

**POPULAR
SCIENTIFIC
LECTURES**

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Popular Scientific Lectures by Ernst Mach & Thomas J. McCormack

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ERNST MACH & THOMAS J. MCCORMACK

**POPULAR
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LECTURES**

BY THE SAME AUTHOR.

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POPULAR
SCIENTIFIC LECTURES

BY
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TRANSLATED
BY
THOMAS J. McCORMACK

WITH FORTY-FOUR CUTS AND DIAGRAMS

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PREFACE.

POPULAR lectures, owing to the knowledge they presuppose, and the time they occupy, can afford only a *modicum* of instruction. They must select for this purpose easy subjects, and restrict themselves to the exposition of the simplest and the most essential points. Nevertheless, by an appropriate choice of the matter, the *charm* and the *poetry* of research can be conveyed by them. It is only necessary to set forth the attractive and the alluring features of a problem, and to show what broad domains of fact can be illuminated by the light radiating from the solution of a single and oftentimes unobtrusive point.

Furthermore, such lectures can exercise a favorable influence by showing the substantial sameness of scientific and every-day thought. The public, in this way, loses its shyness towards scientific questions, and acquires an interest in scientific work which is a great help to the inquirer. The latter, in his turn, is brought to understand that his work is a small part only of the universal process of life, and that the results of his labors must redound to the benefit not only of himself and a few of his associates, but to that of the collective whole.

I sincerely hope that these lectures, in the present excellent translation, will be productive of good in the direction indicated.

E. MACH.

PRAGUE, December, 1894.

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TRANSLATOR'S NOTE.

THE present lectures, extending over the period from 1864 to 1894, are here published in *collected* form for the first time. What few repetitions occur, in the way of examples and quotations, have been retained, as throwing additional light on the topics they are designed to illustrate.

As the dates of the first five lectures are not given in the footnotes they are here appended. The first lecture, "On the Forms of Liquids," was delivered in 1868 and published with that "On Symmetry" in 1872 (Prague). The second and third lectures, on acoustics, were first published in 1865 (Graz); the fourth and fifth, on optics, in 1867 (Graz). They belong to the earliest period of Professor Mach's scientific activity, and with the lectures on electrostatics and education will more than realise the hope expressed in the author's Preface.

The four remaining lectures are of a more philosophical character and deal principally with the methods and nature of scientific inquiry. In the ideas summarised in them will be found one of the most important contributions to the theory of knowledge made in the last quarter of a century.

All the proofs of this translation have been read by Professor Mach himself.

T. J. McCORMACK.

LA SALLE, ILL., December, 1894.

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