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He also laid the basis for the kinetic theory of gases by demonstrating that the impact of molecules on a surface would explain pressure. His father, Johann Bernoulli, published shortly thereafter a work entitled *Hydraulica* in which he claimed priority for these discoveries. Both Daniel and Johann Bernoulli expected to receive the backing of Euler, who carefully avoided taking sides. This led to a cooling of the friendship between Daniel and Euler and a lessening of their epistolary exchange. Between 1754 and 1766 they did not write to each other. It is only after Euler returned to St. Petersburg that their rapport improved and in 1767–1768 they exchanged seven letters.

As is customary in the Euler edition, we find a comprehensive bibliography, and extensive indices of names and subjects.

These two tomes will be welcomed not only by historians of mathematics and physics but also by readers interested in the relationships between European scientists and the broader impact of new discoveries on the philosophy of the age.

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Euler, Leonhard: **Correspondence of Leonhard Euler with Christian Goldbach.** Edited by Franz Lemmermayer and Martin Mattmüller. 2 vol. Basel, Birkhäuser, 2015. XII+1270 p. Ill. (Leonhard Euler, Opera Omnia, Commercium Epistolicum, 4a / 1). CHF 399.–. ISBN 978-3-0348-0879-8

This new volume of the Euler edition introduces a welcome change inasmuch as the introduction, the remarkably scholarly and useful notes, and all the letters (originally written in Latin, German, or French) are rendered in English in Part II. This means that the interesting correspondence between Euler and Goldbach can now be read by a wider audience. It consists of 196 extant letters, 102 written by Euler and 94 by Goldbach.

Christian Goldbach may not be a household name, but he was a brilliant polymath. In the summer of 1710, when he was 20 years old, he left his hometown of Königsberg in Eastern Prussia and embarked on a more than three-year European grand tour. After stopping at some of the principal German university towns including Halle, where he called on Christian Wolff, and Leipzig where he met Gottfried Wilhelm Leibniz, he went on to the Netherlands. He attended the University of Groningen and obtained a law degree. His next stop was England where he visited the Royal Society and encountered Newton, Halley, Flamsteed and de Moivre. At the Bodleian Library in Oxford he struck up an acquaintance with a scholar of his own generation, Nicolas Bernoulli from Basel. By way of Brussels he then proceeded to Paris before traveling extensively in Italy, visiting Turin, Florence, Rome, Naples (where he even climbed Mount Vesuvius), Bologna, Padua, and Venice. Everywhere, he visited museums, libraries and learned societies, and he introduced himself to all the well-known scientists, always looking for scholarly discussions on an ever-widening range. He returned to Königsberg in 1714, but in 1718 he set out on another long journey. He spent nine months in Sweden, and then travelled at a frenetic pace across Denmark and all of Germany. The purpose behind all these short stays and meetings is not obvious, and his friends

suspected that there was more on his agenda than just the pleasure of seeing ever-new places.

In 1725, Goldbach was offered a position at the new Imperial Academy of Science at St. Petersburg. He had reached the age of 35, and he knew that it was time to give his life a decisive turn. He was engaged to "diligently serve the Academy's progress and glory", write its history and cultivate mathematics for a period of at least five years. His salary was fixed at 600 roubles per year, plus free lodging and candles – equal to the most junior professors' wages. Euler joined the Academy in 1727 and the two became friends, but Goldbach had to follow the Court when it moved to the old capital Moscow in January 1728. The first letter in the correspondence is from Euler to Goldbach and is dated 13 October 1729. Goldbach also corresponded with Daniel Bernoulli and there was a regular flow of letters between St. Petersburg and Moscow. In 14 months Goldbach exchanged 25 letters with Bernoulli and 13 with Euler, but the correspondence was suddenly interrupted in November 1730. It is not known whether this silence, which lasted almost a year, was due to personal, professional or political reasons. Meanwhile, Bernoulli and Euler went on with their intense and productive research. On 29 November 1731 Goldbach just as abruptly resumed contact, writing on the same day to both his colleagues without any reference to the reasons for his silence. His correspondence with Daniel Bernoulli terminates with this letter. Bernoulli remained at the Academy as professor of mathematics until June 1733, but for unknown reasons his relations with Goldbach were now distant and even hostile, as several disparaging remarks in his later letters show.

Euler remained in good terms with Goldbach and they continued to correspond for over 30 years. It is in a letter to Euler in 1742 that Goldbach formulated the Conjecture (now known under his name), that every even integer greater than two is the sum of two prime numbers. They also discussed, among other topics, Fermat's numbers, Mersenne's numbers, perfect numbers, the representation of natural numbers as a sum of four squares, Waring's problem (which Euler solved before Waring), polynomials representing numerous primes, Fermat's Last Theorem, and the representation of any odd numbers in the form $2n^2 + p$ where p is prime.

Between the 1732 and 1741 Goldbach and Euler both lived in St. Petersburg, and since they regularly met at the Academy most of their communication took place directly. After Euler moved to Berlin the correspondence intensified once more. Goldbach now occupied a senior position in the Russian civil service, commuting between Moscow and St. Petersburg. Between 1756 and 1762, when Prussia unleashed the third and most obstinate war for Silesia, only one letter was exchanged. Immediately after the conclusion of a peace treaty, Euler resumed the correspondence, but Goldbach's health was failing, and Euler's efforts to reawaken his interest in mathematical ideas came too late. Goldbach died in 1764, and the last letters sent on both sides were mainly limited to civilities and friendly advice, but they contain much that is interesting about the personalities of two great men.

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