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*Why write a book? Artisanal experience and the written word in early modern Europe*

This paper considered the relationship between craft techniques and writing. Around 1400 craftspeople and practitioners, used to looking, learning, and practicing on the shop floor, suddenly transformed their lived experience and embodied—often tacit—knowledge into writing and compiled it into texts. Many well-known artists, such as, Leonardo da Vinci (1452-1519), and Albrecht Dürer (1471-1528), to name only two, wrote about their techniques, but many more lesser-known artisans, including gunpowder makers, gunners, fortification experts, and navigators, who previously had been happy to live out their lives without recording their experiences and knowledge, and creating and producing in relative obscurity, suddenly began to write.

We might take this writing as an expression not only of self-consciousness, but also of self-confidence expressed in materials, such as in the 1392 self-portrait in stone of Peter Parler proudly placed on the Prague Cathedral where he acted as master mason, in the goldsmith and sculptor Lorenzo Ghiberti's (1378?-1455), own portrait in bronze on the doors adorning the Florentine baptistery (1425-52) at the same time he was experimenting on paper in his "Commentaries," and Jan van Eyck, who referred to himself prominently and powerfully in writing in his paintings, his 1434 the Arnolfini couple, placed his maker's signature, "Johannes de Eyck fuit hic," in the very center of the painting.

These men all expressed ambitions to record themselves in some medium, often in writing as well as representation. This self-assertion took place in the context of increasingly powerful territorial rulers and their need of artisans for war technologies and for the representation of power. At the same time, Europe had become increasingly urbanized, with concentrations of artisans experimenting with different media and engaging in an intense exchange of skills and ideas with their fellow craftspeople and other social groups.

Now there are two intriguing points about this boom in technical writing. First, artisans and practitioners of the mechanical arts didn't need to write in order to engage in this intense exchange, for, as we all know, craft knowledge is efficiently transmitted by means of apprenticeship and disseminated rapidly by the movement of embodied knowledge in the artisans themselves. Evidence that the written word was in fact not the best method of transmission comes ironically from the writings of practitioners such as Benvenuto Cellini, (1500-1571), Nicholas Hilliard, who experimented with luminous portrait miniatures, and

Bernard Palissy, who made extraordinary ceramics at the end of the sixteenth century, and who declared:

Even if I used a thousand reams of paper to write down all the accidents that have happened to me in learning this art, you must be assured that, however good a brain you may have, you will still make a thousand mistakes, which cannot be learned from writings, and even if you had them in writing, you would not believe them until practice has given you a thousand afflictions. Admirable Discourses on the nature of waters and fountains, either natural or artificial, on metals, salts and salines, on rocks, earths, fire and enamels....The whole arranged as dialogues, in which are included theory and practice (1580)

Writing is not an optimal medium for conveying skill and technique, for craft is a largely embodied form of knowledge, and in the past, as well as today, most craftspeople did not learn skills from books but by experience. Artisans in early modern Europe learned their craft, not by following written instructions or even sometimes by language at all, but rather by working alongside experienced practitioners, observing and imitating. Descriptions of craft procedures could not capture workshop experience because it involves unpredictable qualities of materials, always-changing workshop conditions, and rapidly transforming matter, all of which the craftsman had to respond to in real time. Little of this could be captured or codified in writing.

The fact that artisans didn't need books in order to transmit and preserve techniques is perhaps an obvious point, but bears stating explicitly because it continues to be true centuries after 1400, just to take one example of a Spanish tailor's (Juan de Alcega's 1580) collection of patterns which was approved by two court tailors, one of whom had to ask the notary to sign on his behalf because he did not know how to write. And this while he was doing quite complex figuring to use a given length of fabric to maximum advantage.

The second intriguing point about this boom in practical writing is that there is actually a great deal of such writing before 1400. None of these pre-1400 writings were aimed at practitioners learning how to practice an art or trade. Rather, they had more complex functions within the structure and reform of existing paradigms of knowledge, often aiming at a reform of method more than an attempt to communicate technical knowledge. So, is the boom around 1400 simply a continuation of such writings or did something different happen at this point? I think the answer is yes—it's both a continuation and something new. The compilation of recipes only expanded after 1400, especially with the advent of printing which brought the books of distillation, assaying, mining, and above all, the "books of secrets" which were such stunning bestsellers beginning in the mid 16th c. Around 1400, however, many practitioners began to write on their own behalf.

In order to illustrate this, the paper examined two examples of technical writing produced right around 1400 by practitioners in order to examine more closely what is new: The "Book of Michael of Rhodes," and Cennino Cennini's *Il Libro della Arte*.

The paper argued that Michael of Rhodes wrote a book in order to prove his expertise (or at least the “look” of his expertise) in competitions for employment with the Venetian fleet, as well as to explain ships and shipping to Venetian patricians. But, more importantly, the copious mathematical problems in his book were a way to gain practice in thinking through the forces of nature and the value of materials until the practice was internalized. This practiced “thinking and working through” allowed a higher-order, intuitive response to tides and winds or the fluctuations in commodity prices. The carefully computed mathematical problems, done three ways, and then copied into his book are thus a demonstration of how to learn this ability of improvisation and intuition, an extremely powerful combination of practice and thought.

Because craft writings, like Michael’s, often took the form of lists of design rules or solutions to specific problems, they have been seen as prescriptive for particular cases rather than describing general methods. If we see these books of practice as intended to replicate the ways in which general methods were taught in apprenticeship, however, they come to have new significance. Such exercises, taught by example and imitation in apprenticeship, led to an ability to apply specific instances more generally, and thus become an example of higher order knowledge.

Michael’s precise contemporary, Cennino d’Andrea Cennini, a painter not far away in Padua, also wrote down his knowledge in *Il Libro della Arte* at the very end of the fourteenth century. Cennino’s book appears to set out a complete course of an apprenticeship for a painter, containing techniques current in the fourteenth and fifteenth centuries. At first glance, Cennino’s book appears as a combination of recipes and an attempt to attain a higher intellectual and social position. Cennino and Michael were both making claims for their expertise within a hierarchy of knowledge that placed the written word and *scientia* higher than embodied knowledge and practice. Their movement from practicing to writing, like other how-to compiler-authors, was partly about asserting their identity, their modes of cognition, their skills, and their own particular kind of knowledge. Knowledge-making is always bound up with power and social stratification. Yet just as Michael’s book can be read in part as a text that demonstrates how to learn to improvise and intuit, Cennino’s book is also more than solely an attempt to move up the intellectual hierarchy.

Cennino’s book is filled with instructions and recipes, which should be taken on the one hand as what they are: straightforward instructions. But, on the other hand, they are also something more: As I’ve argued elsewhere, they proclaim through the instructions, for example, about the use of the flesh tone, “*incarnazione*,” the transformative power of art and artisan. Moreover, they contain a kind of “theory” that underlay his practices, although it was a lived and practiced “theory,” rather than a written and abstracted one, consisting of a web of interlinked homologies among red, blood, and gold shared with other artists and metalworkers expressed largely in recipes.

Cennino’s deceptively straightforward recipes also convey an understanding of matter about which we are first alerted when Cennino writes about the wooden panel on which he is going

to paint as being hungry, and having to give it an appetizer of size (a thin gesso mixture) before laying on the following coats which constituted its meal. Matter was a constantly transforming and surprising thing, like a living being one had to come to know through intimate and bodily acquaintance. The artisan had to sound out his materials, to be attuned to them, to taste, smell, and handle them through the bodily senses, or to ‘overhear’ matter, as the medical and intellectual reformer Paracelsus expressed it in trying to capture this element of artisanal practice. Craft writings are full of directives about this type of discernment by listening, tasting, and smelling, which is very hard to describe in words, and instead is known in the body. Contained within recipes were instructions for inculcating habits of regarding matter and working with materials. First of all, by their very repetition, often listing different variations of ingredients or slightly different methods of doing something, they encouraged and modeled trial and error testing, which teach that matter is something to work through, something in which to explore resistances, in which to seek out the characteristics of a material in different situations. Such grounding in the behavior of matter led, like Michael’s computational practice, to an ability to intuit and improvise. Hours—years—of practice enabled the practitioner to respond to the unknown (indeed, cognitive psychologists now believe that expertise in a craft comes after 10,000 hours of practice.) This was the training that made possible intuitive action, and it involved a repetition of particular instances and experiences until they became generalized as “second nature,” like Michael’s calculations. Improvisation based on thorough experience was the stock in trade of the practitioner.

To conclude, the paper turned briefly to a sixteenth-century manuscript written by a French practitioner of metalworking, held by the bibliotheque nationale in Paris containing numerous recipes for a variety of processes. I have been working with Tonny Beentjes, a practicing silversmith and conservator based in Amsterdam, to reconstruct the techniques of casting from life by trying the recipes and instructions in this manuscript. Our reconstructions have made clear that this manuscript arises out of practice, but, more than this, they have revealed much about the relationship between writing and making.

Reading the manuscript could not be separated from trying the methods recorded in it. From the evidence of the manuscript—in which a fair copy has been set down, but then more trials have been made and the maker has filled the margins with further observations and notes—it would appear that the composition of the manuscript itself also could not be divorced from the lived experience of actually performing the actions.

The metalworking section consists of hundreds of recipes, and record trial after trial of different materials and techniques. Clearly, the practitioner is exploring materials and their properties and resistances, and the written form reproduces and models the process of repeated trials. This kind of repeated experimentation with materials results in a knowledge of the behavior of matter that allows for an ability to intuit, improvise, and innovate in materials and techniques.

The result of a practitioner’s repeated trial and error was “skill,” that is, a capacity of “judgment” which made him able to improvise in response to the contingencies of the

workshop and the materials. In attempting to define skill, Michael Polanyi distinguished between subsidiary and focal awareness, giving the example of the pianist who shifts her attention from a subsidiary awareness of the movement of her hands in relation to the notes and music, to a focus on the individual movements of her fingers. Such a shift in attention often leads to disaster. Skill, whether the hammering of a carpenter, the handling of a tennis racket, or the abilities of the average car driver, moves in the course of repeated practice from a focus on particular bodily movements to an increasing unconsciousness of the particular actions, and finally results in attainment of the ability to hold in subsidiary awareness the particulars while performing a series of integrated movements and procedures to bring about the whole skilled performance or result.

How can writing convey this embodied amalgam of action, sensory apperception, and cognition? I would argue that many craft writings, including Ms. Fr. 640 and many recipe collections, attempt to convey essential components of the acquisition of skill: first and foremost, the constant trial and error, the trying again and again, the necessity to practice, practice, practice, in other words, the essential need to proceed by what we would call experimentation. Second, these texts necessitate imitation and re-enactment in order to be comprehensible, thus pointing to the indispensability of learning a skill by “doing” and imitation. Third, they seek to make clear the necessity of educating the attention: the need to be alert to the signs of matter and for close observation, and the state of being attuned with body and senses to the material, while simultaneously transcending these particulars to attain the higher-order awareness which allows the skilled practitioner to respond to the contingencies of the workshop. These technical writings often seem to be an attempt to capture in writing—perhaps to teach by modelling—the tacit, bodily knowledge of the manipulation of matter by the human hand, in other words, to capture that elusive human ability, skill. Skill is the essence of craft knowledge, and I would argue that it represents a higher-order form of knowledge, perhaps analogous to generalization in propositional knowledge. In addition to everything else they are, then, these artisanal writings can be seen as an attempt to “think about thinking,” to think about embodied cognition and its processes, indeed, to think about the foundation of knowledge itself.