

Art in Science

Art and Science in the Renaissance: The Case of Walther Hermann Ryff

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Note from the Column Editors:

While hard to do justice in a single paragraph to the heritage and continuing contributions of the *Instituto Ortopedico Rizzoli* (Rizzoli Orthopaedic Institute), the richness of its traditions and treasures far belie its relatively short formal history. The Rizzoli Orthopaedic Institute was dedicated in

Bologna, Italy by King Umberto I in 1896 for the purposes of treating rickets and congenital deformities. It remains housed in the greatly expanded monastic complex of San Michele in Bosco, dating back to at least the 14th Century, and is named for its founding philanthropist and surgeon, Francesco Rizzoli (1809–1880). Directed initially by Alessandro Codivilla (1862–1912) and succeeded by Vittorio Putti (1880–1940), the Rizzoli Orthopaedic Institute has been the source of enormous clinical contributions, and houses one of the world's most significant collections of medical books and visual images. As such, the

Rizzoli and its faculty have an unparalleled seat at the intersection of the Arts and Sciences.

In the exceptionally articulate and well-illustrated contribution by Dr. Berardo Di Matteo and his colleagues, we learn a great deal about our profession and its traditions. Let us single out their Figure 4. The frontispiece to Walther Hermann Ryff's 16th century text, *Great Surgery*, admirably demonstrates the power and purpose of the visual arts in education, approachable regardless of literacy and without the barrier of requiring multiple language skills. In this single moment, the artist has captured the event of an amputation, while also providing multiple comments and insights of a social and scientific nature. For example, the person providing comfort to the patient is holding a book. Is this a spiritual text or scientific publication? This illustration is on the cover of a state-of-the-art description of medical practice, but at a time in history when scholarship and worthiness was measured in both the theological and scientific realms, usually simultaneously. The cloths of the orthopaedic surgeon are reflective of his place in society. Are these the garments of a

Note from the Editor-in-Chief:

I am pleased to introduce the next installment of our “Art in Science” column coedited by Gary and Linda Friedlaender. Linda Friedlaender is the Curator of Education at the Yale Center for British Art; Gary is the Chair of the Department of Orthopaedics and Rehabilitation at Yale School of Medicine. Together, they will share observations from a fascinating vantage point: *The interface of art and medicine*.

The authors (BDM, VT, GF, MM, AV, PT) are employees of Rizzoli Orthopaedic Institute, Bologna, Italy.

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Art in Science

tradesman, artisan, professional, or aristocrat? Was health care available to just the wealthy or to the average worker? The tools of medicine are inventoried in the foreground of this skillful woodcut and in the hands of the surgeon. The use of a tourniquet, the degree of attention to cleanliness, the emotional and physical response of the patient to his treatment, perhaps the underlying disease requiring amputation are all chronicled in this single visual format. The answers to these questions can be found in a thoughtful analysis of these images, in conjunction with the available contemporaneous text.

There is much to see and to learn in the work of Ryff and his contemporaries. We are indebted to Dr. Matteo and his colleagues for their remarkable contribution to Art in Science.

—Linda K. Friedlaender BA, MS,
Gary E. Friedlaender MD

Introduction

Few moments in mankind's history have seen such an impressive cultural revolution as the one that occurred during the Renaissance. An entirely new concept of man emerged, and the philosophical principles of Humanism overcame the old ideas and ideals of the Medieval period. Besides the well-celebrated achievements in the fields of architecture, figurative arts,

literature, and philosophy, science also presented important innovations, particularly in medical studies, which were strengthened by the Renaissance concepts of the centrality of humanity and the rejection of dogmatic knowledge. Medical schools had been flourishing throughout Europe since the 11th century, and a new figure was acquiring social and cultural relevance: The surgeon.

In previous centuries, surgeons were considered lower level practitioners, since their profession was regarded as a form of craft. The emerging knowledge about human anatomy, partially due to the studies of enlightened artists such as Leonardo da Vinci and Michelangelo, brought a new awareness about the role of surgical treatments. One of the most fascinating aspects of surgery during those times was the fact that it was performed by people representing the Renaissance ideal of polymath—people not only interested in one specific field, but endowed with a creative and inquisitive spirit so powerful that they were often also poets, artists, mathematicians, naturalists, and more.

Although surgery had ascended beyond a mere craft, the profession still needed to find its own voice, and the invention of printing offered the chance to spread this new knowledge. The illustrations contained in those precious books made them works of

art. As such, surgical knowledge was conveyed through art during the Renaissance. Today, these documents are admired as artwork, but they also can help us reconstruct Renaissance everyday life and trace the evolution of surgical techniques through time.

In this column, we focus on one of these amazing books, *Grossen Chirurgie (Great Surgery)*, by the German surgeon Walther Hermann Ryff. The book is considered both a masterpiece of Renaissance printing and among the most accurate sources to understand current concepts of traumatology during the Renaissance.

The Mysterious Walther Hermann Ryff

Walther Hermann Ryff could be a character from a historical mystery novel, shrouded in ambiguity and conflicting information. He is thought to have been born around 1500, most likely in Strasbourg, Germany, but according to some historians, he may have been born in Zürich, Switzerland [4]. As many other renowned people of that time, his very name is uncertain: Ryf, Reiff, Reif, Rivius, Riffus, Rūf, Reuff, Ruff, and the Latinized Gualtherius Hermenius Rivius, just to quote the most recurring ones [10].

His training in medicine began in the care of Hans Von Gersdorff [3], a

Art in Science

master of traumatology, whose attitude towards universal knowledge became the inspiration for Ryff's scientific activity.

In 1534, he moved to Mainz, Germany to start his medical career and his vast production of writings. Sometime later, he relocated to Nuremberg, Germany, where he took the position of city physician and surgeon until 1551. Even the date of his death is uncertain, maybe 1548, more likely in 1562, and, of course, the location is unknown.

The reason for this scarce and contradictory information can be found in a sort of "damnatio memoriae" (condemnation of memory), which Ryff endured for years in many cultural circles. His work enjoyed great popularity, multiple translations, and reprints, but nobody wanted to preserve the facts about his life and legacy until it was too late.

"Dubious Morals"

Ryff is the author of 48 different books on topics that extend well beyond medicine including mathematics, architecture, and even cooking. He also translated, for the first time in the German language, the scientific works of Pliny the Elder, Pedanius Dioscorides, Albertus Magnus, Vitruvius, and many other Classical scholars [1]. He

invented surgical instruments for various uses, from eye care tools to the first modern devices to treat contractions and stiffness of the elbow and knee. These braces consisted of an articulated apparatus where progressive extension of the joint was obtained by adjustable screws (Fig. 1). Ryff was truly a Renaissance polymath with few equals, but he had a dark shadow lurking over him.

Swiss scientist Albrecht von Haller described Ryff as a "Compiler et poligraphus malorum morum" [1], which translates to "a compiler and polygraph of dubious morals." More plainly, Ryff was a plagiarist, according to many of his contemporaries and later, to scholars. He was the author of books that were near-verbatim translations of the research of others [6]. In a letter about the printing of his *De*

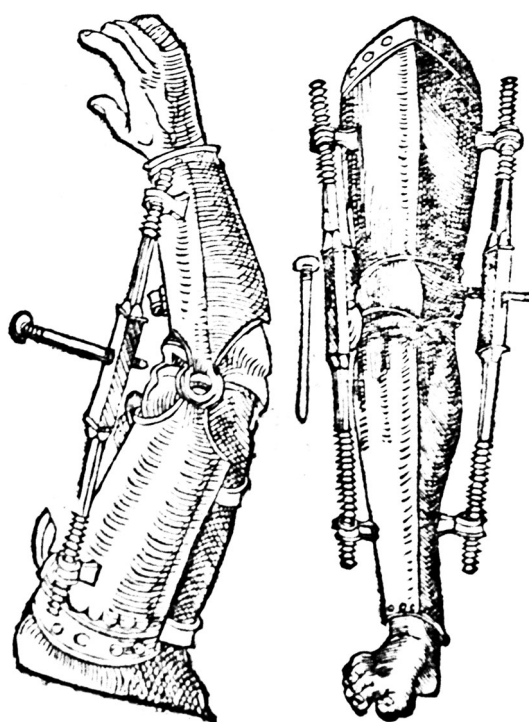


Fig. 1 The knee and elbow braces consisted of an articulated apparatus, made of leather and brass, where progressive extension of the joint was obtained by adjustable screws. The design, with few modifications, is directly taken from the work of Hans von Gersdorff. Republished with permission from the Library of the Rizzoli Orthopaedic Institute.

Art in Science

Corporis Fabrica [9], Andreas Vesalius said: “Worst of all, so far as science is concerned, at Strasbourg, another plagiarist [...] thought fit to contract the size of the plates, which can hardly be too large, to daub them with ugly coloring, and to surround them with a text borrowed from that of the Augsburg edition, but put forth as his own.” [6].

We now know Vesalius was talking about Ryff. Vesalius was not the only victim of Ryff’s plagiarism. In Ryff’s work, it is possible to find illustrations taken from the book of his master Gersdorff, Eucharius Rösslin (*Der Swangern Frauen und Hebammen Rosegarten*, 1513), Johann Dryander (*Anatomia Capitis Humani*, 1536), Gregorius Reisch (*Margarita Philosophica*, 1504), Lorenz Fries (*Spiegel der Artzney*, 1518), and many others.

Was Ryff truly a villain? Not entirely. Some commentators note that Ryff’s version of Vesalius’ plates brings a marked improvement to certain aspects of the original, making them more understandable and easier to interpret [5].

Ralf Vollmuth, probably the greatest expert on Ryff, and certainly his greatest apologist, tried to restore the historical importance of the “Strasbourg plagiarist” in a persuasive and informed book about Renaissance traumatology [2], defining Ryff as an archetype of surgical experience. The act of copying books of other authors was common at that time, as were

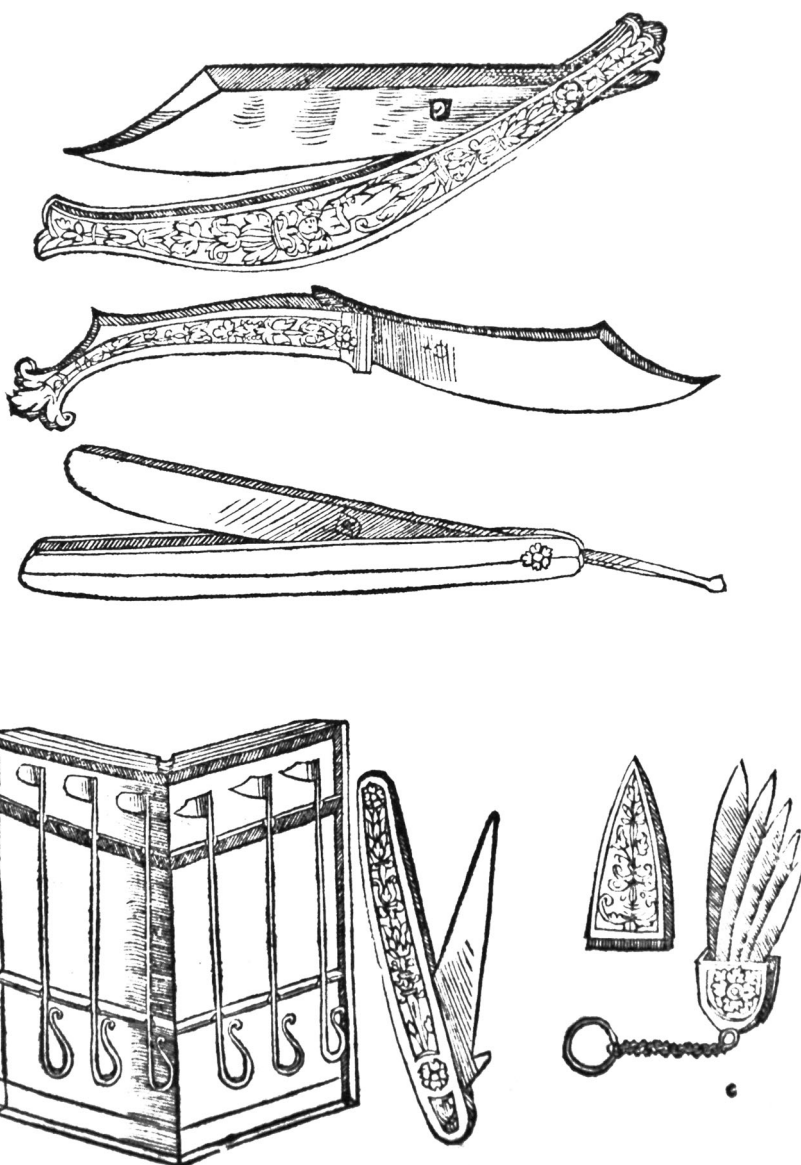


Fig. 2 Surgical knives used during the Renaissance. Republished with permission from the Library of the Rizzoli Orthopaedic Institute.

Art in Science

citation practices that would be considered loose by today's standards. Ryff himself was later plagiarized by Loys Vasse in his book, *In Anatomien Corporis Humani Tabulae Quatuor* (*Four Tables on the Human Body Anatomy*) [8].

Ryff's contemporaries might have been rightly angered by some of his publications, but to our contemporaries this is not an issue. In fact, we currently have an extraordinary panoramic picture of the status of medical knowledge in Renaissance Europe thanks to Ryff's work. Ryff's writings, with hundreds and hundreds of pictures attached, are some of the most compelling collections of Renaissance wisdom, and also a representation of the average knowledge of European surgeons and "scientists" in the late Middle Ages.

Maybe he was not a man of great ingenuity, not a genius and inventor like Leonardo da Vinci, but he was a man of vision, who despite his questionable background, remains one of the most influential and widely read science communicators of his time. Almost all the works by Ryff were translated in Latin and passed down through the centuries. Those works show us how, in the hands of a master, the false divide between art and science may be readily spanned. For example, his illustrations of medical instruments of his time (Fig. 2) look practical, dependable, and altogether

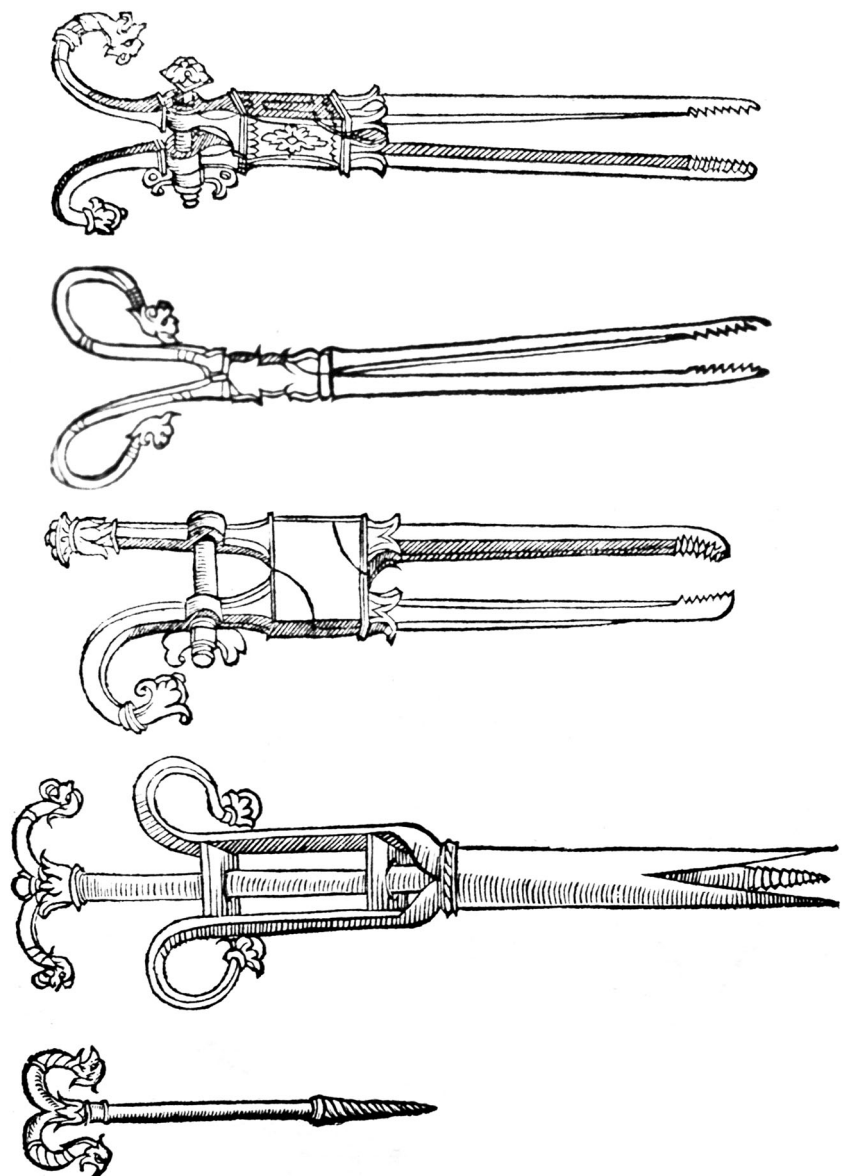


Fig. 3 Additional medical instruments used during the Renaissance. Republished with permission from the Library of the Rizzoli Orthopaedic Institute.

Art in Science

ready to use — even as they are spectacularly adorned, as though they were ceremonial swords of our trade (Fig. 3).

Great Surgery

Great Surgery was the sum of all the known traditions and contemporary experiences about surgery and trauma in 16th century Europe. This masterpiece by Ryff enjoyed tremendous fame and diffusion across the continent for centuries.

The first edition was printed by Christian Egenolf in Frankfurt, Germany in 1545 [7]. A second edition followed in 1556, a third in 1559, and a fourth in 1562. The book consists of five chapters plus an introduction, and contains a considerable number of woodcut images; as mentioned before, some of these pictures come from other books, and some are original.

We all know the old adage “don’t judge a book by its cover”, but *Great Surgery* should be an important exception to that rule. Its frontispiece is one of the best images of all Renaissance medical history — a black and red woodcut depicting a dramatic amputation, a surgeon sawing the bleeding right leg of a patient below the knee (Fig. 4). The artist is unknown, but the details are remarkable — the richly dressed patient, the instruments needed for the operation (including a Renaissance tourniquet), the surgeon’s box, and many others.



Fig. 4 The frontispiece of *Great Surgery*, representing a leg amputation procedure. Republished with permission from the Library of the Rizzoli Orthopaedic Institute.

The quality of the woodcuts suggests the work of the best German artists of the time.

This is not a book of universal medical knowledge, like the masterpiece by Hans von Gersdorff [2]. It is a

specialist manual uniquely devoted to conveying all the Renaissance wisdom about the treatment of wounds. It is a treatise on traumatology. After a long dedication to Ryff’s patron, the author expresses the reason for his work:

Art in Science

“[...] being greatly fond of this art (surgery), I wanted, with all my ingenuity and the utmost zeal, to do everything in my power to restore its dignity and brilliance [...] after reading with great care not only the most famous Greek and Latin books about surgery, but even Arabian ones, I wanted to report them faithfully for posterity. And to enrich all the discoveries made by the Ancients with my daily experience, to add to and complete them.” (There is no official English edition of the book, so the quotes reported [from the first-print German edition of the book] are translations made by the authors of the present paper, with the help of a study authored by Prof. A. Allaria in 1956 [1].)

The first chapter is an introduction to the practice of surgery, and a definition of all the things related to it as construed by a Renaissance practitioner. It is followed by a discussion on the different kinds of tumors, wounds, dislocations, and fractures. Here, the author describes some surgical instruments and techniques, with a focus on sutures and orthopaedic devices used to put under traction and reduce dislocations and fractures of the limbs (Fig. 5).

The second chapter summarizes “fresh” wounds — how to extract an arrow, how to treat a cannon wound, bloodletting, purges, and the like. He details, in brief subchapters, the differences among wounds to the head, face, neck, chest, and other body parts.

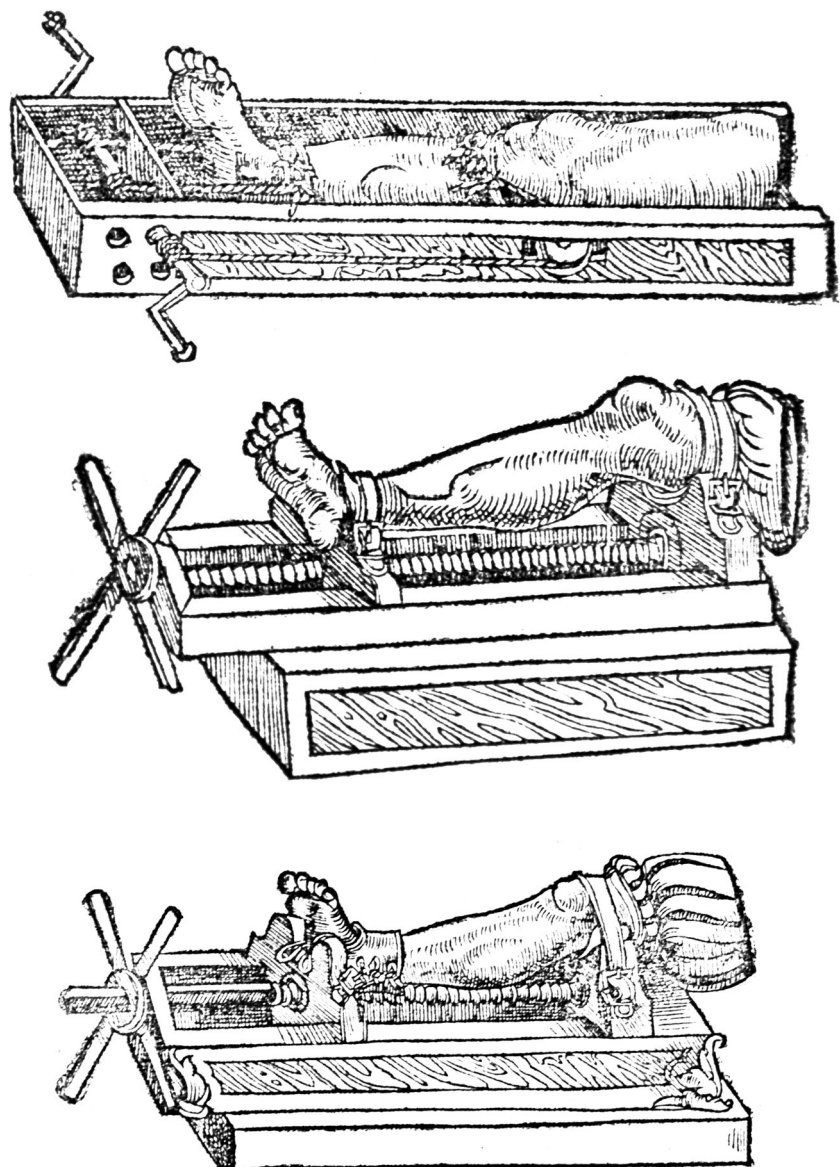


Fig. 5 Various orthopaedic devices for limb traction are shown. Republished with permission from the Library of the Rizzoli Orthopaedic Institute.

Art in Science

The third chapter covers orthopaedics. It begins with a guide to fracture diagnosis, along with a list of fracture-related symptoms, followed by first-aid suggestions, and finally focusing on the importance of a quick treatment. “You must bear in mind that for every fracture, the longer the time lapse between breakage and intervention, the harder it will be to heal,” Ryff wrote. He lists the healing times for many fractures. With surprising modernism (and, for the most part, accuracy), Ryff clarifies that everything depends on the patient’s age, agility, fitness, life-style, and season of the year. Some of the pictures of the first chapter are reproduced to better show the ways to treat the various fractures.

The fourth chapter describes sprains and dislocations. The chapter covers the differences between old and new dislocations, the former harder to treat because of the presence of scars and adhesions. This chapter also presents differences based on the specific joint involved.

The fifth and final chapter includes different topics about “old” wounds. The author uses it to conclude his exploration of surgical knowledge by composing essays on exposed injuries, gangrene, poultices against pus and fistulas, and more in-depth descriptions related to the different parts of the body.

The lasting success of *Great Surgery* is partly due to its clear and comprehensive writing approach, and partly to

the striking amount of images that made it one of the most popular and sought-after books among medical practitioners, during and following the Renaissance.

A 500-year-old Treasure

One of the great legacies of the Renaissance is that knowledge can be spread through art. This also applies to printed works. Before becoming industrial products, books were authentic “educative” masterpieces. Even a gory discipline like traumatology benefitted from this art-based approach.

Ryff’s book is a clear example of the true Renaissance spirit — a 500-year-old treasure, precious both for its contents and its attempt to divulgate them through a masterpiece of art. *Great Surgery* can be enjoyed both by readers interested in the history of science and by aficionados of art.

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