



# The Beginnings of Piezoelectricity: A Study in Mundane Physics (Boston Studies in the Philosophy and History of Science)

*By Shaul Katzir*

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The Beginnings of Piezoelectricity, the first history of the subject, exhaustively examines how diverse influences led to the discovery of the phenomenon in 1880, and how they shaped subsequent research until the consolidation of an empirical and theoretical knowledge of the field circa 1895. Shaul Katzir's historical account shows that this 'mundane' science was an intriguing intellectual and practical enterprise, which involved originality, surprises and controversies.

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## **Editorial Review**

### Review

From the reviews:

"The subject is the study of piezoelectricity?the production of electric charge by mechanical pressure and its converse effect on certain crystals?from 1880 to 1900. ... In addition to illustrating the pretheoretical/theoretical division, Katzir makes it clear that the beginning of piezoelectricity can serve as a window on certain broad themes of nineteenth-century physics at the level of practice. ... it does make readers wonder what broad lesson can be learned from it." (Chen-Pang Yeang, *ISIS*, Vol. 102 (1), March, 2011)

"Even though Shaul Katzir's *The Beginnings of Piezoelectricity: A Study in Mundane Physics* is published as part of the Boston studies in the Philosophy of Science series, it will also interest applied scientists and engineers working on modern aspects of piezoelectricity and electromechanical transduction in materials. ... is a useful and thought-provoking study of an often-neglected but exciting seminal field of material physics." (Reimund Gerhard, *Physics Today*, December 2007)

### From the Back Cover

Involving electricity, elasticity, thermodynamics and crystallography, several scientific traditions and approaches and leading physicists, the history of piezoelectricity provides an advantageous perspective on late nineteenth century physics and its development. The beginnings of piezoelectricity, the first history of the subject, exhaustively examines how these diverse influences led to the discovery of the phenomenon in 1880, and how they shaped its subsequent research until the consolidation of an empirical and theoretical knowledge of the field circa 1895. It studies a particular subdiscipline representative of many similar 'mundane' branches of physics that did not bear revolutionary consequences beyond their field. Although most research is of this kind, such branches have rarely been studied by historians of science. Shaul Katzir's historical account shows that this mundane science was an intriguing intellectual and practical enterprise, which involved, among other things, originality, surprises and controversies. Thereby, it displays the fruitfulness of studying such a field.

Employing exceedingly rich material Katzir gains interesting insights into the nature of scientific development from this history. Among the themes raised here are: the sources of a discovery, the interplay between molecular-atomistic and phenomenological approaches and between scientific practice and protagonists' philosophy of science, the role of thermodynamic formulation, the interaction of different levels of theories with experiment, the use and design of qualitative versus precise quantitative experiments, the employment of symmetry in physics and the role of national and local experimental and theoretical traditions. Observations regarding these and other issues in this book portray an unexpected picture of turn of the century physics.

### About the Author

Shaul Katzir is a historian of science. He teaches history of science [and general history] at Bar Ilan, Ben Gurion, and Tel Aviv universities, at the Hebrew university of Jerusalem and at the Academic College of Tel Aviv Jaffa.

## **Users Review**

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