ALBRECHT DÜRER (May 21, 1471 – April 6, 1528)

by HEINZ KLAUS STRICK, Germany

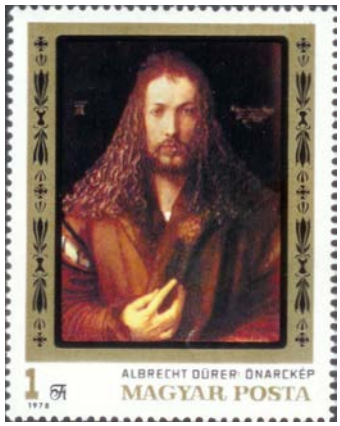
ALBRECHT AJTOS (Ajtos = door), coming from Hungary to Nuremberg, learnt the profession of a goldsmith with HIERONYMUS HOFER; he took the name TÜRER and married the daughter of his master. The third child (of a total of eighteen) from this marriage was baptised with the first name of the father.

At the age of 13, the young ALBRECHT DÜRER entered his father's workshop, but at 15 he began an apprenticeship with the Nuremberg painter MICHAEL WOLGEMUT.

At the end of the apprenticeship, the "master" realised that he could no longer teach his "apprentice" anything and recommended him to "wander" to Basel, Colmar and Strasbourg – as was also customary in other trades.

After his return, ALBRECHT DÜRER married AGNES FREY, daughter of a craftsman friend, probably at his parents' request. Although just married, he set off on his first trip to Italy just a few months later to learn more about the new dramatic developments in art and science. Although he only visited the cities of Verona and Venice and met neither LUCA PACIOLI nor LEONARDO DA VINCI in person, he learned so much about the new, special significance of mathematics for art that after his return he became intensively involved with the *Elements* of EUCLID, with the *Architectura* of the Roman VITRUVIUS and with the *Summa* of PACIOLI.

DÜRER was a gifted, versatile artist – his reputation was spreading fast. He set up his own workshop and received a number of commissions. Although his income was not always secure at first (he was sometimes forced to offer his own prints for sale at regional markets), he did not want to leave Nuremberg and he refused the offer to become court painter to the Saxon elector FRIEDRICH DES WEISEN in Weimar.



(The self-portraits of Albrecht Dürer were painted in 1493, 1498, 1500 and between 1500 and 1512)

In 1505 he set off for Italy again – among other things to learn more about perspective drawing from LUCA PACIOLI and JACOPO DE BARBARI. This was guarded like a secret by Italian painters. After his return he began to systematically collect material on mathematics and its application in art.

In 1514 DÜRER made the copper engraving *Melencolia* (Melancholy), one of his most enigmatic works. Is the "angel" thinking about mathematical problems perhaps DÜRER himself?

Apart from a wealth of symbolic references, it contained the first magic square shown in Europe.

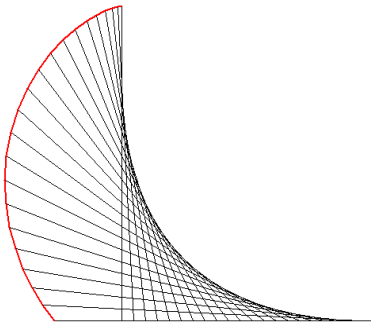
This contained the natural numbers from 1 to 16 in four rows and four columns, and the sum 34 could be arrived at in a variety of ways, as well as the year 1514 in the bottom row of the square.

The engraving also depicted a polyhedron, whose surface consisted of two equilateral triangles and six irregular pentagons and this was also of mathematical interest (see also the EULER stamp from 2007).

The polyhedron is a slanted rhombohedron formed by a cube stretched along a diagonal.

From 1509 onwards, DÜRER was a member of the city council of Nuremberg; in 1518 he represented his home town at the *Reichstag* in Augsburg. In 1520 he undertook a triumphant but arduous journey to the Netherlands. The city of Antwerp offered him a house and a fixed annual salary in vain to persuade him to stay. DÜRER took the trouble to make the journey because he wanted the newly elected Emperor Charles V to confirm, for reasons of prestige, the privileges granted to him by his predecessor, Emperor MAXMILIAN I, in 1510.

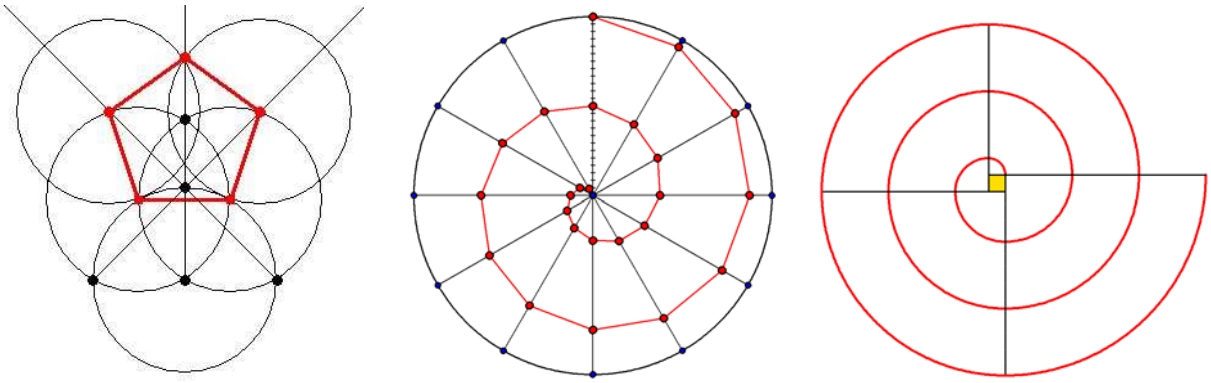
In 1525 the four-volume *The four books on measurement* was published. This was the first geometry book in the German language. DÜRER endeavoured to replace the terms used in the previous Latin-language works on geometry with appropriate, self-invented German terms: *messung* stood for construction, *messkunst* for geometry, *richtescheyt* for the ruler, *zirckel lini* for circle, *brenlini* for parabola, *gabellini* for hyperbola. A circular surface was a *runde ebene*, a square a *gefierte ebene*.



In the first volume, DÜRER dealt with the geometry of "lines": from straight lines to algebraic curves, spirals and helixes; he described the construction of ellipses, parabolas and hyperbolas as conic sections using the plan and elevation projections.

He discovered the "shell curves" now named after him and various epicycloids and hypercycloids. He constructed the first spline curves by joining arcs with matching tangents.

In the second volume he presented a wealth of approximate constructions for regular *n*-gons and for the quadrature of the circle. He also had an approximate construction for dividing an angle into three parts, which was not surpassed until much later. It is worth noting that he made the distinction between whether a construction is demonstrative (exact) or mechanical (approximate). The volume also contained a large number of "parquet floorings" with regular *n*-gons.

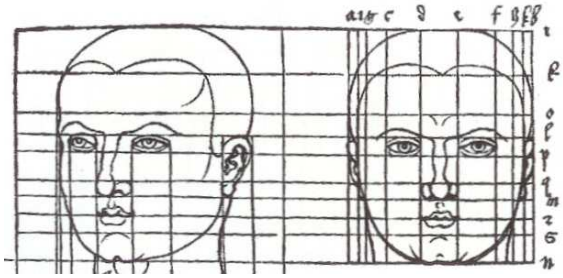


DÜRER's approximate constructions of a regular pentagon and an Archimedan spiral

The third book dealt with questions of architecture as well as the construction of printed letters according to geometrical rules and so DÜRER thus became the founder of typography. He used the tangent function to solve the problem of how to choose the size of letters on a building so that they all appear the same height.

The fourth book contained the representation of the PLATONIC and some ARCHIMEDIAN solids in plan and elevation form and their nets, as well as practical hints on central perspective (including the construction of views of the cube with shadows).

In 1528, in addition to a book on fortress construction, there followed four volumes of *A treatise on human proportion*, in which he presented various types of male and female bodies and their proportions, as well as types of head shapes – the latter being a foretaste of modern computer graphics.



In 1522 he had returned from his trip to the Netherlands weakened by a malaria-like disease and this finally led to his early death in 1528.

He left behind a tremendous life's work: 9 textbooks in German, 50 watercolours, 70 paintings, 350 woodcuts, over 100 copperplate engravings and 1000 drawings.

First published 2008 by Spektrum der Wissenschaft Verlagsgesellschaft Heidelberg

https://www.spektrum.de/wissen/albrecht-duerer-1471-1528/947214

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Here an important hint for philatelists who also like individual (not officially issued) stamps.
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