

### Architecture and Perspective Flaps

Vitruvius, *I dieci libri dell'architettura*, Daniello Barbaro, ed. 1556. Volvelles and extension flaps, liftable flap.  
Albrecht Dürer, *Unterweisung der Messung*, Nuremberg: Hieronymus Andreae, 1525. Two perspective flaps.

### Anatomy Flaps as Revelation

Johann Remmelin, Lucas Kilian, *Catoptri microcosmici*, Ulm: 1613. On loan from the Medical Historical Library. Three mounted plates with many flaps.

### Apian's Astronomy

Peter Apian, *Astronomicum caesareum*, Ingoldstadt: Peter Apian, 1540. Twenty-one volvelles.

### Globes and Gores

*Ambassadors Globe*. Terrestrial globe made from (or after) Johann Schöner gores from 1523.  
Facsimile, C.H. Coote, ed., *Johann Schöner's "Long Lost" gores from 1523*, London, 1888.

### Sundials

Peter Apianus, *Folium populi*, Ingolstadt: Peter Apian, 1533. Woodcut time-keeping instruments to cut out and construct.  
Franz Ritter, *Speculum solis*, Nuremberg: Paul Fürst, 1660. From the German Literature Collection. Eight engraved sundials to be constructed.

### Timeline

1302 Llull's earliest surviving manuscript volvelle.  
1474 Regiomontanus creates the first printed volvelle.  
1482 Publicius publishes *Art of Memory*. A version with alphabet volvelles follows in 1483.  
1509 Murner publishes his logical card game.  
1513 Stoffler's *Explanation* of astrolabes, with flaps.  
1514 Llull's *Brief Art* printed for the first time.  
1520s In Nuremberg, Johann Schöner prints matched terrestrial and celestial globes; Georg Hartmann prints paper do-it-yourself sundials.  
1524 Apian's *Cosmography*.

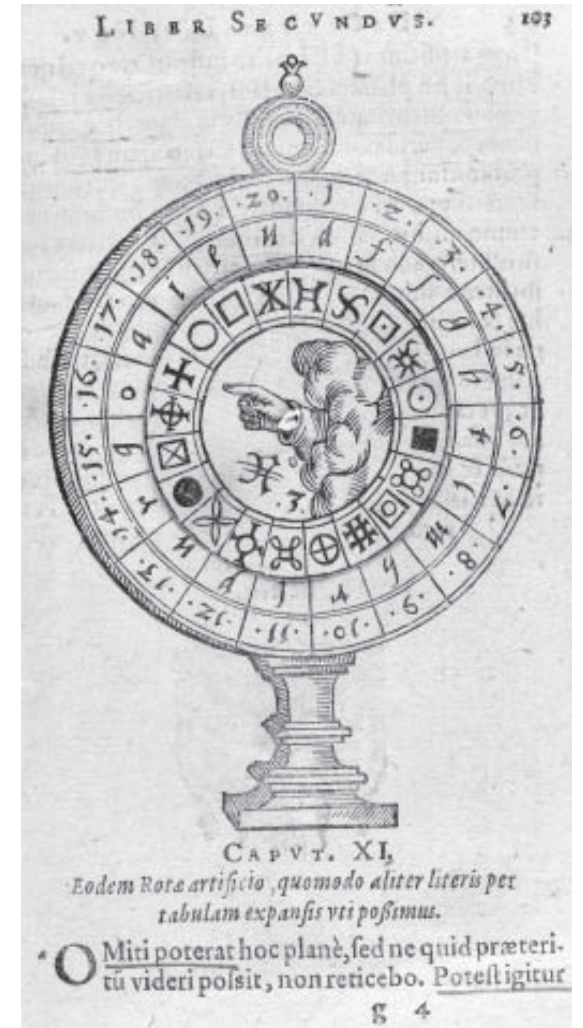
1525 Dürer's *Instruction in Measurement*.  
1533 Apian's *Poplar Leaf* with its three-dimensional timekeeping device.  
1539-1543 Strassburg lottery-book craze.  
1540 Apian's *Imperial Astronomy* for Charles V.  
1556 Barbaro adds flaps and dials to Vitruvius.  
1561 French version of Trithemius' *Polygraphy*.  
1563-1606 Della Porta publishes several versions of his cryptography text.  
1589-1596 Bertelli publishes his three-volume costume book with five flap images.  
1606 David produces the *Christian Truth-Teller*.  
1607 Ritter publishes his *Mirror of the Sun* with do-it-yourself sundials;  
Harsdörffer edits the 1660 revised edition.  
1610 Bolton "invents" a heraldry design volvelle.  
1613 Remmelin and Kilian produce the *Mirror of the Microcosm* anatomy sheets.  
1617 Van Hulsen festival book from Stuttgart with flaps of parade floats.  
1635 Wither lottery book.  
1642 Hexham military handbook with volvelles.  
1644-57 Harsdörffer publishes the eight-volume *Women's Room* with his flap self-portrait.  
1651-77 Harsdörffer's *Physical-Mathematical Delights* with its "Five-Fold Think-Ring."

### Further Reading:

Owen Gingerich, "Astronomical Paper Instruments with Moving Parts," R.G.W. Anderson, J.A. Bennett, eds., *Making Instruments Count*, Brookfield, Vt.: Variorum, 1993, 63-74.  
Jessica Helfand, *Reinventing the Wheel*, Princeton: Princeton Architectural Press, 2002.  
Suzanne Karr, "Constructions both Sacred and Profane: Serpents, Angels and Pointing Fingers in Renaissance Books with Moving Parts," *Yale University Library Gazette*, April 2004.  
Sten G Lindberg, "Mobiles in Books: Volvelles, inserts, pyramids, divinations, and children's games," *The Private Library Series 3, Vol 2:2*, 1979, 49-82.  
Gay Walker, *Eccentric Books: an exhibit from the Yale University Library collections, January-March 1988*, Yale University Library: New Haven, 1988.

# Renaissance Pop-Ups

## Interactive Books at the Beinecke Library: 1474-1677



Guest Curator, Suzanne Karr

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Ever since moveable type ushered in mass-production, new technologies have pushed the boundaries of the book. This exhibit examines what might be termed *interactive* printing in Germany and Italy before *pop-ups* became children’s fare. These scholarly printed tomes contain moveable illustrations that make them as unique as manuscripts. Such diagrams lifted or turned while attached to the page, or were even cut free and built into functional three-dimensional instruments.

The main types of moving parts before 1700 were flaps and *volvelles*, or calculating dials. Workshop members simply glued a flap on one edge to complete diagrams, which contrasted before-and-after scenes or opened up human anatomy. The most radical flaps revealed the disjunction between appearance and reality, such as Pietro Bertelli’s stilt-walking courtesan. Volvelles could be simple enough for scholars to construct themselves—by cutting out the dials, and sewing them to the page so they could rotate. Other volvelles were colored and multi-layered with silken string indices for astronomical calculations, as in the magnificent *Astronomicum caesarium* Peter Apian produced for Emperor Charles V. Double-sided dials turning from either side of the page retained the mystery of the liftable flap, and could generate arbitrary answers for fortune-telling.

The first row demonstrates early books of both types, and how their moving parts were constructed. The second treats playful applications, such as lottery books with moving parts and seventeenth-century novelty texts. The final row traces the scientific applications of moving parts from extension flaps to full-fledged three-dimensional globes and sundials. Although the same moveable images reappear in different contexts, their artists usually remain unknown. In the end, as the volvelle’s inventor, the mystic Raymond Llull, insisted, the user is also the *Artist*.

## Exhibition Checklist

### Firsts

Johannes Mueller, (Regiomontanus), *Kalendar*, Nuremberg: Johannes Mueller, 1474. Earliest printed volvelle.

Johann Stöffler, *Elucidatio fabricae vsvsque astrolabii*, Oppenheim: Jacob Köbel, 1513. Extension flaps.

Raymond Llull, *Ars brevis*, Lyon: Stephanus Baland, 1514. Volvelle.

### Ars Memorativa

Jacopo Publicius, *Artes orandi, epistolandi, memorandi*, Venice: Erhard Ratdolt, 1485. Snake pointer supplied in facsimile from the Library of Congress Rosenwald Collection.

Jacopo Publicius, *Ars memorativa*, Cologne: Johann Guldenschafft, 1483. Photograph from the New York Public Library. Volvelles.

Thomas Murner, *Logica memorativa*, Strassburg: Johannes Grüninger, 1509. Uncut cards.

### Construction: Printed and Manuscript Volvelles

Peter Apian, *Cosmographicus*, Landeshut: Peter Apian, 1524. Three volvelles.

MS 558, Anonymous sixteenth-century British astronomy manuscript. Volvelles.

### Construction: Cryptography

Giambattista della Porta, *De furtivis literarum*, London: John Wolfe, 1591. Three uncut volvelles.

Giambattista della Porta, *De occultis literarum*, Montbéliard: Jacob Foillet, 1593. Three volvelles. See illustration on title page.

Johann Trithemius, *Polygraphie*, Paris: I. Keruer, 1561. Eleven volvelles.

### Construction: Morphology

Georg Philipp Harsdörffer, ed, *Deliciae physico-mathematicae*, Nuremberg: Jeremia Dümlern and Wolfgang Endter, 1651; 1677. Three volvelles including a “Five-Fold Think-Ring of the German Language”; 1677 edition, two uncut volvelles.

### Lotteries: Beyond Card Games

Anonymous, *Kartenlossbuch: Darinnen auss H. Schrift vil Laster gestrafft, vnd heylsamer Leeren angezeygt werden*, Strassburg: M. Jacob Kammerlander, 1543. From the Cary Playing Card Collection. Double-sided unicorn volvelle.

### Lotteries: Quasi-Pagan

Paul Pambst, *Loosbuch zu Ehren der römischen vngerischen vnnd böhemischen Künigin*, Strassburg: Balthassar Beck, 1546. From the German Literature Collection. Double-sided Angel and Christ Child volvelle.

### Lotteries: Christian

Joannes David, *Veridicus Christianus*, Antwerp: Ex Officina Plantiniana, 1606. Volvelle.

George Wither, *A COLLECTION OF EMBLEMES*, London: Robert Allot, 1635. Two volvelles.

### Military Magnificence

Henry Hexham, *The first [-third] part of the principles of the art military*, Delft: Antony of Heudsdén, 1642. Several engraved rectangular volvelles.

Esaias von Hulsén, *Aigentliche wahrhaffte Delineatio vnnd Abbildung . . .*, Württemberg, 1618. Festival book with five sets of moveable engravings of parade floats.

### Novelties

Pietro Bertelli, *Diversarum nationum habitus*, Padua: Pietro Bertelli, 1589. Three flaps.

Edmund Bolton, *The elements of armories*, London: George Eld, 1610. Volvelle.

Georg Philipp Harsdörffer, *Frauenzimmer Gesprächspiele, so bey ehr- und tugendliebenden Gesellschaften. . . geübet werden mögen*, Vol 4, Nuremberg: Wolfgang Endter, 1644. From the German Literature Collection. Flap self-portrait.