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Ms 88

Germanicus, *Aratea* with 'scholia' from ps. Bede, *De signis caeli*

Franco-German (St Bertin?)  
early 11th century (c. 1000)

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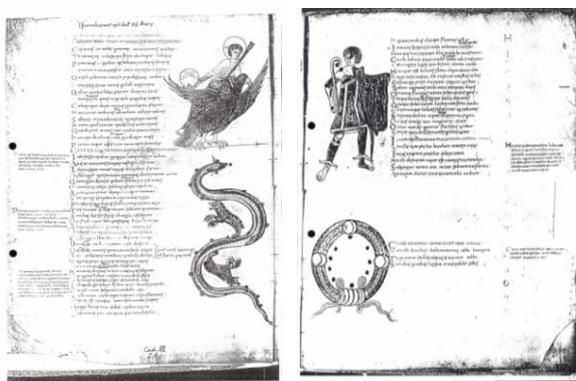
text

- ff. 1r-10r      Germanicus, *Aratea* with gloss from ps. Bede, *De signis caeli*
- fol. 1r          CLAUDII CAESARIS ARATI PHOENOMENA  
AB IOVE PRINCIPIUM MAGNO DEDUXIT ARATUS  
Carminis at nobis genitor tu maximus auctor ... (cf. Breysig 1897, p. 1; Gain 1976, p. 21)
- 'scholia' begins: Helice arcturus maior habet autem in capite stellas obscuras VII. ... (cf. Maass 1898, p. 582; Breysig 1897, p. 233 and dell'Era p. 283). Note in the 'scholia' to Ursa Minor, it is also called 'Helix'.
- fol. 7v          ... Sic tenuis cunctis iam pene evanuit ardor. [...] (text appears to end with l. 386; see Breysig 1897, p. 24 and Gain 1976, p. 33).
- 'scholia' ends: ... autem clariores esse noscuntur. (cf Breysig 1897, p. 238; dell'Era, p. 294)
- fol. 8v          After a blank side, text begins again with:  
SIGNORUM PARTES QUORUM PREDICTA FIGURA  
Annum expleturi praedicunt quattuor orbēs—  
Significet ventosue truces fidamque quietem.  
(vv. 446-72 ff; cf. Breysig 1897, pp. 27-72 and Gain 1976, pp. 35-42)

- fol. 10r Two lines before the bottom of the first column, begins:  
 Gradine permixtus aries nivibusque caducis —  
 Fulmina tum crebro iaculatur iuppiter & tunc...  
 and appears to break off at v. 4 of fragment ii (Breysig) or fragment iii (Gain).
- fol. 10v On the verso, however, the verse resumes, with v. 5 (written in a different hand)  
 Intonat emissis violentior ignibus aether
- Before the original hand has the same line in capitals, as if the title of a new section:  
 INTONAT EMISSIS VIOLENTIOR IGNIBUS ETHER
- Then the verse the continues with  
 Ad (corrected to At) geminis leviter perstridunt caerula venti —  
 et rigor accedit ventis. mitissimus ille.  
 (cf. Breysig 1897, pp. 43-44 (= fragm. II, ll. 4-28) and Gain 1976, pp. 45-46 (= fragm. iii, vv. 4-28))
- A new text begins halfway down the left-hand column:  
 UNA VIA EST SOLIS BIS SENIS LUCIDA SIGNIS  
 Ac rapitur phoebae est per idem cythereius ignis —  
 Mercurius binos graduius perficit orbis.  
 (cf. Breysig 1897, p. 42 (= fragm. i, vv. 40-55) and Gain 1976, pp. (fragm. ii, vv. 1-16))
- ff. 10v-11r Two lines from the bottom of the right column, with no change in script:  
 Tempore tum proprio modulatur noxtua carmina  
 Tum vespertinum cornis longeva resultat —  
 Pluribus indicens solleris fulcire memento.  
 (= Avienus, *Prognosticorum*; cf. Holder, 1965, pp. 77-82: vv. 1741-62, 1769-70, 1773, 1870, 1877 and 1878. See notes by Breysig 1897, p. 42 and Gain 1976, p. 45)
- fol. 11r Vale fidens domino Christo vestitus amore.
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**illustrations**

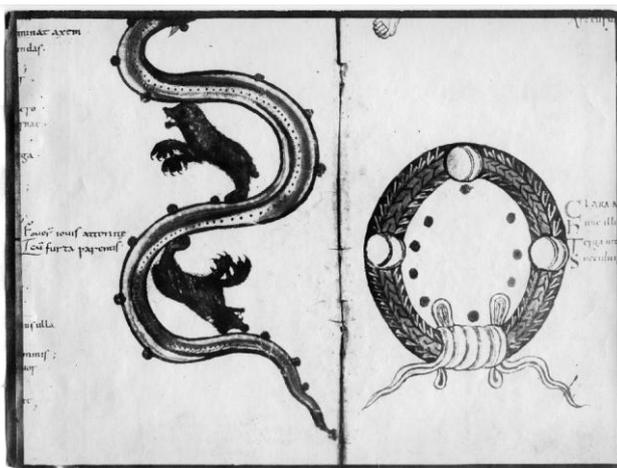
**note:** the following illustrations have been assembled in order to reproduce how the images appear on each bi-folio, on the inner margins of each page.

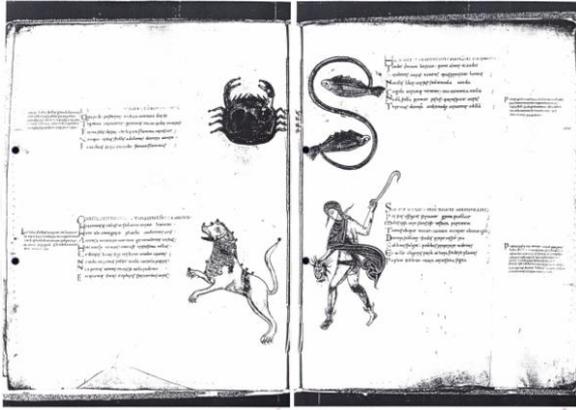


ff. 1v-2r

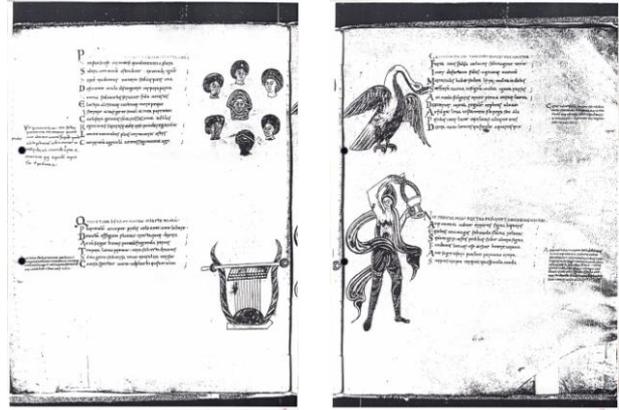


ff. 2v-3r

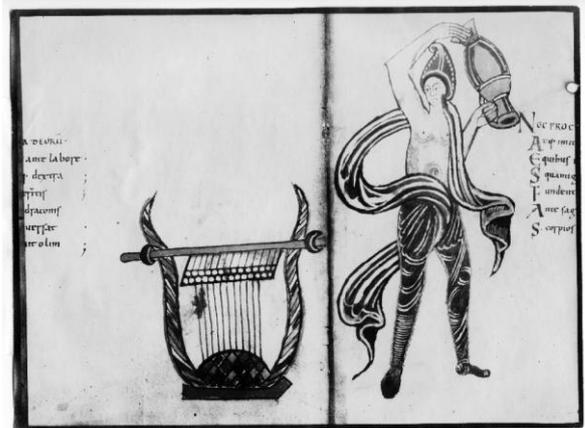
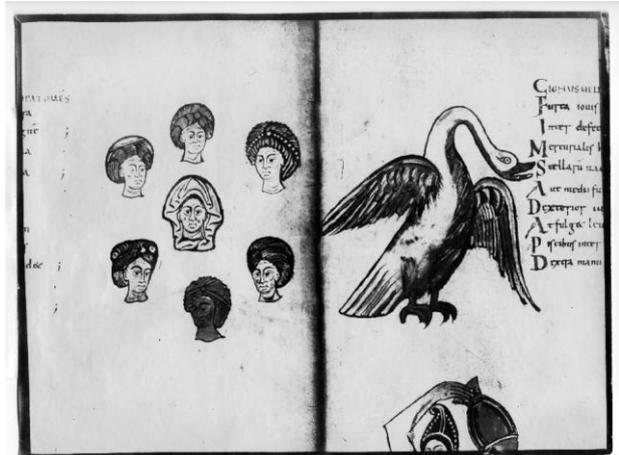
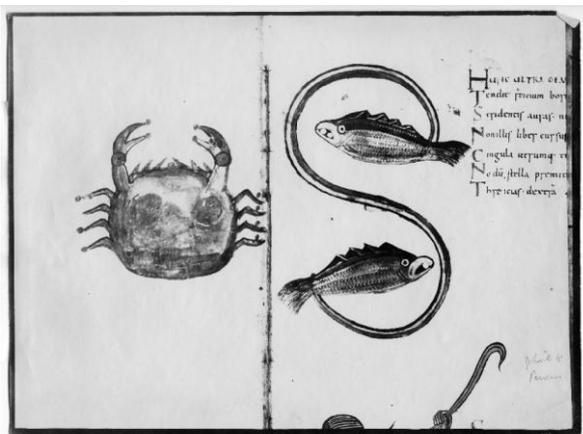




ff. 3v-4r

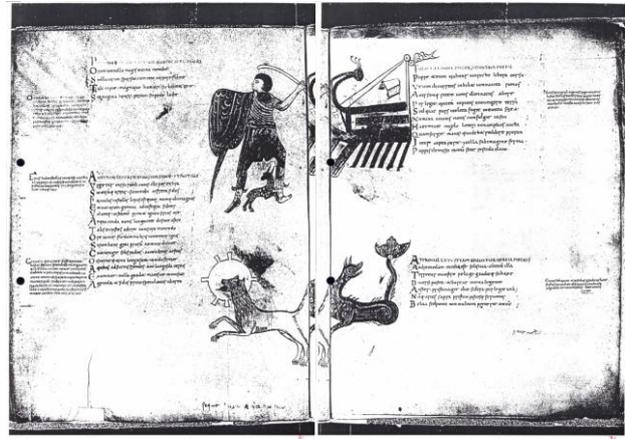


ff. 4v-5r

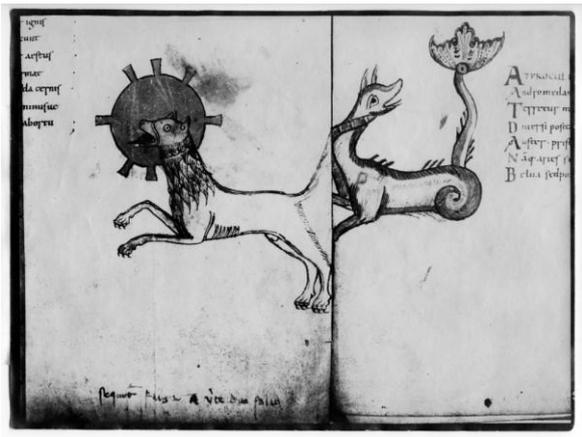
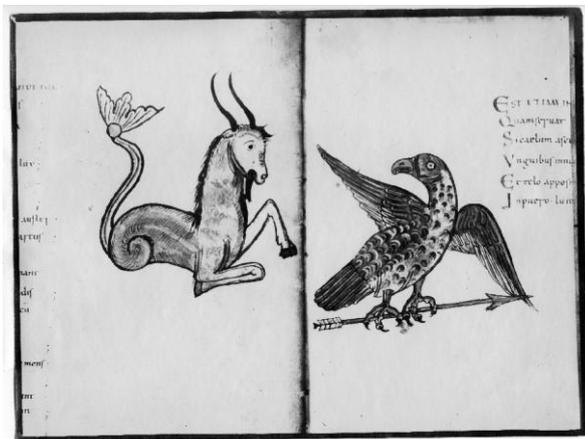


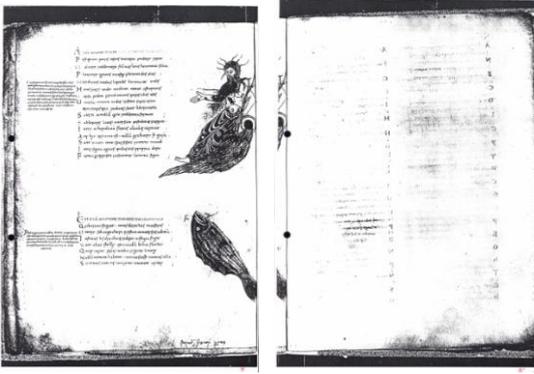


ff. 5v-6r

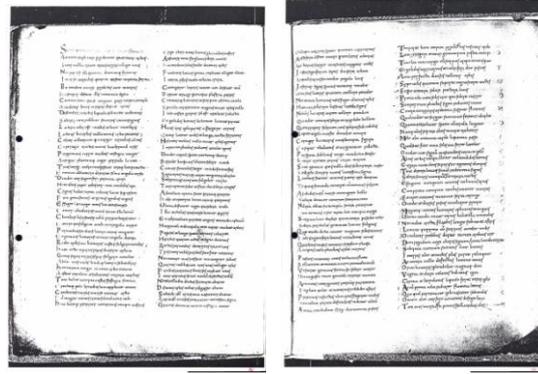


ff. 6v-7r

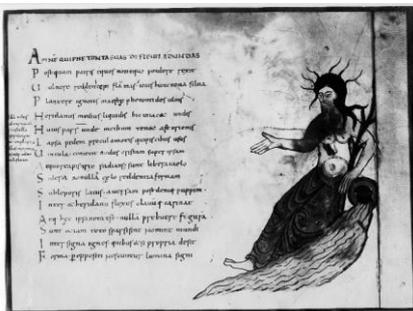


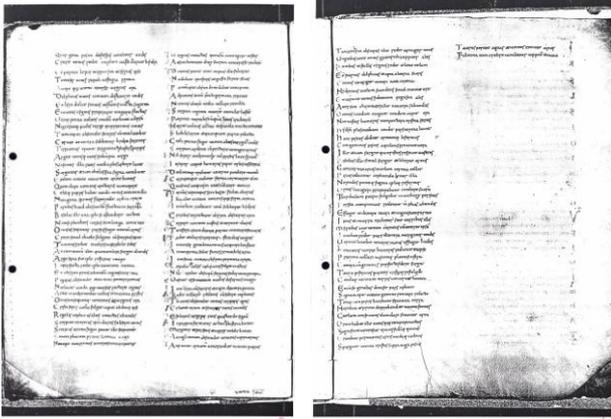


ff. 7v-8r

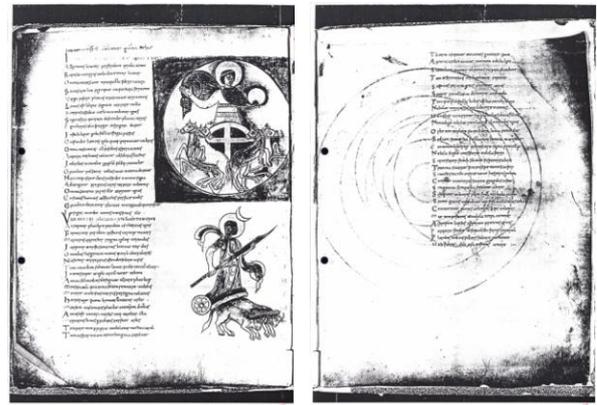


ff. 8v-9r





ff. 9v-10r



ff. 10v - 11r





fol. 11v

ff. 1v-7v multi-coloured drawings in which orange, grey-blue, yellow and brown predominate. Each figure is placed with a vertical format along the inner margin of the page, with the text running down the single, central column and the '*scholia*' running down the outer margin. The stars are marked with either black (oxidised silver) or red circles, a few of which appear to have flaked off, leaving dull grey smudges. Missing are Auriga, Taurus, Cepheus, Cassiopeia, Andromeda, Pegasus, Aries, Delatoton, Ara, Centaurus, Hydra, Crater, Corvus, Canis Minor and the five planets.

fol. 1v picture of Jupiter as a young, beardless man seated on an eagle, dressed in a long skirt with his torso exposed. He wears a halo, and carries a torch in his left and a globe with crossing lines in his right. His skirt is green and his globe and halo are yellow, with the tip of his torch red. The eagle is brown with grey highlights and stands on a red-orange arrow.

fol. 1v **DRACO** with the two bears. Draco has three bends in his body, with his head facing to the right.

**URSA MINOR** is enclosed within the second bend and **URSA MAIOR** within the third.

Draco has a red-orange crest and a yellow beard on his head. His body is striped along

its length with blue-grey, pink in the middle and the red-brown. His body is marked with 18 black (silver) dots. Both bears are leaping upwards, with the mouths open and their claws bare. They both face away from the snake, towards the open space, and Ursa Minor is placed upright, while Ursa Maior is placed upside-down above the tail of Draco. They are both grey-brown. Ursa Minor (*sic*) is marked by 16 dots and Ursa Maior (*sic*) 8 dots.

fol. 2r **HERCULES** is standing facing the viewer, wearing a grey *tunica exomis* that is decorated with yellow stripes. He looks over his shoulder to the left, and holds a curved red and yellow staff in his right hand and the lion-skin (complete with face and tail) over his outstretched left arm. The flaps at the tops of his boots have been misunderstood, so that he seems to be wearing yellow wings on his ankles. There are some small circles on his bare ankles, however, that recall the buttons originally included on the feet of the Leiden Hercules. These dots also appear in the Boulogne ms. He is marked by 12 stars.

**CORONA BOREALIS** has become so stylised that the leafy quality one sees in the Leiden and Boulogne mss is now modelled as a series of decorated circlets, the two outer ones red and the middle stripe yellow. The three 'jewels' and the ribbons are pink. Inside the wreath, there are 9 stars.

fol. 2v **OPHIUCHUS** is nude with red-orange hair, standing to the right with both feet on the back of Scorpio, with the **Serpent** knotted around his waist. The **Serpent**, which is green with a red stripe down his body, faces him. The man's body is marked by 17 red stars, including 1 in his head, 1 on each shoulder, 1 on his hip, 3 on his left hand and 4 on his right hand, 1 on his left thigh, 1 in his right knee, 1 on his right shin and one on each foot; and the Serpent by 6 or 7 red stars. **Scorpio** is green with yellow, black and brown stripes. He faces towards the left and has two front claws held in a circle and 8 pointy legs. He is marked by 17 red stars, but there are circlets on each of his front 'elbows' that may be stars as well; in which case, it would have 19 stars.

**BOÖTES** stands facing the viewer leaning slightly to the left, wearing a blue *tunica exomis* that is decorated with an orange inner side that flashes out at his knees. He has red-orange hair and carries a yellow crook in his right hand, which he rests on his right shoulder. His left hand is raised in a sort of salute and he has a bracelet on his left wrist. He is marked by 17 red stars, including 1 on his head, 1 on each shoulder, 1 on each nipple, 4 in his right elbow, 4 on his right hand, 1 on his left elbow and 1 on each knee.

fol. 3r **VIRGO** is standing facing the viewer, dressed in a long red dress with yellow stripes at the neck, chest and waist. She is not winged and the clearly outlined right leg has been chastely covered with fabric. Her face is marked with a number of red-orange lines, giving her the appearance of a hag. She holds two blades of wheat down to her side in her right hand and holds a caduceus upright in her left hand. She has two large yellow dots in her hair, otherwise she is marked by 21 red stars, including 1 on her head, 1 on each shoulder, 1 on each hand, 3 along her left side, 4 on her belt, 4 on her right thigh, 1 on her hem and 1 on each foot.

The **GEMINI** are nude, save the long *chamlys* they each wear falling over their left shoulders. The one worn by the left Twin is green and the one on the right wears orange. It is interesting to note that the green of the left Twin's cape has also been used to colour-in his hand. The left Twin holds a slightly curved orange club. The right Twin holds a yellow and blue harp in his left hand and holds what looks like a small cudgel in his right hand near his right hip. They both have red-orange hair and their caps have now become fully transformed into bright yellow haloes. Each of which is surmounted by a cross. They also have strapped sandals on their feet. The left Twin has 9 red stars, including 2 on his head, 1 on his left shoulder, 1 on each nipple, 1 on his left knee, 1 on each foot and 1 below his left foot. The right Twin has 6 stars, including 2 on his head, 1 on each shoulder and 1 on each knee.

fol. 3v **CANCER** has a round body, two short front claws and 8 short, pointy legs. His body is orange-brown and he has two dark brown circles on his back. He is placed vertically on the page, with his head towards the top, and he is marked by around 20 (?) stars (difficult to tell as they are the same reddish-brown as his body colour).

**LEO** leaps to the left with his mouth open and his tail is raised. His curls have become very stylised and his brown, pin and orange body is marked by 13 red stars, including 3 on his head, 2 on his neck, 3 on his chest, 1 on his right front paw, 3 along his back and 1 on his tail.

fol. 4r **PISCES** are brown, grey and yellow fish, swimming in opposite directions, with both their backs to the top of the page. They are connected at their tails to a grey, brown and yellow cord that forms a large 'S' shape. Their mouths are open and the top one has two white (unpainted) dots in his mouth and the bottom one has one. The Fish are not marked by stars.

**PERSEUS** appears tip-toeing to the left, with his back to the viewer. He is nude except for a green and yellow *chamlys* that he wears, fastened with a red and yellow button from his right shoulder. The cloak flows down his left arm and then crosses his back,

above his exposed buttocks, ending in a flourish. His head is covered with long, yellow tresses. He holds a yellow stick with a red strip in his upraised right hand and the severed Medusa's head by the hair in his left hand in front of his right thigh. The gorgon's head has brown hair and her face is covered with blood. His ankles are adorned with wings. There are no stars marked.

fol. 4v The **PLEIADES** are represented as 7 busts of women. They are cut by wavy lines at the neck. The middle one has a headdress. The others are bare headed, with hair sometimes adorned with a jewel. The maiden in the bottom centre has a darker face than the rest.

**LYRA** is a harp with two red-orange, grey-blue and white striped oxen horn at either side. The sounding board at the bottom is a harlequin pattern and the crossbar holds 11 strings. There are no stars marked.

fol. 5r **CYGNUS** stands to the right with its neck bent in a 'U'-shape and its mouth open. His wings are outstretched to either side. He is coloured pink and has no stars.

**AQUARIUS** stands frontally, leaning slightly to the right. He wears a red hose and red leggings and has a red scarf that runs over his left shoulder, around his back and then through his legs, with its end trailing behind him by his feet. He is nude from the waist up and has a small red Phrygian cap with white highlights. He holds the urn in an awkward manner, with his right arms crooked over the top of his head holding the base, and his left arm bend upwards to shoulder height holding the handle. The urn itself is coloured yellow and red-orange with horizontal white bands. There are no stars marked.

fol. 5v **CAPRICORN** faces towards the right, with his right leg tucked under his body and his left leg extended. His forepart is pinkish and his fish-tail is grey-blue, with his mane, beard and long curved horns dark brown. The slim end of his tail is pink and orange striped, with a yellow circle and an orange trefoil fin. He is not marked by stars.

**SAGITTARIUS** is depicted leaping to the right, with his forelegs raised. He wears a brown, spotted animal's skin from his right shoulder and the horse-part of his body is also brown. He holds the bow extended in front of him with his left hand, pulling back the string with his right hand. The bow and arrow are yellow, but the string is red-orange. He is not marked by stars.

fol. 6r **AQUILA** stands with his body to the right, but his head looking back over his shoulder to the left. Both of his wings are outstretched, but only his right wing is raised. His

body is brown with grey and dark brown feathers, and he has yellow talons and a yellow beak. He stands on a green Sagitta. There are no stars marked.

**DELPHINUS** is a classical dolphin swimming to the left. He has the integral dorsal fin-beak- bottom fin so common to these images. He has a pinkish-grey body and the dot on his tail is yellow. There is a white 'hole' in his mouth which, when compared to the Leiden and Boulogne manuscripts, was intended for a star. There are no stars marked, however.

fol. 6v **ORION** stands with his back to the viewer, lunging to the right. His head is in left profile. He is dressed in a short grey *tunica exomis*, which is caught at the waist by a wide red belt. He wears a red and yellow scabbard and sword on his left hip and holds a curved yellow club (outlined in red) upraised above his head in his right hand. The skin he wears draped over his extended left arm is reddish-brown and has grey and brown markings in it. There are red-orange highlights on his legs and on his boots. He has no stars marked.

**LEPUS** is placed between the legs of Orion and leaps to the right, also turning his head backwards to the left. He has a red-orange body marked with grey and brown. He has no stars marked.

**CANIS MAIOR** leaps to the left with both forepaws and his tail raised. His mouth is open and he has a red-orange tongue sticking out. His body is pinkish, with orange and brown markings and the 7-rayed starry disk that surrounds his head is yellow with a red outline. He is not marked by stars.

fol. 7r **ARGO** is a half ship with the stern at the left. The ship has an orange body with a grey-blue top band and red and re-orange panels on the side. The mast is brownish-pink with a yellow dot at the top and bearing a pink flag. It has two long steering oars and 6 shorter pulling oars and there is also a small building on the deck. The stern is red and there is a red line-line figure of a female wearing a long dress with her left hand raised (the shoulders and head of the figure are lost in the gutter of the page, but it appears to be similar to the female figure found on the depiction of Argo in the Boulogne ms). There are no stars.

**CETUS** is a classical sea monster who faces to the left, but turns his head back to the right and stretches it backwards towards his raised tail. He has tufted ears and the end of his tail is shaped like an acanthus leaf. His forefeet are lost in the gutter of the page. His body is grey, with a pink-grey tail with a yellow dot towards the end. Around his neck is a parti-coloured scarf. There are no stars.

fol. 7v **ERIDANUS** is depicted as a classical river god facing towards the left and leaning on an upturned yellow urn with his left forearm. He holds out his right hand. A grey stream of water pours from the urn. The god has a grey beard and re-orange hair with a number of straggling tendrils. His chest is bare, and he wears a long green skirt with orange and yellow highlights. He holds a yellow, red and brown plant in the crook of his left arm. He seems to have two bright yellow stars on his knees, but is not otherwise marked by stars.

**PISCIS AUSTRINUS** is placed upside-down, at an angle of 45° off at an angle slightly off the vertical with his open mouth uppermost. He has a grey body with a pink belly and yellow eyes and he is white around the mouth. There are no stars marked.

fol. 10v picture of Sol set within a circle in his *quadriga* drawn by 4 horses (1 and 3 are grey and 2 and 4 are white) with both arms outstretched. He holds a yellow orb in his left hand and wears a yellow halo. His dress is white and his cloak red, while the chariot is red and yellow;

Luna in a biga drawn by 2 oxen, wearing a pink dress and carrying a grey torch Her Hal and moon are yellow and her chariot is yellow and grey, while her oxen are pink, with a red, brown and yellow yoke

fol. 11v planisphere

**This preliminary study was made jointly with Elly DEKKER. An updated and corrected version will be published in her book in 2012.**

folio size: 37 x 28.5 cm

A full-colour map, with orange, red-orange, blue, grey-blue and green predominating. The background of the zodiacal band is orange and its northern and southern contours are marked in green, painted over a thin black line. All the other circles are drawn in green over a thin black line. There are no measurement marks readily apparent, though there is a small red dot at the top of the map, near the belly of Piscis Austrinus, which coincides with the point where the solstitial colure would intersect with the boundary of the ever-invisible circle. There are also faint traces of a pencil line that runs from this dot, through the belly of the Southern Fish and, perhaps, clips the edge of Aquila's wing. And, there pencil traces of a circle drawn along the top (Piscis Austinus side) of the map.

There are three compass holes: one just behind the right elbow of Ursa Minor (the northern celestial pole), one in Draco's mouth (the northern ecliptic pole) and the third below the left elbow of Bootes (the centre of the Milky Way).

### Constellations:

The constellations are in sky view.

Of the 48 Ptolemaic constellations 43 are present. Missing are Corona Austrinus, Equuleus, Lyra, Sagitta, Triangulum. The constellations drawn conform to Hipparchus rule are Andromeda, Aquarius, Auriga, Boötes, Cassiopeia, Centaurus, Cepheus, Eridanus, Gemini, Hercules, Ophiuchus, Orion, Perseus, Sagittarius, Virgo, and the figure holding a pair of scales.

### Cartography:

The planisphere has a grid consisting of five concentric circles centred on the northern celestial pole. From inside to outside they represent: the ever-visible circle which is differentiated from the others because it is both thicker and is coloured orange and framed by thin green lines), the Tropic of Cancer, the equator, the Tropic of Capricorn and the ever-invisible circle. When expressed as a fraction of the radius of the equator, the radii of the Tropics of Cancer and of Capricorn are 0.71 and 1.39, respectively. The radii of the ever-visible and ever-invisible circles are 0.32 and 1.86, respectively. In addition, there are three other circles. Two of them are concentric and represent the northern and southern boundaries of the zodiacal band. The third one is the Milky Way. The centre of the two concentric boundary circles, that is the ecliptic pole, is located inside the ever-visible circle, in the head of Draco. The Tropic of Capricorn touches the southern boundary circle of the zodiacal band. The Tropic of Cancer intersects the band. When expressed as fractions of the radius of the equator, the distance of the ecliptic pole from the centre of the map amounts to 0.25. The radii of the boundaries of the zodiac are 0.86 and 1.16 and the radius of the Milky Way turns out to be 1.09.

### Locations with respect to the main circles:

- a.) Inside the ever-visible circle: Ursa Maior, Ursa Minor and Draco.
- b.) Between the ever-visible circle and the Tropic of Cancer: Cepheus, Cassiopeia (except for her left arm), the left arm and left leg and Medusa held by Perseus, Auriga, Boötes from his thighs to his head, the tips of the ears of the Serpent held by Ophiuchus, the northern half of Corona Borealis, Hercules (save the top of his head) and Cygnus.

- c.) Between the Tropic of Cancer and the equator: Perseus (except for his left arm and left leg), Taurus, Gemini, Cancer, Leo, Virgo (except for her left hand and left foot), the thighs and feet of Bootes, Ophiuchus from his head to his waist and the upper part of the Serpens, the southern half of Corona Borealis, Delphinus, the lower part of Aquila, all but the ears and the tip of the wing of Pegasus, and Andromeda.
- c.) Between the equator and the Tropic of Capricorn: the head of Cetus, the very top of the hair of Eridanus, Orion from his waist to the tip of his staff, Canis Maior, Canis Minor, the top of the stern and the sails of Argo, Hydra with Crater and Corvus, the male figure with a pair of scales (Libra) from his neck to his feet, the head and shoulders of Centaurus, the tips of Bestia's feet, Ophiuchus from his chest to his feet and the lower half of his Serpent, Scorpio, Sagittarius, Capricorn, Aquarius, Pisces, and Aries except for his head.
- d.) Between the Tropic of Capricorn and the ever-invisible circle: the body of Cetus, Eridanus, Orion from his waist to his feet, Lepus, most of Navis, Centaurus from his shoulders downwards, Bestia, Ara, Piscis Austrinus and the stream of Aquarius.

In the zodiacal band: one finds Aries, Taurus, Gemini, Cancer, Leo, Virgo, the upper part of a male figure with a pair of scales, Scorpio with Ophiuchus from his waist to his feet, Sagittarius except his head and the top of his bow, Capricorn, Aquarius and Pisces.

The **ever-visible circle** cuts off the right leg of Cepheus, touches both feet of Hercules, the head of Boötes and the head of Auriga.

The **Tropic of Cancer** passes through the left arm of Cassiopeia, the right arm and leg of Perseus, the feet of Auriga, below the thighs of Boötes, the ears of Serpens, the middle of Corona Borealis, the head of Hercules and the left wing of Cygnus.

The **equator** passes through the neck of Aries, the hind legs of Taurus, the curved staff of Orion, the rear legs of Leo stand upon it, it passes through the left hand and left thigh of Virgo, the left shoulder and neck of the figure holding the pair of scales, and the chest of Ophiuchus and the middle of Serpens. It touches the tail of Delphinus and the head of Sagittarius, and it passes through Aquila and the head and wing of Pegasus.

The **Tropic of Capricorn** passes through the neck of Cetus, Eridanus's hair, the hips of Orion, and the hind feet of Canis Minor rest upon it. It continues through the sail and stern of Argo, the feet of the figure holding the pair of scales, the shoulder and the long skin flowing out behind of Centaurus, the hind feet of Lupus, and the hind feet of Sagittarius.

The **ever-invisible circle** passes just below the stream of Eridanus, the rear feet of Centaurus and Ara both rest upon it .

The **Milky Way** passes through the right arm of Cassiopeia and the hips of Auriga. It touches Cancer and continues through the horse part of Centaurus, the middle of Lupus, the flames of Ara, the middle of Sagittarius, the feet of Aquila and the left wing of Cygnus.

As mentioned above, the positions of the ecliptic and northern celestial pole (the equatorial pole) have been marked. The line connecting these two poles is the solstitial colure. The line passing through (or close to) the small red dot at the top of the map, near the belly of Piscis Austrinus, through the belly of the Southern Fish and, perhaps, clipping the edge of Aquila's wing. The solstitial colures pass through the belly of Piscis Austrinus, the neck of Capricorn, the tip of the right wing of Aquila, the head of Delphinus, the right shoulder and hand of Hercules, the ecliptic pole in the head of Draco, the middle of Ursa Minor, Draco, and the middle of Ursa Maior. They touch the hind legs of Cancer and pass through the middle part of Canis Maior. The equinoctial colures pass through the feet of Virgo, the left hand of Boötes, Draco, the equatorial pole in the body of Ursa Minor, the feet of Cepheus, the Gorgon head and the hips of Perseus, the tail of Taurus and the head of Cetus.

The 'first circle of latitude' (the line parallel to the equinoctial colure but through the ecliptic pole) passes through of the figure holding the pair of scales, the length of Boötes, the ecliptic pole in the head of Draco, the middle of Cepheus, and Cassiopeia, the head of Perseus, the middle of Aries and the head of Cetus.

#### **Significant features of the constellation images:**

- **Ursa Minor** [+] is an orange bear with a long tail (held close to the body), placed inside the second bend of Draco and it is looking into it, with its mouth open. It is facing opposite to the direction of the zodiac.
- **Ursa Maior** [+] is an orange bear with a short tail, placed inside the third bend of Draco, and it is looking into it with its mouth open. It walks opposite to the direction of the zodiac.
- **Draco** [-] has a green-grey body in four bends. Its tail passes below the feet of Ursa Maior and hugs the contour of the ever-visible circle. His head is directly north of the feet of Hercules.
- **Cepheus** [n/a] is parallel to the zodiac and above Cassiopeia. He is dressed in a short, light brown tunic, dark brown shoes and raises both his hands. His bottom rests upon the ever-visible circle and his right leg is cut off by it at the shin.

- **Boötes [-]** is stands directly north of the figure holding the pair of scales. He wears a short grey exomis that exposes his right shoulder. He raises both arms and holds a orange crook in his right hand. His head touches the ever-visible circle, his thighs are intersected by the Tropic of Capricorn and his are cut off by the northern boundary of the zodiacal band.
- **Corona Borealis [+]** consists of a simple orange ring with ribbons, placed between Boötes's staff and Hercules's right shoulder.
- **Hercules [+/-]** stands with his head facing south and his feet towards the north. His right foot and left heel are cut off by the edge of the ever-visible circle. His feet nearly frame the head of Draco and Corona is placed behind his back. He faces towards the vernal equinox (in the direction of the zodiac). He is nude and a green lion's skin covers his left arm. He holds a curved brown staff/club in his right hand, resting it on his shoulder. His head is cut by the Tropic of Cancer.
- **Cygnus [-]** is placed between the head of Cepheus and flies in the direction of Hercules, with its beak grazing the lion's skin. The tip of its right wing touches the head of Cepheus and its left wing nearly touches the intersection between the Tropic of Cancer and the circle of the Milky Way.
- **Cassiopeia [n/a]** is placed nearly parallel to the zodiac, standing between Cepheus and Perseus. She is dressed in a long green robe that exposes her shoulders and has orange hair. She stretches her arms to either side, and has no seat, so she resembles one of the conventional the posture of Andromeda more than a figure of Cassiopeia. Her right foot touches the head of the Medusa. Her left arm is cut by the Tropic of Cancer and her right arm is cut by the Milky Way.
- **Perseus [+/-]** is parallel to the zodiac, with his back running along its northern border. The orientation of his body is not clear: his buttocks are visible, with his left leg closer to the viewer, but since the fingers of the hand holding the Medusa's head are clearly visible, it suggests that this is intended to be his right hand and that his upper torso faces the viewer. His head is directly north of Aries and his body from his waist to his feet is north of Taurus. He is nude, but wears a pale green cape over his shoulders and a brown and white Phrygian hat. He holds the Medusa's head in front of his body by its hair in his right hand in front of him and he raises a straight white stick vertically above his head with his left hand. The Tropic of Cancer runs through his body from his right foot, left thigh and to right shoulder.
- **Auriga [n/a]** is depicted facing the viewer and kneeling in advance of Perseus and to the north of the Gemini. He holds something that looks like a divining rod (the beginning of a flail?) in his left hand and has two small goats on his outstretched right arm. He wears a light blue-grey shift with long sleeves. His head touches the ever-visible circle; his hips are cut by the Milky Way; both ankles are cut by the Tropic of Cancer and the northern boundary of the zodiacal band actually covers

over the tips of his feet.

- **Ophiuchus [-]** is nude, faces towards the man who carries the scales (opposite to the direction of the zodiac). The bottom of his body is in profile with his right leg closer to the viewer, but from the position of his hands on the neck and body of the Snake, it seems his upper body is faces the viewer. He stands with both feet on on a brown, legless Scorpio, which also faces towards the man carrying the scales. The green snake held by Ophiuchus encircles his body with the Snake's head facing away from him.
- **Aquila [-]** is north of both Capricorn and Aquarius, with his body facing towards Sagittarius and his head turned back so that it faces towards Aquarius (in the direction of the zodiac). His feet are cut by the Milky Way and his body is bisected by the equator.
- **Delphinus [-]** is a grey fish with a trefoil tail, placed with his back towards the south, north of Sagittarius and the head of Centaurus. He faces towards Aquila (in the direction of the zodiac).
- **Pegasus [n/a]** is depicted as half a white and winged horse. He is positioned with his back to the south and facing towards Aquila (opposite to the direction of the zodiac) , directly north of Aquarius. His brow and the tip of his wing are cut by the equator and his left forehoof touches the boundary of the Milky Way.
- **Andromeda [n/a]** is in advance of Pegasus and to the north of Pisces, with her head close to the severed belly of Pegasus. She is nude, with short-cropped orange hair, facing the viewer and both her arms, which are held down by her sides, are tied with some rope, but there are no accompanying rocks. Her right hand touches the Tropic of Cancer.
- **Aries [n/a]** is leaping opposite towards Pisces (the direction of the zodiac), while looking back over his shoulder towards Taurus (following the direction of the zodiac). He is pinkish and there is no ring around the body.
- **Taurus [n/a]** is a complete, pinkish bull, lying down with both front legs stretched out in front of him and his tail raised. He faces towards the Gemini (in the direction of the zodiac).
- The **Gemini [+/-]** are is nude and stands facing each other, each holding the elbow of the other's inner arm in such a way that they seem co-joined like Siamese twins. They are set parallel to the zodiacal band, with their heads pointing towards Cancer. The southern Twin has a slightly curved, brown staff in his right hand, so that its curved end rests near his feet. The outer (left) arm of the right Gemini seems to have been amputated at the elbow. The Tropic of Cancer skims the left arm of the right Twin, and the Milk Way touches his head. (The planisphere Gemini are completely nude and without hats or haloes. Also the harp is missing. But their postures are similar.)
- **Cancer [-]** has two claws and eight pointy legs. It is orange with brown and white

markings and faces towards Leo (in the direction of the zodiac).

- **Leo** [-] is grey-blue with white highlights and leaps towards Cancer (opposite to the direction of the zodiac), with his head and tail held high. His hind feet on the intersection between the southern boundary of the zodiacal band and the Equator.
- **Virgo** [+/-] is a female figure, dressed in a blue dress covered by a green cloak. She has no wings, but holds a drooping, 2-frond plant in her right hand. Except for her right hand, she is within the zodiacal band and aligns with it. Her left hand and much of her left leg lies on the equator. (The two figures share a posture, but are reversed (mirror-image) from each other.)
- In the compartment for Libra, there is a **male figure holding a pair of scales** [n/a]. He wears a short blue tunic and a green cape over his left shoulder and has red stockings and brown shoes. He faces the viewer, but walks towards Scorpio (in the direction of the zodiac). In his right hand, he holds a pair of whitish scales, that swing away from his body so that they nearly fall in line with the position of Scorpio's claws. He is standing with his feet on the Tropic of Cancer with the southern boundary of the zodiacal band running through his thighs and the northern one clipping the top of his head. The equator cuts through his neck.
- **Scorpio** [-] is brown with white highlights. He has two long front claws, no legs, but a curved tail. He faces towards the man holding the scales (opposite to the direction of the zodiac). Ophiuchus does not so much stand on him as obscure the Scorpion with his naked legs. His southern side hugs the southern boundary of the zodiacal band.
- **Sagittarius** [-] is a centaur with a blue horse's body, holding a golden bow with his left hand outstretched in front of him. He faces towards Scorpio (opposite to the direction of the zodiac). His hind hooves rest on the intersection between the southern boundary of the zodiac and the Tropic of Capricorn. The line where his human and horse halves meet follows the curve of the Milky Way.
- **Capricorn** [-] has two white horns and a series of curls in his brown body and a short, pointed tail. His front legs stretch in front of him towards Sagittarius (opposite to the direction of the zodiac).
- **Aquarius** [-] is a nude male facing the viewer, who wears a grey-blue Phrygian hat and a red cape draped over his left shoulder. He holds an upturned greyish urn that pours water into a stream flowing towards the mouth of Piscis Austrinus. He is within the zodiacal band and runs parallel to it.
- **Pisces** [-] are two grey and grey-blue fish, swimming in opposite directions, with both their backs to the north. Their mouths were tied by a cord, but the cord has been overpainted during the later addition of an orange background to the band of the zodiac.
- **Cetus** [-] is a large blue-grey sea monster, with a brown backbone, marked with white dots and a red-orange acanthus-like tail. He has a dog's face and breathes

orange-red flames. He has flippers on his front legs and two coils in his body. The figure stretches across the area directly south of Aries, Pisces and most of Aquarius. He faces towards Eridanus (in the direction of the zodiac), with his front flippers just touching the edge of the stream. His neck is cut by the Tropic of Capricorn.

- **Orion** [-] is standing facing the viewer, wearing a short blue tunic and with an orange cape hanging over his left shoulder. He is barefoot and has orange hair. He is placed to the south of Gemini and Taurus. He holds a brown, curved stick aloft in his right hand and there is an orange scabbard with white highlights hanging at his waist. His left foot nearly touches the open mouth of Eridanus's urn and his waist is cut by the Tropic of Capricorn, while the tip of his stick intersects the equator.
- **Eridanus** [+/-] is depicted a sea god, visible from the waist upwards as if emerging from his stream. He is nude with flowing brown hair. He holds his urn out in front of him (towards Orion) so that the stream pours back towards his body. His head is cut by the Tropic of Capricorn. (The two figures are both river gods, but the one accompanying the text is much more fully developed as his body is not obscured by water and his stream flows in the opposite direction.)
- **Lepus** [-] is in advance of Orion, leaping towards his right leg
- **Canis Minor**[n/a] is blue and placed between Canis Maior and Orion, leaping towards Orion's staff (opposite to the direction of the zodiac). He has a long tail and his mouth is open, with his orange tongue sticking out, with his hind feet on the Tropic of Capricorn.
- **Canis Maior** [n] is orange and leaps towards the hind quarters of Canis Minor (opposite to the direction of the zodiac). His hind feet touch the sails of Argo.
- **Navis** [-] is a partly visible green ship with blue sails attached to an orange mast. It appears to the south of Cancer and its sails touch the hind feet of Canis Maior. There are no oars (note: its position on the map is reversed from the norm; the stern should be at the side of Canis Maior). The Tropic of Capricorn passes through the sails and the tip of the stern.
- **Hydra** [n/a] is has a snakey, green and grey body with its head south of the front feet of Leo and its tail below the feet of Virgo.
- **Crater** [n/a] is an orange vase on a foot, placed on the first bend of Hydra.
- **Corvus** [n/a] is brown with darker brown wings and stands near the tail of Hydra facing backwards and pecking at its body.
- **Centaurus** [n/a] is south of the figure that holds the scales and Scorpio. He is nude to the waist, but he has an brown animal's skin draped over his left shoulder in such a way that it seems more an extension than covering his arm. His horse parts and light blue-grey and blue. He faces towards Ara (in the direction of the zodiac). He holds a dead animal with a short tail (note the closeness in form to Lepus) by its heels in his right hand in front of him. The Tropic of Capricorn cuts through his skin and shoulders and the tip of Lupus's feet, while the Milky Way runs through the

length of the horse part of his body.

- **Lupus** [n/a] is an animal held by Centaurus upside down, which is closest in from to Lepus.
- **Ara** [n/a] is stepped, three-story structure with flames on top, placed to the south of the tail of Scorpio. It touches the Tropic of Capricorn and the Milky Way with its flames and its base rests upon the ever-invisible circle.
- **Piscis Austrinus** [-] swims towards the tail of Cetus (in the direction of the zodiac), with his back facing north and his mouth connected to the stream of Aquarius. His body is blue and orange.

### Comments:

The Bern planisphere relates to those in Harley 647 and Boulogne-sur-Mer. The cartographic parameters show the same sort of deviations, but the Bern picture is less accurate than the one in London and more accurate than the one in Boulogne. This feature, needless to say, is somewhat problematic if one considers the accepted wisdom that the material in the Bern manuscript was copied directly from the Boulogne one.

It is also worth noting that there is very little iconographic overlap between the constellations depicted in the planisphere and those depicted with the text.

The radii of the various circles indicate that a linear scale underlies in the construction of the map. Assuming the distance of the equator of  $90^\circ$ , one finds that the angular distances of the Tropics of Cancer and of Capricorn from the centre of the map correspond to  $64^\circ$  and  $125^\circ$ , respectively. These values show that these circles are not symmetric with respect to the equator. In order to interpret these values correctly, we note that the Tropic of Capricorn has been placed tangentially to the southern boundary of the zodiac, instead of being properly tangential to the ecliptic in the centre of the zodiacal band. With an obliquity of the ecliptic of  $24^\circ$  and a width of the zodiacal band of  $12^\circ$ , this model dictates that the angular distance of the Tropic of Capricorn from the centre of the map would correspond to  $120^\circ$ . The measured value of  $125^\circ$  is only slightly more than expected. The Tropic of Cancer, however, is neither tangential to the ecliptic nor to the northern boundary. With an obliquity of the ecliptic of  $24^\circ$  and a width of the zodiacal band of  $6^\circ$  on either side of the ecliptic, one expects values of  $66^\circ$  and  $60^\circ$  for a tropic placed tangentially to the ecliptic and to its northern boundary, respectively. The measured value of  $64^\circ$  agrees with the fact that the Tropic of Cancer is closer to the ecliptic than to its northern boundary.

Assuming the distance of the equator of  $90^\circ$ , the ecliptic pole appears to be located at an angular distance of  $23^\circ$  from the centre of the map, which is close to the expected  $24^\circ$ . Using the same linear-scale factor, the radii of the boundary circles centred on the ecliptic pole correspond to angular distances of about  $77^\circ$  and  $104^\circ$ , respectively. This indicates a size of the ecliptic of about  $90^\circ$  (the mean value of the sizes of the upper and lower boundaries) and a width of the zodiacal band of about  $13^\circ$ - $14^\circ$  on both sides of the ecliptic. The angular distances of the ever-visible and the ever-invisible circles correspond to  $29^\circ$  and  $167^\circ$  from the centre of the map, respectively. These values, which are the equivalent to the geographical latitude of  $29^\circ/13^\circ$ , show that these circles are not symmetrical with respect to the equator - though this may be the result of inaccurate copying. Finally, the radius of the Milky Way turns out to be  $98^\circ$ , which is  $8^\circ$  more than the expected value for this great circle.

From the location of the colures, one can conclude that at least some of the zodiacal constellations are in a curious position. The vernal equinoctial colure should pass roughly between Aries and Pisces instead between Aries and Taurus. Another deviation is that the Bears are not on both sides of the North Pole, but that the Pole is in the body of Ursa Minor.

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### notes

The locations of the stars have been reproduced only haphazardly from its model Boulogne Ms 188 on the one hand and front the DSC star catalogue on the other hand.

folio size: 37 x 28.5 cm

Library database says dimensions are 37 x 28.5; dated before 1028; contains Germanicus and Avienus; Carolingian miniscule; has rubrics and orange and green initials changing each line; bright red title lines; splendid constellation drawings; two per page; with schema on fol. 11v; on fol. 1v: 'Werinharius episcopus dedit sanctae Mariae' (Strasbourg cathedral)

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### bibliography

WIMPELFELING 1508, p. xxvii.

SINNER 1760-72, III vols, I (1760), pp. 278-82.

HORTIN 1684, p. 47 (sign XV. 3)

WILD 1697, fol. 48v.

ENGEL 1740, ff. 22r and 72r

BREYSIG 1867, pp. xvii-xviii.

in published *De signis caeli* attributed to Bede in part and called it 'scholia Bernensia ad Germanicum', without recognising it; the text itself; ff 1v-2v contains vv 1-393 of Germanicus, which has this 'scholia' running around the figures and in the margins (lacking chapters 13-20 and 37-41); after 22 (Perseus), there is an insertion of a scholium on the *Virgiliae* in another hand.

DAHMS 1869, pp. 270-71.

ORELLI 1832, pp. 137 ff.

HAGEN 1875, p. 108.

dates 10th century

RAHN 1876, pp. 793-94.

BETHE 1893, p. 102.

THIELE 1898, pp. 83 ff.

ZINNER 1925, nr. 697.

BOECKLER 1930, p. 58.

BLOESCH 1932, p. 96.

SAXL and PANOFSKY 1933, p. 236, n. 9.

say the 10th-century Boulogne ms is 'a more complete copy' of Leiden *Aratea*.

BAINS 1936, pp. 50, 59, 72 and *passim*.

ROTH 1945, p. 189 and 332 (Liste 93).

**WEITZMANN** 1947, p. 161.

kind of error when scribe writes a whole text and leaves pictures to be illustrated later, sometimes illuminator puts pictures in the wrong place: **Boulogne 188** from the 10th c depicts youth clad in an exomis and holding a skin and a lagobolon, so this is not the figure of Hercules described in the text as a kneeling figure; also in **Madrid 19** from the 12th century, represents Hercules as a nude kneeling figure in the Garden of Hesperides ‘... and this is undoubtedly the original constellation type’. According to Weitzmann the picture of Hercules in the Boulogne ms cannot be described as a disguised or corrupted type of Hercules, but must have originally represented another constellation type, which by mistake has been inserted here. He follows Thiele, whom he believes has convincingly shown that this is really a representation of Bootes, for whom exomis, lagobolon and striding position are more characteristic (Thiele, pp. 92-93, fig. 19). A special group of mss all share this mistake, showing them to be of the same recension (**Leiden, Boulogne and Bern** - from the 11th c)

p. 190: manner of discovering a genealogy: identical alterations in corresponding miniatures are hardly ever made independently of each other (i.e **Leiden, Bern and Boulogne**); also, it is essential to recognise that often people use more than one model for a copy, the scribe or illuminator choose variants from two sources and combine them into a third version;(p. 191) in making a stemma, must separate iconography from style;

p. 192: ‘a miniature stemma should be based exclusively on iconographic and not on stylistic evidence, which is only of subsidiary help for the dating of single documents and cannot be used for questions of descent’. The transmission of style and iconography often follow very different paths;

**BYVANCK** 1949, p. 215 (no. 39).

copy of Boulogne 188, with planetarium, and figures of constellations; gift of Weriharius of Strasburg (1001-29) to the cathedral of Bern; written in Strasburg at the beginning of the 11th century

**HOMBURGER** 1953, pp. 116-18.

**MÜLLER** 1953, pp. 79-106, esp. p. 99.

**MARTIN** 1956, p. 40.

a partial copy of Boulogne ms, from the same epoch (beginning 11th century)

**BOUTEMY** 1957, pp. 427-33.

**HOMBERGER** 1962, pp. 116-18

ULMANN 1964, pp. iv, 268.

re: Werinhar; says that he intended this and other mss to foster the study of the liberal arts in the cathedral school

NORDENFALK 1965, p. 300.

BISCHOFF 1966, I, p. 58.

GUNDEL and BÖKER 1972, 682, nr. 228.

Le BOEUFFLE 1975, pp. xli-xlii.

says that family Z conserves the *Aratea* in almost its totality, save some rare omissions (lines 35, 65-70, 83, 97, 143, 267, 300, 343, 555, 568-71). They also add fragments III and II from the prognostics, but not fragm. IV. There is a melange of additions and interpolations from Avienus, such as after line 146 there is a mixture of Germanicus l. 148 and Avienus 370; then follows vv. 371-378 of Avienus. Thereafter is a line that corresponds to Germanicus l. 147 again followed by lines from Avienus: 383ff and 388-390. Another passage starts with v. 341 of Germanicus, which is followed by 749 of Avienus, then comes 342 of Germanicus. The next lines, Germanicus l. 343 is left out and replaced by vv 747-750 of Avienus, then 344 of Germanicus. Also, there are interpolations after 464 and 472 and fragm II is followed by verses of Avienus. He says that it is copied from a retouched Boulogne, and corrected against another ms from the O family (probl. Paris BN 7886).

GAIN 1976, pp. 2-8.

dell'ERA 1979, pp. 269-70.

notes that Breysig mistakenly published the Bern marginalia as '*scholia Bernensia*' and re-orders the passages to fit the text; also says that Bern 88 is 10th c, 1v-7v and has vv 1-393 of Germanicus

REEVE 1980, pp. 508-18, esp. p. 513.

10th century, presented to St Mary's Strasbourg by Werinhar, bishop from 1001-1028; copied from Boulogne 188; scholars cannot help deriving Boulogne 188 and Bern 88 from Leiden ms, some have believed that lines 142 and 144b were omitted, therefore *not* source for Bern 88 and Boulogne 188; but, according to Reeve, this mistaken assumption is based on a lack of knowledge that there are traces showing that these lines were erased by the later author who added his more readable version to the text to manuscripts.

VERKERK 1980, pp. 245-87.

LOTT 1981, pp. 147-58.

MUNK OLSEN 1982, I, p. 406.

REEVE 1983, p. 20.

BOURDELLÈS 1985, pp.           .

BISCHOFF *et. al.* 1989:

[Obbema, pp. 13-14]: vellum, 11 ff, 37 x 28 cm and incomplete; contents: an interpolated Aratus with *scholia* that appears only in this member of the Z-family. Images are opposite side of Boulogne ms and without frames or background in the borders, placed beside the text; written and illuminated at the beginning of the 11th c in Saint-Bertin under Odbert; originally bound together with the Boethius ms (now Bern 87) in 1004 (dates as both were a gift from Bishop Werinhars I of Strasbourg (1001-1028) to his cathedral

[Mütterlich, esp. pp. 13, 34-41, 45-48, 51-53, 50, 37, 40, 43, 49, ]

[Eastwood, esp. pp. 60-61, 73-74,]

[Bischoff, esp. p. 90]

GUNDEL 1992, pp. 93, 312, nr 394, fig. 309

STÜCKELBERGER 1990, p. 77, fig. 7

STÜCKELBERGER 1993, p. 66, fig. 4

STÜCKELBERGER 1994, pp. 41f, pl. 5

BORST 1995, 2nd edn, p. 173, n.19.

Oberrhein, before 1000.

STÜCKELBERGER 1998, pp.           .

HAFFNER 1997 p. 24.

closely related to Leiden *Aratea*; she says early X11th century.

VEDERE I CLASSICI 1997, pp.           .

KÜNZL 2000 [2003], pp. 495-594, esp. pp. 550.

around 1029, daughter ms of Leiden Aratus

**GARCIA AVILÉS** 2007, p. 95-98.

erroneously cites Boll's drawing after Vat grec 1087 (fig. 24) as the Bern planisphere

**BLUME** 2009, p. 549.

**BLUME, HAFFNER and METZGER** 2012, pp. 114-15 and 214-18.

pp. 114-15: a simplified copy of the 'expansion' (Boulogne 188) made at the Strasbourg Cathedral school under Bishop Werinhar; used for teaching the quadrivium; the large size is retained, but the pictures have no background and the placing of the stars is abandoned; 'negligence in execution'; star catalogue from *De signis caeli* added to margins; with ps-Boethius on geometry and arithmetic

pp. 214-18: Northern France, end 10th/beginning 11th century; miniatures follow 'stroke-by-stroke' the **Boulogne 188** illustrations and then from tradition of Leiden *Aratea*; notes reorganisation of image and text; notes that Boutemy 1958 attached it to St Bertin and as the place where it was copied from Boulogne 188; Bern not copied from Carolingian original.

**DEKKER** 2012, pp. 145, 163, 173-75 and 233-35.

p. 145: belongs to the Z branch of the Germanic tradition; closely related to Leiden *Aratea*; Bern copied from Boulogne 188 in St-Bertin during the Abbacy of Odbert.

p. 163: seen in sky view

pp. 173-5: Libra is held by a figure and has Eridanus as a river-god; has strings around Andromeda's wrists, which Boulogne 188 does not (since also in the BM Harley map, suggests that there was an exemplar in St Bertin behind all three);

pp. 233-35: St Bertin before 1029 and during the Abbacy of Odebert (986-1008); all follow Hipparchan rule except Perseus; images of Navis and Corvus are reversed; the pole is in the body of Ursa Maior; originally bound with Bern 87 (Boethius) which STEVENS 1997, p. 434 says was written before 1004 at the monastery of Luxeuil.

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consulted March 2004