

der Zeitstellung der Gliederungselemente des bestehenden Baues. Ob sie anstelle einer bis dahin nicht ersetzten, geraden Abschlußwand der Notkirche nach dem Brand oder, was bei der mit der Altfriedapsis identischen Linienführung nahe liegt, auf deren Resten errichtet wurde, bedürfte noch detaillierter Untersuchung. Für die im Scheitel der Chorkrypta gefundenen Ansätze eines Durchgangs gab es zur Zeit der Apsiserneuerung nach Aufgabe der Umgangskrypta keine Veranlassung mehr.

Die besprochene Veröffentlichung bringt manches Neue und anregende Aussagen, aber auch solche, die kaum Aussicht haben, sich in der angestrebten Gesamtdarstellung wiederzufinden.

Dies dürfte durch die Gegenüberstellung der Begrenztheit der archäologischen Möglichkeiten zu der schier unbegrenzten interpretatorischen Entfaltung deutlich geworden sein. Wer meint, die Veröffentlichung sei nicht ausgewogen gewürdigt, sei auf einen demnächst in *architectura* erscheinenden ausführlichen Forschungsbericht hingewiesen, der die Thematik vor dem Hintergrund der Hildesheimer Geschichtsforschung und im Kontext der zahlreichen Beiträge aus jüngster Zeit behandelt.

FRIEDRICH OSWALD
Gersfeld

Francesca Dell'Acqua e Romano Silva (a cura di): Il Colore nel Medioevo. Arte, simbolo, tecnica. La vetrata in Occidente dal IV all'XI secolo. Atti delle Giornate di Studi, Lucca, 23–24–25 settembre 1999 (*Collana di studi sul colore*, 3); Lucca: Istituto Storico Lucchese 2001; 287 pp.; 52 tav. ill., most in colors; without ISBN

This volume is the third in a series dedicated to color in the Middle Ages sponsored by several institutions in Lucca – the city which preserves some of the oldest manuscripts on glass coloring (such as the *Compositiones ad tingenda musiva*). The twenty-one essays collected here are the results of a symposium which attracted participants from all over the western world with a wide range of expertise including archaeology, chemistry, history and philology. This time the general theme, honouring Enrico Castelnuovo, was window glass from late Antiquity to the eleventh century. The material assembled here brings us up to date on glass production and technology largely based on recent excavations allowing a better informed reading of ancient texts. What distinguishes this combined effort is the enrichment of historical understanding and aesthetic appreciation of glass in its various forms including mosaics and enamels. This multi-disciplinary approach corrects various misapprehensions. For instance, it used to be said that glass window panes and colored „stained glass“ windows did not appear until about the twelfth century (Enrico Castelnuovo: *Introduzione*, p. 10; David Whitehouse, pp. 31 ff.). This was because until about twenty years ago glass fragments found in excavation work were neglected and therefore many opportunities were lost for collecting evidence (Caterina Pirina, p. 17; Whitehouse, p. 32).

In his introduction, Enrico Castelnuovo raises the question of the origins of

medieval glass technology in Byzantium and Islam (p. 12). Caterina Pirina gives an excellent overview of recent archaeological finds pointing out the known and unknown evidence for centers of glass production in Italy along with the nature of the material found (*Una breve riflessione sul convegno*, pp. 13–26).

John Mitchell, noted for his work at S. Vincenzo al Volturno (eighth and ninth centuries) and his familiarity with Lombard work, poses the question whether or not there was a decline in Roman glass making in the sixth century or whether it continued through the early medieval period (p. 29). He points out that, so far, little is known of the glass technology in Byzantium and Rome. He also asks if the production of window glass was a specialty or whether it was linked to the manufacture of other glass objects such as vessels, beads, jewelry and enamels. The question of the social and symbolic values associated with glass of the early medieval period is also raised (p. 30).

David Whitehouse, archaeologist and director of the Corning Glass Museum, is concerned with window glass between the first and eighth centuries found throughout the Roman empire (*Window glass between the first and the eighth centuries*, pp. 31–43). Since no ancient texts about their manufacture are known, the evidence consists entirely of archaeological finds (p. 32f.). Whitehouse is especially good on the techniques used for early window glass: poured, cylinder (muff), and crown (pp. 33ff.). He argues that „after the second century most Roman window glass was made by the cylinder process“ (p. 34). Crown glass was produced by the late second century and seems to have had a wide but scattered distribution by the fourth century. Although the earliest written evidence for multi-coloured glass dates from the late eighth-early ninth centuries, the author shows that it already existed earlier in Ravenna though of limited colour range and was sometimes even painted (pp. 36ff.). Because of manufacturing methods, Roman window panes were not transparent but they provided light as well as insulation – sometimes even involving double glazing (p. 35). Although evidence for colored or pictorial glass is lacking for ancient Rome, colored and painted windows existed in eighth century Islamic examples (p. 37f.).

Whitehouse is also concerned with the use of grills in windows made of stucco which were fairly common by the ninth century in Islam, Byzantium and parts of Europe. Leading for windows seems to have been introduced about the same time in Britain, France and Italy (pp. 38–39).

Marina Del Nunzio mentions that Tiberius made glass manufacture an imperial monopoly (*La produzione di vetri da finestra tra tarda antichità e Medioevo: la situazione romana*, pp. 45–65). As for colored glass, the use of mosaic tesserae as coloring agents are mentioned for fifth century Rome (p. 51). It would be interesting to find out if recycled tesserae merely tinted the glass or if strong colors were obtainable with a large quantity of them. During the eighth and ninth centuries, colored glass windows existed in a number of Roman churches including the Lateran, S. Martino al Monte and S. Maria in Trastevere (p. 55). Some of the most valuable information in this essay is to be found in the notes especially concerning the use of stucco and metal window

screens in Norman Sicily where the long neglected study of A. Salinas (1910) is discussed (p. 55, n. 64–66). The important role of monasteries as centers for glass production in Italy and Britain is also reviewed.

Rosemary Cramp, the English archaeologist and pioneer of early glass research in Britain, refers to seventeen sites – domestic as well as ecclesiastical – that have yielded plain as well as colored glass dating between the seventh and eleventh centuries (Window glass from the British Isles 7th–10th century, pp. 67–85). The itinerant nature of some of the glass makers is mentioned such as the artisans from Gaul invited by Benedict Biscop to the monastery at Wearmouth in 675 (pp. 69–70). The author also describes how potassic glass (from fern or wood plant ash) gradually replaced natron used for the more stable soda glass in north western Europe. Re-used glass (cullet) and tesserae as colouring agents are also mentioned (pp. 71 ff.). The relations between glass and pottery glazes are suggested as a good topic for further research (p. 80).

An important link between Roman and Carolingian glass at Sion and Mustair is taken up by Jürg Goll (*Frühmittelalterliche Fenster Gläser aus Müstair und Sion*, pp. 87–98). Most of the glass found at these sites are plain, pale green and pale blue while yellow and red proved scarce. The author believes that this was due to red's lack of transparency (pp. 92–93). But more likely this was because red, was always difficult to make requiring high temperatures. As for yellow, this may have been due to lack of available material such as antimony. Therefore, it is arguable if these choices were due to taste, technology or lack of raw materials. The author also mentions rhomboid patterns on some of this glass derived from opus sectile work (pp. 94–95).

Sveva Gai notes that tesserae as colouring agents were also found at Paderborn (*Frammenti di vetro da finestra dal palazzo carolingio di Paderborn. Nuove considerazioni alla luce della recente analisi dei dati stratigrafici*, pp. 99–112). Soda glass was manufactured there in Carolingian times while potassic glass was introduced later. The author doubts that glass making here started out with raw materials; instead, cullet or blocks of imported glass were used (p. 105).

In northern France soda glass was used for the Carolingian archbishop's palace at Rouen (Jacques Le Maho: *Les fragments de vitraux carolingiens de la cathedrale de Rouen*, pp. 113–124), while a foliate frieze adorned a fragment from a ninth/tenth century glass window unearthed at Beauvais (Jean Vittoz: *Notre-Dame de la Basse-Oeuvre de Beauvais*, pp. 125–126).

Fabrizio Crivello points out the compositional similarities between manuscript illuminations and windows going back to the tenth century in southern Germany (*Vetrate medievali e miniature ottoniane: in margine alla miniature delle Pentecoste dell'Evangelistario Clm 23338*, pp. 127–145). The author notes that these compositions varied according to the site such as lunettes, tympanums, lancet windows or a façade (pp. 134, 136). The gold background of some miniatures raise the question if these were supposed to allude to light or simply to richness (pp. 136–138). Aside from the relevance to light from windows, this also brings up possible influences from Byzantine manuscript illuminations and mosaics (p. 143, n. 42). The author also mentions

the linear divisions in some miniatures which may have inspired the leading patterns in contemporary windows.

Rüdiger Becksmann's essay concerns pre-Romanesque fragments of window glass from Germany and the Alsace (*Vetrate preromaniche e del primo romanico in Germania: ritrovamenti, fonti, ipotesi*, pp. 147–158). Helen Zakin studies the patterns of Cistercian glass and their origins which turn out to have been frequently Roman pavements and tiles (Cistercian reuse of late Antique and early Medieval decorative motifs, pp. 159–172). Richard Marks discusses window imagery in north European parish churches between the late eleventh and thirteenth centuries (*Glazing in the Romanesque parish church*, pp. 173–181). According to Giancarlo Lacerenza, flat glass as well as round disc glass were used in synagogue windows as early as the second century (*Simboli del mistero. Vetri e finestre nel giudaismo fra età romana e Medioevo*, pp. 183–194).

Francesca Dell'Acqua, one of the conference's organizers who has worked as an art-history consultant at many excavation sites throughout Europe, tries to coordinate textual sources with recent archaeological findings (*La presenza/assenza dei vetrai nelle fonti scritte, secoli IV–XI*, pp. 195–211). She is also interested in window screens (or grills) and how they were combined with either colored or plain glass (p. 196). She noticed that published texts focus upon the window glass rather than their makers and processes of manufacture (p. 197). Possibly this was because the centers of glass production were often isolated and because of the ethnic nature of their makers (Jews and Middle Eastern workmen) who were not part of the general social fabric (p. 196). She points out that in sharp contrast to Roman Antiquity, when glass artisans belonged to an elite, during the earlier middle ages they were subordinated to other crafts and had no guild of their own (p. 197). Although glass makers were mentioned in Carolingian chronicles and letters, it turns out that they were often itinerant and hence were probably few in number. This was true of France, Germany, England and Lombard Italy (pp. 200–205).

Anscari M. Mundó tells the fascinating story of colored glass windows commissioned by Catalan patrons for Barcelona cathedral as well as Old St. Peter's in Rome during the tenth and eleventh centuries (*Documenti catalane per la storia delle vetrate antiche*, pp. 213–232). Many of the documents, hitherto unpublished, appear here in an appendix.

The materials that go into glass are the concern of Marco Verità, the physical chemist and historian, based at the Stazione Sperimentale del Vetro in Murano (*La composizione chimica di materiali vitrei in Italia tra IV e XI secolo attraverso le analisi di reperti archeologici ed architettonici*, pp. 233–245). He explains why the sands of the Belus and Volturno rivers were favorite sources in Roman and early mediaeval times due to their fine silica and high lime content which made them ideal for glass while natron was long used as the flux in the glass making batch. These materials lowered the melting point which during heating transforms quartz into alkali silicates (p. 235). Natron is natural sodium carbonate richer in soda content than plant ash which tended to replace it gradually in the tenth century (cfr. M. VERITÀ: *Tecniche di fabbri-*

cazione dei materiali musivi vitrei, in: E. Borsook, F. Gioffredi Superbi and G. Pagliarulo (ed.): *Medieval Mosaics: Light, Color, Materials*; Milan 2000, p. 55). By the thirteenth century, soda glass was made exclusively from a special plant ash then obtained from Syria and Sicily (p. 238). It must be pointed out that soda glass is more stable than potassic glass which was used mainly in northern Europe and later spread southwards. For the latter, Verità cites as examples the mosaics in the matroneum of the Florentine Baptistry and in the glass ornament in the S. Maria Novella cross attributed to Giotto which date from the early fourteenth (not thirteenth sic!) century (p. 240).

Verità mentions a fascinating aspect of glass production for mosaic tesserae which required greater fluidity, more sodium and less silica than the usual mix for blown glass (p. 239). To make the cakes from which the tesserae were cut, the glass was then poured and flattened. As for lead glass, it appears earliest in opaque colors with pigments involving tin and antimony (pp. 240–241; Verità 2001, p. 195). According to Verità, the pale yellow, blue and green found in early glass may be due to impurities in the raw materials (p. 241). Verità notices the limited color range of window glass in the early middle ages as compared to the vivid mosaic tesserae of the same period. He wonders if this is fortuitous or if this signals a scarcity of raw materials or poor technology (p. 241). He also wonders if the bright colours of the mosaics may be due to the use of spoils (p. 242).

Isabelle Biron, another chemist, is mainly concerned with glass decay (*Evolution des compositions chimiques et degradation des verres*, pp. 247–256). She asks why soda fluxes diminish with the tenth century onwards. Was this due to growing scarcity of raw materials as was the case with Limoges enamels in the fifteenth and sixteenth centuries (p. 248)? She points out that the processes of glass decay are still not well understood making it all the more difficult for the development of conservation methods (pp. 249 ff.).

The essay by Karl-Hans Wedepohl is exasperating (*The composition of glass from the Carolingian and post-Carolingian period in Central Europe*, pp. 257–270). It is a pity that his discussion of glass composition in Carolingian and post-Carolingian times is vitiated either by the author's misunderstandings or a bad translation. The text is not made any easier by leaving chemical formulae untranslated into words accessible to the lay reader (e.g. K_2O for potassium oxide). What is meant by „3t cullet“ (p. 260)? Unclear is the distinction between soda lime and soda ash glass (has this to do with particular proportions of calcium and soda?). Then, there is no such thing as „Potassium oxide of soda ash“ (p. 261).

The last essay is devoted to the making of false jewels. Anne-Françoise Cannella points out the need of studying other medieval texts besides Theophilus in this respect (*Le „Trésorier de philosophie naturelle des pierres précieuses“ de Jean D'Outre-meuse: étude, par les textes anciens, de la coloration du verre et de la fabrication des fausses pierres précieuses au Moyen Age*, pp. 271–280). Although colored glass was regarded in the middle ages as noble as precious stones (p. 278), the author admits that it is difficult to show how the techniques of false gem making might have influenced window glass manufacture.

The volume concludes with excerpts from the round-table discussion (by Francesca Dell’Aqua and David Whitehouse, pp. 281–287). Among the topics touched upon were: the possible relationship between late antique opus sectile work and historiated windows; the geographical locations for the appearance of geometric and curved leading patterns; the relationship between mural painting and window glass. It was pointed out that most blue glass of the middle ages is potassic in nature with the exception of York, Dover, Charters (sic: Chartres?), and Jerichow (Brandenburg, p. 285). Freestone remarked that the presence of cobalt blue in the medieval period must be attributed to the use of ancient Roman mosaic tesserae because of the difficulty of finding natural cobalt. Warnings were made against regarding Theophilus’ treatise on glass technology too seriously because his treatment of cloisonné and gilding on glass do not correspond with actual practise.

Altogether, these essays answer many questions and raise many further issues for future study. What more can one ask for in the way of stimulation and information from a single volume? The only missing features are an index, a glossary and a list explaining who the contributors are. The organizers and editors of this occasion are to be heartily congratulated for gathering together so many distinguished scholars and bringing so much new material to our attention.

EVE BORSOOK

*Harvard University/Villa I Tatti
Florence*

Erwin Panofsky: Die altniederländische Malerei. Ihr Ursprung und Wesen; übersetzt und hrsg. von Jochen Sander und Stephan Kemperdick; Köln: DuMont 2001; Band 1: 566 S. mit 48 Farbtaf., Band 2: 319 S. mit 509 SW-Abb.; ISBN 3-7701-3875-0; € 178,-

Vor einem halben Jahrhundert, im Jahre 1953, erschien Erwin Panofskys „Early Netherlandish Painting. Its Origins and Character“. Es ist sein umfangreichstes Werk und sicherlich auch sein bedeutendstes; er selbst bezeichnete es als sein „opus majus“. In der Kritik wurde es sofort als eine überragende wissenschaftliche Leistung gewürdigt, ja sogar mit einer mittelalterlichen *Summa* verglichen. Die Untersuchung spannt einen weiten Bogen über nahezu 200 Jahre künstlerischer Entwicklung von Jean Pucelle im frühen 14. Jahrhundert über die franko-flämische Buchmalerei bis zu den ‚Heroen‘ des 15. Jahrhunderts, dem Meister von Flemalle, Hubert und Jan van Eyck sowie Rogier van der Weyden; in einem Epilog unter dem Titel das „Erbe der Gründerväter“ werden schließlich Hans Memling, Hugo van der Goes und andere Meister bis hin zu Hieronymus Bosch behandelt. Etwa ein Drittel des Textes ist allein der Frage nach den Voraussetzungen des völlig neuartigen niederländischen „Realismus“ gewidmet.

Panofskys großes Werk war ein Ereignis ersten Ranges in der Kunstgeschichtsschreibung. Es hat nicht nur ein neues, kohärentes Bild der altniederländischen Ma-