

Gunther von Hagens and *Body Worlds* Part 1: The Anatomist as Prosektor and Proplastiker

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Recent calls to reintegrate the sciences and humanities are challenged by the contemporary work of anatomist Gunther von Hagens and his *Body Worlds* exhibits of plastinated cadavers. The anatomical quest to understand our physical interior has long been in tension both with aesthetic ideals and religious sensitivities regarding the metaphysical significance of the human body. Part I of this two-part Historical Note examines tensions epitomized by Goethe's figures of the prosektor and proplastiker. The former, driven by scientific curiosity, is willing to destroy, even desecrate, the human form to obtain knowledge. The latter demurs at such mutilation of our physical body, wondrous even in death — seeking instead to rejoin what the prosektor has pulled apart, to restore human dignity. In the confrontation between prosektor and proplastiker, roles disturbingly fused in the person of von Hagens himself, questions arise regarding the authenticity of models as well as the appropriate recipients of such mediated yet intimate anatomical knowledge. Part II will focus on religious perspectives on the human body, variously interpreted as God's handiwork, habitation for the soul, and vehicle of resurrection. Consideration also is given to the role of anatomist as priest, prophet, and Promethean creator, roles self-consciously embraced by von Hagens. *Anat Rec (Part B: New Anat)* 276B:8–14, 2004. © 2004 Wiley-Liss, Inc.

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THE CONFLICT OF TWO CULTURES CONTINUES

The intersection between anatomy, art, and religion has frequently resulted in a conflict between different

views of the human body and of what it means to be human. The anatomist historically has stood at this intersection, often striving to integrate quite disparate roles—scientist, artist/dramatist, and priest/prophet. We explore this conflict and the roles of the anatomist, using Gunther von Hagens and his *Body Worlds* exhibitions of plastinated cadavers as the contemporary embodiment of this controversy.

Von Hagens' work challenges the recent call to reintegrate the sciences and the humanities. Proponents of such integration decry the lack of insight into human creativity on the part of those who would regard the two enterprises as tightly boundaried or opposed. Stephen Jay Gould, for example, in one of his last books, *crossing over: where art and science meet*, coauthored with the artist Rosamond Wolff Purcell, notes:

Small minds have usually viewed Science and Art as adversarial—at least from Goethe's complaints about narrow-minded naturalists who would

not take his anatomical and geological works seriously because he maintained a day job as a poet to C.P. Snow's identification and lament about two non-communicating cultures. . . . But the unifying modes and themes of human creativity surely transcend the admitted differences of subject matter in these two realms of greatest interest and occasional (even frequent) triumph of both heart and mind. (Gould and Purcell 2000, p. 13)

Of direct relevance to our present topic are some of the anatomical illustrations in the book, including a beautiful photograph of the original skeletons juxtaposed with wax models of craniopagus Siamese twins. Perhaps even more unsettling are the photographs in an older Gould and Purcell collaboration, *Finders, Keepers*, of Fredrik Ruysch's remarkable late 17th century preparations of infant heads, variously adorned with frilly lace, preserved as wet specimens in shimmering glass jars (Purcell and Gould 1992, 25–27).

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Figure 1. Gunther von Hagens' late 20th century plastinated whole body in an "exploded-view" presentation. The intent stated by von Hagens is to show relationships between various structures of the body. This and other whole body plastinates of von Hagens have been publicly displayed in Europe and Asia in a traveling exhibition called *Body Worlds*. Copyright: Professor (VCR) Dr. med. Gunther von Hagens, Institut für Plastination, Heidelberg, Germany (www.bodyworlds.com).

Confined to the printed page, Gould and Purcell's integration of anatomy and art remains safely abstract. However, in the exhibit halls of Japan, Germany, Austria, Belgium, South Korea, and England where *Body Worlds* has appeared, such integration can be as explosive as some of the "exploded-view" plastinated cadavers themselves (Fig. 1). For human anatomy, unlike other areas of scientific investigation, both explores and proposes who and what we humans are in the most intimate of ways, using methods and

means that often disturb deep-seated aesthetic, moral, and religious sensitivities.

Interestingly, Goethe himself, while lamenting the separation of the two cultures, was keenly aware of the deep tension between the scientific quest for certain kinds of knowledge—specifically that of our physical interior—and the humanistic imperative to preserve human dignity. These two ideals collide in the figures of the Prosektor and the Proplastiker in Goethe's story of the young and ambivalent anatomy student Wilhelm Meister. Confronted in the dissecting room with the arm of a young woman who, despairing of love, had drowned herself, Wilhelm visualizes the lovely limb encircling

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the neck of her lover. The image overwhelms the aspiring anatomist: "The repugnance to deform still further the splendid production of Nature was at variance with the demand which man, thirsting for knowledge, has to make on himself" (Goethe 1947, 234). A visiting Proplastiker (plastic anatomist) sees Wilhelm's hesitation and suggests an alternative to anatomical destruction: modeling in wax and other materials. The visitor explains "that building up teaches more than tearing down, joining together more than separating, making what is dead alive, more than making what is already dead still further dead. . ." (Goethe 1947, p. 236). Taking Wilhelm aside, the Proplastiker contrasts the grue-

some work of the Prosektor (dissector) with his own beautiful plastic transformations (compare Figs. 2 and 3), and reveals to Wilhelm a replica of the bony skeleton of the young woman's arm. The Proplastiker sees his art as an imitation of divine creativity—even of divine restitution. Claiming his work represents a first step "to put life again into the rattle of the dead bones," the Proplastiker refers to Ezekiel's vision of the Lord's resurrecting the dead, noting how the prophet "had first to see his valley of bones gather together and join themselves in this manner before the limbs were able to move, the arms to touch and the feet to raise themselves upright." (Goethe 1947, p. 236).

In Gunther von Hagens we see a fusion of Goethe's scientific Prosektor and humanistic Proplastiker, with his various pedagogical, aesthetic, and spiritual—or quasi-spiritual—agendas. As Prosektor, von Hagens is universally acknowledged as unexcelled. As Proplastiker, he is most engaging and, at the same time, most enraging. To gain insight into the controversies surrounding the creator of *Body Worlds*, we must first examine in historical perspective the diverse views of the human body that such a fusion brings and the tensions it generates, focusing on the interpretive viewpoints of the anatomist as scientist, artist/dramatist, and priest/prophet.

SCIENTIFIC VIEWS OF THE HUMAN BODY—THE ANATOMIST AS PROSEKTOR

There are many ways to glean scientific knowledge about the body other than peering into dead ones—for instance, one could observe how the living body reacts to being needled or burned, as with the Chinese practices of acupuncture and moxibustion (Kuriyama 1999, p. 118; Porter 1997, pp. 7-8). Such practices are often sustained by and implicated in traditional notions of the body as a mirror or microcosmic reflection of cosmic forms and forces. The reasons that anatomy became the privileged mode of exploring the body in the West during and after the Renaissance are naturally complex, but the development is related at least in part to the view of the body, not as a microcosm, but as a

beautifully and intricately designed machine. Thus, the Western anatomist is interested in the way the body moves and functions, its structure and parts, and the means to repair the delicate mechanisms when they no longer perform properly. It seems hardly an accident that the meticulously rendered drawings of flayed bodies and articulated skeletons found in anatomical textbooks from the Renaissance on are frequently in motion, the reanimations depicting the abilities of this incredible machine.

The basic assumption of anatomy, then, is that “the dead shall teach the living,” an anonymous motto that in one form or another adorns the entrances to many anatomy laboratories in medical schools today. But who is to have access to knowledge about the internal workings of the complex machinery that is our body? In other words, to whom are the dead to teach? Only those who, by academic or professional qualifications are allowed to pass through the dissecting room doors of our teaching institutions—that is, only research scientists and future health care providers? Or is such knowledge to be given to the general public, regardless of educational qualifications and motivations?

The scientist is often portrayed as being unconcerned about the lay public’s view of her work. And yet, in order to make informed decisions from voting for funding for scientific research to participating in their own health care, the general public needs to be informed about their bodies and



Figure 2. Eighteenth century wax model of a woman’s arm showing the magnificence of human anatomy without the horror inherent in human dissections, illustrative of the Proplastiker’s “beautiful transformations.” In “La Specola” Museum in Florence. Photo credit: Saulo Bambi, Museo di Storia Naturale, Sezione Zoologica “La Specola.”

the effects various insults can have. At the same time, few members of the general public would want to access such intimate knowledge in the traditional venue of the dissecting room. While authenticity of presentation is an important desideratum for the public, perhaps even more so is concern for a non-repelling and aesthetic presentation. Thus, in general, models have been used to disseminate knowledge to the lay audience while actual specimens have been reserved for the education of a privileged few.

For teaching future scientists and health care professionals, the use of models alone—at least until the very

recent possibility of using virtual cadavers—has often been regarded as less than ideal (Aziz et al., 2002). At the same time, anatomy instructors have viewed preserved specimens as valuable adjuncts in assisting students to interpret their own dissections from Vesalius’ articulated skeleton overlooking the dissecting table, down to the present use of plastinated sections of muscle and bone in the anatomy laboratories along side the whole cadaver. Development of ways to preserve soft tissues began with the early preparations of anatomists such as Frederik Ruysch (1638-1731) and Honoré Fragonard (1732-1799), using desiccation, special varnishes, or injection of vessels with embalming fluids. Such specimens increasingly have come into use, providing an authenticity missing in models that tend to be idealized representations and lack the unique and anomalous features of real cadavers.

Preservation methods have reached their acme in the plastination techniques used by Gunther von Hagens. In the late 1970s, von Hagens developed a procedure for preserving whole bodies and individual organs using curable polymers. These chemicals replace the water and lipids in the body and are subsequently hardened. As von Hagens notes: “When I replace this water by a permanent



Figure 3. Honoré Fragonard’s eighteenth century dissection of a preserved arm, suggestive of the Prosektor’s “gruesome works.” In the musée Fragonard de l’École nationale vétérinaire d’Alfort. The arm was preserved through desiccation and a varnish coating developed by Fragonard, whose exact formula has not been discovered. Copyright: C. Degueurce, musée Fragonard, France.

polymer like silicon rubber, then there is no decay anymore. Certainly, those specimens will hold longer than the mummies from the pharaohs" (quoted on National Public Radio, *All Things Considered* 2001, p. 11).

While stopping decomposition in a most convincing manner, plastination involves such extensive chemical manipulation of the corpse that some have asked how natural or authentic such specimens are. José Van Dijck, for one, questions whether plastination provides for any more "scientific transparent truth" than any other mechanical mediation that seems, naively in her opinion, to remove "the contamination of human intervention" (van Dijck 2001, p. 117). She notes that some of the classical, eighteenth century wax models are more life-like than von Hagens' specimens.

Whatever the philosophical merits of such questions, from a practical standpoint, are the plastinates sufficiently "real" to serve the pedagogical needs of the professional anatomist? And does the chemical manipulation preserve enough of the authentic while removing the horror, smell, and repugnance that is part of the dissecting room ambience to still attract and fascinate, as well as educate, the general public? A tentative answer is that they certainly are real enough to provoke the controversies that mere models would not, as well as to attract over eleven million visitors to the exhibits to date. Indeed, no other exhibition has presented the internal structure of the human body to as many individuals from the general population or even the scientific community.

One of us (CMM) saw *Body Worlds* while attending a scientific meeting in Vienna in 1999. First learning about Dr. von Hagens and *Body Worlds* when he came to her meeting to promote the exhibit, she became interested in seeing the exhibit for its educational components. Immediately striking to her while walking through the exhibit were the technically exquisite dissections. The spinal nerves of the "chess player," the whole skin dissection "carried" by one of the cadavers, and the disembodied plastinated vessels of a hand were among the most impressive. The scientific information provided with the dissections illustrating the growth of a hu-

man fetus and the malformations that can occur, as well as the comparisons of healthy and diseased lungs and normal and cirrhotic livers that show the effects of smoking and drinking clearly served an educational function. Similarly, the displays of bodies showing pacemakers, hip replacements and artificial knees allowed the public to see more directly advances that have been made in medical care.

The circus element, however, that Dr. von Hagens encouraged when he escorted guests dressed as space creatures through the exhibit with TV cameras in tow, made the author uneasy with this so-called "edutainment." And yet as an anatomist/dramatist von Hagens is not dissimilar from the anatomists in the anatomical theatres of 16th century Bologna and Padua who sold admission tickets to

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their dissections, not only to medical and art students, but to the nonprofessional public as well who looked on the procedure as entertainment as much as education. In fact, on November 20, 2002, von Hagens recently reintroduced the public autopsy, dissecting an elderly male's preserved body before a London audience of five hundred. The admission charge was \$19. Unlike some other visitors to von Hagens' *Body Worlds* exhibit, though, the author was not particularly disturbed by the artistic poses in which many of the whole-body plastinates were presented, seeing the life-like postures as splendidly illustrating the workings of the body engaged in everyday activities. Von Hagens also follows in a long history of representing cadavers in artistic displays to help allay the sense of disgust, among

whatever other motives may have been at work. While he often denies that he is an artist when arguing that his dissections have been made purely to educate, he does accept the notion that the plastinates themselves are "anatomy art" (von Hagens 2000, p. 34).

ARTISTIC VIEWS OF THE HUMAN BODY—THE ANATOMIST AS PROPLASTICKER

According to the early 16th century anatomist Berengario de Carpi, the flayed figures like those appearing in his *Commentaria* (1521) were to assist physicians in their surgical incisions and artists in their rendering of the human body. Leonardo, Michelangelo, and other artists dissected cadavers to learn the internal structure, especially the musculature and skeletal scaffolding. Such artistic representations of the human body have presupposed a conception of personhood as willful agent, making choices that muscles, especially, translate into action. As Kuriyama notes with regard to Western anatomical and artistic traditions: "Interest in the muscularity of the body was inseparable from a preoccupation with the agency of the self" (Kuriyama 1999, p. 144). Muscles are thus, par excellence, the mediating organ between the autonomous will of the person and the actions of his or her body. Renaissance anatomical artists celebrated this mediating function by displaying the flayed and dissected human body in their sketches, paintings, engravings and sculpture, not as lifeless forms, but as robust and vivid "muscle-men," anticipating the Proplasticker's ideals of "making what is dead alive."

Throughout the 17-18th centuries, dissections and even dried specimens were rare, so artists (the real proplastickers) such as Zumbo, Ecolli, Susini and the Manzolinis created exceptionally realistic wax models of dissected human specimens. The models preserved the information from these dissections, and more often than not, appeared as pieces of art in themselves. Body casts from cadavers represented another way to present anatomical models in an aesthetically pleasing mode. William Hunter (1718-1783),



Figure 4. A 3rd century B.C.E. Roman copy of an earlier Greek work from Pergamon, in the Capitoline Museum, Rome. Known as *The Dying Gaul*, this sculpture served as a model for William Hunter's anatomy art two millennia later. Photo credit: E. Lessing, Art Resource, NY.

who taught artists as well as medical students, did not actually display the body of the criminal he flayed, but instead made a cast of the smuggler, recast of which now resides in the Royal Academy of Arts, London posed in the position of the Dying Gaul, a sculpture in the Capitoline Museum in Rome (Figs. 4 and 5). In the process, Hunter significantly blurred the line between anatomical and artistic goals.

Anatomy art—from sketch to sculpture—began as an imitation of body and life. In Hunter's "Smugglerius," anatomical representation imitates not just life but also art. With the development of better ways to preserve body specimens, the potential for anatomical presentation to effect a radical "reversal of art-representing-body into body-representing-art" (in the words of van Dijck, 2001, 116) was soon realized. Thus Ruysch created his fantastic dioramas made entirely of human material (Fig. 6). Honoré Fragonard, the cousin of the celebrated painter of the same name, posed one of his whole body dissections as Samson holding the jaw of an ass (Fig. 7).

This radical reversal runs rampant in the plastinates of von Hagens. The positions of his figures "are at least as determined by artistic conventions as by scientific insights" (van Dijck 2001, p. 114). Van Dijck notes the resemblance between *The Chess Player* and Rodin's *The Thinker*, and between *The*

Runner (Fig. 8), with its flying skin and muscle flaps, with "futurist art in which movement and speed were represented in new ways" (van Dijck 2001, p. 114). Among the most fascinating of von Hagens' reversals is his flayed plastinate bearing his own skin, an imitation of a similar figure in Juan Valverde's *Historia de la composición del cuerpo humano*, first published in 1556 and later reproduced in *Anatomia del corpo humano . . .* (1559). These two figures will be discussed in more detail in Part II.

Much of the controversy surrounding *Body Worlds*, at least in Europe, has focused on the dual purpose of the exhibits proposed by von Hagens—education and entertainment (in his

word, "edutainment")—as well as on his own description of his work as "anatomical art." In part, the contentious nature of such a dual purpose historically reflects the separation of art and anatomical science that began by the end of the 18th century. The cavorting cadavers striding through exotic settings or coyly self-exhibiting their own dissected viscera so typical of 16th-18th century anatomical illustrations gradually gave way to a stark realism that eschewed imaginative embellishment, a development nicely documented in the recent *Dream Anatomy* exhibit at the National Library of Medicine. Thus, according to one reviewer of this exhibit, Gautier d'Agoty's 1773 mezzotint of a pregnant woman écorché, her musculature and developing fetus "daintily on display," is credibly "*Dream Anatomy's*

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most mesmerizing image, one in which art and science seem to merge effortlessly" (Smith 2003, p. 829). The

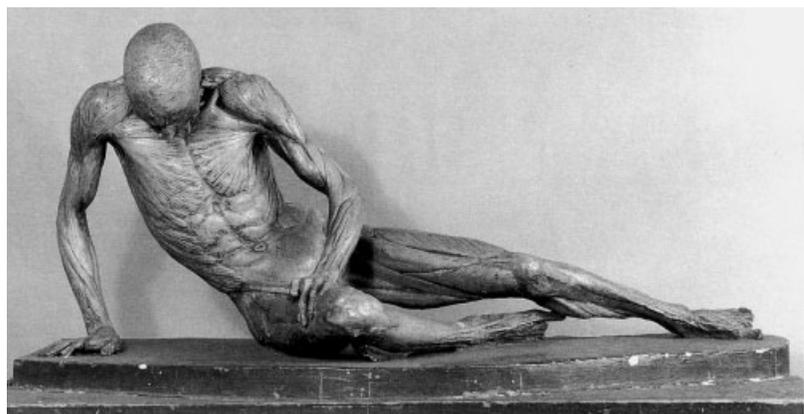


Figure 5. William Pink's plaster cast of Agostino Carlini's *Smugglerius* (1775), prepared from the body of a criminal hung for smuggling, flayed by William Hunter and arranged to imitate the position of *The Dying Gaul*. In the Royal Academy of Arts, London. W. Pink after Agostino Carlini RA, 1834. Copyright: Royal Academy of Arts, London.



Figure 6. Etching of Fredrik Ruysch’s late seventeenth—early 18th century diorama constructed entirely of fetal and adult human body parts. From National Library of Medicine exhibition, *Dream Anatomy*, 2002. Image taken from *Alle de ontleed- genees- en heelkundige werken. . . van Fredrik Ruysch . . .* Vol. 3. (Amsterdam, 1744). Courtesy of the National Library of Medicine.

wedge splitting medical schools and art academies soon made such fusions of art and science untenable—at least until von Hagens entered the anatomical scene in the late 20th century with his artistically posed plastinates, including his own version of a flayed pregnant woman with exposed fetus.

The reconvergence of science and

art in von Hagens’ work, however, is not in itself the most fundamental source of controversy. On one hand, it is the use of the particular medium, human organic material, that lifts the issues surrounding the aesthetic display of plastinates far beyond the tensions or conflicts between scientific and artistic prerogatives. On the



Figure 7. Honoré Fragonard’s 18th century whole body preservation representing Samson holding the jawbone of an ass as described in Judges 15:14-16, in the musée Fragonard de l’École nationale vétérinaire d’Alfort. Copyright: C. Degueurce, musée Fragonard, France.



Figure 8. Gunther von Hagens’ plastinated whole body in the form of a runner with the muscles stripped from their origins and extended from the bone in a spirit of movement illustrating the muscles as mediators of the autonomous will as often portrayed by Renaissance anatomical artists. Copyright: Professor (VCR) Dr. med. Gunther von Hagens, Institut für Plastination, Heidelberg, Germany (www.bodyworlds.com).

other, as is evident in the context of the public autopsy where the artistic element was absent, something akin to sacerdotal privilege is at stake. When the British Inspector of Anatomy Dr. Jeremy Metters threatened von Hagens with arrest for violating a 1984 Anatomy Act by failing to have a post-mortem license, the latter protested that he was breaking no laws. Metter’s attitude, von Hagens added, “reminds me of the times when clergymen reserved the right to read the Bible” (quoted in *Record Searchlight* 2002, Nov. 21). The body is indeed a sacred text of sorts, with metaphysical attributes of its own that have been read in a variety of ways. Like the Bible, the body is subject to a variety of religious and philosophical interpretations, each with its own healing or therapeutic prescriptions and prophetic visions of the good life—both now and in post-mortem existence. In Part 2 we shall explore the priestly, prophetic, and Promethean roles of the anatomist in interpreting the humanistic and spiritual meaning of the human body.

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