Figure 19. Andrea Mantegna, Detail of Minerva Chasing the Vices from the Garden of Virtue, 1502. Musée du Louvre, Paris/Giradon/The Bridgeman Art Library.
Twenty-five notes on pseudoscript in Italian art

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Ornament drawn from objects and textiles from the eastern Mediterranean and from the Muslim-dominated Iberian peninsula pervades the early history of Italian art, from the thirteenth through the fifteenth centuries. Some of this ornamentation consists of script, usually eastern in flavor, sometimes close to Greek or Hebrew, often close to Arabic, but in fact in no known language: for the sake of convenience I call them “pseudoscripts” or, collectively, “pseudoscript.” These apparently arbitrary strokes, slashes, and squiggles correspond to individual letterforms; their sequences sometimes repeat the same form at considered intervals, giving the array the appearance of having a linguistic structure. Apparently illegible marks designed to carry a message would normally be classed as encryptions, but only very few of the pseudoscripts, so far as we know, are messages to be deciphered with a secret key. The rest only resemble encryptions, sometimes even alluding to encryption procedures.

The most carefully considered pseudoscripts reveal a high degree of interest in the routines of producing and reading texts; some train attention on the differences between writing and ornament; all of them bear the double message that this is script and that it is not legible to you, the viewer, though it is presumably intelligible to the sacred figures who bear it. The very unintelligibility of these scripts could be said, in some cases, to mark a gap between a fallen present and a sacred past. The intelligence gap can be understood to belong to the viewer, who cannot read these marks, or to the producer, who is only able to make marks that resemble those of a language he does not know, a language either dead or foreign, or foreign in the sense of otherworldly.

In either case, pseudoscripts clarify the idea that there is a look to sacred script, a look that can be transmitted even in the absence of understood content. Pseudoscript gives a style to the foreign and the sacred, prompting by consequence the idea that the foreign and the sacred have a style—indeed, that style may be the only means by which the sacred is made known to a belated and fallen culture. During the period in which it flourished in Western art (it appears with greatest frequency between 1300 and 1500), pseudoscript was a laboratory for isolating an idea of style as such.

This article is presented as a series of notes because the problem opens out in many directions that only a book-length study could treat; the format also suggests an arena where provisional and experimental thinking about the problem is encouraged. Pseudoscripts appear throughout European art in this period, but initial surveys suggest that they are overwhelmingly more numerous in Italian than in Iberian art or the art of northern Europe. This article concentrates on Italian examples.

Pseudoscripts are a realm of experimentation largely ungoverned by the oversight of patrons or ecclesiastical authorities. It is one of the few areas in the painting of this period where artists exercised improvisational freedom in the handling of the brush, the stylus, the chisel, or other marking instrument. The invented marks occur even in works where they would have been impossible to perceive in their original location, such as on the sleeve of a Prophet by Donatello for the third story of the campanile of Florence (fig. 1). Whether it is the master or the assistant who attended to these areas, the invented letterforms constitute an often-overlooked artistic signature.

A familiar phenomenon in art of many periods and cultures, pseudoscript was cultivated in Italian painting and sculpture amid increasingly intensive contact with the eastern Mediterranean in the wake of the Latin conquest of Constantinople in 1204. In Cimabue’s Maestà in Bologna, the cloth of honor behind the enthroned figures carries real Arabic letterforms; one can make out several lams and aliphs. On the curtain behind the Virgin in Duccio’s great Maestà in Siena, we see a more kuficizing Arabic script; the curtain curls over at the right edge, revealing the textile pattern (and its woven text) from behind: a letterform close to one from the textile’s front can even be seen in reverse (fig. 2). It is a not quite exact reversal; this is a puzzle that,
once recognized, takes some time to think through. In Giotto’s Arena Chapel, many of the figures carry on their clothing a script that is remarkably close to Phags-pa, the script adopted throughout the Mongolian empire in the later thirteenth century. In his later work, Giotto turned to scripts that run closer to Arabic (figs. 12–14). The painting of this period clearly reflects the dramatic emergence of a unified world system of trade in the wake of the establishment of a Mongol sphere extending from East Asia to the edge of Europe.

4.

In the early fifteenth century, pseudoscript in Italian art gathered new force, in part due to intensified commercial contact with Mamluk Egypt. Gentile da Fabriano introduced Arabic letterforms in various works much like those found on Mamluk objects. Like Gentile, Masaccio used very Arabic-looking letterforms in his haloes, both in the early work at San Giovenale and in the more mature Pisa altarpiece now in London. Rosamond Mack made the ingenious proposal that such inscribed haloes may have taken their inspiration from Mamluk brass plates, where we occasionally see a similar disposition of script around the circumference of the form, interrupted at regular intervals by ornamental rosettes or roundels, just as they are in the haloes.

Mamluk brassware also seems to have played a role in Filarete’s bronze doors for St. Peter’s of the 1440s. There we see haloes with arabizing script behind the heads of St. Peter, St. Paul, and Christ, conforming rather closely to the script seen on Mamluk vessels of the sort imported into Italy in substantial numbers at that time, several of which still exist in Italian collections. Along the edge of the cloths of honor notionally hung behind the figures of Peter and Paul run extremely long pseudo-inscriptions that bear all the marks of Arabic calligraphy of the sort seen on Mamluk objects: serifs, strike-throughs, and continuous text written in two registers within the same epigraphic band (figs. 3–4). The many pilgrims that passed through this doorway from the jubilee of 1450 onward were thus ceremonially addressed in an indecipherable language of clearly Eastern derivation. Efforts have been made to read Arabic and Persian words and figures here, without convincing results.

5.

The commitment to producing authentic-looking oriental scripts persisted throughout the fifteenth century. Andrea Mantegna had an especially developed interest in Semitic languages, writing correct Hebrew in several works and even, I suggest, emulating Syriac manuscripts in his Paris Ecce Homo. He was also a fluent emulator, in
receive orientalizing script despite their provenance, but usually there is some basis for this in their antiquity and erudition. In a polyptych by Sano di Pietro in the Siena Pinacoteca, for example, we see to the left a figure of Saint Jerome holding a book with Hebraizing script on it, as is appropriate for the translator of the Bible. On the right is the figure of St. Gregory the Great, carrying a book with identifiably Greek letters. Although born in Rome, Gregory's erudition and authority, and also possibly his many dealings as Pope with the Eastern ecclesiastical authorities in Constantinople, may have prompted this association. Sometimes the distinction was more hierarchical than geographical: In Giovanni di Paolo's San Domenico polyptych now in Castelnuovo Berardenga, the Virgin wears Latin script while the angels wear pseudoscript. Needless to say, artists were also occasionally confused or simply unconcerned about questions of provenance, geography, and theologically inflected linguistics. That only makes it more notable that the distinctions were observed consistently.

6. According to Mack, orientalizing inscriptions of this sort mark the scenes and figures as ancient and remote, lending them a Holy Land atmosphere. Her hypothesis is fundamentally supported by the fact that pseudoscripts are used overwhelmingly on accessories belonging to personages of Eastern derivation. In a panel by Filippino Lippi in the Norton Simon Museum, Saint Apollonia, from Alexandria, carries orientalizing script; next to her, Saint Benedict, born on the Italian peninsula, does not (fig. 5). This is not to say that all Eastern saints bear script; the matching panel to this carries a St. Paul without script. Conversely, Latin saints do on certain occasions receive orientalizing script despite their provenance, but usually there is some basis for this in their antiquity and erudition. In a polyptych by Sano di Pietro in the Siena Pinacoteca, for example, we see to the left a figure of Saint Jerome holding a book with Hebraizing script on it, as is appropriate for the translator of the Bible. On the right is the figure of St. Gregory the Great, carrying a book with identifiably Greek letters. Although born in Rome, Gregory's erudition and authority, and also possibly his many dealings as Pope with the Eastern ecclesiastical authorities in Constantinople, may have prompted this association. Sometimes the distinction was more hierarchical than geographical: In Giovanni di Paolo's San Domenico polyptych now in Castelnuovo Berardenga, the Virgin wears Latin script while the angels wear pseudoscript. Needless to say, artists were also occasionally confused or simply unconcerned about questions of provenance, geography, and theologically inflected linguistics. That only makes it more notable that the distinctions were observed consistently.

7. There is a geo-historical and theological frame for the phenomenon of the pseudoscripts. Early Renaissance art was an oriented art, a fact that is still insufficiently integrated into accounts of the art of the period. In the
hand of the Christ child in Fra Angelico’s San Marco altarpiece is a globe where we see the land masses of Europe, Africa, and Asia. At the center of the globe—\(\times\) or rather \(+\), marks the spot—is Jerusalem (fig. 6). The division of the world into the three continents goes back to antiquity, but the word “Europe” was not used in common parlance, and the word “European” was virtually unknown. To describe the people from this part of the world during this period as Europeans is inevitably to project onto that time and that place the resonances that the word carries now—such as the implications that Europe is central and that it is the originator of cultural forms that are emulated throughout the world.

In this period and for centuries before, this part of the world was most often designated as the Latin West when it was designated at all, and, as Fra Angelico’s map suggests, it was most emphatically not the center of the world. Moreover, it knew itself not to be the center, in part because it did not have a center. After the fall of Rome there was a succession of weak popes and various relatively unsuccessful claimants to the mantle of the Roman imperium. The Latin West also had to contend with the not unreasonable claim that the true heir of the Christian world was not Rome but Byzantium. There was a center in the Latin consciousness, as Angelico’s globe indicates, but it was far away and difficult of access, especially after the Holy Land came under Muslim domination in the seventh century. This center was always more fantasy than reality, and as such it exerted a powerful symbolic pull, occasionally impelling real and violent efforts of recovery, such as the crusades. The crusades, in turn, fed the late-medieval imaginary with a steady stream of reports, relics, images, and other information, intensifying the relation with the imagined center.

8.

The Latin West cannot properly be called a diaspora, but it did arguably have a diasporic structure. Unlike the neighboring diasporic populations of Judaism and Islam, however, the Christians of the Latin West, as the term suggests, read their sacred texts in translation. They never forgot this fact. Magical charms and amulets regularly maintained textual incantations in something approaching Greek or Hebrew, and often enough in mere gibberish, in the belief that the formulas lost efficacy in translation. Ecclesiastical benedictions and blessings, particularly in the context of exorcism, maintained Greek and Hebrew words intact. From the church fathers through Roger Bacon and the Renaissance...
a practice of architectural imitation by which a building built here is understood as an instantiation of a building that exists over there, in a more sacred place.

9.

Aristotle (De Caelo, 2.2.284b) says that the universe moves from right to left, from east to west, as confirmed (in a non-heliocentric view) by the daily course of the sun and stars. The word “orient” comes from the present participle oriens of the Latin orior, to rise. It is related to the Greek verb orino, to rouse or move, which is not far from the Sankrit aruh, to set in motion, suggesting a common Indo-European root associating the word with rising or moving and making move. Orions is thus not a place but rather a direction and a principle of movement; it is where things come from. Orior is the...
great ruler sat, Columbus believed, in the capital Quisay (that is, Hangchou, which had been the capital of the Southern Sung dynasty in the thirteenth century and had been effusively described at that time by Marco Polo). Columbus and his patrons the Spanish kings believed the Gran Kan was disposed to convert to Christianity; with him as an ally, they reasoned, it would be possible to mount a two-front crusade and recapture the holy sites of Palestine once and for all. The interpreter sent inland by Columbus was a Jew named Luis de Torres; Columbus calls him a converso; no doubt he was one of the many Jews forced to convert to Christianity by a Spanish edict passed a few months earlier in the wake of the successful victory of the Catholic kings at Granada, the last remaining Nasrid stronghold in Spain, earlier in 1492. Knowing Hebrew, Aramaic, and some Arabic, Torres was, Columbus believed, well equipped to deal with the Asiatic locals. The first negotiations with the Taino natives of Cuba were thus held in a Babel of languages. If Mantegna’s painting was made well into the 1490s, as is usually thought, then it is possible that his far-Eastern magus with his narrow eyes, rather Chinese moustache and beard, and Ming porcelain cup was imagined as an inhabitant of these Indies. (Columbus died in 1506 still convinced that he had reached Asia.)

10.

The prevailing orientation of the Latin West drove the discovery of America. When Columbus reached Cubanacán, present-day Cuba, on November 2, 1492, he thought he was already on the mainland of Asia, his goal, and accordingly sent an interpreter inland to find a representative of the Gran Kan, as he called him. The root both of orient and origin. The corollary is that the West is recent, by implication young, and also belated. The Vulgate Latin translation of the Bible says that the Magi came ab oriente, and they can be seen as oriental in this deeper sense, as embodiments of the dynamic principle of a rising movement from the East. Mantegna’s Adoration of the Magi shows them in exotic clothing and turbans, and also tries to locate them a bit more precisely (fig. 7). The youngest king is dark-skinned, suggesting an African provenance, apparently confirmed by the jar he holds, which is made of Egyptian alabaster. The Middle King holds a Turkish censer, suggesting a Middle Eastern derivation. The hoariest king comes from farther East, perhaps from very far, as he offers his gift of gold in a porcelain cup that closely resembles Ming porcelain produced only a few decades previously.
11. On January 31, 1492, the very day that news arrived in Rome of the Spanish-Catholic victory at Granada, a signal relic from the Holy Land was rediscovered in the church of Santa Croce in Gerusalemme in Rome, a church under Spanish patronage. This was the titulus crucis, the wooden tablet mounted on the cross that Pontius Pilate had had carved with an inscription that read, in the three languages of Hebrew, Greek, and Latin, “Jesus of Nazareth King of the Jews.” This artifact, which still exists, carries one signal feature unremarked in the biblical text: The Greek and Latin text are written in mirror script from right to left. Reports of the discovery of early 1492 were sent far and wide; one was duly sent from Rome to the de facto ruler of Florence, Lorenzo de’ Medici, as well as to the papal ambassador in Florence, who was in close contact with the most important scholars there, including Angelo Poliziano and Pico della Mirandola. It was probably shortly after the arrival of this news that Michelangelo, a teenage pupil of Poliziano and a lodger at Lorenzo de’ Medici’s palace, carved the famous crucifix for the church of Santo Spirito, whose titulus bears the telltale feature of the backwards Greek and Latin script (fig. 8).

The report sent to Florence announcing the discovery of the titulus offered an explanation of this curious feature, proposing that the Greek and the Latin were written backwards in conformity with the more venerable Hebrew, as “they did not want to go against the primary way of ordering script that belongs to Hebrew letters.” Brought into the proximity of the more sacred language, the Greek and Latin switch direction and march backwards, as it were performing a kind of pilgrimage. The backwards orientation of the Greek and Latin is an acknowledgment that they are later derivations, departures from the Hebrew source. Some scholars at this time held that Hebrew was the true original language, spoken by Adam and Eve in paradise. Others contended that it came into being only after the expulsion from Eden, remaining dominant until Babel. Whether primordial or not, Hebrew was far older and thus more authoritative than Greek or Latin. In 1524 the English Hebraist Robert Wakefield explained, citing Aristotle’s words about the movement of the heavens, that the Hebrew language follows the example of nature by going from right to left, putting the Hebrews in greater harmony with God’s order than the Greeks and Latins, who somehow got themselves into the bind of writing in such a way that the pen is in the way of the letters one is trying to put down. For such reasons, Hebrew was believed to have powers that the other languages did not have. In the years just preceding the discovery of the titulus, Pico della Mirandola, who had been engaged in an intensive course of Hebrew and Kabbalah study, affirmed that the only names that were effective in magic were Hebrew or derived from Hebrew.

12. The year 1492 was thus a high-water mark of the Italian fascination with its own Eastern roots. It was the year that the titulus with its strange script was discovered and Columbus reached what he believed to be the coast of Asia in the company of his Hebrew, Aramaic, and Arabic-speaking interpreter; it was also the year of the supposed (and highly celebrated) discovery by the Friar Annius of Viterbo of a cache of ur-ancient archeological finds, including hieroglyphs commemorating the presence of the Egyptian god Osiris on Italian soil. Not long after this point, that basic orientation—the idea that it was necessary to return to or recover an Eastern origin—was to fade. Eurocentrism as we know it was soon to emerge as a determining conception of the world. The pseudoscripts are a powerful index of the fundamental orientation of Western art up to this point. Post-Roman Western art before the sixteenth century could thus be called pre-European art.

13. The entire culture of courtly silks in late medieval Europe was based on imports from the eastern Mediterranean and from Spain, and many of these païles d‘orient and porpre sarazinesche carried Arabic script. Sometimes these prestigious textiles were adapted for sacred objects and implements, used to line reliquary boxes, for example, or adapted as liturgical vestments or altar cloths. When silk production got going in Italy in the fourteenth century, the Italians imitated the
patterns of the Eastern silks right down to the scripts. Painters often functioned as designers of textiles, so it is no surprise that they should have paid careful attention to the silks that appeared in their own paintings and sculptures. It is thus notable that the garments worn by the figures represented in the art of the period should be so freely invented.

In a painting of the Egyptian Saint Catherine, the Spanish artist Fernando Yañez adapted patterns of the sort found on a Nasrid curtain now in the Metropolitan Museum (figs. 9–10). The pattern on her sleeves is very close to that of the curtain, but no garment with script-filled sleeves of this sort was ever actually produced. The artist tailored his saint’s clothing as it were from whole cloth. The garment may be fanciful, but the transcription of the interlaced forms is extremely faithful.

14.

Why do we see such a prevalence of pseudoscript in Western art of this period when accurate transcription of the Arabic inscriptions on Islamic objects and textiles was clearly possible for Western artists? The pseudoscripts cannot simply be ascribed to incompetent or merely lazy transcription. When copying letters of a foreign language errors will inevitably creep in, due to the fact that it is difficult to tell which parts of a given letter are formative and which parts are ticks of a scribal style. But even a very faulty transcription produces some areas of correspondence. Instead, what we have is a great number of invented scripts and then a few scattered cases of startlingly accurate transcription, such as the adroitly rendered Arabic inscription in thuluth script from one of the appurtenances of the emperor John VIII Palaiologos seen in a famous drawing by Pisanello now in the Louvre (fig. 11). He took careful notes on those things that elude a drawing in ink, such as the color of the garments, and in keeping with that documentary emphasis he made an effort to transcribe this text correctly.
operating at the edge of conventional iconography, the invented scripts entered a realm of equally daring conceptual experimentation that clearly attracted the art makers, who poured their ingenuity into it, and on occasion perhaps intrigued their clients.

15.

Western artists repeatedly put pseudoscripts on sleeves, on collars, and on hems. These are not the places where script usually appears on Islamic apparel, indicating a rhetorically significant choice. The sleeves, collars, and hems that carry the scripts are labile zones, places where the body emerges from the clothing and makes contact with the world. To put the scripts there is to suggest that these scripts have an oral quality, that they are communications, messages either emanating from the personage or addressed to the personage. What might be the nature of these communications?

Excellent transcribers of forms, Renaissance artists such as Pisanello could have copied foreign scripts exactly if they had wanted. Instead, they opted, over and over again, to place scripts of their own devising in their paintings and sculptures. A negative explanation would have it that this reticence was designed to avoid the danger of unwittingly transmitting un-Christian messages. Outright challenges to Christian orthodoxy could be contained in the Arabic inscriptions. A bronze platter “made with Egyptian letters as ornaments” offered to the Byzantine emperor Michael VIII Palaiologos (during the ceremony of the Feast of the Presentation of the Christ Child on February 2, 1279) caused a scandal when it was learned that the inscription bordering its rim praised the “loathsome name” of Mohammed. The Byzantine Patriarch who had prepared the gift, John XI Bekkos, fell from grace as a result of the incident.

There are also possible positive explanations of the preference for pseudoscripts over transcriptions. The infra- or extra-linguistic sphere of the invented scripts may have had value in its own right. Such experiments crystallized a number of significant theological and philosophical questions about the nature of language and its relation to ornament. Pseudoscripts willfully dismantled and recomposed the medium of language, pointing to a language beyond language, or perhaps a state before conventional language. Formal experiments operating at the edge of conventional iconography, the invented scripts entered a realm of equally daring conceptual experimentation that clearly attracted the art makers, who poured their ingenuity into it, and on occasion perhaps intrigued their clients.

Figure 11. Pisanello, Drawings after John VIII Palaiologos, 1438–1439. Musée du Louvre, Paris. Photo: NYU Luna Imaging.
him. Such acclamations and invocations have a distinctly oral quality, marked by the use of imperatives and exclamations.

16.

Linguists have often observed that exclamations belong to a category apart from the normal propositional and representational functions of language. At the beginning of his treatise De Interpretatione, Aristotle classed utterances such as prayers and cries apart from the realm of logic and thus excluded them from consideration. In his Principles of Phonology Nikolai Sergeevich Trubetskoi noted that this kind of para-linguistic utterance, which includes interjections, onomatopoeias, as well as calls and orders aimed at domestic animals, tend to have an exceptional phonetic structure, involving the production of sounds foreign to those normally produced in the speaker's tongue. For example, the clicking and clacking sound used to spur on a horse, or the “brrrr” used to express a shudder, or the exclamation of disgust “acchh,” which involves a constrictive consonant KH reminiscent of the Castilian letter JOTA, also close to Arabic, are all moments that escape the normal phonetic limits of English.

Christian liturgical language has recourse to untranslated Hebrew words, such as Hallelujah, Osannah, or Amen, at moments of prayerful exaltation. Passing beyond the boundaries of one's language, exclamations can also leave behind language altogether. In his exposition of the Psalms, Saint Augustine says that since there are no words capable of pleasing God, it is suitable to address him in non-verbal utterances of jubilation. “[H]ow can we celebrate this ineffable being, since we cannot be silent, or find anything in our transports which can express them, unless unarticulated sounds?” This proposal provided justification for the use of melismas floating freely of lexical units in liturgical chant.

In all these cases, the speakers of a given language are led outside the normal range of their speaking ability, and as it were, part of the way back to the condition of the infant's prattle before the acquisition of language. The Czech linguist Roman Jakobson showed that the babbling child is capable of a range of articulations that far exceeds that of any one language or any group of languages. At the “apex of babble” (die Blüte des Lallens) there the child's sound-producing ability is virtually unlimited, but this astonishing range falls away, Jakobson observed, as the child acquires the ability to speak a given language. Exclamations, interjections, onomatopoeias, and the prayers and cries that Aristotle left outside the realm of logic are, in this sense, remnants, echoes of the babble from which language emerges, as Daniel Heller-Roazen has pointed out.

I am not affirming the truth of this linguistic theory about infantile babble. I am interested rather in its affinity with the concerns that motivated the pseudoscripts. Jakobson's openness to the possibilities of babble is not unrelated to cultural preoccupations of his time, to the experiments of, say, Kurt Schwitters’s Ursonaten. (Jakobson wrote an early essay on the Dada movement in 1921.) Hugo Ball’s experiments with nonsensical utterances at the Cabaret Voltaire were, Ball himself noted, relapses into the patterns of liturgical chant.

17.

The escape from the limits of one's language was often taken to be a sign of divine inspiration, as in the gift of tongues given to the Apostles and the glossolalia of mystics throughout the Christian tradition. A famous case is Hildegard von Bingen, who was a practitioner not only of glossolalia, the gift of unknown speech, but also glossographia, inventing the alphabet of her lingua ignota. The Bolognese early sixteenth-century mystic Elena Duglioli acquired the spontaneous ability to write in Aramaic and Hebrew, despite the fact that she had never studied those languages. Were her scribblings inspected by someone with knowledge of those languages, or were they orientalizing pseudoscripts of the sort seen in countless paintings and sculptures?

Given this context, it would be a mistake to see the pseudoscripts simply as feeble efforts to portray languages beyond the ken of a given artist or patron. Instead, at least on occasion, they figure a rapture of human utterance. They resemble a hoary, sacred language without being identified with any one. They are not simply another language; instead, they signal a potentiality that is lost sight of in normal, conventional language. Rather than simply representing a language understood as a collection of signs with meanings, pseudoscripts place on view the process whereby signs acquire and communicate meaning. They are unreadable to us, and yet they are being presented to us. Is there something in them that can speak to us across the gap of illegibility? In the terms of the period, they train attention on the problem of the “signature,” a potentiality that makes it possible for any form or thing to become signifying, enlivening the world with meaning. Adam, giving proper names to all things, was, according to the sixteenth-century Swiss doctor and philosopher Paracelsus, “the first signator.” In The Signature of All Things (1621), the philosopher Jakob Böhme explained the nature of signatures through the
simile of the lute, which remains inert and silent, its signature not perceived, until it is played. As he wrote, “For though I see one to speak, teach, preach, and write of God, and though I hear and read the same, yet this is not sufficient for me to understand him; but if his sound and spirit out of his signature and similitude enter my own similitude, and imprint his similitude into mine, then I may understand him really and fundamentally, be it either spoken or written, if he has the hammer that can strike my bell.” Pseudoscripts, possibly meaningful and possibly just gibberish, isolate the function of the “signature” itself.

The border between meaning and non-meaning, highlighted by pseudoscript, acquired special importance in the context under consideration here, which is among other things an emergent culture of collecting. The collector of antiquities in this period continually confronted the border between attachment to and detachment from the life-world and belief systems presupposed by the objects they collected. How do they communicate across this gap? Antique statues and cameos were idols for some and objects of beauty, or cultural artifacts, for others. On his first-ever encounter with New World artifacts (October 29, 1492), Columbus wondered whether certain “very well carved” sculptures of female figures were made as ornaments or in order to be worshipped—that is, whether they were “aesthetic” or “functional” objects, a question that has overshadowed the study of art ever since. When artifacts are imported from elsewhere and then presented for admiration and study, the passage from functional object to collectible is, as it were, performed in real time. Pisanello, carefully copying an inscription he could not read, knew that it was also very probably illegible to the man who had acquired it, the Byzantine Emperor—in other words, that it had traversed a threshold from one context of use and understanding to another (fig. 11). If he had inquired as to the inscription’s meaning, he would have learned that in fact it no longer was “working” for the man in whose behalf it invoked blessings. The pseudoscripts are products of a receiving and collecting culture. They focus attention on pressing questions about whether and how artifacts mean. They show communication occurring, or failing, across a threshold. Apparently about other cultures, the questions are really ones posed by Western art about itself.

18.

We might well ask how we know many of the decorations at the edges of the figures’ garments are script and not ornament. In Giotto’s Virgin and Child in the Washington National Gallery of Art the sequence of forms is carefully devised to avoid overly strict repetition on the one hand and mere randomness on the other (fig. 12). There is repetition of an irregular sort, generally the sort that one would expect from a linguistic structure. For example, the backwards K that we see at the top of the Virgin’s forehead appears again at the Virgin’s right temple (fig. 13). Even in the repetition, the forms vary somewhat, raising the question: How much latitude is allowed in the formation of a letter? Are these two forms versions of the same letter, or is the modification a distinguishing phonetic feature, like the Hebrew dagesh? Or are they two different letters? Already to ask these questions is to accept provisionally that what we are looking at is a sample of language. By contrast, the diamond shapes that appear at regular intervals contain a stylized foliate cross formation that is very consistent throughout, too strictly consistent to be that of a language.

There is an illuminating contrast between the border of the Virgin’s mantle and that of Christ’s wrapping, where instead of the foliate crosses and diamonds we have quatrefoils, and instead of script we have a highly regular pattern of double brackets framing double points (fig. 14). This is not a linguistic structure. However, we find a third solution, somewhere between the other two, on the Virgin’s sleeve (which is part of her tunic, a separate vestment from her mantle). It shows characters like the ones on her mantle, but now the array has been reduced to two characters presented in alternation: an upward-forking form followed by a downward-forking form, followed by an upward-forking form, and so on. We thus have: 1. the Virgin’s mantle, which carries a full-fledged language; 2. Christ’s wrapping with its repetitive ornamentation; 3. the Virgin’s sleeve with the alternating characters. Solution three offers the ones and zeros of a binary code, building blocks of a language still in a dormant state. Ornament, here, is language in a potential state.

Some of the most ingenious solutions offered by Italian artists respond to the challenge of negotiating the frontier between ornament and script. In his panel of St. Andrew in the Metropolitan Museum, Simone Martini places repetitive ornamental forms on the saint’s mantle, whereas on the collar of his tunic we see script. Only a small portion of the collar is visible, but that is enough to indicate that these forms are samples of a language. The fact that such discriminations can be made on the basis of a partial view, and at a glance, confirms the distinction.

Another related solution is offered in a painting by Giovanni di Paolo in the Norton Simon Museum (fig. 15). We see a number of legible Latin inscriptions distributed throughout the painting, but on the border of the Virgin’s
mantle there is illegible script that derives from Latin lettering. The letters do not form recognizable words and the letterforms themselves are freely played with. There is an upside-down and backwards F, a backwards N, a backwards B, and so on. Moreover, the letters are imbricated in ornamental lines, making them difficult to discern at all. We are made to wonder, which lines in this welter of striations belong to the letterforms and which lines do not? The logic here seems to be that one can reverse-engineer an archaic script by turning familiar script in unfamiliar directions and processing it through a mesh of ornament.

19.

The main point of pseudoscript is to indicate, first, that these marks are linguistic in structure, and, second, that we cannot read them, or have lost the capacity to read them. Since they are, in fact, impossible to read, one could say they mimic encryptions, messages that have been deliberately rendered illegible to all readers not in possession of the message's key, with the difference that here there is no key. These scripts are going through the motions of cryptography. Rather than call them pseudoscripts we could call them pseudo-encryptions.

It is possible that under sufficiently patient scrutiny some of them will turn out to be encrypted not only in appearance but in fact. Cryptography was, after all, a highly developed art in the period. Besides writing treatises on painting, sculpture, and architecture, Leon Battista Alberti wrote a treatise on ciphers. The holy grail of cryptographers, right down to the present day, is the so-called Voynich manuscript at Yale University, now dated by radio carbon analysis to the early fifteenth century. Statistical analysis of character frequency, word length, and repetition distance distribution indicates strongly that this array of characters has a structure resembling that of language. But does that mean it is encoded—that it is language? The field of Voynich studies remains divided.
20.

The word ornament is “kosmos” in Greek because ornament bespeaks the ordering of the universe. Ornament is a kind of pre-language, and it is also the direction in which language moves when it aims to become universal or original. Ornament is the orientation of language. Or, rather, it is the language of things.

21.

In Raphael’s Terranuova Madonna in Berlin, we see an M for Mary in the middle of her collar, on either side of which are mirrored bracket-like forms, and then extending to either side there is a kind of script (fig. 16). Unlike the scripts reviewed so far, this one seems devised to avoid obvious resemblance to known oriental languages. Instead, Raphael has endeavored to imagine an archaic or Edenic script hovering at the frontier of ornament. Each of the letters is delicately balanced and yet manages to avoid mere symmetry; at the same time, they verge on geometrical figures, just beyond script. But then viewed another way, they are just Latin letters hiding in plain sight. There is an R, an ornamental M, and a Z, as well as a K, and an A.

22.

Pseudoscripts are a kind of signature, revealing the hand of the artist not only in their manual ductus but also in what could be called their conceptual style.
The subtlety of expression, storytelling, description, and stage-setting in Giotto’s painting (figs. 12–14) is matched by the subtlety of his pseudoscripts. Similar things can be said of the pseudoscripts in works by other exceptional artists: Carefully conceived pseudoscripts are an excellent index of purely autograph work or at least work in which the shop was operating at its highest level. They offer data that should interest connoisseurs in a systematic way.

23.

A painting of 1502 made by Andrea Mantegna for the studiolo of Isabella d’Este shows the goddess Minerva dispelling monstrous vices from the garden of virtue (fig. 17). The goddess strides in from the left bearing shield and lance, preceded by two of her companions yelling battle cries (unless these, too, are vices). Most of the vices shown fleeing from the goddess are conveniently labeled. Just in front of Minerva, we have an armless Leisure sluggishly dragged away through a dank swamp by an irritable Inertia. Farther along, we have a simian Suspicion who carries the seeds of Bad, Worse, and Worst. Farther along still, we have a scantily draped huntress standing on the back of a centaur, a hybrid creature with a lion’s head, and on the right we see a fat and dazed Ignorance carried (that is, sustained) by Ingratitude and Avarice. At the extreme right edge of the picture is a walled-in structure to which is appended a scroll that reads: “And you, oh Gods, save me, the Mother of the Virtues,” suggesting she lies imprisoned within.

On the left is an olive tree with a long scroll wrapped around it that reads at the top, in Latin, AGITE, PELLITE SEDIBUS NOSTRIS / FOEDA HAEc VICIORUM MONSTRA / VIRTUTUM COELITUS AD NOS REDEUNTIUM / DIVAE COMITES: “Come, divine companions of the Virtues who are returning to us from Heaven, expel these foul monsters of Vices from our seats.” The scroll wends around the tree, revealing two more inscriptions below: The middle one has been seen as a kind of pseudo-Greek, and the bottom one carries Hebrew letters that do not form any known words (fig. 18). The tree is anthropomorphic, the head shown with open mouth as if saying the words. With its arm-like branches outstretched, the tree is a sort of crucifix where the figure and the wood have merged. This scroll is thus a kind of secular version of the titulus of the cross with its three languages of Latin, Greek, and Hebrew.

Once we identify those Christian resonances, other crypto-Christian elements in the painting come through. A call to unseat malevolent forces wrongly occupying a sacred site presided over by a tomb-like structure: The

Figure 16. Raphael, Mary and Jesus, ca. 1505, detail. Gemäldegalerie, Berlin. Photograph by the author.
scene fairly reverberates with the rhetoric of Christian crusade, whose battle cry was “Liberate the Holy Sepulcher.” Right next to the quasi-Sepulcher at the right edge, we have a parody of an Entombment scene in the two figures carrying the brain-dead ignorance. Even the lightly draped terrestrial Venus standing atop the centaur rhymes with countless figures of the blessing by resurrected Christ, particularly resurrected Christ figures by Mantegna himself. The light in the painting streams in from the right, in contrast to conventional left-to-right picture lighting. In its original location in Isabella’s studiolo, the source of light would indeed have been a window to the painting’s right. That window, which still exists, looks east. Coming from the west, Minerva strides eastward to reclaim and liberate the holy sanctuary.

More than a veiled reference to crusade, the work anatomizes the rhetoric of crusade, in particular the tropes of occupation, displacement, and contested reference. What is the name of this place? If it is the garden of virtue, why is it occupied by vices? Does that mean that it is no longer the garden of virtue? What does it mean that a place can be assigned, reassigned, and is now contested territory? Under this kind of analysis, the binaries that structure crusade rhetoric are difficult to maintain. Is the conqueror a native or a colonizer? Who belongs here? What does belonging mean? If this is a triumph of clarity over confusion, of virtue over vice, then why is the garden that is supposedly the seat of virtue so uncannily artificial and polymorphous? In the foreground, vegetation has assumed the form of arcades, and in the background a craggy mountain gradually, very gradually, assumes the structure of masonry. Even the cloud formations above take the shape of profile heads, mimicking those below. And what sounds the call to expel the monsters but a rather monstrous anthropomorphic tree?

It turns out the scripts scrolling around the tree, too, are not what they seem. Most scholars have seen the second inscription as a kind of pseudo-Greek, but several years ago Giulio Busi pointed out that this inscription is in fact perfectly legible, that it is nothing other than a highly floriated version of the Latin text directly above (fig. 19, p. 228). It takes a while to habituate one’s eyes, but then the repeated words emerge clearly enough. Bordered by shadow on the top line is the word nostris. The N and the O are fairly straightforward; the S is rather extended, the T is made up of a twirling line; the R is in lowercase, followed by a very long and foliated I, closely
resembling the S that follows it. These last two letters are a mini-disquisition on the question of language and ornament. On the I the upright is what matters; the flourishes at the bottom and top are decorative. In the S, the very same curling form at the bottom and the somewhat more ample curve at the top are, instead, constitutive of the letterform.

Just a few years before this painting was made, Mantegna’s patron Isabella d’Este wrote to her humanist advisor, Paride Ceresara, thanking him for having sent her a sampling of “Syrian or Babylonian sacred letters” (probably Syriac or Aramaic). She asks him, however, to clarify whether certain features of the letterforms belong to the letters or are merely ornamental, solum per adornamento, in which case she asks him to send a transcription of the letters pure and simple, schiette et semplici, “as they were written in their own time.”

In the word following nostris, foeda, the D is backwards and carries a rather extravagant flourish at the top. The A that follows it could easily be misread as an X if some of its flourishes were deemed essential features. We are able to parse the text because we have the clear Latin capitals directly above for reference. Would we be able to navigate legibly through these forms without the help of this inscription in Latin majuscules before our eyes? Given that the identity of the two texts—one highly legible, one not—has been missed by generations of scholars intent on deciphering all the clues in this painting, it is highly likely that if it had been presented entirely on its own this second inscription would be consigned even today to the family of pseudoscripts.

Mantegna thus shared Isabella’s interest in the frontier between ornament and script. His contribution to the discussion is the playfully disguised text on the scroll, where a perfectly legible script hides in plain sight under a thin veil of ornament. It is a pseudo-pseudoscript, a commentary on a now centuries-old tradition of pseudoscript in art. The trick he plays on his viewers serves as a demonstration of how easily a real message can be camouflaged by ornament. It also admonishes, conversely, that what looks like mere ornament, or mere pseudoscript, may in fact be message-bearing. This jeu d’esprit strongly encourages a closer look at the bottom-most script of our scroll, which contains mostly real Hebrew letters in an apparently nonsensical jumble (fig. 18). Perhaps here, too, we are being offered a challenge of decipherment. In Mantegna’s painting, we have reached the point where the whole tradition of pseudoscript is itself undergoing scrutiny and recognized for what it is, which is, among other things, a meditation on encoding itself.
24.

The no-longer-quite pseudoscripts of Mantegna in 1502 and Raphael in 1504 announce the end of a history. Shortly after this point, pseudoscript falls away from visual art. It is rare to see it in a work of art after 1520. We might explain this as evidence of cultural progress: knowledge of the relevant languages had increased to the point where orientalizing gibberish now seemed embarrassing or downright silly, and the alternative of introducing real Hebrew or real Arabic seemed too heavy-handed. It is more likely that the disappearance of the pseudoscripts has rather to do with changes in the status and claims of art. The art from Cimabue to, let us say, Mantegna and Raphael is an art that is persistently concerned with the problem of reference, that is, with truth in reporting; it deals in true likenesses, authentic portraits, reliable copies, and so on. The pseudoscripts, far from being naive and silly, are bound up in the referential commitments of this art. Those commitments fall away in the sixteenth century under the critical pressure exerted by, among other things, the Reformation. It became possible to describe all works of art, both present and past, as fictions, dammingly as nothing more than fictions in the eyes of Protestant reformers, and, affirmatively, as nothing less than fictions for, say, Giorgione, or Titian, or those who appreciated their art. And fictions do not need pseudoscripts.

25.

After 1500, works of art do not simply expel the pseudoscripts. They become pseudoscripts, writ large. Invented scripts are improvised forms that seem to imply a set of rules, forms that insistently raise the question whether they are meaningful or not, whether they are a language or not, whether they have a grammar and a history. The pseudoscripts thus raise questions that apply to works of art generally. So much is suggested by a 1506 letter from the poet Pietro Bembo to the same Isabella d’Este, where he informs her that if she wants a painting to be given overly assigned terms [il suo stile] to be given overly assigned terms [molto signati termini], as he is accustomed to wander at will in his paintings. Artistic freedom of invention is here described as a work of the pen (stile) that does not hold to the given terms, a description that makes painting sound quite a lot like producing a script of one’s own invention. The combination of free handling and fictional rule-making characteristic of the pseudoscripts now extends to the entire work, not only in the literal sense of experiments with open brushwork, which do start occurring at this date, but in this deeper sense. When pseudoscripts pass from being a feature of art to being a model for art, the history of art comes into view as nothing more, and nothing less, than a history of ways of doing things, which is to say a history of styles. Religious art can be seen as nothing but a manipulation of stylings of the sacred, and indeed was condemned as such by Protestant reformers. Or, style can emerge as the fundamental category for understanding how humans shape and interact with their world.

BIBLIOGRAPHICAL REFERENCES


2. For a recent set of essays on the question of improvisation in both music and art in this period, see Improvisation in the Arts of the Middle Ages and Renaissance, ed. T. J. McGee (Kalamazoo: Medieval Institute Publications and Western Michigan University, Kalamazoo, 2003).


5. On Mantegna’s Hebrew scripts, see G. Busi, L’enigma dell’ebraico nel Rinascimento (Turin: Aragno, 2007), pp. 99–105. On Verrocchio’s David, see A. Butterfield, The Sculptures of Andrea del Verrocchio (New Haven: Yale University Press, 1997), pp. 18–31; the scripts are clearly visible in fig. 25a–d. For Jacopo della Quercia, see Le Arti a Siena, Da Jacopo della Quercia a Donatello, ed. M. Seidel (Milan: Motta, 2010), in particular the terracotta Virgin and Child in the Salini collection in Gallicco, where the scripts are clearly visible in the illustration on page 53.

6. On the Filippino panels, see J. Katz Nelson and P. Zambrano, Filippino Lippi (Milan: Electa, 2004), cat. 26, pp. 38–40. On the Sano di Pietro altarpiece, see La Pinacoteca Nazionale di Siena: I Dipinti, ed. P. Torriti (Genoa: Sagep, 1990), cat. 231, p. 277. The fifteenth-century preacher Bernardino da Siena, portrayed more than once by Sano, raised against the belief, evidently popular in his day, that Christ had acquired the ability to perform miracles as a result of having stealthily entered the Jewish temple and gained possession of a carefully guarded writing (the Tetragrammaton), “a name that no one was allowed to name or to know, which was guarded by many dogs so that that name would not be learned, nor read, nor written, nor in any way taken away . . .” San Bernardino da Siena: Le prediche volgari, ed. P. Bargellini (Milan: Rizzoli, 1936), sermon 24, p. 523.


8. On charms and talismans in the Middle Ages, see E. Pettit, Anglo-Saxon Remedies: Charms, and Prayers from British Library Ms Harley 585: The Lacnunga. Vol. 1: Introduction, text, translation and appendices (Lewiston, N.Y.: Mellen, 2001) and D. C. Skemer, Binding Words: Textual Amulets in the Middle Ages (University Park: Pennsylvania State University Press, 2006). On benedictions and blessings, see A. Franz, Die kirchlichen Benediktionen im Mittelalter, 2 vols (Graz: Akademische Druck und Verlaganstalt, 1960), II: 429, 532–534. (My thanks to Herbert Kessler for this reference.) On the translatedness of the Latin bible, see R. Belle Burke, The ‘Opus Majus’ of Roger Bacon (Philadelphia, 1928), vol. I, p. 75: “For it is impossible for the Latins to reach what is necessary in matters divine and human except through the knowledge of other languages. . . . For the whole sacred text has been drawn from Greek and Hebrew, and philosophy has been derived from these sources and from Arabic; but it is impossible that the propretias of one language should be preserved in another. . . . Therefore no Latin will be able to understand as he should the wisdom of the sacred Scripture and of philosophy, unless he understands the languages from which they were translated.” See also B. Smalley, The Study of the Bible in the Middle Ages (Oxford: Blackwell, 1952), p. 362. For Isidore of Seville on the lessons of the titulus, see Etymologies IX, 1.3. On the phenomenon of architectural imitation, see, principally, R. Krautheimer, “Introduction to an ‘Iconography of Mediaeval Architecture,’” Journal of the Warburg and Courtauld Institutes 5 (1942):1–33. One of the great instances of architectural imitation, and an important pilgrimage target of the later Middle Ages, was the house of the Virgin miraculously (re)constructed in Walsingham, England. Erasmus visited Walsingham in 1512 and then offered a semi-fictional account of the visit in his Colloquy “A Pilgrimage for Religion’s Sake,” in Collected Works 40 (Toronto: University of Toronto Press, 1997), pp. 619–674. Erasmus actually left a votive tablet at the shrine with a poem inscribed in Greek to the Virgin (see p. 651, note 78). In the dialogue, its reception is described; some thought it to be in Hebrew, some in Arabic, some thought it mere gibberish (p. 636):

Ogygius: He asks if I was the man who two years earlier had put up a votive tablet in Hebrew. I admit it.

Menedemus: Do you write Hebrew?

Ogygius: Of course not, but anything they don’t understand they call Hebrew. . . . [The keeper of the shrine] tells me how hard many persons toil to read those lines and how often they wipe their spectacles in vain. Whenever some aged person came along he was marched off to the tablet. One would say the letters were Arabic; another, that they were fictitious characters.


11. The titulus has been dated by radiocarbon analysis to no earlier than the tenth century and is probably a forgery of the twelfth century. The forgers masked their own ignorance of Hebrew by cutting the top line of text, leaving only a few squiggles and strokes. The papal master of ceremonies, who kept a very informative diary of goings-on in Rome, was one of
the many people who noted this strange feature of the artifact, saying that the texts were written “in reverse order, in the manner of the Jews.” He also carefully noted where the letters were truncated, as this is only a fragment of the original *titulus*: the Latin inscription, for example, stops halfway through the word “rex,” king. A letter of February 4, 1492, from Leonardo Sarzano in Rome to Giacomo Gherardi in Florence is in the Vatican Library, Vit. Lat. 3912, f. 43v. Gherardi was *nuntio* of Pope Innocent VIII and close to Giovanni Pico della Mirandola and Angelo Poliziano. For these and other references and a fuller discussion, see A. Nagel and C. Wood, *Anachronic Renaissance* (New York: Zone Books, 2010), section XIX. On the quest for the primordial language see generally U. Eco, *The Search for the Perfect Language* (Oxford: Blackwell, 1995). Robert Wakefield, *On the Three Languages*, ed. and trans. G. Lloyd Jones (Binghamton: Medieval and Renaissance Texts and Studies, 1989), pp. 96–97. On Pico (who is echoing Origen, *Contra Celsum*, 1.24–25 and 4.45), see A. Ansani, “Giovanni Pico Della Mirandola’s Language of Magic,” in *L’Hébreu au Temps de La Renaissance* (Leiden: Brill, 1992), pp. 89–104, and Busi (note 5), pp. 35–46.


15. A. Contadini, *Fatimid Art at the Victoria and Albert Museum* (London: V and A Publications, 1998) points out that though *tiraz* fabrics with inscriptions could carry text on a border (see fig. 19), most, especially in the later period, tended to feature inscriptions in rows throughout the garment rather than on borders. My thanks to Elizabeth Williams for this reference.


Writings, ed. A. E. Waite (London: James Elliott), 1894, vol. I, p. 188. For Böhmé on signatures, see The Signature of all Things (London and Toronto: Dent, 1912), chap. 1, pp. 9–10. My remarks on this question are also inspired by G. Agamben, The Signature of all Things: On Method (New York: Zone, 2009), chap. 2. On Columbus’s encounter with New World artifacts, see A Synoptic Edition of the Log of Columbus’s First Voyage (Repetitorium Columbianum, vol. VI), as in n. 10, p. 61; for Spanish, p. 517: “Hallaron diz que muchas estatuas en figura de mugeres y muchas cabeça muy bien labradas de palo; no supo si lo tenian por arreo y hermosura de casa o lo adoravan.”


20. Hugh of St. Victor, De scripturis et escriptoribus sacris, cap. 14, PL CLXXV, col. 20: “The philosopher knew only of the meaning of the words in his books; but in the holy Scriptures the meaning of the things is much more important than that of the words, because the latter is only customary, but the former is ordered by nature. The latter is the language of man, the former that of God addressed to man. The meaning of the words is man-made, the things have their meaning from nature and by the act of God who wished some things to be meant by others. The meaning of things is also much more multiple than that of words. Because few words have more than two or three meanings, but every thing may mean as many other things, as it has visible or invisible qualities in common with other things.” The best discussion of the medieval and Renaissance understanding of ornament as cosmos is A. Fletcher, Allegory: The Theory of a Symbolic Mode (Ithaca: Cornell University Press, 1964), pp. 108–144.


23. Some scholars believe that the two figures striding ahead of Minerva with mouths open are not Minerva’s companions but are part of the assembly of vices, fleeing together with them. See R. Lighthoon, Mantegna (Oxford: Phaidon, 1986), pp. 206 and 266, note 103, and S. Campbell, The Cabinet of Eros: Renaissance Mythological Painting and the Studiolo of Isabella d’Este (New Haven: Yale University Press, 2004), p. 147. Campbell calls the bottom two inscriptions on the scroll pseudo-Greek and pseudo-Hebrew. Lighthoon (ibid., p. 202), calls the three scroll inscriptions Latin, Greek, and Hebrew, but in the attendant note (p. 266, note 86) he says that in fact the Greek letters contain a Latin inscription, without apparently recognizing the text to be the same as the one directly above. On Paride Ceresara’s study of Oriental languages and his connections to the Hebrew scholars of Mantua, see Busi (note 5), pp. 99–109. For Isabella’s letter asking for the Syrian letterforms pure and simple, see A. Luzio and R. Renier, La coltura e le relazioni letterarie di Isabella d’Este Gonzaga, ed. S. Albonico (Milan: Bonnard, 2006), p. 97: “Havemo gratissime le literare sacre, o siano syrie o babilonice, come scriveti, quali . . . ne haveti mandate, et vi ne ringratiamo. Ma per più nostra chiarae haveremo charo che ce avisiati se alcuni fogliami che hanno esse literare sono di sustantia o pur solum per adornamento, il che quando fosse vi pregamo ne mandiati un altro esempio d’esse literare schiette et semplici, come si solevano a li soi tempi notare.”

24. On some of the modalities of documentation and reference in the art of the earlier period, see Nagel and Wood (note 11).