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**Onsager, Lars**

★ **The collected works of Lars Onsager.**

With commentary.

Edited by P. C. Hemmer, H. Holden and S. Kjelstrup Ratkje.

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The 112 papers in this collection include the following: Bibliography—Lars Onsager (1–7); H. Christopher Longuet-Higgins and Michael E. Fisher [Michael Ellis Fisher], Lars Onsager (27 November, 1903–5 October, 1976) (9–34); Lars Onsager, Solutions of the Mathieu equation of period  $4\pi$  and certain related functions (921–987).

{Onsager’s dissertation, on solutions of the Mathieu equation, is being reviewed individually.}

This collection of the work of the great mathematical scientist is long overdue but will nevertheless be warmly welcomed by mathematicians, mathematical physicists and theoretical chemists alike. Onsager had a highly distinguished career, including a long period as J. Willard Gibbs Professor of Theoretical Chemistry at Yale. In fact he was a worthy successor to Gibbs, whom he closely resembled both in his areas of interest and in the originality of his research. His early work included his discovery of the “reciprocal relations”, which had a profound influence on the development of the modern theory of irreversible processes and for which he received the 1968 Nobel Prize in chemistry. But he made many other important contributions to statistical mechanics: perhaps the best known is his solution of the two-dimensional Ising problem, which had been a challenge to mathematical ingenuity for many years, but there is almost nothing in this large collection of papers which does not deserve careful study.

This well-produced volume is rewarding in many different ways. Although its appeal might seem to be mainly to the student of the history and philosophy of the sciences, many of the papers are as important now as they ever were, and any aspiring mathematical scientist will find much in the way of ideas and mathematical technique to help him on the way. For this reason it deserves to be placed in the hands of Ph.D. students in many different disciplines. But it is also enhanced by a variety of commentaries, beginning with an essay by Longuet-Higgins and Fisher which contains much delightful anecdotal material. These commentaries also serve to emphasise the continuing relevance of Onsager’s contributions to modern mathematical science, and are well worth reading on their own account. This volume should be valuable resource material not only in university and departmental libraries but also on the shelves of many individual scientists.

Reviewed by *H. S. Green*