# NOTES ON CRYSTALLOGRAPHY AND CRYSTALLO-PHYSICS: BEING THE SUBSTANCE OF LECTURES DELIVERED AT YEDO DURING THE YEARS 1876-77

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Notes on Crystallography and Crystallo-physics: Being the Substance of Lectures Delivered at Yedo During the Years 1876-77 by John Milne



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JOHN MILNE

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BEING THE SUBSTANCE OF LECTURES DELIVERED AT YEDO DURING THE YEARS 1876-77.

BY

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# NOTE BY THE EDITOR.

In the latter part of 1877, Prof. J. Milne sent home from Japan lithographed copies of his *written* Lecture-Notes on Crystallography and Crystallo-Physics—to Prof. N. S. Maskelyne, F.R.S., Dr. H. Woodward, F.R.S., Prof. J. Tennant, F.G.S., to the Editor, and other friends, with a request to me to publish the same in the Geological Magazine, or elsewhere.

Owing to the absence of the Author and from other causes, a long delay has occurred in presenting them to the scientific public in their present form; and it is only due to Prof. Milne to state that these notes (*as now printed*) were completed, and lithographed by his Japanese assistant, in 1877.

I have to thank Prof. J. Morris, M.A., F.G.S., and my colleague, Dr. H. Woodward, F.R.S., for kindly assisting me in reading over and correcting the proofs of these Notes on behalf of the Author.

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59, Lawford Road, N.W.
*26th February*, 1879.

# INTRODUCTION.

THE following notes on Crystallographical calculations have been written for those students who wish to know the general principles which these calculations involve, rather than for those who wish actually to employ them. The system that has been followed is that of Prof. Miller. In this system the symbols of a face consist of three whole numbers, each of which invariably refer to the same axes; whilst the calculations to determine these symbols are concise, being usually of such a nature that they may be determined by making one or two angular measurements, and the observation of those faces which have parallel intersections. In all respects there is a simplicity which recommends it before all others.

The few demonstrations which have been given have been treated of by those methods which appeared to be the simplest for the student's comprehension; the first portion, referring to the determination of symbols, being treated by Analytical Geometry and Spherical Trigono-