

- North, John D. (1975). "Monasticism and the first mechanical clocks", in Julius T. Fraser and N. Lawrence, eds., *The Study of Time, II*, pp. 381–398. New York: Springer Verlag.
- Oestmann, Günther (1993). *Die astronomische Uhr des Straßburger Münsters: Funktion und Bedeutung eines Kosmos-Modells des 16. Jahrhunderts*. Stuttgart: Verlag für Geschichte der Naturwissenschaften und der Technik.
- Pedersen, Olaf (1975). "The corpus astronomicum and the traditions of Medieval Latin astronomy: a tentative interpretation", in [Owen Gingerich and Jerzy Dobrzycki, eds.], *Colloquia Copernica III*, pp. 57–96. Wrocław: Ossolineum.
- Pedersen, Olaf (1993). *Early Physics and Astronomy: a Historical Introduction* (revised edn). Cambridge: Cambridge University Press.
- Schaldach, Karlheinz (1996). "Vertical dials of the 5–15th centuries", *Bulletin of the British Sundial Society* 96(3): 32–38.
- Schechner, Sara (2001). "The material culture of astronomy in daily life: sundials, science, and social change", *Journal for the History of Astronomy* 32: 189–222.

---

## Case Study 11.1: Monkwearmouth–Jarrow, United Kingdom

---

### Presentation and analysis of the site

*Geographical position:* City of Sunderland (Monkwearmouth) and South Tyneside Metropolitan Borough (Jarrow), North Tyne and Wear, England, United Kingdom.

*Location:* Monkwearmouth: Latitude 54° 54′ 48″ N, longitude 1° 22′ 29″ W. Elevation 50m above mean sea level. Jarrow: Latitude 54° 58′ 49″ N, longitude 1° 28′ 20″ W. Elevation 75m above mean sea level.

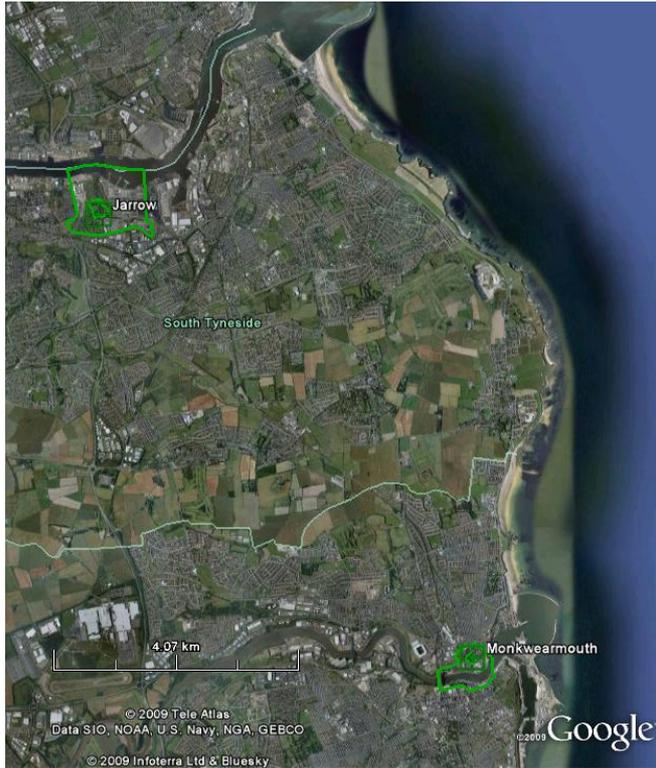
*General description:* The twin monastery of St Peter (Monkwearmouth) and St Paul (Jarrow) lies near the mouths of the rivers Wear and Tyne.

*Inventory of the remains:* The relevant portions include the Anglo-Saxon monastery and Medieval Priory Scheduled Monument and St Peter's Church at Monkwearmouth and St Paul's Church and Churchyard and the St Paul's Monastery and Village of Jarrow Scheduled Monuments at Jarrow.

*History of the site:* The twin monastery was established in the seventh century by Benedict Biscop and by the early eighth century was an internationally renowned centre of learning with one of the most important libraries and scriptoria of its time.

*Cultural and symbolic dimension:* The significance of this site for the development of astronomy relates to the scholarly activity of the monk, Bede of Jarrow (c. 673–735), who entered the monastery at the age of seven and remained there for the rest of his life. As the proposed statement of value from the draft site nomination says:

"Bede's exceptional abilities ... flourished in this environment. His prolific output ... on a great variety of ... subjects, including theology, astronomy, science, music and language ... still inspire active international scholarship, as they have done for more than thirteen centuries."



Bede wrote his works on astronomical computus between AD 703 and 731. His writings focused on integrating the astronomical and liturgical concepts of time, by means of numbers, in order to compute a correct religious calendar. These works were rapidly carried throughout Europe and provided a significant intellectual element of the Carolingian Renaissance. His *On the Reckoning of Time* became the principal text for early medieval astronomical study and continued to be taught and copied from the eighth to the fifteenth centuries.

*Authenticity and integrity:* The physical site contains elements of the original seventh-century monastic structure, and the plan of the site follows the plan of the original seventh-century monastic settlement. From the astronomical perspective, the associated computistical and scientific works of the Venerable Bede are of even greater significance.

### Present site management

*Present use:* The Churches of St Peter (Monkwearmouth) and St Paul (Jarrow) are operating churches, currently owned in trust by their respective incumbent rectors and managed by their respective Parochial Parish Councils.

*Protection:* St Paul's Monastery at Jarrow, the Village of Jarrow, and Monkwearmouth Anglo-Saxon Monastery and Medieval Priory are designated as Scheduled Monuments. St Peter's Church at Monkwearmouth, St

**Fig. 11.1.1.** The World Heritage Property proposed by the State Party: Monkwearmouth–Jarrow: overview (top), Monkwearmouth (centre) and Jarrow (bottom). © Document from *Wearmouth-Jarrow Candidate World Heritage Site*, 2010, based on Google.



**Fig. 11.1.2. Top:** St Peter's Church, Monkwearmouth. Photograph © R.J. McNaughton, Creative Commons Licence. **Bottom:** St Paul's Monastery, Jarrow. Photograph © Ken Crosby; Creative Commons Licence

Paul’s Church at Jarrow, and the ruins of the Jarrow Medieval Monastic Site are Grade I Listed Sites. Additional elements of the site have further statutory protection. Protection of St Peter’s Church and St Paul’s Church is effected by the Church of England through its own internal controls that require a license, called a ‘faculty’ for all alterations to the fabric, ornaments or furniture of churches.

*State of conservation:* The state of conservation of both churches is monitored by the Church of England and that of St Paul’s monastic site by English Heritage. Both are generally good.

*Context and environment:* The two monastic sites are in an area of controlled urban growth; their historical importance guides the planning of this development.

*Main threats or potential threats to the site:* These are pressures from urban development, and hazardous industrial operations in the vicinity.

*Management:* The Churches of St Peter and St Paul both maintain outreach and interpretation programs based on the archaeological and historical discoveries. English Heritage currently conducts an ongoing interpretation programme at the monastic site of St Paul, Jarrow; arrangements are being made for an interpretation program at the monastic site of St Peter, Monkwearmouth.

### **Additional bibliography**

Cisne, John L., et al. (2005). “How science survived: medieval manuscripts’ ‘demography’ and classic texts’ extinction”, *Science* 307, 1305–7.

Stevens, Wesley (1985). *Bede’s Scientific Achievement (The Jarrow Lecture, 1985)*. Jarrow: St Paul’s Church.

Wallis, Faith (2006). “*Si naturam quaeras: reframing Bede’s ‘science’*”, in *Innovation and Tradition in the Writings of the Venerable Bede*, edited by Scott DeGregorio. Morgantown: West Virginia University Press.

Wallis, Faith, trans. (2004). *Bede: The Reckoning of Time*, translated with introduction, notes and commentary (Translated Texts for Historians, corrected edition). Liverpool: University of Liverpool Press.

*Wearmouth-Jarrow Candidate World Heritage Site: Nomination Document For World Heritage Site Status 2010*. Public Consultation Version, April 2009.

---

## **Case Study 11.2: The Baptistery of Parma, Italy**

---

***Manuela Incerti***

### **Presentation and analysis of the site**

*Geographical position:* Parma, Emilia Romagna, Italy

*Location:* Latitude 44° 48′ 10″N, longitude 10° 19′ 50″E. Elevation 62m above mean sea level.

*General description:* The Baptistery of Parma is a religious building in Parma, located adjacent to the Cathedral. It is one of the most important medieval monuments in Europe.