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: *Dictionary of Marxism, Socialism,*
De Gruyter 1981. Pp. iv + 660. US$

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volume's title). Thus while there are entries for Bukharin, Plekhanov, and Zhdanov (though oddly not Deborin), one looks in vain for Adorno, Bloch, Benjamin, Brecht, Gramsci, Habermas, Horkheimer, Kosík, Pollock, or Szabó. When we do find brief mention of Korsch, Labriola, Lukács, Marcuse, and Sartre, we can only wonder what they are doing in such antagonistic company. That the author claims he has tried 'to be as objective as is humanly possible' (though 'he does not hesitate, still in the informative vein, to highlight the strengths and failings of Marxism, especially in comparison with capitalism') may even leave us mildly depressed, or at least in doubt about the value of 'encyclopedic dictionaries.' Not only does one fail to perceive a totality here. One may well feel robbed even of the satisfaction of bourgeois but nicely-textured abstract particulars.

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CANADIAN PHILOSOPHICAL REVIEWS. Vol II 1982

RAYMOND L. WILDER, *Mathematics as a Cultural System.* New York: Pergamon Press 1981. Pp. xii + 182. US$ 23.00. ISBN 0-08-025796-8

Studies of complex cultures as a rule benefit from a concentration on details and come to grief when the temptation to generalize is given free rein. When cultures are reduced to a few allegedly salient features, what makes them worth studying is invariably lost. It is a platitude to say that cultures reflect social reality when how they reflect it is left unspecified, and it is unhelpful to be told that cultures evolve as a result of internal stresses and external pressures of one sort or another. Perhaps the problem is that we have not yet uncovered an appropriate general scheme for analyzing culture, but it could well be that there is no such scheme to be found.

Raymond Wilder, who has had a long and successful career in mathematics, is certainly in an excellent position to cast light on the folkways of the mathematical community. Personal experience may not be the best evidence, but it could prove especially useful in an area as little explored as 'mathematical culture.' What Wilder attempts in this book, however, is a general account of mathematics as a cultural system, and the result is as

unrewarding as usual. Worse still, Wilder has chosen to ignore the more prosaic aspects of the mathematician's work and to concentrate instead on mathematical ideas. It is as though an anthropologist interest in the culture of the Trobriand Islanders were to focus on the Islanders' cultural artifacts to the exclusion of their practices, customs and attitudes.

Wilder's main contribution to the discussion of cultural systems is the idea that their various components can be represented as 'vectors' corresponding to interests. We may, he tells us, think of North American culture as a vectorial system, the vectors of which represent religious interests, agricultural interests, oil interests, etc. (15). In the case of mathematics, we have a system of vectors respresenting subjects such as algebra and topology 'in which each vector is striving for further growth and in which the different vectors impinge on one another, offering assistance by diffusion of ideas to other vectors, sometimes resulting in new consolidations which will become vectors in their own right' (16). This makes vectors — which were first said to represent interests, then fields of research — sound as though they have lives of their own. Even if diverting, the idea of vectors striving, impinging and offering assistance is not one that helps us to explain very much.

This complaint also applies to Wilder's treatment of what he calls the 'before his time' phenomenon. As he sees the matter, cases such as Desargues' development of projective geometry in the 1630s, two centuries before its time, occur as 'a result of stresses being imposed by a cultural vector *V* at a time when successful breakthrough of *V* is smothered by other, stronger vectors; later, at a more opportune and usually more appropriate time, *V* achieves recognition and consequent development of its proper niche in the evolution of the related science' (25). In other words, developments occur when the time is ripe, an observation which hardly demonstrates that the conception of a vectorial system is 'very useful as an explanatory device' *(ibid.)*.

In his discussion of the development of mathematical ideas, the other main theme of his book, Wilder quite rightly notes that innovations are often made more or less simultaneously by different scientists, that discoveries occasionally occur prematurely, that mathematics on the whole is becoming progressively more abstract, and that the development of specific fields of research often gives rise to new problems (see chapter II); and he is right to insist that there has been a diffusion of mathemtical ideas from certain social groups to others, that practical exigencies occasionally prompt mathematical developments, and that theories have been combined or 'consolidated' to yield more general and more powerful theories (see chapters III, IV and V). However, none of this is particularly surprising or significant when presented as abstractly as Wilder presents it. De Solla Price's argument (mentioned on p. 59) that the beginnings of science resulted from the consolidation of Babylonian numerical astronomy and Greek geometric astronomy is an important historical conjecture, but the claim that consolidations occur is too trivial to warrant extended discussion.

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NICHOLAS WOLTERSTORFF, *Wor*
New York: Oxford U.P. 1980. Pp.
ISBN 0-19-824419-3); Cdn$ 31.95

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The same problem attends Wilder's attempt to provide general laws governing the evolution of mathematical culture. These laws, which supplement and qualify those in Wilder's earlier *Evolution of Mathematical Concepts* (1968), are presumably meant to be empirical generalizations. But, unlike interesting generalizations such as Kepler's three laws, Wilder's twenty-three laws are only distinguished by their often obscure formulation. Consider, for instance, law 10, which says that 'diffusion between cultures or fields frequently will result in the emergence of new concepts and accelerated growth, always assuming the requisite conceptual level of the receiving entity' (135), or law 13, which says that 'discovery of inadequacy in the conceptual structure of mathematics will result in the creation of remedial concepts' (141). Would it not be better to say that mathematicians use ideas from diverse fields when they know about them and need them, and that when mathematicians become aware of contradictions they usually try to eliminate them?

The final chapter on 'Mathematics in the 20th Century; its Role and Future,' despite its title, is as tame and as torpid as the previous ones. And Wilder's advice to aspiring mathematicians — do not worry about being first to obtain a result, do not fear that one's filed of interest is becoming 'played out,' etc. (164-6) — is unlikely to inspire very many. For my own part, I found it discouraging to be told that 'the way of looking at mathematics presented (in this book) is not asserted to be the 'true' state of affairs' (vii), and I would have preferred not to have had to negotiate words like 'religion-wise,' 'culturological' and 'premat.' There may be something general and important to be said about mathematics as a cultural system, but it is not apparent in this disappointing book.

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NICHOLAS WOLTERSTORFF, *Works and Worlds of Art.* Don Mills, Ont. and New York: Oxford U.P. 1980. Pp. xv + 375. Cdn$ 62.50: US$ 55.00 (cloth: ISBN 0-19-824419-3); Cdn$ 31.95: US$ 24.50 (paper: ISBN 0-19-824426-6).

'Throughout this century,' Nicholas Wolterstorff notes in his Preface, 'aesthetics has been a somewhat turgid backwater alongside the main currents