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THE LEIBNIZ FRAGMENTS PROJECT

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A treasure trove of scholarly history

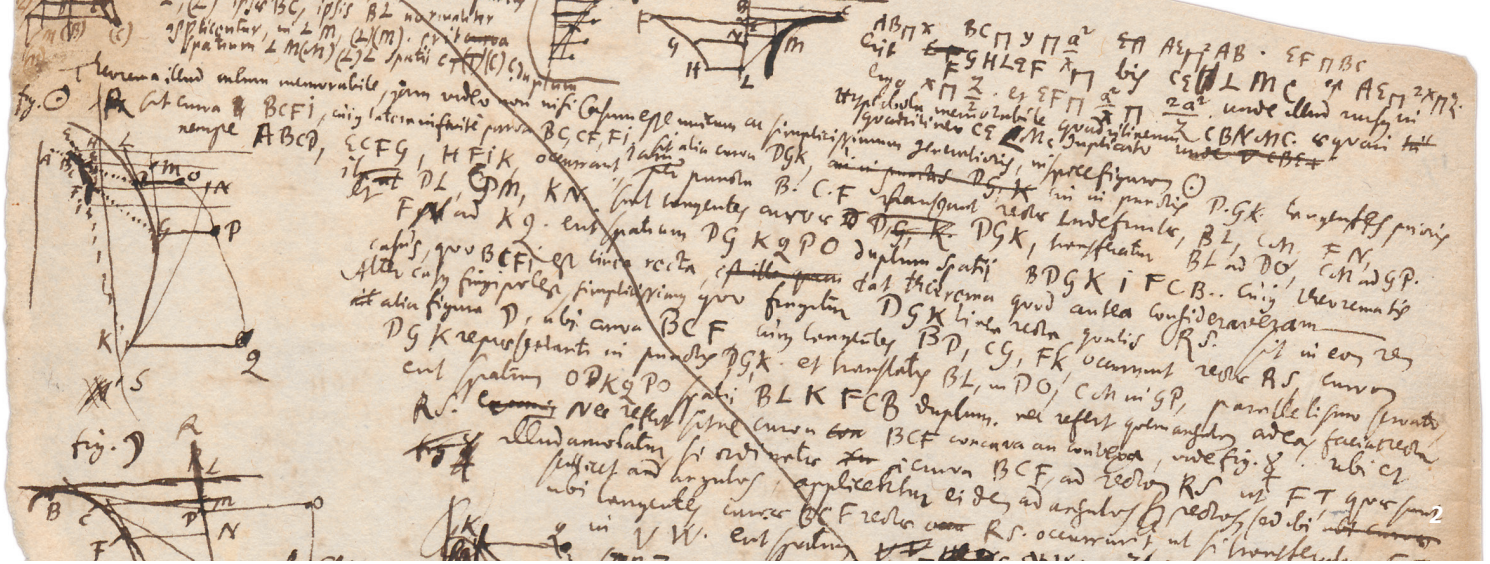
Considered as the great polymath of his time, Gottfried Wilhelm Leibniz was one of the leading philosophers of the end of the 17th and beginning of the 18th century. His body of work covers not just philosophy, theology and politics; he also received worldwide acclaim as a natural scientist, engineer and mathematician during his lifetime. In competition with Newton he developed the differential and integral calculus which fundamentally changed the possibilities of mathematics. Without Leibniz, the technical developments of the 21st century would be inconceivable; he invented the binary numeral system which laid the foundations of modern informatics.

On his death Leibniz left behind him 200,000 written pages, probably the largest legacy in the history of the world. Apart from manuscripts in a huge range of formats and

covering a broad spectrum of topics, this legacy also includes the working library of the polymath and artefacts from his life and work which have now been examined by a German Research Foundation (DFG) project. In particular, the historical importance and real value of his stepped reckoner, the first calculator that could perform all four arithmetic operations, can hardly be overestimated. In 2008 his international correspondence, which forms part of the legacy, was included in UNESCO's Memory of the World programme. Nearly all of Leibniz's legacy is now housed in Hanover, the place where he spent a great part of his life, at the Gottfried Wilhelm Leibniz Library. It forms the most important material witness we have to the scholarly world of the early modern period and the enlightenment.

As early as 1777, Christoph Gottlieb Murr praised the scientific value of the legacy in the following terms: »What treasures these papers contain for the scholarly community and for learned history over the period of

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50 years in which Leibniz dedicated his life to science!«

To publish all of these treasures in a historical critical edition is the aim of the »Gottfried Wilhelm Leibniz, Collected Works and Letters« edition. This project is one of the most prestigious and scientifically important editorial ventures ever undertaken. Called into life at the beginning of the 20th century, it has since been through an eventful history. Since German reunification, it has been jointly run by the Berlin-Brandenburg Academy of Sciences and Humanities and the Göttingen Academy of Sciences and Humanities with offices in Berlin, Hanover, Münster and Potsdam.

Work on such a huge legacy offers an unprecedented opportunity in the history of science. Never before has it been possible to gain such immediate insight into the workings of Leibniz's mind and the evolution of his thinking. At the same time, scientists investigating the texts are faced with a number of highly daunting challenges. These begin with the question of the chronological order of notes where Leibniz's habit of cutting up his notes, adding new notes to them, and placing them in various places within his body of manuscripts poses huge problems for contemporary research. Up to present, it has only been by chance that the true place of single pages within a joint text grouping could be discovered. It is only now that the reconstruction of the common text grouping can allow for dating of the notes and jottings.

New ways for science

By a certain irony of history, Leibniz himself is now aiding in the examination of his legacy: it is the binary numerical system he invented that forms the bedrock of the modern reconstruction software that will place the textual fragments of his precious legacy in their original context. In a number of other projects, a team of experts from Fraunhofer

At a glance

The aim of this project is to develop a computer-supported assistance system for the reconstruction of text fragments in the Leibniz legacy. Such reconstruction is highly desirable as a large part of the legacy consists of fragments of pages, loose jottings and cut-up pages which are often very difficult to assign to a proper chronological order.

At the same time, the digitalization of the legacy needed for the project means that when it is presented in the digital collection of the Leibniz Library (GWLB), the legacy can be freely accessed and researched from anywhere in the world.

IPK has already developed and successfully implemented systematic methods for the automatic virtual reconstruction of damaged or destroyed documents. Similar to the case of the Leibniz papers, the authorities faced

with reconstruction of the shredded files of the former GDR secret police (Stasi) for a long time were faced with a seemingly unsolvable problem, given the extraordinary diversity of the fragments and the enormous amount of data involved. Scientists at Fraunhofer IPK, however, developed special novel image processing techniques and matching algorithms that now aid the Federal Commissioner for the Stasi Records in his enormous task. At MusterFabrik Berlin, these methods are now being transferred to novel applications in the field of the digital reconstruction of documents.

In a collaborative effort between the Edition, the Leibniz library, MusterFabrik Berlin and Fraunhofer IPK a new interactive software is being developed, tested and brought into use. This software will be capable of reconstructing previously unclassified hand written notes by Leibniz and thus will make an innovative and vital contribution to international and interdisciplinary Leibniz research. This forward-looking research project will mark a decisive step in opening up and facilitating public access to the world's greatest legacy of scholarly papers. In its own unique way it brings together basic research in such disparate fields as computer science, library science and cultural studies. All participants in the project are breaking completely new ground in interdisciplinary research and cross-institutional collaboration which hopefully will lead to innovative outcomes.