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" part of the rate-burden (which tends to fall ultimately upon them " under the present rating system) and consequently to enhance the " value of their property." Finally, it may be noted that in their examination of other possible sources of local revenue, the Committee have given careful consideration to the local income-tax system of Prussia, and have reached the conclusion, that no scheme of the kind would be practicable in this country. P.A.

2.—*Les Mathématiques appliquées à l'Économie Politique.* By Wl. Zawadzki. 331 pp., 8vo. Paris: Librairie des Sciences Politiques et Sociales. M. Rivière et Cie, 1914. Price 8 francs.

The appearance of this book is opportunely coincident with a revival of interest in the subject. The question, what is the worth of Mathematical Economics, has lately been re-opened in this country. A slashing article by a distinguished economist in the *Quarterly Review* has encouraged the natural disposition of the plain man to suspect paradoxical refinements. M. Zawadzki's temperate discussion of the question is calculated to mitigate the captiousness of the learned and the prejudices of the laity. He does not weaken his case by overstatement. Wiser than some of his predecessors, he does not put forward mathematical economics as a sort of social astronomy, capable of predicting economic phenomena quantitatively. More cautious than some recent writers, he does not press the analogy between Mechanics and Mathematical Economics. " Very little has been done up to the present," he candidly admits; " mathematical economics will always remain extremely abstract: " its theorems are only ' schemas ' conducing to a comprehension " of the reality, but not the faithful image of that reality. They " will never be capable of direct application to practical cases." But the study is not, therefore, useless. It is valuable as an instrument of criticism, it is a powerful solvent of fallacious reasoning—a proposition which is inexact on the simplified suppositions proper to mathematical science can evidently not be exact in the more complex conditions of concrete reality. But the rôle of the new science is not entirely negative. It is required to impart a necessary precision to conceptions which play a great part in economic theory. We might instance the relation of Joint Production (Cp. Zawadzki, pp. 173, 219), upon the right understanding of which turn important issues respecting the public control of railways. Mathematics are required to express the mutual dependence of economic phenomena; averting vain controversies as to which of two correlated variables is the *cause* of the other. In preferring symbols to geometry for the purpose of exhibiting that interdependence our author goes further than some English writers. But they would not deny the advantage which algebra has over geometry in dealing with a great number of variables. Differences on points of doctrine must exist; but we think that the general feeling of economists, in this country at least, would accept as fair our author's estimate of what mathematical economics can and

cannot do. The whole of his discussion on this subject appears to us to be permeated with what may be called scientific common-sense. As that is rather an uncommon quality, we are not precluded from also attributing to the work that rarity which is the condition of value.

But we think that an even higher value, for those at least who do not come fresh to the subject, attaches to the portions of the book which are devoted to the exposition of works on mathematical economics. The use, and we may add the "final utility," of this element not existing elsewhere in abundance is due to the difficulty which most people, however well instructed, find in reading other people's mathematical economics. As Dr. Marshall has said: "When a great many symbols have to be used they become very "laborious to anyone but the author himself." The labour imposed by new symbols may be aggravated by novelties in economic terminology; and the meaning may further be concealed by the difficulties of a foreign language. Confronted with this triple obstacle the reader may well hesitate; the doubt arises whether the immense labour of cracking the nut will be rewarded by the supreme excellence of the kernel. In these circumstances it is a singular advantage to have the leading doctrines of the leading writers presented in clear outline. The reader is guided to sources of knowledge which he can assimilate; he is introduced to authors whose further acquaintance he may desire. The service which M. Zawadzki has thus conferred falls under two heads. He acquaints the present generation with the earlier writers on the subject and he establishes communication between contemporary English-speaking and Continental economists. To prevent beginners being discouraged by the opening chapters, it may be well to explain that the work is not exactly an elementary text-book for the use of beginners. The history of "first tentatives" (Chapter I) towards a mathematical conception is not, in our opinion, and is not represented by our authors as, the best means of teaching that conception. Those who bring some knowledge of the subject to the perusal of M. Zawadzki's opening chapters will carry away much from his account of Von Thünen, Gossen, and other fathers. The study of Cournot is facilitated by judicious criticisms. Even Jevons, for whom our author has a due admiration, is simplified by the suggestion that his theory of economic dimensions should be ruled out: "though not exactly false, it "is perfectly useless." Attention is directed to the important contribution made by Walras to economic theory when he recognised and formulated the interdependence of economic quantities. M. Zawadzki lends the considerable weight of his authority to the paradox of the Lausanne school, that the entrepreneur works for nothing. He has made the issue clearer; still, we can hardly repeat after him: "We easily see that in a "regime of perfect competition and in a state of equilibrium the "entrepreneur quâ entrepreneur can neither gain nor lose [. . . en

"tant qu'entrepreneur ne peut faire ni bénéfice ni perte]." In this connection may be noticed the observation that the case contemplated by Walras was that in which there are no general expenses.

The living leader of the Lausanne school has a place of honour among the theorists who have established the principles of diminishing utility and economic equilibrium. Attention is directed to Professor Pareto's most characteristic doctrines; for instance, the formula for the change in what we might call the marginal utility of money consequent upon the change in the price of a particular commodity (Zawadzki, p. 181); and the suggestion that the significance in respect of value (we are not aiming at precision of terminology) of two commodities may differ with the *order* in which they have been acquired (pp. 150, 176, 195). The latter point is connected with Professor Pareto's theories as to the motives of economic action. Professor Pareto first proposed the term *ophelimity* as a substitute for what English writers used to call "utility," and now, it seems, prefer to call "satisfaction." Later it dawned upon him that ophelimity, too, might be dispensed with. In the words of his faithful interpreter, "we may obtain equations "which suffice to construct the theory of economic equilibrium with-"out employing the notions of utility, ophelimity, &c., by simply con-"sidering the state of indifference in which we have choice between "two courses—the state represented by the so-called 'lines of "'indifference.'" We agree with M. Zawadzki that the difference between this view and that with which it is contrasted is not so great as may appear. For, on the one hand, those who have thought away the existence of a psychical quantity which economic action tends to maximise yet retain the use of mathematical expressions appropriate to such a quantity. "It is convenient to admit the "effectiveness of a psychological principle; in particular (in the "present state of our knowledge) that of the tendency to the greatest "personal gain or ophelimity" (Zawadzki, p. 154 and context). On the other hand, those who proclaim that utility or satisfaction is measurable must admit that the measurement is of a peculiar and hypothetical species—not exactly comparable with "Long Measure" or "Avoirdupoids." As Bishop Berkeley, while denying the existence of *substance* in external bodies, for an example, an orange, yet retains the taste, the fragrance, the beautiful contour and all the attributes of the orange which appeal to our senses and interest us practically; so Professor Pareto retains the doctrine of "maximum ophelimity" as bearing upon practice (Zawadzki, p. 288 and context). Another distinguished foreign economist whom our author has made accessible to a greater number of readers is Professor Barone (p. 292).

With equal impartiality M. Zawadzki has introduced the English mathematical economists to foreign readers. The gentle criticisms with which he tempers appreciative encomium appear to us to deserve attention. The account of English mathematical economists

would be more complete and interesting if the latest of them had come under M. Zawadzki's notice in time to be included in his review. A comparison at certain points between the theories of Professor Pareto and of Professor Pigou, made by one who is so deeply imbued as M. Zawadzki with the doctrines of the Lausanne school of economics, could not have failed to prove instructive. Take for example the opening postulate in *Wealth and Welfare:* that (economic) welfare "includes states of consciousness only, "and can be brought under the category of greater and less." How does this trenchant statement compare with the disquisitions on ophelimity and indifference which, though abridged by our author, are still comparatively elaborate? Again, what is the relation between the "maximum satisfaction" of the one economist and the "maximum ophelimity" of the other? According to Professor Pigou, the *maximum* realised by unrestricted competition is not the *greatest possible* satisfaction. We are not likely indeed to gain by an *arbitrary random* departure from that maximum; but we may with advantage go beyond it in some definite directions pointed out by science. So, according to Professor Pareto, to infer that in practice free competition was better than any other economic arrangement would be mere folly (Zawadzki, p. 289). Still, in the absence of specific evidence to the contrary, the result of an ideally free competition would be accepted, we believe, by both writers as an object to be aimed at, a sign-post pointing towards the practically advantageous course. Professor Pigou has thus been guided to recommendations as to the regulation of railways, the importance of which seems to realise our author's most sanguine hopes for the progress of the mathematical method. F.Y.E.

3.—*La Banque en France* (*considérée principalement au point de vue des trois grandes banques de dépôts*). Par Dr. E. Kaufmann. Translated and brought up to date by A. S. Sacker. vii + 503 pp., 8vo. Paris: M. Giard et E. Brière, 1914. Price 14 francs.

This scholarly German work, written in 1910, has been made available for French readers at a time when it is likely to be of peculiar value to them. The consideration of the whole banking system of France by an extra-parliamentary commission since 1911 is now having issue in legislative proposals for strengthening that system at its weak points and for supplying its deficiencies in order that it may meet the economic needs of the nation as a whole. Dr. Kaufmann's complete review of the system, in its historic development and in the present division of its functions, will be of the greatest assistance to all concerned in solving the practical problems now in hand. The point of view is detached, and the treatment comparative, while there is ample recognition of economic influences in development and of national psychological elements in its characteristic features. Criticism is sound and broad based. Space fails for a résumé even of subject headings; suffice it to say that the introduction skilfully places the