

cesses, but this is not always necessary. Furthermore, in the majority of such complex reactions of the homogeneous type there is little doubt that although on the surface catalysis appears to take place, the catalyst is actually chemically consumed during the operation. The question to be decided is whether it is legitimate to extend the term 'catalysis' to all such cases. Prof. Métadier decides for this extension, and consequently cites in his survey a great variety of homogeneous and heterogeneous and even enzymatic reactions where it is difficult to say whether heterogeneous or homogeneous process operates. There is, however, much to be said against this classification. It would be more satisfactory to treat the matter upon the basis of chemical kinetics on which everything rests and to discuss on its merits each type of reaction.

This book, therefore, is a review of chemical kinetics in a compact form. Formal chemical kinetics are briefly surveyed with appropriate definitions of reaction velocity coefficients, and there is a short account of the elements of the quantum theory of reactivity without going into the details of the transition state treatment. Then follows the systematic treatment based not on specific reactions but on types of catalysis, namely, homogeneous catalysis, physical catalysis, heterogeneous and negative catalysis, catalysis by colloids and biological catalysis. Each subject is a vast domain in itself; and therefore only very brief descriptions can be given of suitable examples in these several fields without going into any critical discussion of the data. There are, unfortunately, no references, so that the inquiring reader cannot pursue the matter further. The reviewer feels, however, that the time has come when such an extension of the scope of catalysis is practically impossible and is perhaps now undesirable.

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A GERMAN VIEW OF THE ATOM BOMB

Die Geschichte der Atombombe

Mit einer elementaren Einführung in die Atomphysik auf Grund der Originalliteratur gemeinverständlich dargestellt. Von Hans Thirring. (Wissenschaft für Jedermann.) Pp. 150. (Wien: Neues Österreich Zeitungs- und Verlagsgesellschaft m.b.H., 1946.) n.p.

PROF. THIRRING was dismissed from the chair of theoretical physics in the University of Vienna by the Nazis because of his democratic views and his association with anti-militaristic movements, was persecuted by the Gestapo, and was reinstated only after the downfall of the Nazi regime. The author certainly is well qualified politically to interpret the significance of atomic energy in a popular book to a German-speaking public. The reviewer considers that Thirring has admirably succeeded in the task he has set himself. The book provides an elementary introduction to the structure of the atom and the nucleus, a history of the attempts in the Allied countries (on the basis of the Smyth Report) and in Germany to make use of atomic fission, and a short evaluation of the political aspects of atomic energy. The book is written in a clear and fresh style enlivened by sarcastic remarks against the treatment of science under Nazism.

The author stresses the necessity of an expert counteracting the fantastic rumours circulating in Central Europe: "There were people who claimed to know that the whole atom bomb business was nothing but a bluff . . . again others thought the Americans had been enabled to build the bomb only by the booty of knowledge and material captured in the conquest of Germany, and it was stated that German inventions had been surrendered to England and America by traitors. Thus the old *Dolchstosslegende* of 1918 has been revived in a modified shape." It is argued that the advantage of the Allied countries over Germany in the development of atomic energy has been primarily intellectual and moral, and only secondarily material and financial. On one hand, the influence of the Nazi physicists Lenard and Stark, who struggled for 'German' as opposed to 'Jewish' physics, prevented Germany from keeping abreast of the scientific developments abroad; Hugo Dingler, a philosophical protagonist of the Lenard-Stark tendency, is quoted as having ridiculed the possibility of a conversion of mass into energy as a "product of an extravagant imagination" as late as 1941. On the other hand, Thirring states that many of the best, notably Hahn and Laue, were quite clear that it would be a crime against mankind to supply the psychopath Hitler with an atom bomb. The net effect was that the Allies were far ahead of Germany even before the full material resources of the United States were mobilized for the atom bomb in 1942.

A very large volume of factual material is marshalled successfully by the author, and the small number of errors is surprising. On p. 8 one would like to see mention of Corson, Mackenzie and Segrè, who made element 85 artificially before Karlik and Bernert announced its discovery as a rare branching product of the natural radioactive series. The reference to the work of Pettersson, Stetter and Kirsch (p. 48) strikes the reader as odd. Faraday is erroneously associated with Cambridge (p. 54). The paper in *Nature* by Dodé, Halban, Joliot and Kowarski, which dealt with the neutrons emitted in fission, was preceded by a paper by Halban, Joliot and Kowarski, in which the large-scale emission of neutrons was first established (p. 81). The slowing down of neutrons to thermal energies by pure uranium (p. 86) is scarcely a practical proposition. Chain reactions based on unidentified natural α -ray emitters (p. 138) do not appear likely.

Thirring expresses reasoned optimism concerning the peaceful utilization of atomic energy. Further, a stimulating discussion of the possibilities of man-made explosive nuclear chain reactions, not involving fission, but requiring ignition by fissile material, is given. The ${}^2_1D(d,n){}_2^3\text{He}$ and ${}^7_3\text{Li}(p,\alpha){}_2^4\text{He}$ reactions are mentioned. These possibilities make the task of the establishment of permanent peace based on understanding even more pressing. Quoting Roosevelt and Einstein, the author takes the opportunity to urge the adaptation to this task of our educational systems, and refers to his book soon to be published on "World Peace as a Psychological Problem", in which he concludes—though he does not blame America for having used the bomb in the War: "Whoever believes in the future of mankind . . . must be imbued with the conviction that man can be taught that . . . those who triumphantly throw the atom bomb in the last analysis only harm themselves".

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