HEP World's Classics

Letters of Euler on Different Subjects in Natural Philosophy : Addressed to a German Princess

Volume II

欧拉致德国公主的书信：关于自然哲学的不同学科

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LEONHARD EULER

HIGHER EDUCATION PRESS

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内容简介

18 世纪 60 年代，著名数学家欧拉应邀为德国公主函授哲学、物理学、宇宙学、化学、音乐等多个科学和艺术分支的知识。为此他写下了一系列文笔优美的文章，它们充分体现了欧拉渊博的知识、极高的文学修养和哲学修养。这些通信被整理成书并翻译成英文，分两卷出版，本卷收录了 119 篇文章。

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There is a Chinese saying: "It is beneficial to open any book." It is even more fruitful to open and read classic books. The world is keeping on changing, but really fundamental and essential things stay the same since there is nothing new under the sun. Great ideas have been discovered and re-discovered, and they should be learnt and re-learnt. Classic books are our inheritance from all the previous generations and contain the best of knowledge and wisdom of all the people before us. They are timeless and universal. We cannot travel back in time, but we can converse with the originators of current theories through reading their books. Classic books have withstood the test of time. They are reliable and contain a wealth of original ideas. More importantly, they are also books which have not finished what they wanted or hoped to say. Consequently, they contain unearthed treasures and hidden seeds of new theories, which are waiting to be discovered. As it is often said: history is today. Proper understanding of the past work of giants is necessary to carry out properly the current and future researches and to make them to be a part of the history of science and mathematics. Reading classic books is not easy, but it is rewarding. Some modern interpretations and beautiful reformulations of the classics often miss the subtle and crucial points. Reading classics is also more than only accumulating knowledge, and the reader can learn from masters on how they asked questions, how they struggled to come up with new notions and theories to overcome problems, and answers to questions. Above all, probably the best reason to open classic books is the curiosity: what did people know, how did they express and communicate them, why did they do what they did? It can simply be fun!

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Leonhard Euler (1707—1783)

欧拉 (Leonhard Euler, 1707—1783), 瑞士数学家, 自然科学家. 1707 年 4 月 15 日生于瑞士巴塞尔, 1783 年 9 月 18 日去世于俄国圣彼得堡. 15 岁在巴塞尔大学获学士学位, 翌年获硕士学位. 父亲希望他学神学, 而他最感兴趣的是数学, 并受到约翰第一 · 伯努利的指导. 18 岁时, 彻底放弃当牧师的念头而专攻数学, 并开始发表文章. 1727 年, 欧拉应圣彼得堡科学院的邀请到俄国. 1731 年接替丹尼尔第一 · 伯努利成为物理教授. 他以旺盛的精力投入研究, 在俄国的 14 年中, 他在分析学、数论和力学方面做了大量出色的工作. 他还应俄国政府的要求, 解决不少诸如地图学、造船业中的实际问题. 大量的写作带来的眼疾使他在 1735 年右眼失明. 1741 年受普鲁士腓特烈大帝的邀请到柏林科学院工作, 达 25 年之久. 在柏林期间他的研究内容更加广泛, 涉及行星运动、刚体运动、热力学、弹道学、人口学, 这些工作和他的数学研究相互推动. 欧拉这个时期在微分方程、曲面微分几何以及其他数学领域的研究都是开创性的. 1766 年他又回到了圣彼得堡. 一场重病使他的左眼于 1771 年也完全失明. 然而由于他惊人的记忆力和心算技巧使他的创造力继续得到发挥. 他通过与助手们讨论以及直接口授等方式又完成了大量科学著作, 直至生命的最后一刻.

欧拉是 18 世纪数学界最杰出的人物之一, 他不但在数学上做出了伟大贡献, 而且把数学用到了几乎整个物理领域. 他又是一个无与伦比的多产作者, 他写了大量的力学、分析学、几何学、变分法的教科书,《无穷小分析引论》《微分学原理》《积分学原理》都成为数学中的经典著作. 除了教科书外, 他在工作的时期几乎以每年 800 页的速度写出创造性论文, 他的全集将近 74 卷.

欧拉的最大功绩是扩展了微积分的领域, 为分析学的一些重要分支 (如无穷级数、微分方程) 与微分几何的产生和发展奠定了基础. 除了分析之外, 欧拉在数学上的发现还有很多, 在代数学上, 他发现了每个实系数多项式必能分解为一次或二次因子之积, 因此根必是 $a+bi$ 的形式. 数论作为数学中一个独立分支的基础是由欧拉的一系列成果所奠定的. 他还给出了费马小定理的三个证明, 并引入了数论中重要的欧拉函数 $\varphi(n)$; 他发现了二次互反律; 他利用连分数给出佩尔方程 $x^2-ay^2=1$ 的最小解; 他用解析方法讨论数论问题, 发现了 ζ 函数所满足的函数方程, 引入了欧拉乘积. 他还解决了著名的组合问题: 哥尼斯堡七桥问题. 在数学的许多分支中都常常见到以他的名字命名的重要常数、公式和定理.

—— 节选自《中国大百科全书 · 数学》

LETTERS OF EULER

ON DIFFERENT SUBJECTS IN

NATURAL PHILOSOPHY,

ADDRESSED TO

A GERMAN PRINCESS.

WITH NOTES, AND A LIFE OF EULER,

BY DAVID BREWSTER, LL.D.,
F.R.S. LOND. AND ED.

CONTAINING A GLOSSARY OF SCIENTIFIC TERMS.

WITH ADDITIONAL NOTES,

BY JOHN GRISCOM, LL.D.

IN TWO VOLUMES.

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THE work now presented for the first time to the American public is the production of one of the most learned and highly-gifted men whose names adorn the annals of sound philosophy, and whose labours gained for him a reputation inferior only to that of Newton. They will be read with great advantage by the young student, on account of the remarkable clearness with which the subjects are treated, the copiousness of the style, and its adaptation to the purpose of easy and familiar instruction. The author, in addition to his profound knowledge, had the advantage of being, both by profession and by taste, a teacher of youth; and the volumes before us bear evidence of the tact which an experienced instructer acquires in discovering the points which stand most in need of varied and reiterated explanation.

These Letters, therefore, designed as they were for the benefit of a lady, will predispose the ingenuous mind to the love of scientific truth. Nor is the evidence of piety he has brought into connexion with some of the highest contemplations of philosophy one of the least interesting features of these agreeable volumes.

AMERICAN EDITOR.

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