

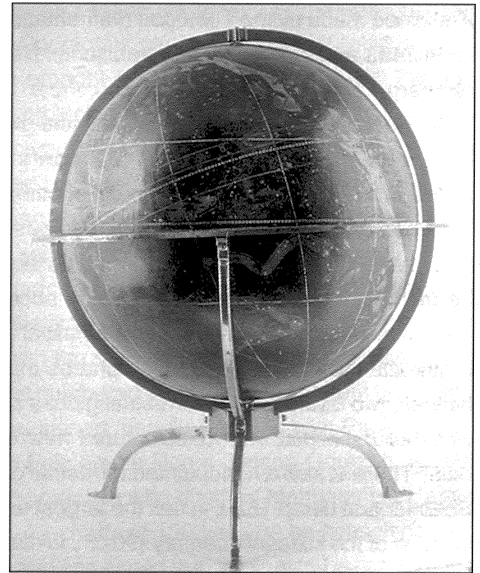
Christopher S. Wood

## Print Technology and the Brixen Globes

The recent re-appearance of the Brixen or Hauslab-Liechtenstein globes, lost to scholarship for more three-quarters of a century, gives us an opportunity to reassess the impact of early print technology on cartography and cosmography. The two globes, one representing the sky and the other the earth, are apparently pendants; they both measure 36.8 cm. in diameter and rest in bronze mounts from the period, presumably the original mounts.<sup>1</sup> The celestial globe, according to an inscription, was given as a gift to the Bishop of Brixen in 1522. Both spheres are handpainted but based closely on woodcut models. In the case of the terrestrial globe, the printed model fixed the contours of the continents, the very sort of information that was most vulnerable to error and drift when it was transmitted by a chain of handmade copies. In the case of the celestial globe, the printed model notated information about the location and the magnitude of the stars, but also information about the forms of the constellations, the pictures of heroes and animals devised by the ancients to organize the sky's chaos. The celestial globe in some instances diverges from its model, but in general achieves a degree of fidelity to the printed constellations that one might say exceeded philological necessity, given that the designer of the woodcut was not Ptolemy himself but only a living German artist. When copying images, it was hard to tell where the essential content ended and the inessential "stylistic" contribution of the artist began. The relationship of the Brixen celestial globe to its woodcut model illustrates the exceptional—indeed not always warranted—authority that printed images enjoyed in the early decades of the sixteenth century.

The Brixen globes were acquired in the early nineteenth century by an Austrian ordnance officer, Franz Ritter von Hauslab.<sup>2</sup> After Hauslab's death in 1883 they entered the far-flung collections of the Princes of Liechtenstein and were apparently separated from one another. The terrestrial globe was mentioned in several scholarly publications between the 1870s and 1890s;<sup>3</sup> the celestial pendant, however, was completely unknown until both globes were properly published by Oberhammer in 1926. For a long time afterwards the two globes were effectively lost. Although the terrestrial globe was mentioned in several later publications,<sup>4</sup> no one seems to have actually seen it. At some point the two spheres were reunited by the New York dealer H. P. Kraus and sold to the American collector Paul Mellon. Shortly before his death in 1999 Mellon transferred the globes to the Center for British Art at Yale University, New Haven, Connecticut, the museum and research center that he had founded in 1977.

The eight-line inscription documenting the commission of the celestial globe, written in a minuscule hand in the southern hemisphere, reads: *Hunc globum Imaginum fieri fecit Nicolaus Leopold Enipontanus Canonicus Brixinensis in gratiam R.mi et illust.mi Principis Domini D. Sebastiani Sperancii Presulis Brix. Cui dono*



1 Celestial globe, 1522, diameter 36,8 cm, New Haven, Connecticut, USA, Yale Center for British Art, Paul Mellon Collection.



2 Terrestrial globe, ca. 1522, diameter 36,8 cm, New Haven, Connecticut, USA, Yale Center for British Art, Paul Mellon Collection.

*dedit Anno salutis 1522 (Nicolaus Leopold of Innsbruck, cathedral canon in Brixen, had this globe made as a favor to the most reverend and illustrious prelate Dr. Sebastian Sprenz, Bishop of Brixen; and presented it to him in the year 1522.)* The stars, applied to or punched on the painted surface in gold leaf, are keyed to a scale with eight magnitudes. Some of the stars are described by name in a minuscule hand. The cities on the terrestrial globe, meanwhile, are marked with points and sometimes with small buildings. Various inscriptions and legends are written in minuscule, in black and red. The word "Brixia", prominently marking a town that was only the fifth largest in the Tyrol, is much too large, confirming the connection between the two globes.

The oldest surviving European celestial globes were fabricated in Germany, one of them painted and made of wood dating from the fourteenth century, and the other of metal with engraved figures dating from the mid-fifteenth century. They were both modelled on Arabic globes and were both owned by Cardinal Nicholas Cusanus.<sup>5</sup> Much larger and more splendid than these is the cele-

stial globe made by the Tübingen mathematician Johannes Stöffler in 1493 and now in the Germanisches Nationalmuseum, Nuremberg.<sup>6</sup>

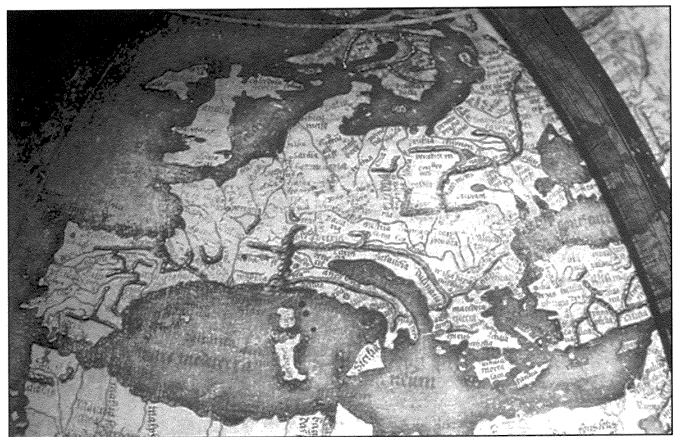
The oldest surviving terrestrial globe is the globe made by Martin Behaim of Nuremberg in 1492-1493, now in the Germanisches Nationalmuseum, recently the object of intense scholarly study.<sup>7</sup> The mathematician Johannes Schöner, based first in Bamberg and then in Nuremberg, soon emerged as the most important globe manufacturer in Europe. In 1515 he published woodcut segments for a terrestrial globe and a celestial pendant, and apparently attached them to wooden spheres that he had fashioned himself; two of the printed terrestrial globes survive. In the 1530s Schöner published and manufactured new editions of both globes.<sup>8</sup> There is also a handpainted terrestrial globe designed by Schöner and dated 1520, in fact the largest terrestrial globe of the first half of the sixteenth century (90 cm. in diameter).<sup>9</sup> Presumably he produced other handpainted globes. The celestial globe that appears in Hans Holbein's *Ambassadors* (London, National Gallery, 1533) has been attributed to Schöner; the source of the terrestrial globe in the painting is less clear.<sup>10</sup>

Schöner, as far we can tell, printed globe segments or gores for his own use, that is, in order to produce multiple, virtually identical copies of his own globes. But some early woodcut gores seem to have been intended for an open market. The purchaser could then fashion his own sphere and glue the segments to it. The 18-cm. segments attributed to the cosmographer Martin Waldseemüller (apparently published to accompany his *Cosmographiae introductio* of 1507) and the 16-cm. segments attributed to Petrus Apianus (c. 1518), both for terrestrial globes, seem to belong to this category.<sup>11</sup> In both cases the segments are considerably less detailed than the flat world maps published around the same time by their respective authors; they result in globes only about 12 and 10.5 cm. in diameter.<sup>12</sup> Schöner's printed globes were also much smaller—only 27 cm. in diameter—than his handpainted globe. It is also possible that the early printed gores served didactic aims only and were never meant to be pasted onto spheres.<sup>13</sup>

The Brixen globes are handpainted, but fully dependent on printed sources. The celestial globe closely follows the well-known woodcuts of the north and south skies by the Austrian mathematician Johann Stabius, the Nuremberg mathematician and astronomer Konrad Heinvoegel, and Albrecht Dürer, published with an imperial privilege in 1515.<sup>14</sup> The terrestrial globe copies even more exactly, even to the inscriptions, the immense world-map that accompanied Waldseemüller's *Cosmographiae introductio* (St.-Dié 1507). Waldseemüller's map, printed from twelve blocks and measuring 120 x 240 cm., survives in a single impression.<sup>15</sup> The map was printed in an edition of 1000, according to an inscription on Waldseemüller's own *Carta Marina* of 1516. The Brixen globes translate the printed forms back into the more prestigious hand-made medium, as was appropriate for a gift to a bishop.

Globes were naturally destined for scholars and learned clergymen. Johannes Stöffler mentioned in letters the celestial globes that he made for Johannes Reuchlin and for Bishop Johannes von Dalberg of Worms.<sup>16</sup> The globe dated 1493 now in the Germanisches Nationalmuseum belonged, according to an inscrip-

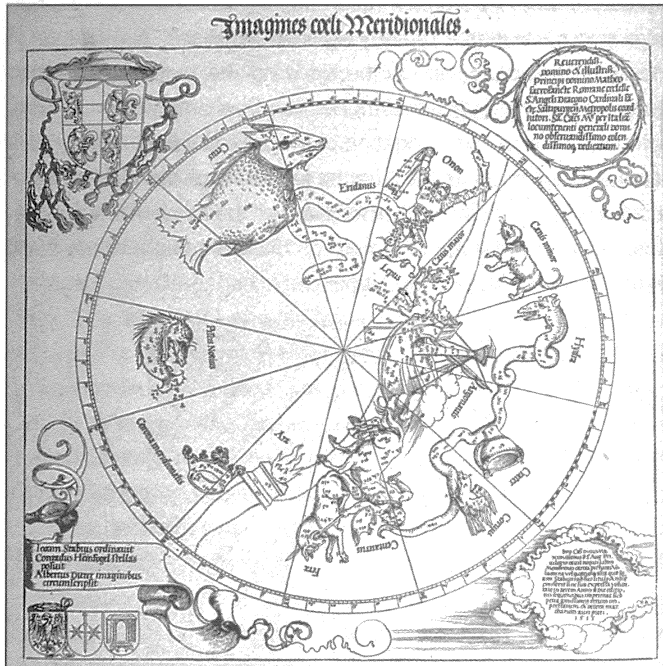
tion on the mount, to Stöffler's patron Bishop Daniel of Konstanz. Sources mention numerous gifts of globes to Italian prelates.<sup>17</sup> But there was no more appropriate episcopal recipient of a globe than Sebastian Sperantius, who enjoyed a reputation as an astronomer. Sperantius was ordained in Augsburg in 1491 and in 1493 was studying at Ingolstadt with Conrad Celtis.<sup>18</sup> In 1499 he earned the master's degree and at some later point a doctorate. At the beginning of the new century Sperantius was directing the Latin school at St. Lorenz in Nuremberg. In these years he established contact with the leading scholars of the day, including Willibald Pirckheimer and Conrad Peutinger. In 1501 he contributed ceremonial verses to Celtis's edition of the plays of Hrosvita; later he translated works by Horace and Terence into German. It is not completely clear what Sperantius's reputation as an astronomer was based on. The Augsburg cleric Veit Bild called him *astronomorum princeps*. We know that Sperantius designed a sundial and that he prepared a calendar for the year 1506. At any rate, he figures prominently on one of a pair of sky-charts made in Nuremberg in 1503.<sup>19</sup> These charts were drawn by an unidentifiable artist or scholar in pen on parchment and heightened with silver and gold. They were hidden in a Hamburg private collection for a long time, first published only in 1943, and acquired by the Germanisches Nationalmuseum in 1965. The coat-of-arms of the city of Nuremberg appears in the upper left corner of the southern sky-chart. In the upper right appears the arms of Conrad Heinvoegel and a four-line poem addressed to him. In the lower right are poetic descriptions of the winds by Dietrich Ulsen. Sperantius, finally, sits in the lower right corner, an armillary sphere in his hands, looking up at the nude figure of the goddess Urania. An astrolabe hangs from a nearby tree. Four hexameters praise Sperantius as one who understands the secrets of Urania and of the heavens.



3 Terrestrial globe, detail: Europe.

The 1503 sky-charts pose a number of unsolved riddles. Mythological and allegorical figures appear in all eight corners: the Fates Clotho, Lachesis, and Atropos; Vanitas in a fishnet costume; Bacchus; Apollo and Mars; Saturn and Venus; Mercury and Luna; Pluto and Jupiter. Apollo with his bow and arrow and Mercury with his flute are the emblems of the *Collegium poetarum et mathematicorum* founded in 1502 by Emperor Maximilian. The collaboration of Conrad Celtis himself is not documented on the charts but can be inferred. Celtis was already using globes as teaching devices

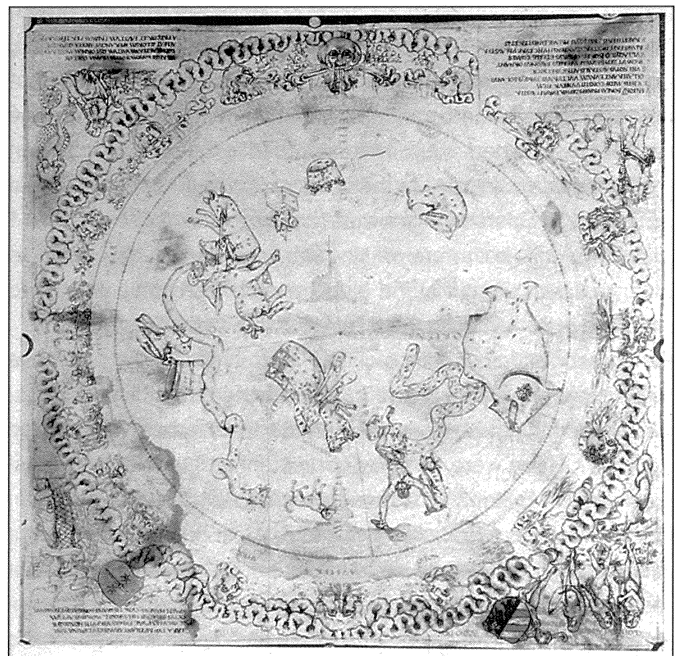
In his lectures on mathematical geography at Vienna.<sup>20</sup> The Nuremberg charts are themselves closely modelled on the sky-charts in a Viennese astronomical manuscript of the 1440s.<sup>21</sup> The positions of the stars in these charts apparently derive from the work of the Viennese astronomer Johannes von Gmunden; the constellations, meanwhile, are dependent on Arabic models. Either a copy of these charts—perhaps by the Franconian mathematician Johannes Regiomontanus—or the Viennese manuscript itself was evidently available in Nuremberg in 1503.



4 Albrecht Dürer, Southern sky chart, 1515, woodcut, 43x43 cm

It seems clear that the Nuremberg sky-charts of 1503 were from the start meant to be published. These were the years of maximum optimism about the contribution of the printing press on humanist scholarship. Conrad Celtis planned a whole series of publications that were to combine text and images in highly creative ways. He spoke of publishing the Roman map later known as the *Tabula Peutingeriana*. Conrad Peutinger was working on a history of the Roman emperors that was to be illustrated by woodcut portraits by Hans Burgkmair. Few of these projects were realized. Publication costs were high, and habitually underestimated by scholars. Scholarly publications did not sell in great quantities, and printers were increasingly reluctant to invest in illustrations. What was needed in such cases was the support of a patron. The Nuremberg sky-charts of 1503 were finally published in 1515 under the patronage of Cardinal Matthäus Lang, whose coat-of-arms is visible on both hemispheres. The privilege of Emperor Maximilian appears in the lower right of the southern chart. On this occasion the scientific team enlisted first-rate artistic talent. The head of the project, according to the inscription, was Johann Stabius; the astronomer was again Konrad Heinvoegel. The models for the woodcuts were the charts of 1503, although not necessarily the copy we know today: small punchmarks on the drawn charts suggest that there were several copies made. Presumably Heinvoegel, Ulsen, and Sperantius each possessed his own set.

Sperantius was not mentioned on the printed sky-charts of 1515. But a connection to Sperantius cannot be ruled out. His career had in the meantime brought him into close contact with the patron of the woodcut project, Matthäus Lang. Sperantius held a lectureship at the University of Ingolstadt from 1503 until 1506, when he was replaced by Jacob Locher. He then moved into the political realm, serving first the Emperor and then, from 1511, Matthäus Lang, as a salaried secretary. He received various sinecures, including cathedral prior and priest in Brixen, although he undoubtedly spent little time in Brixen. This is not to say that Sperantius lost contact with the scholarly world. In the controversy of the *virii obscuri* he was numbered among the supporters of Johannes Reuchlin. He maintained friendly relations with Pirckheimer, Peutinger, Johannes Eck, and in Rome Johann Goritz. It seems possible that it was Sperantius who directed Matthäus Lang's attention to the drawn sky-charts of 1503, where he himself had so prominently figured, and convinced the cardinal to have them published.



5 Southern sky chart, 1503, pen on parchment, 67x67 cm, Germanisches Nationalmuseum, HZ 5377

In April 1521 Sperantius was elected Bishop of Brixen. Traditionally, the ecclesiastical princes of Brixen were subordinate to the Tyrolean nobility. But in this case the bishop was put in place over the heads of the local authorities, an assertion of power by the new emperor, advised by Lang.<sup>22</sup> The local powers were openly hostile to the newcomer, just as they had been to Sperantius's great predecessor, Nicolaus Cusanus. The election was confirmed in Rome in July 1521. In August Sperantius at last arrived in Brixen and in September was ordained as bishop. Until 1523 he was more or less in residence, and by all accounts tried to establish a learned, cultivated court in the style of Lang. Until then Brixen had never been an important cultural center, despite the humanistic leanings of Sperantius's predecessor Christoph von Schrofenstein. But already in 1523 Sperantius was called to Innsbruck as Chancellor of the Tyrol. The indignation of the old local

families was memorably expressed by Georg Kirchmair, administrator of the monastery of Neustift. In his diary Kirchmair described Sperantius's irresponsibility and blamed him for the political unrest that rocked the country between 1523 and 1525.<sup>23</sup> Sperantius did not enjoy a quiet end. At the time of the Peasant Rebellion in 1525 he fled and died on the run, in Bruneck.

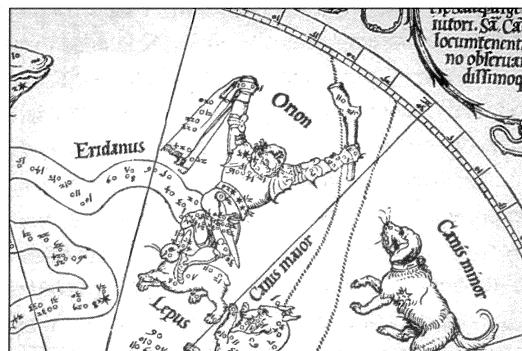
This was the context for the commission of the Brixen globes. The canon Gregor Angerer reported that the clergy was also opposed to the election of Sperantius. Nevertheless, Nikolaus Leopold decided to honor the new bishop with the gift of one or both of the globes. (The idea of a celestial and a terrestrial globe forming a pair was quite new, apparently introduced by Schöner in 1515.<sup>24</sup>) Who was Nikolaus Leopold? Perhaps significantly, he was not a native of Brixen, but rather of Innsbruck, where in 1511 he was employed as a teacher in the Latin school and as director of the Pfarrkantorei, and held the degree of Master of Arts.<sup>25</sup> He is next documented in 1515, in this case as a cathedral canon in Brixen, with the degree of Doctor of Law. Lukas Madersbacher has suggested that the portrait in a private collection in Milan of a man holding a compass, dated 1519 and attributed to Marx Reichlich, could represent Nikolaus Leopold.<sup>26</sup> Between 1511 and 1515 Leopold was possibly in imperial service; we can infer this from the fact that he was personally recommended to the position in Brixen by both Maximilian and Matthäus Lang. It is thus conceivable that Leopold and Sperantius knew each other already between 1511 and 1515, while both were working for Maximilian or Lang. It seems clear that with the gift of the globe or globes Leopold wanted to maintain or establish a special relationship to the new bishop.

One must wonder whether globes of such high quality could have been produced locally. Were local craftsmen and painters capable of producing the globes solely on the basis of the printed sources? There were certainly competent painters, both in Innsbruck and in Brixen.<sup>27</sup> The most plausible author of the globes in Brixen was Andreas Haller, a citizen since 1509 and from 1524 a member of the city council. In Haller's fat-cheeked figures—for instance in the Anna Selbdritt altarpiece of 1513 in the Tiroler Landesmuseum—one can almost see the painted constellations on the globe.<sup>28</sup> The anthropomorphic constellations on the globe are generally chubbier and more child-like than those in Dürer's woodcuts. The greatest barrier to the hypothesis of a local production is the problem of the spheres themselves. There was no tradition of globe manufacture. One has difficulty imagining that local craftsmen would have been able to fashion such perfect spheres, not to mention the bronze mounts with their engraved majuscule lettering. It seems most likely that Leopold ordered the globes from Nuremberg.

However, it must be remarked that the terrestrial globe does not incorporate the latest information gathered by the voyages of discovery, which naturally was available in Nuremberg. The absence of this information proves at least that it was not the leading globe-maker Johannes Schöner who made the Brixen terrestrial globe. Schöner in his globes of 1515 and 1520 also based himself on Waldseemüller's 1507 map, but introduced numerous improvements and additions. Already on the 1515 globe, for instance, he included—without any evidence for it—an antarctic continent. The

Brixen globe also failed to take into account Waldseemüller's own widely distributed 1516 map, the *Carta Marina*, which offered more information about the Americas.

Among the Brixen globe's few departures from Waldseemüller's 1507 map are two inscriptions from a second, more recent printed source: the world-map attributed to Petrus Apianus and published in an edition of Solinus by Johannes Camers (Vienna 1520) and again in an edition of Pomponius Mela (Basel 1522).<sup>29</sup> The Brixen globe describes the island Hispaniola, for example, following Apianus's map, as *insula in qua capitur guaiacum lignum* (guaiacum wood, used as a remedy against syphilis).<sup>30</sup> The caravel in the south Pacific Ocean on the Brixen globe, incidentally, which does not appear in Waldseemüller, has been interpreted as a reference to the circumnavigation of Magellan in 1522, providing a *terminus post quem* of 1523 for the terrestrial globe. But this is not at all certain. A similar caravel appears off the coast of South America already on the Apianus map of 1520, although further north than the one on the Brixen globe.



6 Dürer, Southern sky chart, detail: Orion.



7 Celestial globe, Yale Center for British Art, detail: Orion.

The Brixen celestial globe was undoubtedly prepared under the close supervision of a scholarly adviser. On the woodcut models of 1515 the individual stars are not named, while on the globe they are. The painter of the globe also modified the constellations in various small ways. For example, Dürer drew the constellation Arrow (*telum*) as a quarrel or crossbow bolt, with a wide, forked tip. The painter of the globe reverted to a traditional arrow with a pointed tip; possibly the quarrel struck him as unantique. The painter's interpretations of Dürer's iconography are consistently intelligent and well-informed, and Dürer's iconography was not always transparent. The Medusa, for example, which Dürer—on the basis of sound archeological knowledge—drew in

correct archaic fashion, is precisely reproduced on the globe. Most remarkable is the careful adjustment of Dürer's Orion. In his woodcut, Dürer clothed Orion in a suit of armor, just as on the Stöffler globe of 1493. But he also gave Orion a cloth on the left hand. This cloth is unorthodox: the usual attribute, and the one that Dürer had before him on the drawn chart of 1503, was an animal skin. It is possible that Dürer was looking at a prior model, for instance the drawing in the Viennese Cod. 5415, where one can barely make sense of the object. The painter of the globe, finally, decided to ignore Dürer and revert to the skin—in this case the skin of a bull, just as on the drawn chart of 1503. It was not in fact Dürer's cloth that was philologically correct, but the animal skin.<sup>31</sup> One can almost assume that Nikolaus Leopold himself was instructing the painter.

Generally, however, Dürer's pictorial ideas carried considerable authority. The painter troubled himself to reproduce small, characteristic details of the printed constellations, including meaningless features that Dürer had in fact superimposed on the pictorial tradition. The Altar (ara) and the Bowl (krater) in the Southern Hemisphere, for instance, are virtually identical to Dürer's, even to the rope handle on the Bowl. The complex rigging of the Boat (Argo-navis) is reproduced almost exactly, with only one of the seven ropes omitted. The authority of the 1515 woodcuts, in other words, extended beyond astronomy and iconography and into the realm of style. Within a given constellation the distinction between the iconographic (or essential) and the stylistic (or accidental) features is hard to determine. This internal frontier was in doubt especially in this period, when the responsibility for the transmission of the astrological types was increasingly left to artists. The inscription on the printed southern hemisphere chart of 1515 describes the contributions of the three authors: Johann Stabius ordinavit or "arranged" the charts; Konrad Heinvoegel stellas posuit, or "placed the stars"; and Albrecht Dürer imaginibus circumscripsit, "circumscribed" the stars "with images". The triple hierarchy corresponds exactly to the three stages of rhetorical composition: inventio, dispositio, elocutio. The entire task of drawing the constellations thus falls under the rubric elocutio, the stage of stylistic embellishment; whereas one might well think that the iconographic correctness of the figures belonged properly to one of the earlier stages. The three-stage program outlined by the inscription collapses the iconographic and the stylistic shaping of the constellations into a single operation, and leaves it all to the artist. How is one to know, on the basis of internal evidence alone, whether in the woodcut charts a given feature should be credited to the iconographic type, or to Dürer's stylistic vision? Without an external guideline or authority one cannot know. The Brixen celestial globe in some cases did rely too heavily on the printed models and ended up retaining many inessential, supplemental features. An example is the tail of the Centaur, which on the drawn sky-chart of 1503 took the form of a gothic trefoil. The tail was in effect a free zone for style, outside the regime of iconography. Dürer, too, worked freely with the tail: on his Centaur one finds a flowing Beiwerk or supplement of the sort developed by the Florentine neo-antique in the Quattrocento. The Brixen globe, naturally, copies Dürer's tail. The authority of the model lent a whole styli-

stic world—the Quattrocento as seen by Dürer—a kind of unearned weight or inertia, and transferred this world intact to Brixen.

One might imagine that the authority of the woodcut sky-charts of 1515 was principally a matter of Dürer's personal fame. In this case, however, I would argue that the star charts became definitive and exemplary above all because they were printed, and not so much because they were designed by Dürer. There are ample testimonies from the time to the authority of mechanical reproductions—and not so much with texts, as with images. Print technology was meant to bring the slow drift of pictorial types, from copy to handmade copy, finally to an end. Mechanical replication fixed a potentially chaotic mass of information into repeatable statements.<sup>32</sup> Whereas book printing was mostly a matter of amplification—of distributing quantities of copies to as many readers as possible, over great distances and as speedily as possible—image printing was a matter of establishing authoritative texts. The process of establishing authoritative verbal texts—of the classic authors, for example—was helped by print, but did not depend so crucially on print. Philology could proceed through distribution of careful handmade copies through small circles of readers. The problem of unintentional deformation of the data was not so dramatic with verbal texts, where the alphabetic system already guaranteed perfect continuity of the textual tradition. One could fear the scribal error—but then typographical errors, in these early stages of printing, were just as common. Thus print technology had a much greater effect on images than on texts. Print technology offered images a completely new prestige and power. Printed images revolutionized the fields of religious iconography, botany, cartography, and practical manuals.<sup>33</sup> They made it possible to reproduce not merely diagrams, but complex analogical information, exactly the sort of visual texts where the iconographic and stylistic components were hardest to distinguish.

The new authority of the printed image meant that in some cases prints managed to fix visual information more precisely than was practically necessary. As an example of this new excessive authority of the replicated image one can point to Hartmann Schedel's practice of pasting prints into the books he owned, both published volumes and manuscripts.<sup>34</sup> When Schedel wanted to insert a verbal text at the end of one of his volumes, for example a transcribed inscription or a passage from a classical or medieval authority, hand-copying sufficed. But when it came to images whose forms conveyed valuable iconographic or factual information, Schedel wanted the authority of mechanical reproduction whenever possible. For images that he found in the notebooks of earlier scholars, for example Cyriacus of Ancona, he had to be content with hand-copying, however inexpert. But in some cases—maps, broadsheet reports on recent miraculous births, or the forms of classical or Biblical figures engraved by Jacopo de' Barbari—Schedel was able to turn to published authorities. Thus one can assume that when Schedel pasted engravings by Jacopo de' Barbari into his manuscript inscription collection, he was interested not so much in Jacopo as an author, but in Jacopo as a kind of mediator of authoritative iconographic types. It was surely not so different with the spherical, handpainted copies of Dürer's published sky-charts made for Sebastian Sperantius in 1522.

## Notes:

- <sup>1</sup> See the exhibition catalogue [www.1500circa.net](http://www.1500circa.net), Diözesanmuseum, Brixen 2000.
- <sup>2</sup> E. Oberhummer, *Die Brixener Globen von 1522 der Sammlung Hauslab-Liechtenstein*, Akademie der Wissenschaften in Wien, Philosophisch-historische Klasse, Denkschriften, Bd. 67. Abh. 3, 1926, S. 4.
- <sup>3</sup> Oberhummer, S. 4-6; see also E. L. Stevenson, *Terrestrial and Celestial Globes*, Bd. 1, New Haven 1921, S. 75-76.
- <sup>4</sup> O. Muris and G. Saarman, *Der Globus im Wandel der Zeiten*, Berlin 1961, S. 73-76; Maximilian I., exhibition catalogue, Innsbruck 1969, Nr. 371.
- <sup>5</sup> Bernkastel-Kues, St. Nikolaus Hospital; *Focus Behaim Globus*, exhibition catalogue, GNM, Nuremberg 1992, Nr. 1.8, 1.9.
- <sup>6</sup> Germanisches Nationalmuseum, Inv.-Nr. WI 1261; A. Fauser, *Ältere Erd- und Himmelsgloben in Bayern*, Stuttgart 1964, Nr. 213; *Albrecht Dürer 1471-1971*, exhibition catalogue, GNM, Nuremberg 1971, Nr. 303; *Focus Behaim Globus*, Nr. 1.16.
- <sup>7</sup> *Focus Behaim Globus*, Nr. 3.1-3.71.
- <sup>8</sup> *Focus Behaim Globus*, Nr. 1.22a, is the copy in Weimar, dated 1534; Stevenson, S. 82-88.
- <sup>9</sup> Germanisches Nationalmuseum, Inv.-Nr. WI 1; Fauser, Nr. 197; *Focus Behaim Globus*, Nr. 2.30. *Albrecht Dürer 1471-1971*, Nr. 302, falsely reports that the globe was assembled from woodcut segments.
- <sup>10</sup> E. Dekker and P. van der Krogt, *Globes from the Western World*, London, 1993, S. 24.
- <sup>11</sup> Muris and Saarman, S. 76. G. Engelmann, *Ingolstädter Globusstreifen*, *Sammelblatt des Historischen Vereins Ingolstadt* 84, 1975, S. 123-127. The Apianus segments are reproduced by Stevenson, Abb. 39.
- <sup>12</sup> *Focus Behaim Globus*, Nr. 2.24, is a globe made from a facsimile of the Waldseemüller segments.
- <sup>13</sup> F. Wawrik, *Deutsche Weltkarten und Globen zwischen 1480 und 1520*, in: *Focus Behaim Globus*, Bd. 1, S. 136-137.
- <sup>14</sup> *Albrecht Dürer 1471-1971*, Nr. 309-310; *Focus Behaim Globus*, Nr. 1.20-1.21.
- <sup>15</sup> Fürstlich zu Waldburg-Wolfegg'sche Kupferstichkabinett; *Focus Behaim Globus*, Nr. 2.23.
- <sup>16</sup> J.C.A. Moll, *Johannes Stöffler von Justingen*, Lindau 1877, S. 49.
- <sup>17</sup> Stevenson, S. 62-66.
- <sup>18</sup> For Sperantius's biography, see G. Bauch, *Die Anfänge des Humanismus in Ingolstadt*, Munich 1901, S. 73-76; K. Wolfsgruber, *Das Brixener Domkapitel in seiner persönlichen Zusammensetzung in der Neuzeit 1500-1803*, Innsbruck 1951, S. 209; C. Bonorand, *Joachim Vadian und der Humanismus im Bereich des Erzbistums Salzburg*, St. Gallen 1980, S. 204-206; and J. Gelmi, *Die Brixener Bischöfe in der Geschichte Tirols*, Bozen 1984, S. 116-120. Everyone agrees that Sperantius was born in Dinkelsbühl, except J. Sallaberger, *Kardinal Matthäus Lang von Wellenburg (1468-1540)*, Salzburg 1997, S. 335, Anm. 26, who names Schwandorf in the Oberpfalz as the birthplace.
- <sup>19</sup> W. Voss, *Eine Himmelskarte vom Jahre 1503 mit den Wahrzeichen des Wiener Poetenkollegiums als Vorlage Albrecht Dürers*, *Jahrbuch der Preussischen Kunstsammlungen* 64, 1943, S. 89-150; F. Zink, *Die deutschen Handzeichnungen, Nuremberg*, Germanisches Nationalmuseum, Nr. 99-100.
- <sup>20</sup> J. von Aschbach, *Geschichte der Wiener Universität*, Vienna 1877, Bd. 2, S. 62.
- <sup>21</sup> Österreichische Nationalbibliothek, Cod. 5415. F. Saxl, *Verzeichnis astrologischer und mythologischer illustrierter Handschriften des lateinischen Mittelalters*, Bd. 2, *Die Handschriften der National-Bibliothek in Wien*, Heidelberg 1927, S. 25-40, 150-155.
- <sup>22</sup> Gelmi, S. 116-118.
- <sup>23</sup> *Georg Kirchmairs Denkwürdigkeiten*, Hrsg. Th. G. von Karajan = Österreichische Geschichtsquellen, I. Abt.: *Scriptores*, Bd. 1, Wien 1855, S. 454, 462, 473.
- <sup>24</sup> Dekker and van der Krogt, S. 23.
- <sup>25</sup> Wolfsgruber, S. 170; E. Fässler, *Zur Lebensgeschichte des Nicolaus Leopold aus Innsbruck*, in: Fässler (Hrsg.), *Festschrift Walter Senn*, Munich-Salzburg 1975, S. 29-35.
- <sup>26</sup> Personal communication. Madersbacher has also pointed out that the age of the sitter given on the portrait, 58, would also permit an identification with Sperantius himself, although it seems unlikely that Sperantius would have sat for Reichlich in Brixen already in 1519. See Michael Pacher und sein Kreis, exhibition catalogue, Neustift 1998, S. 260, Abb. 7.
- <sup>27</sup> E. Egg, *Zur maximilianischen Kunst in Innsbruck*, *Veröffentlichungen des Tiroler Landemuseums Ferdinandeum* 46, 1966, S. 11-80; Egg, *Die spätgotische Malerei in Brixen*, *Veröffentlichungen des Tiroler Landemuseums Ferdinandeum* 48, 1968, S. 5-68.
- <sup>28</sup> Egg, *Kunst in Tirol*, Bd. 2, *Malerei und Kunsthandwerk*, Innsbruck 1972, Abb. 57.
- <sup>29</sup> Wawrik, S. 138-139, Abb. 3.
- <sup>30</sup> Oberhummer, S. 8, 13.
- <sup>31</sup> See G. Thiele, *Antike Himmelsbilder*, Berlin 1898, S. 30, on Orion in Hipparchus and on the Farnese Atlas.
- <sup>32</sup> See W. M. Ivins, Jr., *Prints and Visual Communication*, Cambridge, Mass. 1953.
- <sup>33</sup> See E. L. Eisenstein, *The Printing Press as an Agent of Change*, Cambridge 1979, S. 66-69 and passim; P. Parshall, *Imago contrafacta: Images and Facts in the Northern Renaissance*, *Art History* 16, 1993, S. 554-79.
- <sup>34</sup> *Die Graphiksammlung des Humanisten Hartmann Schedel*, Hrsg. B. Hernad, exhibition catalogue, Bayerische Staatsbibliothek, Munich 1990.