

**ON AN INVERSION OF  
IDEAS AS TO  
THE STRUCTURE  
OF THE UNIVERSE**

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On an Inversion of Ideas as to the Structure of the Universe by Osborne Reynolds

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On an Inversion of Ideas  
as to the Structure of  
the Universe

*(The Rede Lecture, June 10, 1902)*

by

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ON AN INVERSION OF IDEAS AS  
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UNIVERSE.

1. *Evidence afforded by the outward facts of nature.*

The general problem of the universe, as hitherto presented by the phenomena which Tyndall, in this house, called "the outward facts of nature," demands that matter, besides being continuous in time and occupying space to exclusion of other matter shall have such physical properties as admit:

(1) of conditions in space which allow of motions of matter, like those of the earth and planets round the sun, at velocities of upwards of 20 miles a second, with scarcely any diminution after thousands of years; *i.e.* they must admit of a perfect vacuum of matter, such as would be obtained by a perfect air-pump;