (e.g. **Russell** or **Kuhn**); (2) may be subjective or objective/physical (e.g. **Carnap**'s earlier 'phenomenalistic' or his later 'physicalistic' bases); (3) may be sensible or non-sensible (e.g. **Mach** or **Frege**). The constituting problem (4) is of the same sort, regarding either procedures (e.g. induction) or content (e.g. existence of theoretical entities). (5) is present in many variants (e.g. **Descartes**'s *Regulae ad directionem ingenii*, F. **Bacon**'s *Tables*, Newton's *Regulae philosophandi* or **Mill**'s *Four Methods of Experimental Inquiry*).

2. Since the sources for **Marx**'s own philosophy of knowledge are only fragmentary, incomplete and often of only indirect significance, it is appropriate first to locate them according to the perspective of the question concerning epistemology.

2.1 *Theses on Feuerbach*. – On the occasion of their first publication in his *Ludwig Feuerbach and the Close of Classical German Philosophy* (1886), **Engels** wrote of **Marx**'s *Theses on Feuerbach* (*MECW* 5, 3–5) that they are 'the first document in which is deposited the brilliant germ of the new world outlook' (*MECW* 26, 353). This suggests the question of the relation between the *Theses on Feuerbach* and the preceding schemata. It is fairly clear that at least the crucial features (1–4) of this problematic of epistemology may be identified here. Thus traditional materialism is characterised in terms of (1) its knowing subject ('separate individuals', Th 9), (2) its 'object' (*Objekt* versus *Gegenstand*, Th 1), (3) the way in which the former is conceived as coming to know the latter (*Anschauung* / 'thought-objects', Th 1), and (4) the general normative question: 'whether objective [*gegenständliche*] truth accrues to human thinking' (Th 2). A characterisation of idealism in similar general terms, though of course differing in particulars, can also be made out. Furthermore, **Marx** certainly rejects traditional materialism and idealism. This is obvious enough from the mere fact that he proposes an alternative view, basically in terms of 'objective [*gegenständliche*]' or 'sensory [*sinnliche*] human activity [*Tätigkeit*], praxis' (Th 1).

However, what does **Marx** think is wrong with the *Objekt-Anschauung*? It is easy to miss the fact that this question is raised at all only insofar as it is implied by way of what may be taken to be, in effect, an answer to it, namely, the remark that (4) 'is not a question of theory, but a practical question', and that if it is not so regarded then it is 'purely scholastic' (Th 2). Beyond this nothing is said on the matter.

Now, is **Marx** really just offering an *alternative* answer to the old question (4), thus essentially remaining within the problematic which it is crucial in constituting,

or is he rejecting (4) in principle and thus contributing to a quite *new problematic* for dealing with questions about knowledge? It has generally been taken, in effect anyway, that the second is the correct option. However, though there has been a prodigious amount of commentary on these few brief sentences, there is not a great deal of consensus within it, in particular about the matter just raised. This is at least partly due to the very brevity of the work, which has not only given rise to much of the hermeneutic effort, but also allowed it a great deal of latitude as regards interpretation. Broadly speaking, the latter has proceeded in one or both of two ways: one relates them to their origin, **Marx**'s earlier work and its 'sources', its 'influences', the other to their (assumed) future, that is, **Marx**'s later work. Such interpretations also differ according to whether they are seen as a point on an overall continuous line of development of **Marx**'s thought, or as marking an 'epistemological break'. The first position tends towards a reductionist-'preformationist' reading, according to which their content is the result of an unfolding of views to be found in **Marx**'s earlier work; the second, towards an essentialist-teleological reading, according to which his later views are an unfolding of what is already there in an undeveloped way (one reading of **Engels**'s 'germ' metaphor). However, on another reading of the latter, it can also be argued, in a way which bypasses these options, that an at least major source of the problems of interpretation is not just, or primarily, their brevity, but that they form a *transitional* work, recording the beginning of a decisive break in **Marx**'s thinking, but not yet in a conceptually adequate form, so that they exhibit irremovable obscurities.

Marx himself never did deal either at length or systematically with such questions. However, there are various passages in his writings after the *Theses on Feuerbach* that are fairly directly and uncontroversially relevant to them. After surveying what are arguably the most important of these, the question of what is amiss with (traditional) epistemology can be posed anew and an answer to it offered.

2.2 *The German Ideology*. – The most significant change is, arguably, the appearance of the idea of 'production', even if at this stage the term is used very vaguely. 'The production of ideas, conceptions [*Vorstellungen*] of consciousness is, to start with, directly interwoven with material activity and the material intercourse of human beings' (*MECW* 5, 35). Thus the cognitive items implicitly referred to in the *Theses on Feuerbach* are now located in the context of 'production' rather than of 'praxis', which effectively disappears (to recur only marginally in **Marx**'s later work), even if a trace related to it remains in the phrase 'material activity'.

What follows the passage just cited says that these 'ideas' etc., spontaneously formed in the context of production and the social and political framework thereof, are in general non-veridical. A particular aspect of this is that 'morality, religion, metaphysics and all the rest of ideology' represent the real relation of 'being' / 'life' and 'consciousness' in an 'upside down way [*auf den Kopf gestellt*]', something which is basically explained in terms of the division between mental and manual labour. It falls to 'empirical observation' to exhibit the 'empirically ascertainable [*konstatierbaren*]' facts 'without any mystification or speculation', to show people 'not how they may appear in their own or others' conceptions, but how they really are'. However, it is neither said nor implied that this understanding itself involves a process of production.

2.3 *1859 Preface*. – The strictly chronological order followed so far may be violated at this point in order to point to both the continuity and discontinuity between the preceding position and that found in the famous *1859 Preface*. Speaking of an epoch of 'social revolution', **Marx** writes (*MECW* 29, 262): 'With the change of the economic foundation the whole gigantic superstructure is transformed . . .'. He continues: 'In considering such transformations one must always distinguish between the material transformation of the economic conditions of production, which can be ascertained with the precision of natural science [*naturwissenschaftlich treu*

zu konstatierenden] and the juridical, political, religious, artistic or philosophical, in short ideological forms in which people become conscious of this conflict and fight it out' (ibid.).

This turns on a contrast between two approaches to the 'transformations [*Umwälzungen*]' in question. On the one hand, there is what 'can be ascertained with the precision of natural science', or, briefly, science. This presumably corresponds to what was referred to in *The German Ideology* as what is 'empirically ascertainable'. On the other hand, there are 'ideological forms'. In distinction to the scientific, these forms are characterised by their essentially practical significance (and this includes, for the first time, art). On this reading, the first should not be regarded as failed attempts at the second; rather, the two belong to different *categories*.

2.4 The *1857 Introduction*. – Section 3 of the 'Introduction' to the manuscript posthumously published as *Grundrisse* is entitled 'The Method of Political Economy'. It contains **Marx**'s most extensive single discussion of themes relevant to this entry. The part of this dense passage which is most significant for present purposes (*G* 100–2) is structured by the following pairs of contrasts: (1) The overarching contrast is between (1.1): what is variously referred to as the 'the real' / the 'actual [*wirkliche*] presupposition'/ 'actual point of departure'/ 'real subject', which 'remains . . . outside the head in its independence, just so long as the head behaves . . . only . . . theoretically', and (1.2) knowledge of (1.1). – (2) Within (1.2) there is a contrast between (2.1): 'what is directly given [*Anschauung*]' and 'conception [*Vorstellung*]', and (2.2): 'thinking' and 'Concept'. – (3) Intersecting (1) and (2) is a general contrast between (3.1): 'concrete' and (3.2): 'abstract'. (3.1) is a way of referring to a 'whole', an internally complex totality; (3.2) is used in the context of two contrasts. One is between (1.1) and (1.2), giving rise to (3.21): 'abstract' applies to knowledge of the real just *qua* knowledge. The other is a contrast with (3.1), giving rise to (3.22): 'abstract' in the sense of what is one-sided in the sense of being considered apart from the relevant totality to which it really belongs. (This terminology partly derives from **Feuerbach**, but more from **Hegel** – see, e.g. *En* III §§ 445 et sqq., and *SL* 75, 511, 830, 840.)

Now, (1.1) is what may be called in traditional language the 'ontological' starting-point for (1.2) and is unaffected, as far as its independent existence goes, by anything connected with (1.2). It is properly described as (3.1). The *epistemological* starting-point is what is contained in (2.1). These are 'abstract' in sense (3.22). They straddle the distinction between (1.1) and (1.2): they are both (ontologically secondary) parts of (1.1) but also means of (1.2). But insofar as they are considered from the epistemic point of view they qualify as (3.22).

If these are the starting-points, in different senses, for knowledge, then the epistemic goal or intended 'result' is knowledge of (1.1), that is, (1.2), in the form of a representation involving (2.2), which qualifies as (3.1), what **Marx** describes in interchangeable ways as 'what is mentally concrete [*geistig Konkretes*]', 'totality of thoughts [*Gedankentotalität*]', 'thought-concrete [*Gedankenkonkretum*]' or a 'thought-whole [*Gedankenganze*]', which is a *Reproduktion* or 'appropriation [*Aneignung*]' of (1.1). It is 'concrete' *qua* the 'totality of many determinations [*Bestimmungen*] and relations', a 'focus [*Zusammenfassung*] of many determinations . . . thus unity of the manifold [*Mannigfaltigen*]'. This cognitive result is a 'product' of a 'process', by way of the 'elaboration [*Verarbeitung*]' of (2.1) by means of (2.2), 'thinking', 'conceptualising [*Begreifen*]' giving rise to 'concepts [*Begriffe*]' used to construct 'what is mentally concrete'.

Note that it is implied by part of what is quoted above that there are other types of 'appropriation' of (1.1). These are listed as the 'artistic, religious, practical-mental'. Since what distinguishes conduct that is 'only . . . theoretical' is said to be that it leaves 'the real subject . . . in its independence', the implication is that the other modes of 'appropriation' do not do this, that they have some involvement in changing it, that is, that they are modes of *practical* appropriation. This brings the distinction between two basic modes of *Aneignung* here, the theoretical and the practical, into line with the distinction,

noted above, between 'scientific' and 'ideological' in the *1859 Preface*. However, there philosophy with its claims to truth belongs to the 'ideological forms', so that this context is not compelling (cf. PIT 1989, 187 et sqq.).

2.5 In *Capital*, this discussion can focus on the following three passages: (A) '. . . the mode of presentation must be strictly [*formell*] distinguished from the mode of inquiry. Inquiry has to appropriate the material [*Stoff*] in detail, to analyse its different forms of development and track down their inner tie. Only after this work [*Arbeit*] has been completed can the actual motion be presented. If this is successful . . . the life of the material is now reflected in ideas [*ideell*] . . . the domain of ideas [*das Ideelle*] [is] nothing but the domain of matter [*das Materielle*] transplanted [*umgesetzte*] and translated into the human head' (*Capital* I, 102). – (B) '. . . I understand by classical political economy all economics since W. Petty which has inquired into the inner structure [*Zusammenhang*] of bourgeois relations of production as opposed to vulgar economics which only knocks about within what merely seems to be [*scheinbaren*] the structure . . .' (*Capital* I, 174 n.34 – cf. *TSV* III, 453, 500). – (C) '. . . it is a job [*Werk*] of science to reduce the visible motion, that which merely appears to be the case [*bloß erscheinende*], to the inner actual motion . . . all science would be superfluous if the form of appearance and the essence of things directly coincided' (*Capital* Ill, 428, 956).

2.51 To start with, we have a distinction (in A) between (5.11) 'the domain of matter', and (5.12) 'the domain of ideas'. This may be taken to be essentially the same as that in the *1857 Introduction* between what was distinguished in the preceding section as (1.1) and (1.2).

2.52 (A) does not make clear the relation between 'the material' and (5.11). However, it is said that the former belongs to the domain of 'inquiry', and in other places it is evident that the latter begins with (5.21) 'conceptions [*Vorstellungen*]', the 'consciousness' of the agents of production (e.g. *Capital* I, 174 n.34; *Capital* III, 311). Adequate knowledge, which is the goal of 'inquiry', requires (5.22) a 'concept corresponding to' the inner structure (*Capital* III), and this 'can only be discovered by science' (*Capital* I, 682 – cf. C above, and by implication, B). The distinction between (5.21) and (5.22) may be taken to be the same as the distinction between (2.1) and (2.2) in Section 2.1. By means of appropriate concepts, belonging to the realm of (5.12), inquiry permits, if successful, a 'presentation' which 'reflects' (5.11): it is 'the domain of matter transplanted and translated into the human head'. This may be taken to be the 'mentally concrete' (etc.) of the *1857 Introduction*.

2.53 Next, there is a distinction, on the side of 5.11, between (5.31) its 'life', its 'inner tie' (A), its 'inner structure' (B), 'actual inner motion' (B and C), 'the essence of things' (C), and (5.32) its 'merely apparent structure' (B), 'the visible motion, that which merely seems to be the case', 'form of appearance' (C). This distinction, expressed thus in the traditional couples of essence/appearance and inner/outer, may be taken to be essentially the same as that made elsewhere in the works in question. Thus the 'topological' mode is repeated in *Capital* III (311) with the distinction between (5.31a) the 'veiled core-shape [*verhüllten Kerngestalt*]', 'hidden background' and (5.32a) the 'shape as it finishes up [*fertige Gestalt*]', 'surface', 'real existence'. In what, more precisely, does this contrast between (5.31) and (5.32) consist?

To start with a negative point, it does *not* consist in any relation to a conscious subject. For instance, **Marx** writes: 'appearances . . . are reproduced . . . as forms of thinking' (*Capital* I, 682). But how, more positively, should we understand the contrast? The answer proposed here is that the contrast is not one between 'orders' of reality as such, according to which one is in some sense 'less real' than another, but rather concerns an explanatory asymmetry between *what explains* and *what is explained*. The first may indeed be spatially separate from the second, as when the (proximate) origin of a causal chain is assigned an explanatory role with respect to the (proximate) end of the chain. For example, to take the astronomical example in *Capital* I (433), certain movements

of the planets are 'actual [*wirklich*]' with respect to ones that 'merely seem [*scheinbare*]' to be such insofar as the first explain the second but not conversely. However, the second are perfectly real in a general sense: they are the ways in which light rays from one optical plane are projected onto another, and this may be registered in perfectly objective terms, e.g. on film. But the two elements need not be spatially separate, e.g. as when the behaviour of what is ordinarily described as a gas is explained as the macroscopic behaviour of a certain body of molecules in motion; the explanation is effected by the hypothesis that the two descriptive expressions have a common referent. See, for example, **Marx**'s treatment of the 'transformation problem', that is, the treatment of the 'price of production' as 'a metamorphosed [*verwandelte*] form of value' (*Capital* III, 263).

2.54 What has just been said also permits an elucidation of the distinction within (5.32) between 'what merely seems to be the case' [*Schein*] and 'appearance [*Erscheinung*]'. **Marx**'s conceptual apparatus here is almost certainly of Hegelian provenance (e.g. **Hegel**, *SL* 394 et sqq., 479 et sqq.). However that may be, both contrast, in **Marx**, with what is 'actual' in the way explained in 5.3, but differ from each other as follows.

'What merely seems to be the case [*Schein*]' is an *explanandum* taken in abstraction from its real *explanans*. Thus Marx writes (*TSV* III, 453) that the idea of revenue and its sources is capitalist production 'as it seems to be [*wie es . . . scheint*] on the surface, separated from the hidden structure and the mediating links [*Zwischengliedern*]'. (cf. **Spinoza** on how in 'knowledge of the first kind' the world is represented 'mutilated . . . and without order for the intellect' in EII, P40, Sch. 2).

'Appearance [*Erscheinung*]' is an *explanandum* taken (a) neutrally as such or (b) in inferential connection with its *explanans*. For instance, exchange-value 'appears [*erscheint*] to start with as . . . a relation that constantly changes with time and place'. This is 'appearance' in sense (a). But to take this as the whole truth of the matter is to be in the context of 'what merely seems to be the case': 'Hence exchange-value seems [*scheint*] to be something accidental and purely relative . . .' (*Capital* I, 126) However, **Marx** goes on a little later: 'The progress of the investigation will lead us back to exchange-value as the necessary mode of expression or form of appearance [*Erscheinungsform*] of value, which to start with, however, must be considered independently of this form' (*Capital* I, 127). This is 'appearance' in sense (b).

2.55 Turning now to the terms in (5.21) above, **Marx** uses them to refer not to inner-subjective items but to the general forms of the immediate *practices* of those agents, which are no more *constituted* in the awareness of individual subjects than the syntactical rules of a natural language are, even though the use of such languages involves psychological processes in conscious agents. Thus, early in *Capital* I, he explains that commodity-owners acted in accordance with certain principles of commodity-exchange long before they had any understanding in general terms of what they were doing – 'They do it but they know it not' (*Capital* I, 166 et sq) – and that the money-form was generated by the exigencies of commodity-exchange, not by conscious artifice – 'In the beginning was the deed' (*Capital* I, 180).

Later on in the same volume he explains how the '*Schein*' which attaches to the wage-form is generated, in the case of both capitalists and workers, by the practices in which labour-power is bought and sold (*Capital* I, ch. 19). Again, **Marx** remarks that a certain erroneous 'theoretical view' about the formation of profit 'expresses a practical fact' (*Capital* III, 270), and the significance of certain forms of 'calculation' (*Capital* III, 311 et sq). In general, it is because 'what merely seems to be the case' is 'directly spontaneous' and the corresponding forms of thinking thus 'customary [*gang und gäbe*]' (*Capital* I, 682) that science is necessary.

2.56 As regards the 'presentation' 'in ideas [*ideelle*]' of which **Marx** speaks, his general procedure is to use his fundamental concepts to construct 'pure cases' (see e.g. *Capital* I, 260), that is, models of the real which take

account only of some of the determining factors always actually at work there, the models becoming more and more complex in the course of the exposition. (For a synoptic presentation of the course of capital along these lines see the opening of *Capital* III.) These pure cases are governed by laws which, in their application in the understanding and prediction of actual states of affairs, are only 'tendential', because the relations which they express are always 'modified by manifold circumstances' (*Capital* I, 798), the most familiar example relating to the fall of the rate of profit (*Capital* III, Part III). **Marx** here stands in the tradition of theory-formation by postulation in tandem with the analytic-synthetic ('resolutive-compositive') method. (On the theme of idealisation with special reference to **Marx**, see **Nowak** 1980.)

3. *Reception*. – Since, as has just been seen, the sources in **Marx**'s own writings for a statement of **Marx**'s views on the philosophy of knowledge are mostly fragmentary and elliptical, and often of only indirect relevance, it is not surprising that attempts to piece together, to reconstruct, a more seamless doctrine which might properly be called '**Marx**'s epistemology' have been quite diverse (cf. **Kallscheuer** 1986). Indeed, in the light of these divergences it may be more appropriate to speak of the question of a 'Marxist' rather than '**Marx**'s' epistemology'.

3.1 Considering the matter from a purely intra-theoretical standpoint, these differences stem from at least two sources. One is disagreement as to whether **Marx** even had a single set of views on this theme. If he had more than one, not necessarily consistent with one another, there arises the question as to what passages and works are taken to be the central, 'canonical' ones. For example, (a) **Della Volpe** (e.g. 1973, 1980, **Fraser** 1976) and his school identify the crucial texts as **Marx**'s *Critique of Hegel's Doctrine of the State* (1843) and the *1857 Introduction*; (b) **Kolakowski** (1971) and **Preti** (1957) concentrate on the *1844 Manuscripts* (cf. here **Markus** in **Schmidt** 1969); (c) **Althusser** and co-workers (**Althusser** *FM*, **Althusser**/**Balibar** *RC*, **Balibar** 1994, **Balibar**/**Macherey** 1968, **Raymond** 1973) base themselves mainly on the *1857 Introduction* and *Capital*; whilst (d) **Lukács** is more eclectic.

Another source of difference concerns the intellectual instruments used both to select and to interpret the chosen texts. For example, group (a) calls upon **Kant** (just as 'Austro-Marxism' did earlier), whilst others are under the influence of neo-Kantianism (e.g. **Banfi** 1965); (b) tends to look to American pragmatism (especially **Dewey**); (c) is influenced by **Spinoza** and certain trends in French epistemology, particularly **Bachelard** (see 1974 for an excellent selection from his voluminous writings), **Cavaillès** (1938, 1960, 1962), **Canguilhem** (1955, 1965, 1966, 1968), and to a lesser extent **Comte** (cf. **Macherey** 1989) and **Koyré** (cf. **Jorland** 1981); whilst (d) **Lukács** made particular use of **Hegel**.

There have also been approaches to **Marx** through **Engels** (see **Liedman** 1986, esp. Ch. VIII), particularly as regards the theory of 'reflection'. This effectively begins with **Plekhanov** and **Lenin** (especially the **Lenin** of *Materialism and Empirio-Criticism*) and, after them, those working within the orbit of the Second and Third Internationals, branching, on the one hand, in the direction of 'Diamat' (see **Sandkühler** 1973), and, on the other, into various more individual contributions (e.g. **Geymonat** 1977; **Ruben** 1977). (**Lenin** has also been used in a somewhat idiosyncratic way by **Althusser** and co-workers – see e.g. **Lecourt** 1973.) M. **Raphael**'s great work, his posthumous (1974), revised version of his *Erkenntnistheorie der konkreten Dialektik* of 1934 – still, disgracefully, almost completely unknown – draws on a variety of resources. So does **Gramsci**'s work in the area, though it is rooted in a critical dialogue with **Croce** (and thus, indirectly, with classical German idealism). It is less systematic than **Raphael**'s work, but contains many important insights, some anticipating more recent positive results in the philosophy of the sciences (cf. **Rossi** 1976).

3.2 The following will attempt to sketch an answer to the question: Is it possible to focus all or at least most of the contents of

the **Marx** texts already surveyed into a reasonably unified picture? The central idea of the answer proposed here is to consider at least scientific knowledge as a result of a process of production. A little more specifically, the basic idea is to construe scientific knowledge systematically on the model of **Marx'**s account of the production of economic use-values, in the first place in the course of a 'labour process'.

Thus we have seen that **Marx** speaks in the *1857 Introduction* of the formation of 'concepts' as the result of a 'process' of 'elaboration' of 'what is directly given and conceptions', and in *Capital* I of 'inquiry' as 'labour [*Arbeit*]'. This connects, verbally at least, with his remark that in the production of economic use-values 'the object is elaborated' (*Capital* I, 287; cf. **Haug** 1984, 36–39). He even speaks of science as 'universal [*allgemeine*] labour' (*Capital* III,199), though it is not entirely clear what he meant by this last phrase (cf. **Haug** 1994). Again, he speaks at various places of 'mental [*geistige*] production', even at one place of 'the product of mental labour – science' (*TSV* I, 285, 353). It is also arguably suggested by the centrality of material production in his thinking, both early (*GI*) and late (*Marginalia*), about knowledge.

The initiative for such an interpretation is essentially due to **Althusser** (*FM*). Yet as early as 1934, 'elaborating [*Verarbeiten*]' had a crucial place in M. **Raphael**'s work. **Brecht** (*GW* 20, 189) speaks of a 'mode of production of truth' and 'experimental thought' (cf. **Haug**, particularly Ch. 3: *Epistemologie der Praxis*). Since then others have taken up the idea from **Althusser** and developed it further (see particularly **Suchting** 1986, **Baltas** 1993, **Stachel** 1974).

4. The Concept of *Theoretical Labour Process* (*TLP*). – The concept of what may be called the 'TLP' is initially to be constructed according to the model of the economic labour process. The fundamental aim of a TLP is the production of a solution to a problem (such a solution might be called a 'theoretical use-value'). The problem may be one about *how* to produce a certain result, but this will generally presuppose one about knowledge *that* something is the case, and it is this with which a TLP will be basically concerned. Further, the knowledge that something is the case may be about *what* is the case, aiming at an appropriate correct *description*, or it may be about *why* something is the case, aiming at *explanation* (which may be sought simply for the sake of understanding or for that of prediction and/or control).

The 'labour-power', realised as 'labour', consists principally in the knowledge and skills (e.g. computational, material-manipulative) of the scientific agent.

The 'object of labour' must be considered, to start with, from both of two points of view (signalled in the *1857 Introduction*) which it is crucial to distinguish. (4.1) It is a *real* object (ultimately, nature). (4.2) It is an 'abstract' object, where this covers both (4.2a) what may be called 'discursive' objects in the broad sense (e.g. expressions in both natural and specially constructed languages and in mathematics), and (4.2b) models specified in terms of these objects (e.g. frictionless pendula). Items belonging to (4.1) in general enter the TLP ultimately via their *causal* features (e.g. their effects on a photographic plate), but they enter the TLP only via (4.2), that is, *discursive* formations associated with them (e.g. the description of a line on a photograph as 'path of a neutron'). The object of labour of each sort may be either 'naturally' given or 'raw material'. As regards (4.1) it may be, e.g. a chemical element as found in nature, or a sample specially prepared to maximise purity. Items belonging to (4.2) may be pre-scientific/theoretical *Vorbegriffe*, e.g. with respect to (4.2a), 'common-sense' biological classifications, and with respect to (4.2b) an Aristotelian type armillary sphere or already acquired scientific concepts and models.

The 'means of labour' (4.4) consist, broadly, of (4.1) primarily 'abstract' ones (e.g. concepts, theories, techniques of logico-mathematical inference), which may be already available or have to be specially constructed, and (4.2) ones centrally involving material instrumentation (e.g. electrometers). The latter exhibit a duality similar to that noted above with respect to (4.1). That is, the material objects involved are, in the first place simply parts of the real

world; they only become 'instruments' when brought under certain descriptions (this is also true of 'pure' logic and mathematics, which are mere *Glasperlenspiele* until given an 'interpretation', from either intra- or extra-mathematical sources). Thus an instrument may be said to be what **Marx** called the commodity, 'a sensible-supersensible [*sinnlich-übersinnliches*] thing' (*Capital* I, 163). It is in this sense that **Gramsci** is right in saying that 'the principal "instruments" of scientific progress are of an intellectual (and also political), methodological order' (*Q* 11, 21).

As in the economic labour process model, (4.3) and (4.4) constitute, together, the means of production of the TLP, and, as there, the characterisations are functional, not intrinsic: for instance, the solution to a problem found in one TLP may well appear as part of the means of labour in another. An example of this may be found in *Capital* I. Here, **Marx**'s problem was, in the first place, (a) the origin of surplus-value, left unsolved by classical political economy (chs 5, 19); (b) his object of labour was (ba) actual capitalist economies, and (bb) the spontaneously formed representations of the latter used by their agents, as well as, say, the labour theory of value of classical political economy; (c) his means of labour included earlier concepts of class struggle in the latter and in bourgeois historians (cf. **Marx** to **Weydemeyer**, March 5, 1852) and socialist writings, which, in the context of other conditions, enabled him to form the concept 'mode of production [*Produktionsweise*]' which permitted him to pose the question of the form as well as the quantitative features of the exchange-relation between commodities (*Capital* I, 174 n.34), making possible the crucial distinction between 'labour' and 'labour-power' (ch. 6). **Engels** compared **Marx**'s solution of this problem (*Capital* II, 97–99) with **Lavoisier**'s solution of the problem of combustion (cf. **Althusser** *RC*, 22 et sqq.).

5. The Concept of *Theoretical Mode of Production* (*TMP*). – An actual TLP, like an actual economic LP, presupposes a combination of its elements in ways determined not only by the inherent character of its elements (e.g. an experiment has to be carried out in a definite sequence of steps), but also social relations of production which define control over the elements of the TLP and which contribute to constituting them as forces of production [*Produktivkräfte*]. (E.g. a laboratory normally has, in the simplest case, a director, who ultimately controls the ends to which the TLP is put and assigns material and human resources to the attainment of these ends.) This may be called, using the preceding model, the '*Theoretical Process of Production*' ('TPP').

The TLP as thus more concretely determined within a TPP is part of a process in which its elements are distributed, exchanged, circulated (e.g. through copying of apparatus, scientific papers given at conferences and published) and consumed (e.g. the result of a particular PP may enter as raw material into another). This totality may be called 'theoretical mode of production' TMP(a).

At the final stage of consumption, TMP(a) already involves not merely production but also *re*production of the theoretical forces of production. But it is also necessary to reproduce the relations of production of theoretical production. This may be done in many ways. These include 'political' ones, like the regulation of 'scientific life' by professional associations, a regulation which generally includes sanctions (e.g. against scientific fraud), and 'ideological' ones (e.g. inculcation of norms like the pursuit of truth for its own sake; cf. **Althusser** 1990). At this stage, that of the differentiated unity of production and reproduction, we may speak of the 'TMP(b)'.

6. *The articulation of the economic MP and TMP*. – A definite TMP is always embedded in an economic MP; that is, an instance of the former always causally presupposes an instance of the latter (though, of course, the converse relation does not hold). This means that the latter at every level 'overdetermines' the former at every level. Using a received way of putting the matter, the TMP(b) is 'autonomous', though only 'relatively' so. It is impossible here to do more than indicate a few aspects of this immensely complex situation.

An economic MP affects the LP of a TMP(b) embedded in it as regards each of

its components. More specifically, the MP influences (a) the choice of the problems which define the aim of a TLP (e.g. the effect of the needs of growing commerce in the reform of astronomy in early modem times, of military needs on fundamental physics in our own time, of the ideological needs of the rising bourgeoisie on the construction of a non-hierarchical cosmology in early modern times – cf. **Lefevre** 1978); (b) the supply of adequately skilled and appropriately ideologically formed scientific labour-power; (c) the supply of much of the object of the TLP, whether this be of a familiar material sort (e.g. fissionable material for experimentation in fundamental physics) or of a discursive sort (e.g. techniques of calculating risk-taking in commerce and games of chance as material for theories of probability – cf. **Raymond** 1975); (d) the supply of much of the instrumentation, in the broadest sense, which is used in the TLP, ranging from material instrumentation (e.g. machinery in early modem times to, say, computer facilities today) to sources of models for the understanding of scientific subject-matter (e.g. the clock).

A MP(b) affects a TMP(a). 1. The social relations of production of the former help determine the theoretical relations of production. (E.g. contrast the largely individual research set-up of a **Galileo** or **Newton** or even of a **Hertz** with the gigantic cooperative enterprises that are the R&D departments of many modern corporations.) 2. A MP(a) influences the patterns of exchange/distribution/circulation and consumption characterising the TPP. (E.g. contrast the relatively interpersonal and small-scale, comparatively free modes of dissemination in earlier modern science with the vast apparatus of print and electronic transfer, the limitations involved in the secrecy of modern corporate and 'classified' research for military purposes.) A MP(b) affects a TMP(b). 1. The sanctions of a MP(b) may affect the TMP(b) whether the force always involved in such sanctions be exercised directly (e.g. in the case of **Vavilov** and other Soviet geneticists), or indirectly (e.g. consequences of breaches of contract). Political pressures affect, for example, the allocation of research-funds (e.g. regarding work on peaceful versus military uses of atomic energy). 2. Ideological features of a MP(b) have an influence on the types of processes studied (e.g. highly predictable linear versus highly unpredictable non-linear systems), the choice of theoretical models (e.g. teleological versus causal models in the life sciences) and the motivation for research (e.g. research considered as a way of finding the traces of divine action versus the search for truth for its own sake).

Of course, a TMP(b) may also affect a MP(b). To take obvious examples, the level of production of scientific knowledge affects to a greater or lesser degree the level of material production (e.g. earlier modern times versus more recent times), and scientific advances, particularly of a fundamental sort, in general have an effect on the prevailing ideological trends, favouring the interests of some groups, disadvantaging others (e.g. the influence of **Copernicus**, **Galileo**, **Darwin**, **Marx**, **Freud**).

7. *The Question of a Marxist 'Epistemology'*. – In what sense is the account sketched here a Marxist successor to, or replacement of, the traditional problematic of an epistemology? It has been seen that it was **Marx**'s view, from first to last, that *all* cognitive appropriation of the world takes place within practical relations of human beings to that world. All such relations are ultimately rooted in, directed to the production of use-values, and mediated, after the most elementary stages, by various sorts of instruments (tools). Furthermore, even the most elementary forms of production always presuppose some knowledge (e.g. of some properties of the means of production), acquired in former interactions. This knowledge need not be explicitly formulated (it may be 'knowledge *how*' rather than 'knowledge *that*') and will probably have been arrived at by accident rather than intentionally and also by trial-and-error rather than by closely directed inquiry. In sum, such production is directed *primarily* at the generation of use-values and any new knowledge generated comes about as a *by-product* of those acts, is incidental to them, or where it is consciously aimed at, restricted in its aim and scope.

However, at a certain point, there comes about, for one or more of a variety of different reasons, not the least important of which are the cognitive needs of production of use-values, a form of production which is distinguished from the latter by the fact that it is directed *primarily* to the generation of knowledge as such. Achievement of this aim makes necessary a qualitatively higher level of instrumentation, both conceptual-theoretical and material. This type of production is *supervenient* upon the first sort, and all that this presupposes, including powers of perception, skills, elementary classifications of objects and their properties, and the like. Such distinctively 'problem-solving' production is not restricted to the sciences, though it is carried on paradigmatically by them. Indeed, these are marked out, inter alia, by the construction of a relatively autonomous conceptual apparatus ('concepts [*Begriffe*]' rather than 'what is directly given [*Anschauungen*]' and 'conceptions [*Vorstellungen*]'), specially devised for the purpose, and in general constituted by a conjunction of intra-theoretical relationships and material-instrumental procedures.

It may now be proposed that the field of a *Marxist* 'epistemology' be demarcated as that of the forms of production of the second sort just distinguished, that is, where knowledge as such is the telos. It is itself scientific in character and replaces traditional epistemology. The latter is wholly replaced by a Marxist-materialist science of psychology, which deals, inter alia, with what pertains to the genesis and nature of the psychic life of the agents of the form of production with which a Marxist epistemology of the sort just envisaged involves, a life that is, of course, grounded in, mediated by, social relations and ultimately in production, considered in its most general features (**Holzkamp** 1983).

8. *Marxist 'Epistemology' versus Traditional Epistemology*. – A contrast, point by point, of the programme of a Marxist epistemology so conceived with traditional epistemology should further elucidate both.

8.1 With regard to items (1) and (2) in the traditional schema, what is basic for a Marxist epistemology of the sort developed above is not a 'subject'/'object' couple, each term of which is preconstituted with respect to the situation in which the first seeks to come into a knowledge-relation with the second, but rather a practical relation within which subjective and objective elements may be distinguished, elements which are constituted, from the epistemic point of view, basically by the character of the relation thus set up. What **Marx** says of economic production applies also to production of knowledge: 'Production produces . . . not only an object for the subject, but also a subject for the object' (*1857 Introduction, G* 92). **Engels** puts essentially the same point thus: 'Natural science, and likewise philosophy, have up till now entirely neglected the influence of the activity of human beings on their thinking; they recognise only nature on the one hand, thoughts on the other. But it is precisely the alteration of nature by human beings, not solely nature as such, which is the most essential and most proximate foundation of human thinking, and the extent to which human beings have learned to alter nature is the extent to which their intelligence has grown' (*Dialectics of Nature*, 171).

Of course, the real object *as such* is not constituted by the process of cognitive production any more than it is in the process of production of ordinary use-values. What is so constituted is the real object *insofar as it is an object of cognitive appropriation*. As regards the 'subject' of knowledge, it must be emphasised that from the epistemological point of view, in the above sense, this is constituted, not constituting, and functions only as the agent of theoretical means of labour, though, of course, individual-subjective capacities are presupposed by (and developed in the course of) its functioning in this way.

8.2 With regard to item (3) in the traditional schema, subjective representations (conceived psychologistically or in a reified-objective manner) are replaced by intersubjective rules (never exhaustively specifiable) for the carrying out of intra- and extra-theoretical procedures (e.g. rules for the formation and transformation of signs and the modes of

practical action which are designed to secure them real reference). These rules are not individual-psychological, though processes of the latter sort are involved in their use. Nor are they independent of human beings in general, though they would not exist were the latter not to exist (in these respects they are like the rules of a natural language). The distinction here is like that involved in **Marx**'s distinction, with regard to commodities, between their material 'objectivity as utilities [*Gebrauchsgenständlichkeit*]' and their 'social . . . objectivity as values [*gesellschaftliche . . . Wertgegenständlichkeit*]' (*Capital* I, 166).

8.3 With regard to item (4) in the traditional schema, the version of Marxist epistemology in question has no place for any completely general, *a priori* specifiable principles of normative evaluation of claims to scientific knowledge with regard to the adequacy of a subject's representations with respect to an object. This is so if only because, as has just been seen, the presuppositions of such principles are absent. Instead, the Marxist approach involves criteria of evaluation as they occur *within* historico-theoretically determinate processes of practical cognitive appropriation of the world. Evaluations occur within these, and therefore vary according to context both 'diachronically' (according to the science in question) and 'synchronically' (according to the state of play in each science).

8.4 Just because of this character of those processes, there is and can be no question of the quite general, *a priori* specifiable 'laws' spoken of in item (5) of the traditional schema, by which a subject generates adequate representations of its object. Just as there is no 'production in general' or 'general production', though there are 'general determinants [*Bestimmungen*] of production' which are used to define 'particular forms of production' (*1857 Introduction, G* 86), so analogously here: a Marxist epistemology of the sort outlined here seeks to identify the most general elements and relations in any cognitive appropriation of the world, but the modes of production of specific items of knowledge are historically specific.

8.5 It is a corollary of the previous point that a Marxist epistemology of the present sort cannot work with a unitary category 'science', but only with 'sciences', the specific character of each of which is historically determinate. Putting the same point in another way, on this view there is and can be no unique 'scientific method'. This was clearly recognised by **Gramsci**: 'every inquiry has its own specific method and constructs its own specific science, and . . . the method has developed and has been elaborated together with the development and the elaboration of that specific inquiry and science, and forms with them a single whole. To believe that it is possible to make progress in an inquiry by applying to it a standard method, chosen because it has given good results in another inquiry to which it was innately suited, is a strange blunder which has little to do with science' (*Q* 11, 15).

By the same token, the history of the sciences plays the role not of a source of examples to illustrate an epistemology constituted independently of it, but rather of the principal subject-matter of epistemological reflection. However, looked at historically, epistemological principles derived from the study of historically determinate scientific discursive formations often function as a heuristic for the continued rewriting of the history of a science.

Finally, this account settles, in principle at least, the long and continuing controversy between 'internalist' and 'externalist' approaches to the history of science. For the TLP assures a relation to objectivity, whilst its embeddedness in, successively, a TMP and an economic MP assures a place for extra-theoretical determinants of the discursive results of that TLP.

9. Marxist epistemology is a very underdeveloped area. As already indicated, work has been and is going on in a number of directions, some of them radically different from one another. This absence of a common programme will doubtless persist into the foreseeable future and may well be, at the very least in the medium term, an important source of innovation rather than of lack of progress. However, whichever direction is

pursued, it may be suggested that work should proceed along at least the following major paths.

9.1 Quite fundamental is the development of clearer basic concepts and theses. Marxist historiography of science would be one beneficiary. Work already done here includes **Baracca/Rossi** 1976, **Ciccotti** et al. 1976, **Fichant/Pêcheux** 1971, **Geymonat** 1985, **Jager** 1985, **Raymond** 1975a.

9.2 Another path, important both for its own sake and also for what it contributes to work in the preceding area, is inquiry into the epistemology of particular branches of scientific knowledge. This will in general include historical studies. Notable work has already done in this regard in the areas of logic and mathematics (e.g. **Badiou** 1970; **Damerow/Lefevre** 1981; **Houzel** et al. 1976; **Leiser** 1978; **Raymond** 1973, 1977; **Renou** 1978; **Schmid** 1978) and the non-'formal' sciences (e.g. **Baracca** et al. 1979; **Bernal** 1969; **Freudenthal** 1986, 1988; **Guenancia** 1976; **Geymonat** 1970–7; **Lefevre** 1978, 1984; **Wolff** 1978; **Zilsel** 1976).

9.3 A third path, the pursuit of which is important for both the preceding, is the critical appropriation of work produced within programmes which are non-Marxist, but convergent in various respects with a generally Marxist approach. This has already been done regarding certain currents in French epistemology, especially **Bachelard**, **Canguilhem**, **Cavaillès** (cf. **Fichant** 1978), by **Balibar** (1994), **Lecourt** (1974, 1975), **Macherey** (1964, 1989), and various contributions in **Balibar** et al. (1993).

Again there is a wide variety of work which looks at epistemological issues from the central perspective of action, practice, production. Instances in the older literature include some American pragmatism (especially **Peirce** and **Dewey**), **Dingler** as well as some work influenced by his (e.g. **von Greiff** 1976, **Holzkamp** 1968), **Watson** (1938), **Wittgenstein** (cf. **Rubinstein** 1981), and, following on from him, **Toulmin** (1953). More recently, in the field of mathematics, there has been the work of **Desanti** (1968, 1975) and **Kitcher** (1984), in that of natural science **Ravetz** (1971) as well as new work on the epistemology of experiments (cf. **Hacking** 1983 and **Gooding** 1990).

9.4 Overlapping the preceding by way of the critical dimension is polemical engagement with orientations of an either implicit or explicit epistemological sort whose only significance is negative. For historical work in this direction, see, for example, **Conry** (1983). Work by German 'critical psychology' criticising methodologies of mainstream psychology (e.g. **Holzkamp** 1983 and summary of the latter in **Tolman** 1994) are paradigmatic for contemporary ideological struggle, just as are **Doyal/Harris** (1986) and **Hindess** (1977) in the social sciences, and **Pêcheux** (1975, 1990) in linguistics.

In general, here it is worth remembering **Brecht**'s aphorism: 'materialism must always tell what emerges from it; in the case of idealism, on the contrary, we must always ask what it emerged from' (*GW* 20, 144).

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Edited for English publication by Peter Thomas

Abbild [image], abstract/concrete, Althusser School, analysis/synthesis, appearance/form of appearance, appropriation, *camera obscura*, consciousness, contemplative materialism, core structure, Critical Psychology, definition, Della Volpe School, discourse analysis, element/elementary form, empirical research/theory, essence/appearance, falsificationism, formal abstraction/real abstraction, general labour, interior/exterior, knowledge, *Leitfaden*, level, method, mode of production, overdetermination, problematic, reconstruction, reflection, representation, research/presentation, *Schein*, science, subject/object, surface/depth, theory, theory of knowledge, theory of science, thought form, transformation problem, truth.

Abbild, abstrakt/konkret, allgemeine Arbeit, Althusser-Schule, Analyse/Synthese, Aneignung, anschauender Materialismus, Bewusstsein, Camera obscura, Definition, Della-Volpe-Schule, Denkform, Diskursanalyse, Ebene, Element/Elementarform, Empirie/Theorie, Erkenntnis, Erkenntnistheorie, Erscheinung/Erscheinungsform, Falsifikationismus, Formalabstraktion/Realabstraktion, Forschung/Darstellung, innen/außen, Kernstruktur, Kritische Psychologie, Leitfaden, Methode, Oberfläche/Tiefe, Problematik, Produktionsweise, Rekonstruktion, Repräsentation, Schein, Subjekt/Objekt, Theorie, Transformationsproblem, Überdeterminierung, Wahrheit, Wesen/Erscheinung, Widerspiegelung, Wissenschaft, Wissenschaftstheorie.