

From a 'domestic commodity' to a 'secret of trade': snails and shells of land molluscs in early (mainly 16th and 17th century) visual arts

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Species of land snails and slugs may be found on paintings and other works of visual arts from the late 15th century onwards. While in the beginning the illustrations were often imprecise, this changed in the late 16th century and most species were realistically illustrated. This was especially so during the 17th century, when still-life painting including one or more snails became well developed in Flanders and the Netherlands. We have checked 582 works of art, the majority showing European species, of which five related to slugs; 45 of these works have one or more species originating from tropical regions. During the 16th/17th century nearly all paintings and a majority of drawings analysed accurately illustrated snails with regard to chirality.

Key words: *Achatina*, *Amphidromus*, *Arianta*, *Cepaea*, *Cornu*, *Corona*, *Helix*, *Liguus*, *Xesta*, still-life painting

INTRODUCTION

The interdisciplinarity between malacology and visual arts is only moderately developed (e.g., Kuechen, 1979), and then mainly from the viewpoint of art history. In literature and data bases on visual arts shells are mostly identified as "shells", with the only exceptions for those widely used in culinary sense (oysters,

mussels) and very peculiar ones (e.g., *Nautilus* shells). The remaining ones are mainly tropical sea shells, usually species from the Indo-Pacific area. In general, these are paintings in which shells are combined with a variety of objects; however, some paintings are a still-life of only these shells (e.g. Meijer, 2006: 100–101, figs 18–21; Schütz, 2002: 107). An exhibition of visual arts with shells as main topic is a rare exception (Woldbye & von Meyenburg, 1984; Barten, 1985). However, with a keen eye one can discover specimens of land snail species in a number of visual art works, mainly in the still-life genre from the 17th century. This genre was particularly well developed in the Low Countries, nowadays Belgium (Flanders) and the Netherlands. While it is generally possible to identify these shells at the genus level, one may occasionally recognise some at species level.

Chirality and the Gould hypothesis

Gould (1995) posed the question whether chirality in shells had always been correctly illustrated and, after examining mirror-imaged shells in woodcuts and engravings in early printed natural history books, came to the conclusion "if standard sources and noted artists all drew snails in mirror image from their natural occurrence, they must have been following a well-accepted convention of the time, not making an error". In this context, it is interesting that the final example

that led him to this conclusion was the work by Agostino Scilla, an Italian painter who also engraved his own plates for his book *De Corporibus Marinis Lapidiscentibus*. This finally led him to postulate “the conceptual world of pre-eighteenth-century zoology must have accorded little importance to the orientation of a shell”. We will refer to this as the ‘Gould hypothesis’. Allmon (2007) attempted to test this hypothesis by examining illustrations of both snails and crabs in major illustrated works printed before 1758. He concluded that Gould was correct. However, his research was limited to a number of natural history works and he did not consider works of art. Thus remain questions like: How are snails illustrated with a different, direct technique like painting or drawing? Is there a difference between different artists?

The aim of this paper is to present a concise overview of—necessarily limited—data from drawings and paintings, focussing on art works from the 16th and 17th century. For practical reasons we have based ourselves on the extensive data available in the Netherlands Institute for Art History (Nederlands Instituut voor Kunstgeschiedenis, RKD). In the analysis we have focussed on identification of species (at least at genus level if possible), on the relative occurrence of the ‘snail theme’, the ratio of domestic and tropical species, and the two chirality questions.

METHODS

This study is based on online searches on several websites and examination of the documentation available at the RKD in The Hague; we searched in several ways the RKD database of images and artists (explore.rkd.nl; accessed May 2013). The subject “schelp” (shell) resulted in 1857 records of art works in their data base, including 780 records for the subject “oyster”, 183 for “mussel”, and 65 for “Nautilus(shell)”; also combinations of these three subjects occurred. A second query for the subject “slak” (snail) resulted in 799 hits (accessed June 2013). The art works in all records were visually checked for the occurrence of land snail shells. Works made later than 1700 were excluded, although some paintings included are dated between the end of 17th century and the first decades of 18th century; also drawings published in printed books were excluded. In the results below, oil paintings are indicated by Arabic numbers, other techniques used are indicated with uppercase letters and arranged alphabetically per category. Several works listed in the database were attributed to an artist or were attributed to pupils in his studio or to followers at a later date. Copies made by later artists are mostly ignored in our listing; however, it has to be kept in mind that attribution and dating of visual art

works may reflect subjective opinions. For the analysis the current attributions by the RKD have been followed; for composite works the artist of the part with the shells / snails has been used. For the chirality analysis we analysed by re-examination 503 art works classified with either ‘shell’ or ‘snail’ on the RKD website, both paintings and drawings; these originated between 1483 and the early 18th century. After excluding ambiguous illustrations (due to low resolution available), 456 works remained, of which 384 paintings and 72 drawings. A total of 103 artists have been identified during the period considered. As a proxy for their total production the number of hits per artist was taken from <https://rkd.nl/nl/explore/artists>. Years of production for art works were also taken from the RKD data base; if a range of years was given, the mean was taken for the timing analysis. Identifications of the shells, however, are dependent on the quality of the available pictures, some of which are old pictures in low resolution; generally, identifications were thus made on the genus level at best.

LAND SNAIL SPECIES OCCURRING IN VISUAL ART WORKS

EUROPEAN FAUNA

Slug species

(1) The oldest work we could find with a land snail (slug) species is an oilpainting on oak wood by Dieric Bouts. This painting is part of a triptych and originated in Leuven, Belgium, dated c. 1454–1462 (Périerd’Ieteren & Henderiks, 2005). On the centre part the adoration of the Magi is shown, with a reddish-brown slug on a stone wall in the lower-right foreground, probably *Arion* cf. *rufus* (L., 1758).

(2) Cornelis Cornelisz. van Haarlem painted two slugs, possibly *Limax* sp., in his painting ‘Zondeval’ [Fall of Man]. Both slugs are situated on the ground near the feet of Adam, one directed away from the viewer (on Adam’s right-hand side). The other one is directed towards the viewer (between Adam and Eve). Slugs are here associated with sin (see also Discussion); the painting is dated 1592 (Fig. 1; see also van Thiel, 1999).

Slugs are rarely seen in art works and in our study, besides the paintings just mentioned, we only encountered them as engravings or water colours.

(A) In the same series as mentioned below under *Helix* sub B by Joris Hoefnagel, an engraving entitled ‘Aenigma’ shows various objects among which a slug, in latero-dorsal view curling towards the viewer, that may be attributed to *Arion* sp. (RKD art work 121190).

(B) A second engraving from the same series (RKD art work 121121) shows a lateral view of a slug

heading to the left, which shows characteristics of *Limax* sp. See also the manuscript illuminated by the same artist, mentioned in the next section sub (B).

(C) Maria Sybilla Merian made in 1695 a water colour on vellum, on which in the center-right a reddish-brown slug may be seen; this slug is probably *Arion* cf. *rufus* (L., 1758). This drawing is RKD art work 107742.

Species with an external shell

One of the earliest pictures of a snail in oil paint may be the altar piece of an anonymous Hungarian artist, dated 1483, and now in the Magyar Nemzeti Galéria, Budapest (RKD art work 223702). The sinistral snail is an imaginary species and quite stylised, but we have little doubt it is modelled after a land snail species. This finding of a land shell on an altar piece seems odd at first, but may be clarified if we know more about Christian symbolics in iconographic works. In 'Defensorium Immaculatae Virginitatis' of the Dominican priest Franciscus de Retza (?–1425) one can find 'Si concha rore desuper proles fecundare claret, currorante pneumate virgo non generaret?' [If the snail is fertilized by the dew, why should the Virgin with the dew of the Holy Spirit not be empowered to give birth?] (Timmers, 1974: 145); this agrees with the snail "mirroring the Virgin's Immaculate Conception" (Werness et al., 2003: 376). Around the same time the Spanish artist Bartolomé Bermejo painted "Saint Augustine" sitting on a throne, where a snail is visible at the right-hand side (Fig. 2). The painting, now in the Art Institute of Chicago, shows a dextral snail with a thickened lip; the animal seems flattened and is without tail. Iconographically the snail symbolises in this context Resurrection of Christ (Friedmann, 1966).

Stylised shells of (imaginary) land snail species may be found in quite a number of paintings, especially during the 17th century. Most of these have undoubtedly been inspired on the species identified below.

(A) The earliest dated drawing of a living snail we have been able to find is the gouache of Joris Hoefnagel 'Studie van bloemen, insecten en een peer, opgedragen aan Johannes Radermacher' [Study of flowers, insects and a pear, dedicated to Johannes Radermacher]. This colour drawing was signed in 1589 by the artist, who worked at that time in Munich (RKD art work 121306; see also Hendrix & Vignau-Wilberg, 1992: 20). In the upper left corner we find a yellowish shell with convex whorls, with the animal stretching out of the shell. This is a helioid land snail. The drawing is now in an unknown Dutch private collection.

(B) During the years 1591–1596 (RKD art work 121344) or "probably done during the second half of the 1590s" (Hendrix & Vignau-Wilberg, 1992: 37), Joris Hoefnagel made in his Vienna period many illuminations for the calligraphic manuscript of Georg Bosckay, of which the text originated in 1561–1562 on the demand of Emperor Ferdinand I of Hapsburg, and for which Hoefnagel produced the illuminations during the reign of his grandson, Emperor Rudolph II. The manuscript consists of two parts: the first a writing model book, and the second a constructed alphabet. See Hendrix & Vignau-Wilberg, 1992 for background data and an annotated copy of the work that is now in the Paul J. Getty Museum, Malibu, U.S.A. The following terrestrial snails are illustrated: Folio 5, a side view of a *Cepaea* sp. 'on the move' to the right; Folio 33, a reddish-brown slug, *Arion* cf. *rufus* (L., 1758); Folio 54, an imaginary, sinistral land snail, probably derived from *Cepaea* sp., moving towards the viewer, its head seemingly lifted off the paper by the way the animal casts its shadow; Folio 59, a (partial) view of *Arianta arbustorum* (L., 1758), moving to the left [illustrated without showing its tail]; Folio 66, possibly another *Arianta arbustorum*, this time moving to the right; Folio 89, two imaginary land snails, possibly derived from *Cepaea* sp., in an upright position; Folio 112, *ibidem*, one moving rightwards and one moving towards the viewer, their head seemingly lifted off the paper; Folio 123, imaginary sinistral land snail, probably derived from *Arianta arbustorum*; Folio 131v, side views of two imaginary land snails, one dextral and one sinistral, mirroring each other with their heads slightly lifted and facing each other; Folio 142v, *ibidem*, the snails orientated in the opposite way. The identifications have been made by A.J. de Winter.

(C) In 1593, his eldest son Jacob Hoefnagel, produced a 'Vanitas still-life with skull, fruits, flowers, and insects' colour drawing (RKD art work 121099). In the lower right a snail is seen, but the resolution is not high enough to ascertain its identification.

The earliest oilpainting of a still-life with a stylised snail we were able to trace, is 'Bloemen in en rond een mand' [Basket of flowers], dated ca. 1610 and made by Ambrosius Bosschaert the Elder or possibly Lodewijck van den Bosch (RKD art work 4798). This work is a copy of related work made by Bosschaert ca. 1607. Two shells may be seen on this work in a latero-dorsal view; one of which is, however, too stylised to be further identified, the other may be a helioid. Nonetheless, around this time the start of more precise illustrations of living snails can be seen in still-life paintings. Living snails were likely familiar species, either found in gardens or in nature. It is



Fig. 1. Cornelis Cornelisz. van Haarlem, Dutch, *De zondeval*, 1592, Oil on canvas, 273 x 220 cm, Rijksmuseum Amsterdam, inventory number SK-A-129. Reproduced from online collection.

difficult to pinpoint a certain painter who started to use these animals as part of his composition of still-life works, since many painters in the early 17th century did not date their paintings and dating usually relies on stylistic grounds by experts.

Cepaea species

The following oil paintings are about the first in Dutch 17th century still-lives showing snails that are attributed to a *Cepaea* species, possibly the common garden snail found in the region where the paintings originated.

(1) The painting 'Bloemstuk in een stenen vaas, met een slak' [Flowers in a stone vase, with a snail] (RKD art work 14684) once was attributed to Osias Beert the Elder, who worked in Antwerp until his death in 1623; the work is dated after 1610 and it might even be a 20th century imitation (F.G. Meijer, pers. commun.). In the foreground a snail is crawling away from the viewer with its head lifted and its tail hinging on the edge of the table; together with the shadow of the animal, this creates a three-dimensional impression.

(2) The same species, but in a lateral view, the snail crawling to the left, may be seen in 'Bloemstillevan van rozen in een roemer, geplaatst in een venster' [Flower still-life of roses in a goblet, placed in a window] made by Ambrosius Bosschaert the Elder; this work is dated 1618–1619 and originated in Utrecht (RKD art work 49650).

(3) A third work, datable to 1615–1699, was probably made by a follower of Jan Brueghel the Elder and originated in Antwerp. The painting 'Bloemstillevan in een mand met op de voorgrond een losse tulp en een slak' [Flower still-life in a basket in the foreground a single tulip and a snail] shows in the right-hand corner a snail crawling to the right in a lateral view. This work (RKD art work 10978) may possibly be the oldest work of the three mentioned here, judged on stylistic grounds. See also below sub *Xesta*.

Where in these paintings a snail seems to be just a casual element in the foreground of the composition, we see in later works that the snail may also be found in the upper part of the figure, e.g. among the flowers. In total we found in the period studied ca. 300 works of art using snails positively identified as or modelled after a *Cepaea* species. Only rarely there is more than one *Cepaea* snail in a painting. *Cepaea* can be found more or less regularly on paintings throughout the 17th century, becoming less frequent during the 18th and 19th century and is only rarely seen in contemporary art works.

Helix species



Fig. 2. Bartolomé Bermejo (Bartolomé de Cárdenas), Spanish, Saint Augustine, 1477-1485, oil on panel, 49 x 27.7 cm, Mr. and Mrs. Martin A. Ryerson Collection, The Art Institute of Chicago inventory number 1947.393. Reproduced by permission.

The first identifiable *Helix* species we have been able to trace may be seen on a painting made ca. 1470/1472 in Ferrara, Italy, by Fernando del Cossa. The work 'Annuncio' [Annunciation], is a well-known altar piece, now in the Alte Meister Gallerie, Staatliche Kunstsammlungen, Dresden. Arrase (2000; translation Waters, 2008) has discussed the meaning of the snail in this painting in a well-written way; he mistakenly regarded it as "a good old Burgundy snail" [i.e. *Helix pomatia* (L., 1758)]. In fact, this is the first example of a painter to depict a snail in such detail, and it is clear he used the local species *Helix cincta* Müller, 1774 (Cesari, 1978: 48, pl. 5 fig. 1–2).

Helix pomatia is a well-known European species

which is also considered edible and of relatively big size; nowadays it is cultured in some countries in snail farms. However, it may only have been encountered in nature in the wild during the 16th/17th century. Only a few illustrations in art works are known to us, all of them either as (colour) drawing or as engraving.

(A) An undated gouache, entitled 'Emblematisch blad met vlinders en andere insecten' [Emblematic sheet with butterflies and other insects] is part of Joris Hoefnagel's work 'The Four Elements' (RKD art work 14549). In the lower center a *Helix pomatia* crawling to the right may be seen, inscribed with 'Festina lente' [Make haste slowly] on its shell. This way the figure was meant to induce contemplation and meditation (Vignau-Wilberg, 2007: 226).

(B) The same species, but mirrored, is in the centre of an engraving by the same author, with the same Latin title in the upper middle (RKD art work 121108). This engraving is part of a series ('ArchaetypaStvdi-aqve Patris Georgii Hoefnagelii'), and originated in 1592 in Frankfurt am Main.

(C) Almost a copy of the snail seen in illustration sub A was made with pencil in black and silver on paper in ca. 1660–1670 (RKD art work 107321). This drawing is attributed to Maria Sibylla Merian and is part of a series being kept in the Universitätsbibliothek Frankfurt am Main.

(D) A similar picture of this species, this time as water colour on vellum, was made and signed by the same artist in 1695 (RKD art work 107742). This drawing is kept in the Fitzwilliam Museum in Cambridge (U.K.), and can be seen (as a mirror image) at <http://bit.ly/GZOGyr>.

Other species

Several species common, at least nowadays, to the European fauna have not been found as identifiable species in our studies. One of the obviously missing ones is the garden snail *Cornu aspersum* (L., 1758). Only occasionally less common species are seen, e.g., *Arianta arbustorum* in the drawings by Joris Hoefnagel mentioned above and identified by A.J. de Winter (Hendrix & Vignau-Wilberg, 1992).

NON-EUROPEAN FAUNA

After the discovery of the Americas in 1492 by Columbus, the newly discovered fauna gradually found its way to Europe. Objects like shells ended up in curiosity cabinets of 17th century traders, e.g. in Belgium and Holland, and may also have been included by artists in their collection of objects which they used during their work. In these countries still-life painting was developed as a special skill (Silve, 1995; Bikker &

Hoyle, 2007). One of these artists was Balthasar van der Ast (1593/1594–1657) who is considered a master of the "combined" still-life composition (Anonymous, 2013a), and is known for his still-lives picturing shells (van der Willigen & Meijer, 2003). In his early works from the late 1610s we find only marine shells among flowers, fruits, various insects, or a lizard; from the early 1620s also tropical land snail shells can be found in his paintings. See also the Discussion below about the ease of (mis)identification of tropical species in this context. But the earliest works with these species seem to have been made in Flanders and in Middelburg (southern Netherlands).

Xesta shells

The work 'Bloemen in een roemer, insecten en een tui-nanjer op een stenen plint' [Flowers in a vase, insects and garden carnation on a stone plinth] by Ambrosius Bosschaert the Elder and dated 1606–1607 (RKD art work 122930) is probably the oldest painting with the attribution of a tropical land snail. This painting was last seen in public at the auction on 11 January 1995 at Christie's New York (lot 35, <http://bit.ly/1i8hnVu>). In the text of the 'Lot notes' it reads "The *Xestria* shell is not a species from the sea, but from a snail living in the trees in Celebes and New Guinea". However, *Xestria* is not known as a genus in molluscan names; possibly *Xesta* Albers, 1850 was meant, which occurs in Indonesia and is sometimes treated as a subgenus or synonym of *Naninia* Sowerby, 1842 and placed in the family Helicarionidae (e.g., Parkinson et al. 1987: 51). Species of this genus are arboreal and catching the eye with colours ranging from yellow to greenish, usually with one or more brownish spiral bands. On this work a dorsal view of a yellowish snail with a dark peripheral spiral band may be seen in the middle-left, with the animal stretching out (Fig. 3). As it is unlikely that a snail from this origin would have survived the long transport, either only the shell was used and the animal painted after a local species, or—more probably—a *Cepaea* species was illustrated. In the latter case, it would be one of the first examples of this species on a still-life painting.

Polymita shells

The Cuban genus *Polymita* Beck, 1837 (Helminetoglyptidae) is also catching the eye, due both to colouration (varying from tints of yellow to (orange-)brown or green) and to the variation in colour pattern (up to 6–7 spiral bands); white tints may be present in combination with colour bands, and in some species either axial patterns or small blackish dots are characterising the colour pattern. Its shell shape makes it very com-

parable to some other (marine) shells, e.g. *Natica* or *Nerita* species (see also Buvelot & van der Vinde, 2008: 96) or as a *Xesta* species, and in some paintings it is hard to reach a definite conclusion due to the orientation of the shell which masks characteristics. In the following works we tend to conclude to a *Polymita* species, for one or more of the following reasons: a) the colour pattern being typical for a *Polymita*; b) the descending suture towards the aperture; c) a small spiral peripheral band, usually in a whitish tint; d) a dark spiral band at the umbilicus; e) presence of a *Liguus* species from the same region of origin in the same painting.

We recognise the following works of visual art with representatives of this genus during the 17th century:

(1) The first painting on which we see a dorsal view of yellowish *Polymita* with a dark sutural spiral band—likely *P. picta* (Born, 1778)—is ‘Mand met bloemen, met daarvoor enkele bloemen en insecten, op een stenen plint’ [Basket of flowers, with single flowers and insects in the foreground, on a stone plinth] by Ambrosius Bosschaert (I). This painting (RKD art work 122792) is dated 1607–1608 (cf. also Bergström, 1963: 65) and originated probably in the Dutch city of Middelburg; it is known to have been in the possession of a private collector in Vienna until 1982, but the current location of the painting is not known.

(2) ‘Stilleven met zilveren en verguld vaatwerk, porselein, schelpen en andere kostbaarheden’ [Still-life with silver and plated ware, porcelain, shells and other valuables], a painting made by David Rijckaert (II) in Antwerp and dated 1616 (RKD art work 7560).

(3) ‘Bloemen in een roemer op een stenen plint voor een rivierlandschap’ [Flowers in a goblet on a stone plinth in front of a river landscape] was painted by Ambrosius Bosschaert (I) on copper, probably in 1619 (RKD art work 67514). On the right-hand side one sees a *Polymita* shell slightly turned and upside down; this yellow shell has a dark subsutural band, and a similar band behind the lip plus an old varix at the beginning of the last whorl. This shell has been identified as *P. picta* by W.S.S. van Benthem Jutting (Bergström, 1956: 65; see note 55 on p. 301).

(4) ‘Floral still-life with shells’, painting by Balthasar van der Ast (dated 1622, during his Utrecht period), a dorsal view of a yellowish *Polymita* in the right-hand foreground. The painting is in the Saint Louis Art Museum (Accession number 172:1955); <http://bit.ly/12vPwGT>. Also as RKD art work 48588.

(5) ‘Stilleven met vruchten in mand, bloemen in glazen kannetje, insecten en schelpen’ [Still-life with fruits in basket, flowers in glass jug, insects and shells], another painting by Van der Ast made during his Utrecht period (datable to 1623–1628). On the left-

hand side of the glass jug a *Polymita* is shown with the aperture down and the apex pointing left; the shell has both whitish and dark brownish spiral bands. This painting was last seen in 2000 in the possession of Galerie De Jonckheere, Brussels; RKD art work 9027.

(6) ‘Bloemstilleven in een rieten mand met schelpen, kersen en insecten’ [Flower still-life in a wicker basket with shells, cherries and insects] is a third work by Van der Ast and originating from the same period (datable to 1624–1626). In the centre foreground a shell with a single dark spiral band is shown, which we regard a *Polymita*. The painting was last auctioned at Christie’s London, U.K. on 19.iv.2000 (RKD art work 17595).

(7) ‘Vruchtenstilleven met schelpen, kikker, hagedis en vlinder’ [Fruit still-life with shells, frog, lizard and butterfly], painting by Johannes Bosschaert (dated 1626), with a dorsal view of likely a *Polymita picta* in the right-hand foreground (Kröller-Müller Museum, Otterloo, NL, inventory 37-17; RKD art work 7341). The work was produced in the Dutch city of Dordrecht.

(8) ‘Stilleven met een boeket bloemen in een glazen vaas, een vlinder, schelpen en een kikker’ [Still-life with a bouquet of flowers in a glass vase, a butterfly, shells and a frog], painting by Bartholomeus Assteyn (dated 1631; like the previous artist he worked in Dordrecht), with a dorsal view of probably the same species (or maybe even the same shell) in the left-hand foreground (Dordrechts Museum, Dordrecht, NL, inventory DM/953/79; RKD art work 7328).

(9) A work of which we have only been able to find a picture in a book (Bergström 1956: 96, fig. 87), is a painting of a glass vase with flowers, a lizard and shells. Its current location is unknown, but its attribution to Anthony Claesz. (II) is certain. He was a possibly influenced by Balthasar van der Ast and worked later in Amsterdam (van der Willigen & Meijer 2003: 61). The painting is dated 1639 and shows in the lower left-hand a *Polymita* species.

Liguus shells

The West Indian genus *Liguus* Montfort, 1810 (Orthalicidae) occurs on the islands of Cuba and Hispaniola, and in southern Florida. Shells of this genus are visually attractive mainly because of their colour pattern (spiral bands or flammulation) and vivid colours.

(1) As earliest painting in which a *Liguus* species is clearly visible, in this case a dorsal view of *L. fasciatus* (Müller, 1774) in the centre foreground, we found ‘Stilleven met zilveren en verguld vaatwerk, porselein, schelpen en andere kostbaarheden’ [Still-life



Fig. 3. Ambrosius Bosschaert (I), Dutch, "Bloemen in een roemer, insecten en een tuinaanjer op een stenen plint", ca. 1606-1607, oil on copper, 30.7 x 23.8 cm, RKD art work 122930. Reproduced by permission.

with silver and plated ware, porcelain, shells and other valuables] made by David Rijckaert (II) in Antwerp and dated 1616. The painting was last auctioned (8.xii.1995) by Christie's in London and now probably is in a private collection; RKD art work 7560. Two other, probably tropical terrestrial species are present in this painting; see below. No other works are known with these shells by this artist.

(2) One year later, in 1617, Christoffel van Berghe made in Middelburg the painting 'Still-life with flowers in a vase' (Philadelphia Museum of Art, inventory 648; <http://bit.ly/1f3kHEc>). Here we find in the lower-right hand corner a shell of *Liguus fasciatus*, the aperture partly obscured by a *Conus* shell (Bergström 1956: 80, fig. 74).

Most illustrations of *Liguus* shells, however, have been made by Balthasar van der Ast during his period in Delft (1632–1657). Interestingly, a book has been found with studies by him, totalling nearly 500 pages, three of which contain colour drawings of a *Liguus* shell:

(A) 'Studie van twee schelpen 'Piramide ofte wenteltrap' en 'Geel en wit Belleken'' (Fondation Custodia, Paris, inventory 6534-54; RKD art work 120472), showing a lateral view of *Liguus virgineus* (L., 1758) with the apex pointing upwards and the aperture downwards on the surface;

(B) 'Studie van twee schelpen 'Wit Belleken' en 'Engoude Laken'' (Fondation Custodia, Paris, inventory 6534-55; RKD art work 120473), showing a latero-ventral view of *Liguus fasciatus* pointing right.

(C) 'Studie van schelpen 'Wijgaest Belleken' en 'Bruijn Cammelot belleken'' (Fondation Custodia, Paris, inventory 6534-67; RKD art work 120497), showing a lateral view of *Liguus virgineus*, with the apex pointing left and the aperture slightly turned towards the viewer.

These three examples make it probable that Van der Ast had at least several specimens of *Liguus* shells at his disposal, although their provenance remains unknown. Despite the availability of only uncoloured illustrations of these shells, we identified the species on the basis of the structure of the colour pattern (see also Breure et al., 2014, for comparable illustrations of these species in early printed books). These studies, attributed to his Delft period (RKD art work 120309), may have been made before the following paintings were produced by him:

(3) In the painting 'Bloemen in een geribde kan met deuk op een stenen plint, met schelpen, bloemblaadjes en een sprinkhaan' [Flowers in a vase with shells and insects] (ca. 1635, National Gallery, London, U.K., inventory NG6593; RKD art work 119901) one can see, in the left-hand corner in the foreground, a dorsal view of *Liguus virgineus*.

(4) In a painting by Van der Ast 'Stilleven van schelpen, kersen en rode aalbessen op een gedekte tafel, met daarboven, in de lucht, een vlinder en een vlieg' [Still-life of shells, cherries and red currants on a set table, above, in the air, a butterfly and a fly] (ca. 1640, Museum Boymans van Beuningen, Rotterdam, inventory 2173; RKD art work 6585) we find—besides several marine species and a *Polymita* shell—a specimen of *Liguus virgineus* pictured in dorsal view in the left-hand corner of this painting.

(5) Painting 'Bloemstilleven in een vaas, met daarvoor schelpen, op een gedekte tafel' [A vase of flowers with shells on a ledge] (1640–1649, Fitzwilliam Museum, Cambridge, U.K., inventory PD.14-1975; RKD art work 120148) shows, in the right-hand corner, a dorsal view of *Liguus virgineus*.

(6) In the still-life 'Pears, grapes and a peach on a porcelain platter, with apples, a rose, shells, a dragonfly, a caterpillar and a lizard on a stone ledge, with a parrot on an upturned woven basket' (unknown date between 1632 and 1657, <http://bit.ly/1eDVu31>), a latero-dorsal view of *Liguus virgineus*, pointing leftwards, is visible in the foreground. This painting from a private collection was auctioned by Christie's in London on 4.xii.2012.

(7) The painting 'Still-life with peaches and shells' (unknown date [possibly between 1632 and 1657], Vancouver Art Gallery, Vancouver, CA, inventory 83.27) also has a *Liguus virgineus*; this shell is viewed from below, with the apex slightly turned to the right-hand side.

(8) In the painting 'Boeket bloemen in een urn met schelpen en salamanders op een tafel' [Irises, tulips, carnations, roses and other flowers in a sculpted urn with seashells and lizards on a ledge] (unknown date after 1630, last auctioned at Christie, Manson & Woods, London, U.K. on 10.vii.1987; RKD art work 119865), we see a lateral view of *Liguus virgineus*, with the apex pointing left and the aperture slightly turned downwards.

(9) Probably an early work shows the upper whorls of a *Liguus virgineus* shell, partly covered by other—marine species—shell in the foreground; the work is entitled 'Stilleven met schelpen, fruit, hagedis en vliegende sprinkhanen' [Still-life with shells, fruit, lizard and flying grasshoppers] (unknown date between 1630 and 1657, last auctioned on 15.i.1986 at Christie's New York, lot number 156; RKD art work 6591).

(10) We found on the painting labelled as 'Sea shells' made by Balthasar van der Ast (undated [but probably from his Delft period], Phoenix Art Museum, Phoenix, USA, inventory 1964.250) in the lower right-hand corner a dorsal view of a shell, which we attribute to a *Liguus* species.

(11) Jacob Marrel, a German artist who lived in Utrecht from 1632 to 1650, made a painting entitled 'Bloemen in een glazen vaas met kersen, schelpen en een hagedis, in een nis' [Flowers in a glass vase, with cherries, shells and a lizard, in a niche] (possibly 1637, now probably in a private collection, last seen in 1983; RKD art work 190618). In the left-hand corner a *Liguus virgineus* shell may be seen, in a latero-ventral view with the apex pointing to the lower left-hand edge of the niche.

(12) Finally, we found one painting of the French painter Jacques Linard, entitled 'Nature morte de coquillages entourant un coffret' [Still-life of shells surrounding a box]; it is dated 1638 and was last auctioned at Galerie Fischer, Luzern, CH, lot number 2017; RKD art work 228155). The painting presents a somewhat stylised view of eight shells, among which a lateral view of the upper whorls of *Liguus virgineus*; the lower part of the shell is obscured by the front of one of the drawers of the box.

Corona shells

Another genus from the same family Orthalicidae is *Corona* Albers, 1850. Species of this genus occurs in the rainforests of northern South America. Although usually shells in this genus are dextral, some enantiomorph species occur, e.g. *Corona regina* (Férussac, 1821) (Simone 2006: figs 542–549). Only two paintings were found, made by Balthasar van der Ast (Bol 1960: 75, nr. 42), where on the right-hand side a latero-ventral view of a sinistral shell is seen that is tentatively referred to this species, mainly based on the dark patch behind the lip and the strong lamella within the aperture, in combination with the sinistral shape. Both paintings originated during the 1620s in Utrecht.

(1) The painting 'Bloemen in een mand, met daarvoor schelpen en bloemen met insekten op een stenen plint' [Flowers in a basket, in the foreground shells and flowers with insects, on a stone plinth] (RKD art work 120540) is last seen in a Dutch private collection in 1973.

(2) The second painting is nearly identical (RKD art work 120545) and was last auctioned on 18.v.1996 at Düsseldorf Auktionshaus, Düsseldorf.

Amphidromus shells

Sinistral shells are also known in the South-East Asian genus *Amphidromus*, Albers, 1850 (family Camaenidae), in which also enantiomorphy occurs. Species of this genus have colour patterns with predominantly yellowish to greenish tints, often with spiral bands or axial flammulation of a (dark) brownish colour.; the thick peristome is usually white. If shell

growth has been temporarily halted during life-time, a dark, axial band indicates the position of the previous peristome (varix) on one of the upper whorls. In several paintings a sinistral, uniformly yellowish shell is illustrated, which we believe to be an *Amphidromus* species.

(1) The first painting in which an *Amphidromus* may be recognised, is 'Kunstverzameling met schilderijen, beelden en schelpen' [Art collection of paintings, sculptures and shells] by Frans Francken (II). This painting was signed by the artist in 1617 and originated in Antwerp. In the lower, left-centre foreground a yellowish shell with a varix is shown in ventral view. The current location of the painting is the Kunsthistorisches Museum, Vienna, AT, inventory 1048 (RKD art work 20853).

(2) The same shell, pointing to the other side, is painted by the same artist on the work 'Kunstkamer met schilderijen, schelpen, munten en een boeket bloemen, met rechts kunst verwoestende ezels' [Art Room with paintings, shells, coins and a bouquet of flowers, with at the right hand art devastating donkeys] (RKD art work 20826). This painting is dated 1618–1619. See SCHÜTZ 2002: 91.

(3) Possibly in the same period, a second painting was produced in Antwerp with the same shell in the same position illustrated; here, however, it is the sole shell in combination with flowers. This painting, last auctioned by Christie, Manson & Woods in London on 12.xii.1986 as a work of Balthasar van der Ast, was likely made by painters using the style of Ambrosius Bosschaert the Elder during the years 1610–1620 (?) in Antwerp. This work, entitled 'Bloemen in een glazen beker met braamknoppen, schelp en tuinanemoon' [Flowers in a glass cup with blackberry studs, shell and garden anemone] is art work 123045 in the RKD database.

(4) Of an unknown date between 1605–1623 is the painting 'Interieur van een kunstverzameling met schilderijtjes en schelpen' [Interior of an art collection of paintings and shells], which is now attributed to a (late) follower of Frans Francken (II), and thus also originated in Antwerp. This painting shows on the left-hand side an *Amphidromus* in ventral view, similar to the painting sub 1, but without varix and slightly darker coloured. Last seen in public, this painting was auctioned at Christie's New York on 26.i.2001 (RKD art work 66171).

(5) The first work from the northern Netherlands in which a presumably *Amphidromus* species is shown is 'Stilleven met bloemen in een roemer, een mand met vruchten en een Wan Li-schotel, schelpen en insekten' [Still-life with flowers in a goblet, a basket of fruit and a Wan Li-dish, shells and insects]. This painting was made by Balthasar van der Ast and is dated

1623; it thus stems from his Utrecht period. In the lower-right corner a uniformly yellowish shell is shown in lateral view with the apex pointing right. This work was last shown in public at the TEFAF Art Fair in Maastricht in 1992 (RKD art work 17856).

(6) A variant, entitled 'Bloemstillevens in een roemer en een rieten mand met vruchten en porseleinen bord op de bovenste trede; schelpen en fruit op de onderste trede' [Flower still-life in a goblet and a wicker basket with fruits and porcelain plate on the top step, shells and fruit on the bottom step], was made by the same artist in the same year and has the same shell in the same position. The painting is in a private collection in the U.S.A. (RKD art work 18071).

(7) Still another variant has the same shell in the same position. The painting 'Stilleven met vruchten en bloemen, insekten en schelpen op enkele treden' [Still-life with fruit and flowers, insects and shells on some steps] was last auctioned on 11–13.x.1921 at Mak van Waay in Amsterdam (RKD art work 18073) and has not been seen afterwards.

(8) 'Stilleven met een schaal fruit en een boeket bloemen' [Still-life with a bowl of fruit and a bouquet of flowers] (RKD art work 104907) shows in the centre part a lateral view of a shell with a yellowish hue and a dark varix, the aperture placed on the surface of the table and the apex pointing left. This painting was made in 1625 by Balthasar van der Ast and was last auctioned at Sotheby's in London on 12.vii.2001.

(9) A similar yellowish shell, its position mirrored, is shown in the left-hand corner of 'Bloemen in een glazen vaas, met schelpen, een hagedis en een lelietje-van-dalen op een stenen plint' [Roses, forget-me-nots, an iris and other flowers in a glass vase, with shells, a lizard and lily-of-the-valley on a ledge]. This painting is attributed to Balthasar van der Ast on the basis of composition, shells used, signature and size (RKD art work 119864); it originated 1624–1625 and was last purchased at a public auction by Art Gallery Richard Green in London on 6.vii.1984.

(10) In the painting 'Bloemen in een porseleinen vaasje' [Flowers in a porcelain vase] a yellowish sinistral shell is seen in dorsal view, partly covered by a *Conus* shell in the foreground. The painting was first attributed to Balthasar van der Ast by Bergström and was dated to the 1640s by Meijer (RKD art work 45068); it was last auctioned in public at Christie's New York on 29.i.1998.

(11) Of the same artist is also 'Bloemen in een Wan Li-vaas, met schelpen, insekten en een hagedis' [Flowers in a Wan-Li vase with shells, insects and a lizard], which is dated 1620/1628. It is suggested (RKD art work 119838), on stylistic grounds, that this painting originated in 1620 which is also during the Utrecht period of Van der Ast; if this is correct, it would be an

earlier work than the painting mentioned sub 3. On the left-hand side a latero-ventral view is present of a shell, the apex pointing right, which is only tentatively identified as *Amphidromus* due to the seemingly different shape of the columella.

(12) The painting 'Bloemstillevens in een porseleinen vaas, schelpen, vruchten en hagedissen, in een interieur' [Interior with large bouquet, shells, fruits and lizards] (RKD art work 119945), made by Balthasar van der Ast, shows a window on the left-hand side; in the windowsill four shells are located, one of which is a yellow *Amphidromus* in lateral view with the apex pointing left and the aperture down on the windowsill. This shell picture bears a remarkable resemblance to the study in colour drawing mentioned below sub A. The painting—which is dated 1640–1650, thus from the Delft period of Van der Ast—is in the Anhaltische Gemäldegalerie Schloss Georgium, Dessau, inventory 63.

(13) A pupil of Van der Ast, Ambrosius Bosschaert the Younger, painted between 1633–1637 the art work 'Bloemen in een mand, omgeven door losse bloemen, schelpen, vlinders en een hagedis' [Flowers in a basket surrounded by loose flowers, shells, butterflies and a lizard] (RKD art work 39879). On the right side a uniformly yellowish shell is seen, with a dark varix.

(14) The same species as in painting sub 10 may be seen in '' [Nine exotic shells from the Far East] (RKD art work 21288). The shell, in the lower right-hand corner of the painting, is viewed from below with the apex pointing slightly left. This painting, which has been unconvincingly attributed to various artists, probably was made during the early 17th century.

(A) Finally, there is a colour drawing by Balthasar van der Ast, in the same album as mentioned sub *Liguus*, 'Studie van twee schelpen 'Herts Horen' en 'Geel Belleken'' (Fondation Custodia, Paris, inventory 6534-47; RKD art work 120464), showing a lateral view of *Amphidromus*, with the apex pointing left and the aperture down on the surface below.

Achatina shells

Achatinids are exclusively African land snails and are only rarely found in visual art works. Only three works featuring species of this group are known to us, all of which have been made by Balthasar van der Ast during his late Utrecht and Delft period.

(1) 'Stilleven met schelpen en hersttijloos' [Still-life with shells and *Colchicum*] (RKD art work 6232) is an oil painting with at right-centre a ventral view of West African *Achatina* species. This painting is in Centraal Museum, Utrecht (on loan Instituut Collectie Nederland, inventory NK 1692), and is from his late Utrecht period (1630–1632).

(2) The same painting as mentioned under *Liguus* sub 10, shows a lateral view of either Western African *Achatina achatina* (L., 1758)—the relatively pointed, reddish apex hints to this species—or *Lissachatina reticulata* (Pfeiffer, 1845) from Zanzibar, which could better fit with the locality of the tropical marine species shown (A.J. de Winter, pers. commun.).

(A) The last work is a colour drawing, entitled 'Studie van schelpen 'Brúijn ghevelechten Belhoren' en 'Cleijn Schaelie Blaeúwe'' (RKD art work 120488). The upper shell shows in all likelihood *Achatina marginata* (Swainson, 1821) in a ventral view, with the aperture downwards on the surface. This is a very variable species, wide-spread in western Africa (Benin to the Democratic Republic of Congo; A.C. van Bruggen, pers. commun.). The drawing is in an album at Fondation Custodia, Paris, inventory 6534-65.

DISCUSSION

A WIDER PERSPECTIVE

Knights versus snails

From ancient times on, shells have been used as body decoration (e.g., Zilhão, 2007; Zilhão et al., 2010), for ornamentation (e.g., Prentice, 1987; Feinman & Nicholas, 1993; Stiner, 1999; Kuhn et al., 2001), inspired architects (e.g., Cook, 1914; Cooper, 1976; Lee, 2010), and have been used as a religious motif through time (e.g., Eliade, 1961; Moholy-Nagy, 1963); Hogen-dorp Prosperetti (2006: 405) linked shells to spirituality by stating "shells are the honorarium of the honest practitioner of humanist piety and the instruments of spiritual repose". In a number of medieval manuscripts, illuminations have been found of a (stylised) land snail opposing a knight (see e.g., Pyrdum, 2009a, b; Biggs, 2013 and the comments therein). Randall (1962) has suggested that the motif of a man fighting a snail originated in northern France around 1300, and later spread to Flemish and English manuscripts. However, this motif has also been noted in studies of traditional rhymes in folklore from several other countries and regions (see Grosskopf 2013, especially notes on entries 15, 512 in his database). For the moment, alternative hypotheses and suggestions on the origin and meaning of these motifs remain in debate beyond the scope of this paper (Randall 1962, Camille 1992, Hurst 2009, Biggs 2013, Grosskopf 2013, Anonymous 2013b, 2013c; see also Werness et al. 2003: 369–371, 375–376).

Snails as symbols

In this context, a brief reference to literature about

symbolism of snails may not be omitted. As Friedmann (1966: 14) remarked, symbols may have been used in opposite senses at the same time; a careful analysis of the context may be needed therefore. Dittrich & Dittrich (2004: 460–468) summarized five symbolics of snails in visual arts:

I. Snail as symbol of Resurrection. The source of this symbolism is attributed to a text in Tertullian's *Apologeticus*, said to be based on a classical source (Friedmann, 1966: 14, referring to Leclercq in Cabrol & Leclercq, 1914: column 2906). Leclercq, however, did not refer to Tertullian but to a sketchy snail on a sarcophagus dating from the third century (Leclercq in Cabrol & Leclercq, 1914: fig. 3303). This symbolism was commonly used at the end 15th/beginning 16th century, e.g. the work of Bermejo mentioned before.

II. Snail as symbol of Mary's virginity. According to Kirschbaum (1972: 99) this symbolism is underpinned by popular belief since Aristotelian times that slugs (*limax*) arise without procreation of clay. See also Ettlinger (1978). Snails as symbols for Mary may be found in visual art works of late 15th/early 16th century, e.g. the works of Bouts and van Haarlem mentioned in this study.

III. Snail as symbol of sloth. In the Bible (Ps 58, 9; Lev 11, 41–44), the snail is characterised as impure and detestable. According to Cats (1627: 47) the snail symbolised sin, spoiling the world with its slimy trail and could only be eradicated by salt (i.e. the Word of God). In the Middle Ages, the snail was identical with *inertia* (Kuechen, 1979: 480, referring to Peter Berchorius' work of the 14th century).

IV. Snail as symbol of virtue. In emblematic literature (e.g., Cats, 1627) the snail is seen as *virgo domicella* during the 16th and 17th century.

V. Snail as symbol of extravagance. Some authors regard the snail as symbol for lust and immodest people (Kuechen, 1979: 481–482; Leibbrand, 1989: 175). Art works representing the fall into sin especially used the snail in this sense (16th/17th century).

Engravings, drawings, still-life paintings

The oldest artworks in our study with a land snail or slug(s) from the late 15th century undoubtedly have to be viewed in this symbolic context. Were these early images particularly sketchy in many cases, during the course of the 16th century the art of drawing snails more and more developed and the work of Joris Hoefnagel in the manuscript *Mira calligraphiae monumenta* (Hendrix & Vignau-Wilberg, 1992: 37–52) can be seen as a pivot point. His work is characterised by strong attention to detail—although he also portrayed imaginary species—and ushered in the development of still-life art using oil paintings, allowing small objects from

nature to be often portrayed realistically. A 'still-life' painting is a representation of a number of objects which are unable to move of their own accord, which are for artistic purposes grouped into a composition; these objects—common as they may be at present—were objects for scientists, collectors and speculators, and many were unknown for the viewers of the paintings at that time (Grimm, 1988). The inclusion of living elements in a still-life is possible, provided that their is subordinate and the tranquillity is not destroyed (Vorenkamp, 1933; Bergström, 1963). This genre of art works became especially popular with Dutch (i.e. Flemish and Dutch in modern sense) painters; the first oil paintings of a flower still-life appeared ca. 1600 (F.G. Meijer, pers. comm.). This may be compared to the ornamental picture which was produced ca. 1590–1595 by Johann Theodor de Bry in Frankfurt am Main after a design made by Jacobus Kempener (Rijksmuseum Amsterdam, inv. RP-P-2004-321; see also de Heer & Breure, 2015).

Bergström (1956: 54–56, 67–68) described Ambrosius Bosschart (I) as one of the first artists who seems to have devoted himself exclusively to still-life paintings of fruits and flowers. As a tutor, Bosschaert the Elder undoubtedly had influence on his son Johannes Bosschaert, and his son-in-law Balthasar van der Ast. Paintings of shells only are comparatively rare in Van der Ast's oeuvre, and may be considered as a basic type, derived from paintings of curiosity cabinets in which shells are rarely lacking (Bergström, 1956: 68; see also Schütz, 2002). He often illustrated shells originating from different continents, a practice also used by other painters from his time.

Still-life paintings have sometimes been imitated by later painters and often it cannot be ascertained during which period. In some cases also the tropical shells were copied (or at least used as inspiration); e.g. 'Bloemen in een mand, met schelpen en een vlin-der op een stenen plint' [Flowers in a basket, with shells and a butterfly on a stone plinth] (RKD art work 185342, dating unknown) is imitating early work of Ambrosius Bosschaert the Elder, and copied his yellow *Amphidromus* as mirror image with the apex pointing right.

Gould revisited

In this section we will attempt to answer the following two questions related to chirality and the hypothesis posed by Gould (1995). How are snails illustrated with a direct technique like painting or drawing? Is there a difference between different artists?

Of the 456 art works studied, 41 have one or more sinistral specimens on them. Of these, 23 correctly il-

lustrated species as sinistral. Thus on 439 art works (96%) the shells were accurately drawn or painted. Only 15 works (4 paintings, 11 drawings) illustrated shells as sinistral which are supposed to be dextral. Apart from an early painting of an imaginary sinistral species mentioned before (RKD art work 223702), one painting by Jacob Marrel shows a somewhat stylised snail, likely modelled after an imaginary species. We consider these both as a case of ambiguity.

Of the paintings with supposedly incorrect sinistral specimens, three are attributed to Balthasar van der Ast (dated 1624–1625), one was made by Anthonie van Borssum during the period 1650–1677. Of the drawings all found with sinistral specimens were made by Joris Hoefnagel during the 1590s. Some of these were studies for later prints by Jacob Hoefnagel (cf. RKD art works 121089 and 121152) and contain one sinistral specimen each. Being studies for later prints, they may show intentionally sinistral specimens, which would then appear correctly as dextral in the final prints. In some other drawings a sinistral snail is mirroring a dextral one, and this clearly is done for the cause of symmetry. Gould's hypothesis thus seems to be valid for a minority (4%) of the paintings and drawings used in this study and these cases seem to be concentrated on a few artists only.

The origin of species used in still-life paintings

Within the Dutch genre of still-life paintings, the majority of painters used snails that were likely locally collected. These were identified by us as being *Cepaea* in many cases, and were possibly *C. nemoralis* (L., 1758). However, a few painters—notably Balthasar van der Ast—used shells of tropical land snail species mixed with those of marine species in a painting, the land shells being in minority. The identification of these shells remains somewhat uncertain, as shells from various origins can show striking similarities; also, their identifying characteristics may not always be discernible in a painting. Some species are more difficult to identify than others in this context. E.g., the shape and colour pattern seen in what we believe to be a form of *Polymita picta*, a yellowish Cuban shell with a dark spiral band along the suture (González Guillén, 2008), is also known from Papua New Guinea in the example of *Naninia citrina* (L., 1758) (Parkinson et al., 1987: pl. 55 figs 7–9). The 'yellowish sinistral' shell in several paintings could be *Amphidromus perversus* (L., 1758), which occurs in Indonesia; similar shaped and coloured shells may, however, also occur in other faunas (A.J. de Winter, pers. commun.). This makes it also interesting to know the origin of the shells at the disposal of the artists. The specimens used by the artists were probably their pri-

vate property (see also Bergström, 1963: 70) and may therefore subsequently not have been stored in public collections, making it impossible to ascertain their identification. The source of specimens of tropical shells used by these artists was in all likelihood foreign trade — mainly through the V.O.C. (East Indian Trading Company; established 1602) and W.I.C. (West Indian Trading Company; established 1612)— which brought various materials to Europe, i.c. the Netherlands, from predominantly Indonesia and Malaysia, West Africa, the Caribbean region, Venezuela, the Guianas, and Brazil (Reese, 1991; Berger Hochstrasser, 2007; van Zanden & van Tielhof, 2009). Exotic goods were numerous, with several shops in Amsterdam selling rarities from distant regions; alternatively, one could visit the frequently held public auctions to obtain specimens (van de Roemer, 2004). Wealthy collectors could gather impressive amounts of specimens, which have either been regarded as places of polite diversion or as centres of scientific research. This is also reflected in studies on these 'rariteitenkabinetten' [cabinets of curiosities] which have been made (reviews in Daston, 1988 and Herklotz, 1994). See also van Benthem Jutting (1939) for a relation between these cabinets and modern museums collections, van de Roemer (2004) for relations with art history and religion, and van Berkel (1998: 85–110) for the cultural setting of these cabinets.

Analysing the 'snail theme' in Dutch still-life paintings and drawings

In figure 4 the number of art works containing snails against year of production is shown. From this figure it is clear that this malacological theme culminated during the first three quarters of the 17th century. The maximum of 59 works was made by Abraham Mignon, a Dutch painter who worked mainly in Utrecht and exclusively used European species. The top-10 ranking artists are listed in table 1. In figure 5 the occurrence of tropical specimens in art works is shown as percentage against time. These species only appear during the 17th century and may be linked to the discoveries brought by the East and West Indian Trading Companies. It seems that *if* an artist decided to use tropical shells, they were used in most of his snail works. A good example is Balthasar van der Ast, which is reflected in figure 6. The occurrence of tropical specimens is shown as percentage of the total number of snail works.

Finally, the percentage of the total works mentioned in the RKD database in which snails as theme are used is presented in Table 2. It appears that only 13 artists out of 105 have a percentage above 10%. Joris Hoefnagel, of whom nearly half of the works

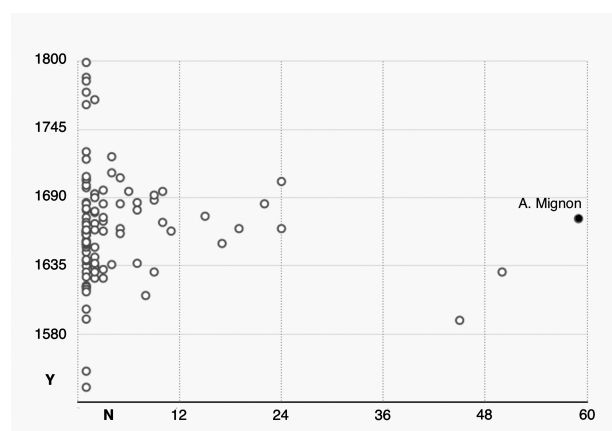


Fig. 4. Analysis of 'snail theme' according to year of production (Y) and number of art works found (N).

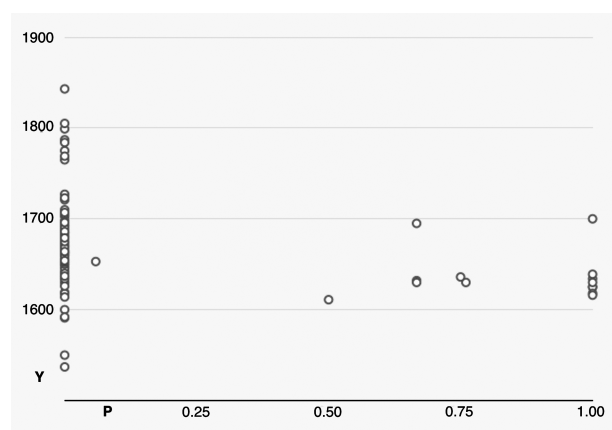


Fig. 5. 'Snail theme' with proportion (P) of tropical species in art works analysed in time (Y).

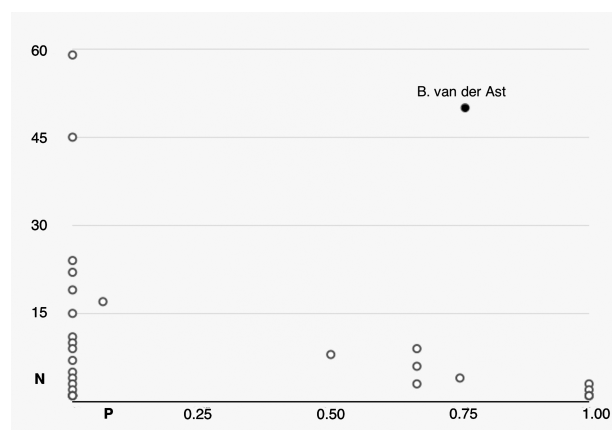


Fig. 6. Proportion (P) of art works with tropical species related to the number (N) of works related to the 'snail theme' analysed.

Artist	Number of works
Mignon, Abraham	59
Ast, Balthasar van der	50
Hoefnagel, Jacob	45
Aelst, Willem van	24
Henstenburgh, Herman	24
Broeck, Elias van den	22
Marseus van Schrieck, Otto	19
Marrel, Jacob	17
Verendael, Nicolaas van	15
Heem, Jan Davidsz.	11

Table 1. Number of works of art with 'snail theme' by artist.

found to contain one or more snails, made drawings; the other artists are painters. Besides Abraham Mignon, the 'snail theme' also seems to have been relatively important for Elias van den Broeck, although the absolute number of works is less than of Mignon. Only Balthasar van der Ast and Ambrosius Bosschaert (II) used tropical species in part of their works.

Snails in art works of artists from other countries

It is rare to find snails or shells on still-life paintings of artists from other European countries, like France, Italy and Spain; they often confined themselves to flowers or fruits and similar still-life motifs. If they used malacological objects it is in a small part of their oeuvre, and terrestrial species are a rare exception. Such exceptions may be found in the work of artists in France e.g. Jacques Linard (*Liguus*, see above), Paul Liégeois (Salvi, 2000: 85), Jacques-Samuel Bernard (Salvi, 2000: 117), Jean-Michel Picart (Faré, 1974: 95), and in Italy e.g. Panfilo Nuvolone (Zeri et al., 1989: fig. 259), Tommaso Salini (Zeri et al., 1989: fig. 836), Paolo Cattamara (Zeri et al., 1989: fig. 1084), Giuseppe Ruoppolo (Zeri et al., 1989: fig. 1116) and Perino del Vaga (National Gallery of Art, inv. 1961.9.31; see also Bocchi & Bocchi, 2004). The shells in their paintings are always European species, likely endemic species from the regions in which they produced their works. No terrestrial species were found in works of Spanish artists of still-lives (Pérez Sánchez, 1987).

CONCLUSION

Still-life paintings were made in such detail that in many cases the species of shell used can be identified,

Artist	Percentage
Hoefnagel, Jacob	49
Broeck, Elias van den	38
Mignon, Abraham	35
Aelst, Evert van	18
Bollongier, Hans	17
Bosschaert, Abraham	16
Henstenburgh, Herman	16
Ast, Balthasar van der	15
Marseus van Schrieck, Otto	13
Verendael, Nicolaas van	13
Aelst, Willem van	12
Bosschaert, Ambrosius (II)	11

Table 2. Works of art with 'snail theme' by artist, shown as percentage of total hits in RKD data base for that artist.

at least to the genus level. While artists used terrestrial species of snails as a domestic commodity — mainly the common garden snail *Cepaea* — in their works, one might conclude that some of them used tropical species as a 'secret of trade' (Berger Hochstrasser, 2007) when they became gradually more readily available during the beginning of the 17th century. Contrary to Gould's (1995) and Allmon's (2007) observations of book illustrations, the shells on 16th/17th century paintings and drawings were made with correct chirality, except very few cases. While our results shed more light on the use of snails in visual arts, no doubt that more cases may be found once 'snail hunting' is continued.

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