Institute for Plastination
Heidelberg, Germany

Donating Your Body

for Plastination

Preface

Dear Sir or Madam,

You are interested in the possibility of donating your body for plastination, a method that makes it possible to preserve natural anatomical specimens permanently for the purposes of research and instruction. The demand for this type of human specimens has remained constant. While, on the one hand, they are absolutely necessary for training physicians and for keeping physicians' skills up-to-date, they can, on the other hand, be used to educate the public on general medical issues – which cannot be said of traditionally preserved specimens. This is why I have set up a body donation programme for plastination.

I invented plastination in 1977 at the Anatomical Institute of the University of Heidelberg, where I worked for 20 years as a physician and anatomist. Since that time I have made it my life's work to continue developing these procedures and techniques, and have been awarded a number of patents for my efforts. In order to be better able to do justice to this ambition, I established the Institute for Plastination (IfP) in 1993, which I now run as Scientific Director. Dr. med. Angelina Whalley is a licensed physician and the Institute's Managing Director.

This brochure contains the important information that you will need if you are thinking about donating your body for plastination. You will learn, for instance, what will be done with your body after death. In addition, we will explain the plastination process to you – a process that is part of a centuries-long tradition of preserving and dissecting anatomical specimens. This brochure will introduce the ethical and moral issues involved and will provide information both on the work and objectives of the IfP and on current and future research endeavors. Finally, this brochure will also provide detailed instructions for donating your body for plastination and will show you how to obtain additional information.

Dr. med. Gunther von Hagens, Physician, Anatomist, Plastinator
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Managing Director

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1. Preservation and Anatomy – Traditions and the Future

"Anatomical dissection gives the human spirit the opportunity to compare the dead with the living, the disassociated with the whole, the destroyed with the nascent, and opens up the profundity of nature to us more than any other effort and observation."

Johann Wolfgang von Goethe
German Poet (1749–1832)

Leonardo da Vinci performed private studies in which he dissected human bodies. These formed the basis for his detailed, life-like, anatomical drawings. He thus made a significant contribution to social acceptance of the study of the human body.

Transience and Immortalisation

Reverence in the face of death is a significant hallmark of all cultures, as evidenced by burial rites in which the deceased are often laid out prior to burial or cremation. For the survivors, graves and cemeteries are places of intense reflection, which offer the opportunity both to keep the memory of the deceased alive as well as to say goodbye before the body succumbs to decomposition and becomes an object of alienation and revulsion. It follows that ancestral burial rites are also rooted in issues of hygiene. A decomposing body poses the risk of infection and contamination for survivors.

Human transience, however, is countered by a need as old as humanity itself: the longing to be immortalised. Cave paintings, the pyramids of Egypt, art collections, charitable foundations, and memorials all testify to this longing. Therefore, it is hardly surprising that the desire to protect one's own body and those of loved ones from decomposition, or at least to slow down the process, has been present in all human civilizations since time immemorial. As a result, the first great achievements of civilization brought with them methods that attempted to immortalise the bodies of the departed – at least in the cases of important individuals.

The mummies of ancient Egyptian phar-aohs and dignitaries, admittedly, are nothing more than mortal shells that have been disembowelled, treated with fragrant resins such as myrrh, and that have shrunk as a result of having dried out. Very little of the life and death of the deceased is still recognisable, which was intended to be beneficial for the journey to the other world. The failed organs that resulted in the individual's death, for instance, were entombed separately in vessels known as canopic jars.

Reverence and Insight

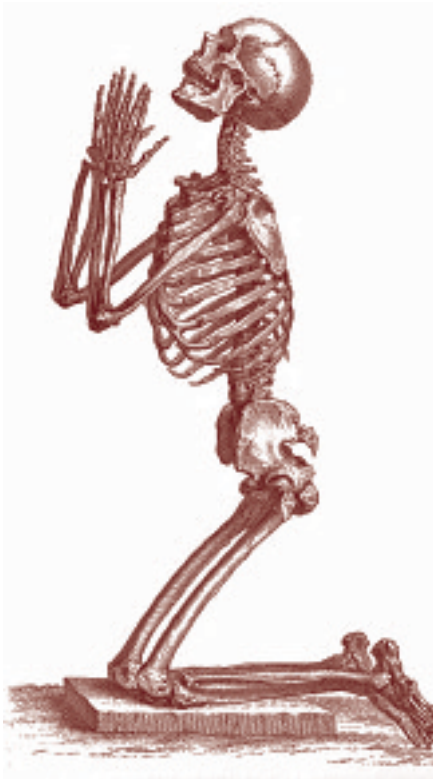
Religion and ideology impeded the study of human anatomy for many centuries. The casual acceptance of killing (wars, witch hunts, the death penalty) and the ban on dissecting corpses stood in striking contradiction to one another. On the one hand, killing was accepted and legalised by society, whereas opening up and thoroughly studying the dead for the benefit of the living was inconceivable. Anatomists had to limit themselves to studying the anatomy of animals, especially dogs and monkeys. Even Hippocrates (460-375 BC) and Aristotle (384-322 BC) obtained their knowledge of anatomy by dissecting animals. Attempting to extrapolate the results to humans, however, resulted in a number of mistakes.

Ever since one of the most significant physicians of antiquity, Galen (c. 129-199 AD), treated wounded gladiators in his home town of Pergamon and then began treating Emperors Marcus Aurelius and Commodus, the art of medicine took more steps backwards than it did forwards. Which makes the following exception all the more striking: as early as 1238, Emperor Frederick II (1194-1250) of the House of Hohenstaufen decreed that regular autopsies be performed to determine causes of death.

The eye for analytical study which emphasised knowledge over piety, first developed in western civilization – this only happened gradually, however, as the West became more oriented towards scientific inquiry. As a telling aspect of this transformation, the late Middle Ages saw a fundamental shift away from a mythical, symbolic understanding of the human body (including corpses and internal organs) and towards a more realistic perspective.

Taboos and Curiosity

The dissection of human bodies represented a triumph of reason over a vague reluctance resulting from what is perhaps a latent aversion to cutting open the human body. Leonardo da Vinci (1452-1519) who today is the best known artist and scientist of that period performed private anatomical dissections. These formed the basis for his realistic and detailed anatomical drawings with which he made a significant contribution to social acceptance of the study of the human body.
Human curiosity has always been the engine that has driven progress, which has often taken place only when socially accepted norms were violated. Today, for instance, we can hardly imagine why it was such a sensation in late medieval Italy when renowned anatomist Andreas Vesalius (1514-1564), personal physician to Emperor Charles V and King Philip II of Spain, correctly assembled human bones into what he called a "skeleton" (Gr. skéllein = to dry). This act artificially brought the dead back to a fanciful sort of life after death. Illustrations from those times, which show skeletons participating in every conceivable activity including praying and dancing (Dance of Death), bear witness to his efforts.



"Osteographia," or "The Anatomy of the Bones," William Cheselden (1688-1752)

The Anatomy Lesson of Dr. Nicolaas Tulp, Rembrandt Harmenszoon van Rijn (1606–1669)

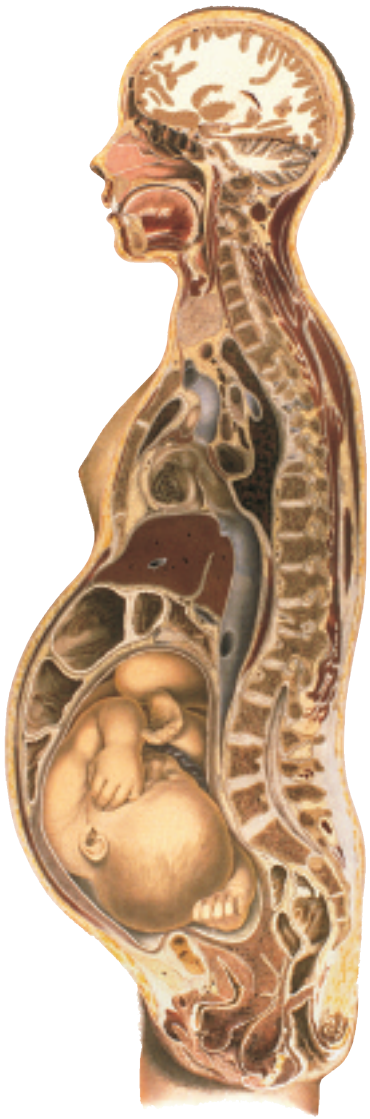
Public exhibitions of human anatomy, known as "anatomical theatres," for the benefit of medical scholars and interested laypersons were another way in which Vesalius broke a taboo. Using these experiences as a basis, he wrote his monumental work, "De fabrica humani corporis" – the first complete textbook of human anatomy – pointing out significant weaknesses and errors in Galen's teachings which until that time had remained unchallenged since the second century AD.

Science and Art

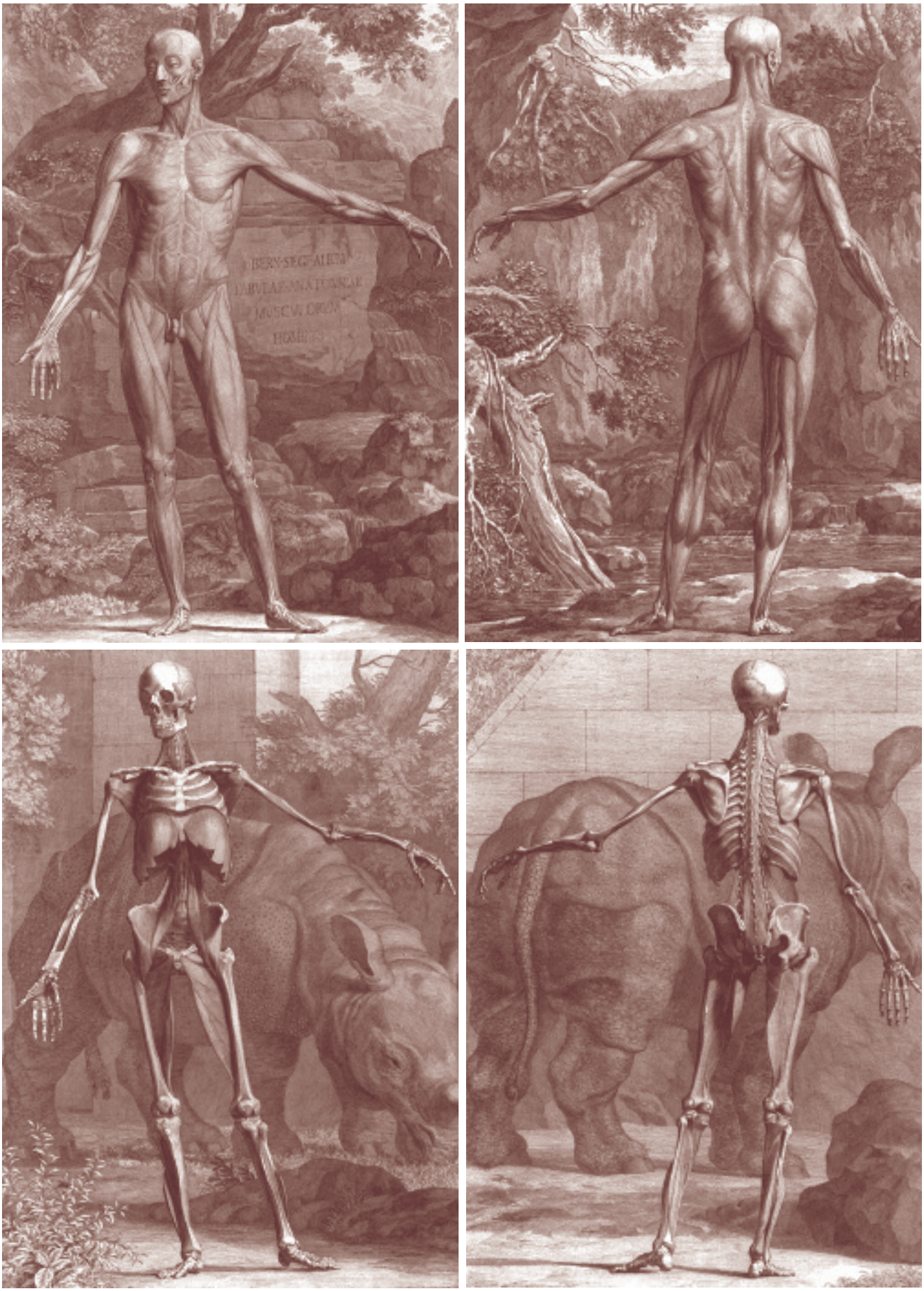
The dissection theatres of the day were more than mere academic lecture halls. Heavily influenced both by humanism and by the aesthetics of the Renaissance, these presentations of medical scholarship had a deeply felt impact on humanity's understanding of ourselves, of nature, and of our world. They also served to inspire the arts. More than a few anatomical drawings from this period show artistically dissected bodies in natural, life-like poses and set in landscapes; anatomists gathered in a circle around an opened body became a significant variation on the group portrait theme in painting. Typical examples include "*Anatomy Lesson of Dr. Joan Deyman*" and "*Anatomy Lesson of Dr. Nicolaas Tulp*" by Dutch painter Rembrandt Harmenszoon van Rijn (1606-1669), created in 1628 and 1632, respectively.

French anatomist Honoré Fragonard (1732-1799) took a slightly different perspective, performing dissections in the service of traditional art and transforming his own anatomical specimens into enduring works of art. His numerous dissection projects made him something of a sculptor of dead bodies. Fragonard also wanted to extend the guiding principle of the Enlightenment to include the workings of the human body. He wanted to present the body in a way that was vivid, insightful, and, above all, beautiful. For him, anatomy was not just a subscience of medicine but was instead its aesthetic culmination. In order to prevent his specimens from deteriorating, Fragonard injected them with coloured wax which solidified in the blood vessels; the remaining tissue dried out and was treated with lacquer.
A particularly stunning work that he created in this way is his "*The Rider of the Apocalypse*," (see page 8) which can still be seen along with his other works at his former workshop in Alfort near Paris. (Info: Ecole Nationale Vétérinaire d'Alfort, 7, Avenue du Général de Gaulle, 94704 Maisons-Alfort, France; Tel.: +33 (0) 1–43967172, www.vet-alfort.fr)

The creation of the first slices of the human body dates back to the nineteenth century, when renowned anatomist Nikolas Pirogoff published "*Anatomia topographica, sectionibus per corpus humanum*" – a volume still informative to this day – featuring 213 drawings of slices of the human body, including one of a pregnant woman. The stone printing blocks are still in existence.



Cross-sectional drawing of the body of a pregnant woman by Russian anatomist Nikolas Pirogoff, 1855



Drawings from 1747 by the German Bernhard Siegfried Albinus who was an anatomist at the University of Leiden in the Netherlands.

Preservation and Restoration

The aesthetic concept of science that Fragonard and Pirogoff shared was made possible in a brief window of history when scientists had already opened up the human body, but when there was not yet a code of medical conduct that restricted how it could be used. On the one hand, the development of suitable preservation methods represented tremendous progress, as the study of human anatomy had been very much impeded by the decomposition process. A breakthrough in preserving organs which, unlike bones, readily decompose, came in 1893 with the introduction of formalin (an aqueous solution of formaldehyde). For the first time, soft tissue and even complete corpses could be preserved as so-called "wet specimens" which provided a high level of quality and, for the times, relative permanence. The first of what were known as "dry specimens" were preserved using a method patented in 1914, in which the body's tissues were saturated with paraffin. This process was not replaced until the 1950s, when water-soluble polyethylene glycol came into use; the plastination process was invented in the 1970s.

Today, anatomical studies performed on human bodies as well as the use of genuine skeletons and organs for medical training have become a matter of course. Yet the knowledge and freedoms painstakingly achieved by the founding fathers of scientific anatomy are now lost to the general public, and dissections performed in anatomical theatres are a thing of the past. Anatomical museums generally show nothing more than bleached out specimens of the human body kept in small jars. Specimens such as these are not suitable for educating the public on the normal functions and disorders of the human organism. Non-professionals rarely have the opportunity to see the material used for research and teaching – which includes malformed foetuses, organs, and tissue that have been damaged in every conceivable manner. And if they do see such things, they are more likely to be filled with the fear of death than actually to learn something that will enhance their lives. Even many prospective physicians initially have to force themselves to look at these specimens.

"The Rider of the Apocalypse," Honoré Fragonard (1732-1799)

Plastination and Education

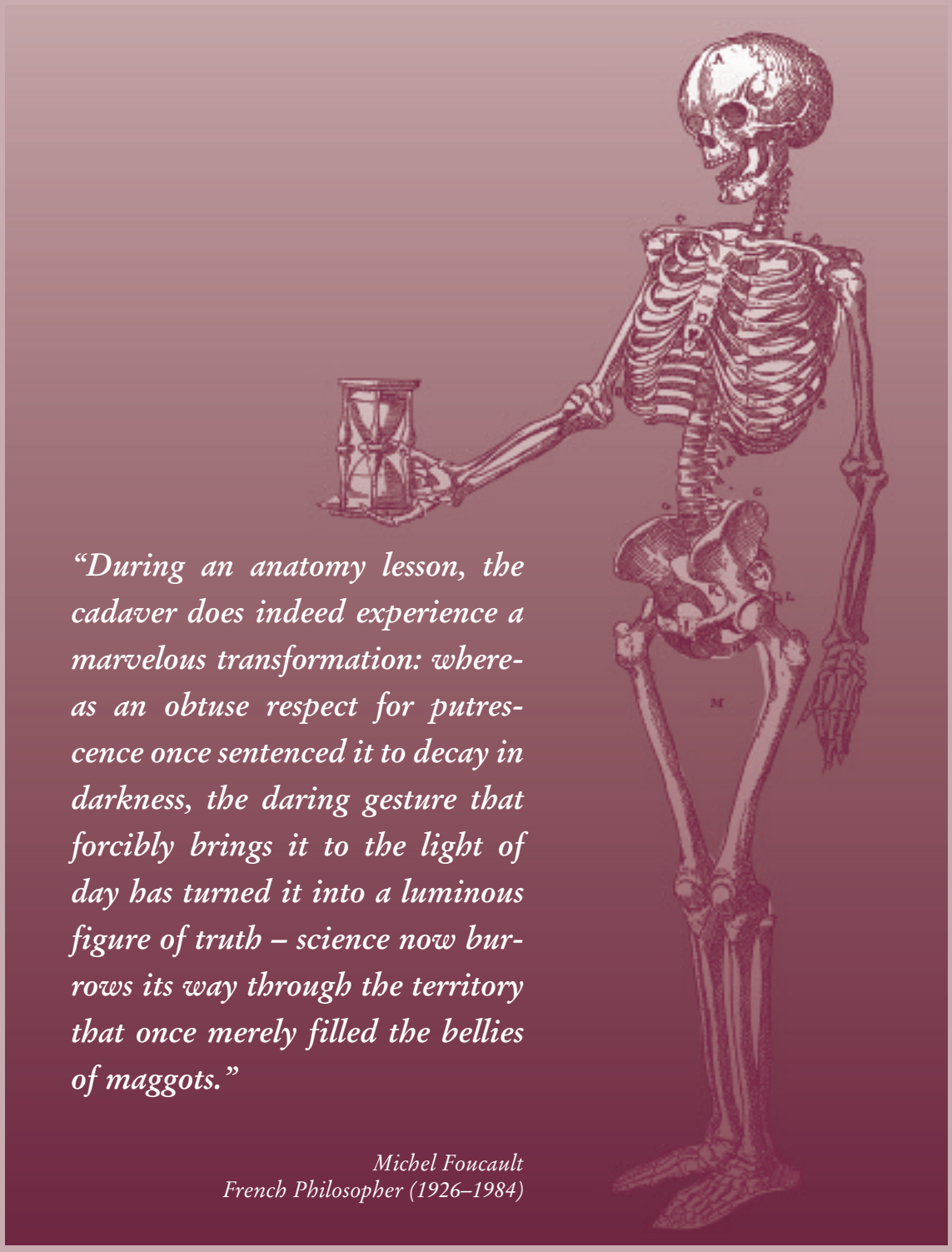
The invention of plastination is an aesthetically sensitive method of preserving meticulously dissected anatomical specimens and even entire bodies as permanent, life-like materials for anatomical instruction. The body cells and natural surface structures retain their original forms and are identical to their condition prior to preservation, even at a microscopic level. The specimens are dry and odourless, and remain unchanged for a virtually unlimited amount of time, making them truly accessible. These characteristics lend plastinated specimens inestimable value both for training prospective doctors and for educating non-professionals in the field of medicine.

When laypersons view a plastinated human body or organ for the first time, their emotional response can be quite powerful. However, if they do not immediately recoil in horror and can regain their composure after facing this existential experience, they are often gripped with a deeply moving fascination for what has been fixed in this novel way on the border between death and decomposition. Many of those who come to the *BODY WORLDS** exhibition have expressed their gratitude for the courage of those individuals who, while alive, explicitly stated in their last will and testament that their bodies should not be buried or cremated, but that others should see them and learn from them.

Revealing the features of our physical being – from its hair, skin, fat, muscles, tendons, and bones to the most intricate networks of blood vessels and nerves – may sound revolutionary. In reality, however, it is merely a continuation of the scientific tradition, which is guided by the proposition that the edification of the public is the ultimate purpose of research. In a sense, therefore, the public display of human bodies represents the resurrection of the anatomical theatres of the early modern period, albeit in a completely new form.

** BODY WORLDS is also known as KÖRPERWELTEN and LE MONDE DU CORPS in some countries.*

2. Plastination – Theory and Practice



"During an anatomy lesson, the cadaver does indeed experience a marvelous transformation: whereas an obtuse respect for putrescence once sentenced it to decay in darkness, the daring gesture that forcibly brings it to the light of day has turned it into a luminous figure of truth – science now burrows its way through the territory that once merely filled the bellies of maggots."

Michel Foucault
French Philosopher (1926–1984)

The Plastination Process

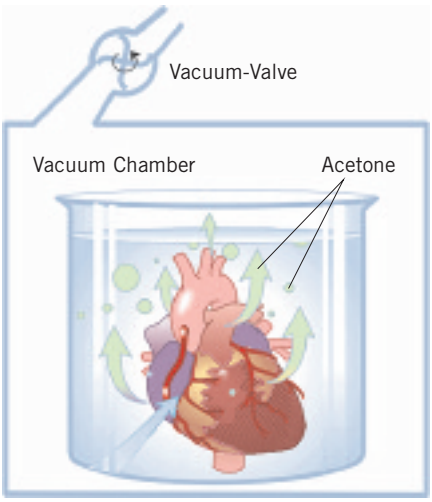
Even though a major German encyclopaedia (the 19th edition of the Brockhaus Encyclopedia, 1992) indicates that the word "plastination" is derived from the Greek (from plassein = to shape, to form), the term is, in fact, a creation of Gunther von Hagens. He coined the term because "plastification" already had a fixed meaning in the field of polymer chemistry, and the expression used in the original patents of 1977/78 ("Polymer Impregnation of Perishable, Biological Specimens") was not terribly catchy and utterly inadequate for popularising the new technology, particularly abroad. The following paragraphs will provide an explanation of how plastination works. We will first present the process in a general, comprehensible manner; for those with an interest, we will then go into more detail regarding the chemicals and chemical processes used.

A process at the interface of the medical discipline of anatomy and modern polymer chemistry, plastination makes it possible to preserve individual tissues and organs that have been removed from the body of the deceased as well as the entire body itself. Like most inventions, plastination is simple in theory: in order to make a specimen permanent, decomposition must be halted. Decomposition is a natural process triggered initially by cell enzymes released after death and later completed when the body is colonised by putrefaction bacteria and other microorganisms. By removing water and fats from the tissue and replacing these with polymers, the plastination process deprives bacteria of what they need to survive. However, bodily fluids cannot be replaced directly with polymers, because the two are chemically incompatible. Gunther von Hagens found a way around this problem: In the initial fluid-exchange step, water in the tissues (which comprises approximately 70% of the human body) and fatty tissues are replaced with acetone, a solvent that readily evaporates. In the second step, the acetone is replaced with a polymer solution.

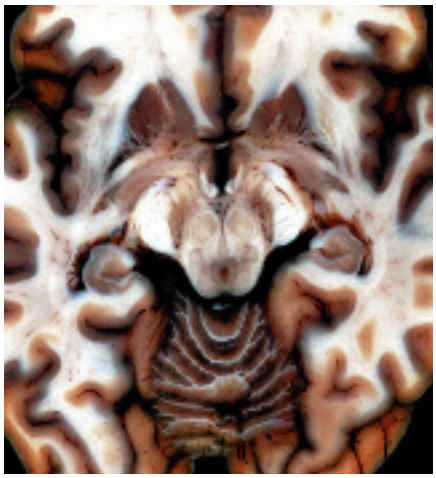
The trick that first proved to be critical for pulling the liquid polymer into each and every cell is what he calls "forced vacuum impregnation." A specimen is placed in a vacuum chamber and the pressure is reduced to the point where the solvent boils. The acetone is suctioned out of the tissue at the moment it vaporises, and the resulting vacuum in the specimen causes the polymer solution to permeate the tissue. This exchange process is allowed to continue until all of the tissue has been completely saturated – while a matter of only a few days for thin slices, this step can take weeks for whole bodies.

The second trick is selecting the right polymer. For this purpose, "reactive polymers" are used, i.e., polymers that cure (polymerise) under specific conditions such as the presence of light, heat, or

Forced impregnation in a glass vacuum bell. The force of the vacuum squeezes the acetone out of the specimen in bubbles and to the top of the impregnation tank.



The centerpiece of plastination: "forced impregnation." In a vacuum, acetone trickles out of the tissue, creating a volume deficit in the specimen which allows it to be permeated by the plastic.



Plastinated brain slice. The plastic used provides excellent definition between grey and white brain matter.

The Plastination Process

Fluids in Tissues

Embalming
Decomposition is stopped using formaldehyde.

Dissection
Posed specimens are dissected with forceps and scalpels.

Sawing
Bodies are cut in 3.5 mm slices while frozen.

Acetone

Fluid Removal
Frozen bodily fluids are replaced by acetone in a cold acetone bath.

Fat Removal
Soluble fat molecules are replaced by acetone in a warm acetone bath.

Solid Plastic ◄ Liquid Plastic

Forced Impregnation
In a vacuum, acetone is extracted and gradually replaced with plastic.

Positioning
Each structure is brought into the proper position.

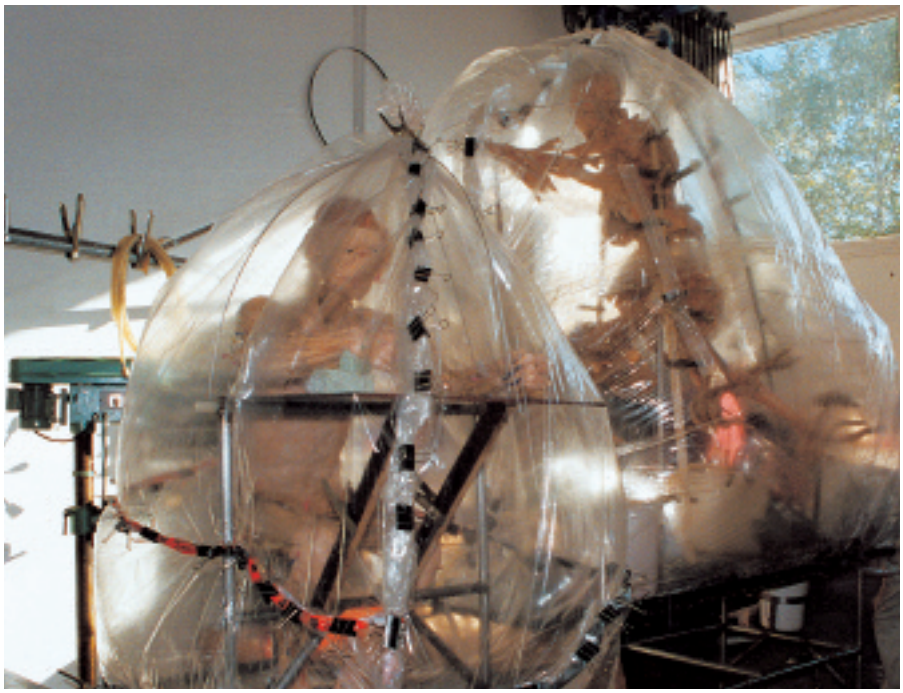
Casting Slices
Slices of tissue are laid between sheets of film and/or glass plates.

Gas Curing

Heat Curing

Posed Specimen
Infused with silicone rubber.

Plastinated Slices
Infused with epoxy resin.



Specimens plastinated with silicone are cured with a special gas.

certain gases. Their viscosity must be low, i.e., they have to be very thin liquids; they must be able to resist yellowing; and, of course, they must be compatible with human tissue. The polymer selected determines the look and feel of the finished specimen.

Special Technical Subtleties

What makes plastination complicated is the large number of variations that have become possible since the invention of this process and that are essential for obtaining the best results. Indeed, these variations represent the very strengths of the process. A large number of factors needs to be taken into consideration: crucial among these is the degree of decomposition, but the list also includes the distribution of fatty tissue and the amount of blood in the veins. As a result, each individual specimen requires its own unique, carefully and precisely planned plastination procedure if it is to be preserved perfectly. Improvements and nuances in the process have understandably been linked to the development of suitable polymers. Today, the following four primary classes of polymer are used in a variety of formulations, each with its own distinctive properties and appropriate for specific types of specimens:

- Epoxy resins which become transparent when heat-cured have become the material of choice for preparing body slices.
- Light-cured polyester resin blends yield excellent results for slices of the brain.
- Polymer emulsions that turn white when cured are primarily suitable for thicker slices, as these emulsions make fatty tissue look more natural.
- Silicone rubber cures in gas and remains relatively soft and pliable, lending specimens an especially lifelike appearance. Very low-viscosity silicone achieves the best results with complete organ systems. Silicone-based processes are now the most frequently used (in over 40 countries).

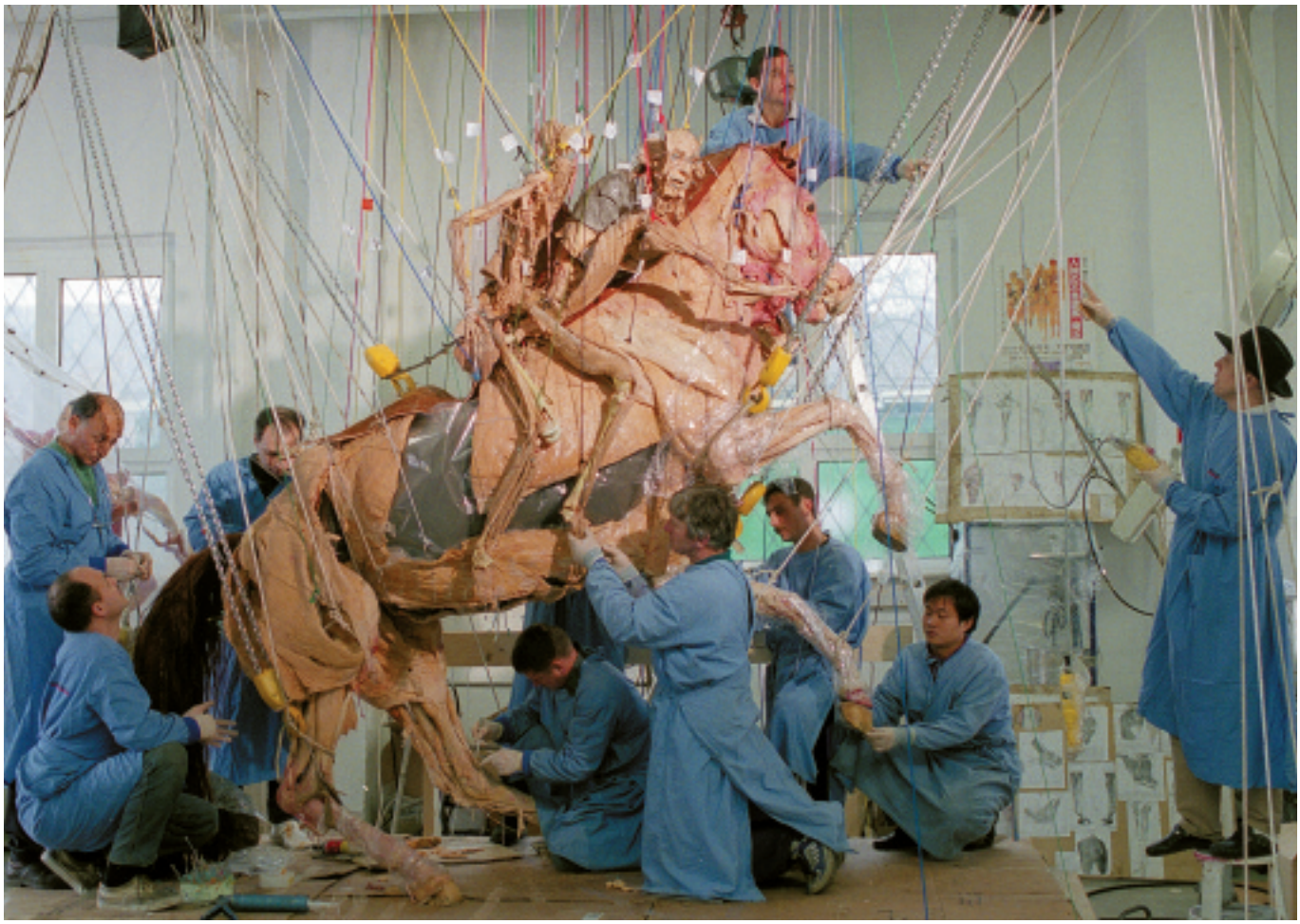
Through the use of silicone rubber, Gunther von Hagens was able to solve the greatest problem posed by plastination: the long periods of time required for complete preservation of large tissue specimens and whole bodies. In 1990, he completed his first whole-body plastination. Other milestones along the way have included "perfusion plastination" which makes it possible to purge organ systems of blood, fix them in place, and then permeate them first with acetone and then with silicone. The vascular system is then evacuated before curing the specimen via gas perfusion. These plastinates are pliable and lightweight because their vascular systems are empty – only their cells are saturated with plastic. A number of key experiences have been integrated into what has become a 30-year-long process of development and optimisation of the preservation and dissection methods used.

A New Approach to Teaching Anatomy

Traditionally, medical students familiarise themselves with the human body through a process of removal. First they remove the skin from the corpse, then they detach muscle after muscle from the limbs, and finally conclude by removing the chest and abdominal walls. After removing the organs, the remainder of the body is – to use their own rather telling term – "dissected down" to the bones and ligaments. According to medical encyclopaedias, anatomy is a teaching discipline within the field of medicine; it is based on the dismemberment of the dead and concerned with the form, composition, and structure of the human body up to and including the most intricate details of its tissues, functions, and prenatal development.

Considered in this light, plastination does not differ from traditional anatomy in any way. As an innovative preservation method, it does, however, make it possible to create completely new types of specimens. When the polymers harden, for instance, muscles that would ordinarily be slack can provide support, allowing the body to be displayed in a variety of unusual poses, either in its entirety or in various stages of anatomical dissection. It is even possible to take a body that has been dissected into components of interest and stretch it in all directions, thereby creating gaps that allow for informative glimpses into the body and reveal structural relationships that would otherwise remain hidden.

Plastinates are able to convey far more than man-made, three-dimensional mod-



"Rearing Horse with Rider" during positioning. Completion of this plastinate took three years.

els, simply because they constitute unique, individual human bodies – models, on the other hand, have at some point had to be consciously designed. Sometimes plastinates even communicate more than untreated anatomical specimens. Transparent slices of tissue, for example, allow observers to trace the course of even the most minute nerves into the depths of the body. The gray matter visible in slices of the brain is easier to distinguish from the white medulla oblongata than is the case with a fresh organ. When the physical/chemical process is performed properly, even small, microscopic bundles of cells retain their original form. The result is a visually arresting plastinate – the ideal method for displaying a preserved body in a way that sheds light on the functions of its structures.

Craftsmanship or Showmanship?

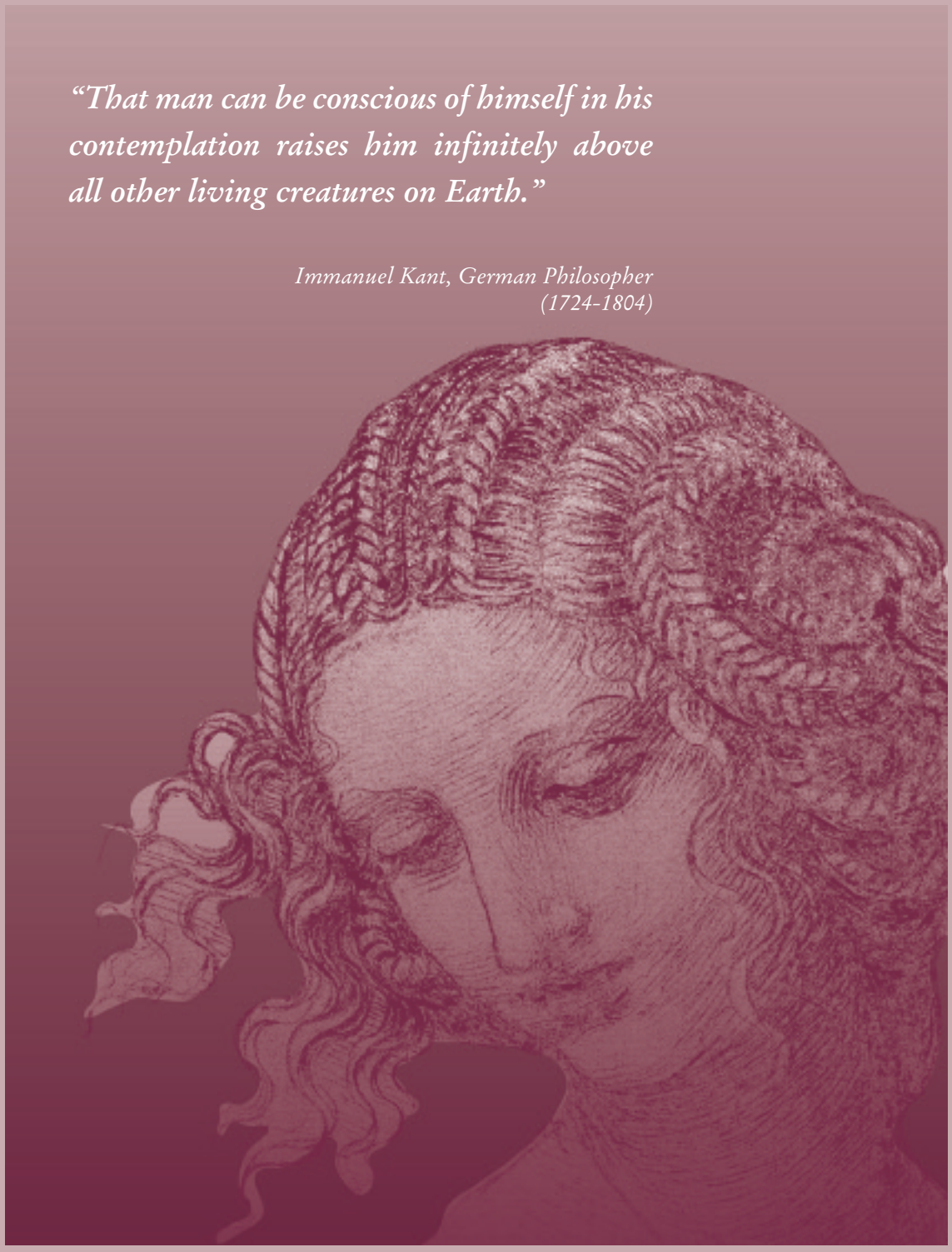
The unlimited shelf life of plastinates makes worthwhile highly detailed dissection work that would have been too time-consuming prior to the invention of the process. After it has been saturated with silicone rubber but before it can be cured, for example, a whole-body plastinate can first be posed as desired; needles and pieces of foam rubber are used to hold nerves and muscles in place that have been cut away from their natural positions.
In addition to tremendous manual dexterity, this also requires a great deal of knowledge in a variety of areas. The individual preparing the specimen must be familiar with the opportunities afforded by process engineering and by the fields of chemistry involved. He or she must also have an excellent memory for, and ability to visualise, anatomical structures as well as years of experience with dissection and a talent for the job.
Above all, preparing a whole-body plastinate is an intellectual and sculptural achievement that requires the plastinator to have a mental picture of the results before even beginning the project.
Viewed from this perspective, creating a plastinate can be compared to the work of an artist who sculpts a figure from a block of stone or who prepares a clay mould for a cast-bronze statue. However, the critical difference is that the purpose of creating a permanent anatomical specimen is not to achieve a perfect shape with a beautiful appearance. The objective is instead to use forceps, scalpel, and often the vision visors (magnifiers) used by watchmakers in order to highlight those details of a pre-existing, natural organism that best illuminate the relationships between structures and their functions within a living body. If this process is executed with meticulous

"The Chess Player," Gunther von Hagens, 1997

dissection and preservation work, the body is transformed into a replica of a life that has been lived that captures the authentic nature of that life.
Presenting bodily functions in this way sometimes requires positions that reflect certain themes. The traditional pose of the reflective chess player, for example, is ideal for illustrating the nervous system, whereas a dancer would lend itself well to showing a particularly powerful female foot. The resulting novel postures have led these bodies to be referred to as "posed plastinates." Of course, it is true that their postures differ from specimens preserved according to traditional anatomical practice, but this is a necessary consequence and not the aim of this integrated "reconstructive anatomy" which aims to recreate the living body. The poses of these specimens can have a disturbing effect on experts and laypersons alike – after all, the bodies and body parts on display have been reconnected to the living environment from which they originated. What is new is that a body rescued in this way from decomposition not only fails to instill revulsion in those who see it, but is instead perceived as something beautiful. Sometimes this perception is so overwhelming that observers may well forget the frailty of the human body, which the specimen so clearly demonstrates.

It would be surprising if this did not produce an emotional storm in need of intellectual and spiritual processing. However, if the shock of the experience immediately triggers feelings of either hostility and aggression or unbridled enthusiasm, we can rest assured that these are only extreme responses that reflect very different natures and worldviews.
Our civilization is so advanced that we live in what is essentially an environment of our own creation, i.e., an artificial world. Consequently, it is all too understandable that we are increasingly inclined to repress our natural side. For many people, their bodies are little more than machines that the doctor is supposed to fix whenever there is any technical difficulty or failure. Even such vital organs as the kidneys, heart, and liver can now be replaced with healthy donor tissue as soon as severe damage sets in. Ever since this possibility has existed, discourse on the subject has been essentially reduced to two problems: the practical issue of whether sufficient replacement parts are available and the ethical issue of determining how to establish the moment of the donor's death so that surgeons can immediately begin removing the organs (assuming consent has been given).
By displaying human specimens publicly, an exhibition like *BODY WORLDS* allows us to encounter what remains of our natural selves within the framework of our artificial environment. Specifically, when we look inside whole bodies and organs in which disease processes such as lung cancer or heart attacks have run their course, we also see both our physical frailty and the cavalier manner in which we often neglect our own bodies. As such, these plastinates can elevate our individual and collective health consciousness. Besides satisfying purely scientific interests for individuals willing to expose themselves to the experience, exhibits such as these can also act as vivid and, most importantly, as intellectual and spiritual bridges to our own bodies. Furthermore, they can also provide profound and moving insight into our own physical nature.

3. The Institute for Plastination (IfP)



Mission and Objectives

Gunther von Hagens found it necessary to establish the Institute for Plastination (IfP) in 1993, because the space and technical facilities available at the University of Heidelberg were no longer adequate for the growing demands of plastination. At the IfP in Heidelberg, the techniques for preparing whole-body plastinates and transparent slices of whole bodies were perfected. The complexity and work involved in preparing these specimens far exceeds the capacity of most interested institutes. Preparing a technically correct whole-body plastinate does, after all, require 1,000 to 1,500 man-hours.

The aim of the IfP is to produce human specimens and make them available both for basic and continuing medical training as well as for the general medical education of the public. The specimens are prepared solely for this purpose and only passed on directly to recognised educational and research establishments and scientific museums but not to private individuals or dealers.

The objectives of the IfP can be summarised as follows:

(1) Improving overall anatomical instruction
The IfP produces high-quality educational specimens for anatomical instruction at universities and other teaching institutions.

(2) Improving awareness of medical issues, particularly among the general public
The IfP produces plastinates aimed at educating non-medical professionals and restores public access to the anatomy of the human body.

(3) Popularising and developing plastination techniques
The IfP disseminates plastination expertise around the world, allowing other teaching institutions to profit from this unique process. The IfP also pursues scientific objectives and strives continually to develop and refine the techniques of plastination and the resulting anatomical specimens. It is aided in these endeavours by visiting scientists and scholarship holders from national and international universities.

There are now more than 400 plastination laboratories in 40 countries around the world using plastination to prepare specimens for academic study. Despite all of the progress made to date, the need for further research is immense. For example, tests need to be performed on new polymers that could be used to retain the colour of tissues and to improve plastination results for specimens such as the eye, which are difficult to preserve.
Every two years, participants at the International Plastination Conference have the opportunity of exhibiting the plastinates that they have produced. In addition, the International Society for Plastination and its publication "The Journal of the International Society of Plastination", provide additional forums for experts in the field to exchange information concerning advances in the scientific application of the process. Current issues include how slice plastinates can be used to show complex systems such as the blood supply to the bones of the wrist or how to display subtle structures such as the muscles and nerves surrounding the prostate. These tissues are critical for proper sexual functioning and understanding them is an extremely important means of obtaining precision when planning delicate surgical procedures.

Visitors at BODY WORLDS

The Body Donation Programme of the IfP

The high demand for plastinated specimens
Although the eminent importance of plastination for medical study has been acknowledged and there is a great deal of interest in the process, for years now the demand for high-quality plastinated specimens for instructional purposes has not been met. This is due to the following reasons:

(1) Only a few academic establishments are in a position to set up their own plastination laboratories and to train and pay the staff needed to maintain such a facility. The nature and size of some academic

Dissection in Gunther von Hagens' laboratory in Dalian, PR China. Approx. 1,000 to 1,500 man-hours are required to produce one whole-body plastinate.

institutions (such as nursing colleges and training centres for medical technicians and other medical professions) would not support such activities.

(2) New technological developments in plastination mean that it is now possible to preserve entire bodies. Whole-body specimens are particularly valuable for anatomical study, because students can examine the body in its entirety, in the same way as they will later be examining and treating living bodies in their entirety. Consequently, the development of plastination has now been getting away from preserving small individual specimens to plastinating whole bodies. This process is technically extremely complex and is far beyond the scope of a university laboratory.

(3) Theoretically, manufacturers of teaching aids could remedy this situation to produce plastinated specimens for anatomical study using the best equipment available. However, as the production of plastinated specimens involves major expenses, they could not be given away for free; they would have to be sold. No one would be prepared to do this in practice, as the sale of bodies or parts of bodies is a controversial issue in our society and is considered unethical or morally objectionable.

This situation not only applies to producing plastinated specimens, but to other urgently needed human specimens as well, despite the fact that their sale and purchase are not against the law in Germany and other Western countries. An important and understandable reason for the controversy surrounding this issue is due to the fact that the donors have not explicitly agreed to let their bodies be sold after their deaths. There are neither laws which state that dead bodies must be left intact, nor are there any which do not allow parts of such bodies to be removed unless consent has been given. Consequently, there is a legal grey area which the tabloid press can always interpret as something scandalous, accusing people of getting rich at the expense of the dead. The real question is whether such claims are fuelled by a legitimate interest or by sensationalism, but this is not an issue for the scientific world to resolve. It is a problem for the respective media and their audiences.

There are many people who would like to donate their bodies to medical science after their deaths. One means of doing so is to work with the anatomical institutes of universities. However, such establishments are unable to pass on specimens to other academic institutions in need of such bodies, as costs would be incurred for which they do not want to issue invoices if body donors have not agreed to a sale. In addition, "services" like these are technically not within the declared province of a university in most countries. This situation is particularly awkward, as anatomical institutes frequently have to turn down prospective body donors, because they already have more than enough bodies for their own instruction.

Helping to meet the need

There is a clear disparity between the number of potential body donors on the one hand and the shortage of preserved specimens (especially plastinated ones) on the other hand. As a result of this, many scientific projects and academic efforts are doomed to failure. The body donation programme of the IfP is working toward correcting this situation. The success of this work as well as the resulting benefits to medical science and education are equally dependent on your decision to become a body donor. Success hinges on people like you who are generous enough to donate their bodies to the future progress of medical science.

Handling Dead Bodies and Specimens

Plastination institutes and cooperation partners

In its endeavours to improve anatomical studies and research, the IfP is supported by numerous organisations which were founded for this purpose. Gunther von Hagens serves as scientific director. Since 2006, the PLASTINARIUM in Guben has been one of the main cooperation partners, who increasingly performs conservation and dissection tasks for the IfP. There are also cooperative efforts with official state-certified anatomical institutes.

Financial and legal issues

The IfP is a private research institute that does not receive any public funding or state subsidies. Due to the high costs of plastination development and production, the IfP can thus only provide specimens for a fee. The understandable proviso that no one should earn a profit from body parts is addressed within the IfP's agreement with body donors for plastination. The donor fills out a form in which he or she explicitly declares that his or her body is being made available free of charge for medical instruction and educating the public. Purchases of specimens are invoiced for "preservation work" or "plastination work" but not for the specimens themselves. Every invoice contains the following declaration: "The specimen provided is only available, because it was donated for plastination to the IfP. We thank the donor for this. There is no charge for the specimen itself, only for the production costs." The fees must cover the costs of preservation, dissection, and plastination, as well as finance new developments in plastination, education of plastination experts, and the establishment of a museum of plastination. On an international level, the IfP aims at eliminating any legal or ethical reservations associated with the sale of human specimens by ensuring that all those involved are aware of the exact facts.

"Rearing Horse with Rider," Gunther von Hagens, 2002

The usage of specimens

The IfP delivers specimens to certain institutions. It pledges to give human specimens only to "qualified users". Qualified users are those who will credibly use human specimens exclusively for research, educational, medical or therapeutic purposes. This includes educational establishments such as universities, hospitals, museums, and schools, as well as medical practitioners, college professors, lecturers, as well as other individuals who conduct scientific research.
In addition, the BODY WORLDS exhibition contains specimens which stem almost exclusively from the IfP body donation programme. Several individual organs as well as the majority of embryos and foetuses were originally preserved in formaldehyde in old museum collections and were plastinated especially for the exhibition.

Measures for Science and Medical Research

Various measures and projects are used in pursuing the IfP's goals. These can be grouped into the fields of science and research and general medical education. To further its goals in science and research, the IfP implements the following measures:

(1) Producing and supplying anatomical specimens exclusively to institutes engaged in anatomy, pathology, and forensic medicine at universities throughout the world;

(2) Producing and supplying anatomical specimens for practice operations such as procedures on the temporal bone for ENT specialists in training;

(3) Allocating body specimens for teaching and scientific projects for medical research establishments

and medical engineering companies;

(4) Producing and supplying traditional anatomical specimens fixed in formalin, plastinates, skeleton and vessel specimens for the purpose of training students;

(5) Producing and supplying anatomical specimens to established natural science museums;

(6) Producing our own specimens for anatomical atlases as well as a computerised anatomical project (CD-ROM).

Projects for Medical Education

The BODY WORLDS exhibition

In the field of medical education, the IfP is heavily involved in coordinating and constantly refining the travelling *BODY WORLDS* exhibition. Because of the high demand, three complete exhibitions have been created so that they can be shown simultaneously in different cities. The medium-term plans of the IfP include creating additional exhibitions and establishing a museum about the body.

BODY WORLDS focuses on approx. 200 authentic specimens of human anatomy – individual organs, transparent vertical and horizontal slices of the body, and whole-body plastinates. The exhibition is structured in such a way that visitors can experience it much as they would a three-dimensional textbook: anatomy as the foundation of the body is laid out in an educational and elucidating fashion. Visitors can envision how their own bodies are constructed as they walk through the exhibition, starting with the human skeleton and the way muscles are structured, on to the intestines and special specimens on the nerves and blood vessels, all the way to the way a baby develops in the uterus. There are also specimens that show the effects of diseases such as a heart attack or cancer.

The *BODY WORLDS* exhibition is intended to help educate people and provide the opportunity for lay people in particular to gain a greater understanding of the body and its functions. It is intended to help remind visitors of how natural our bodies are and create an impression of the unique character and anatomical beauty of the body's interior. The exhibition has been on constant display since 1995 and has been shown in Japan, Germany, Austria, Switzerland, Belgium, the UK, Korea, Singapore, Taiwan, the US, and Canada. To date, it has attracted over 25 million visitors, making it the most successful travelling exhibition of all time.

Visitors at BODY WORLDS

In spite of its great success and the high levels of acceptance that visitors have demonstrated, the controversial nature of *BODY WORLDS* continues to provoke debate in the European cities where the exhibition was shown. The topic has been the focus of a long and particularly heated dispute in Germany. Dr. Ernst-D. Lantermann, professor of personality and social psychology at the University of Kassel, developed an extensive representative survey of visitors and conducted his

Non-smoker's lungs

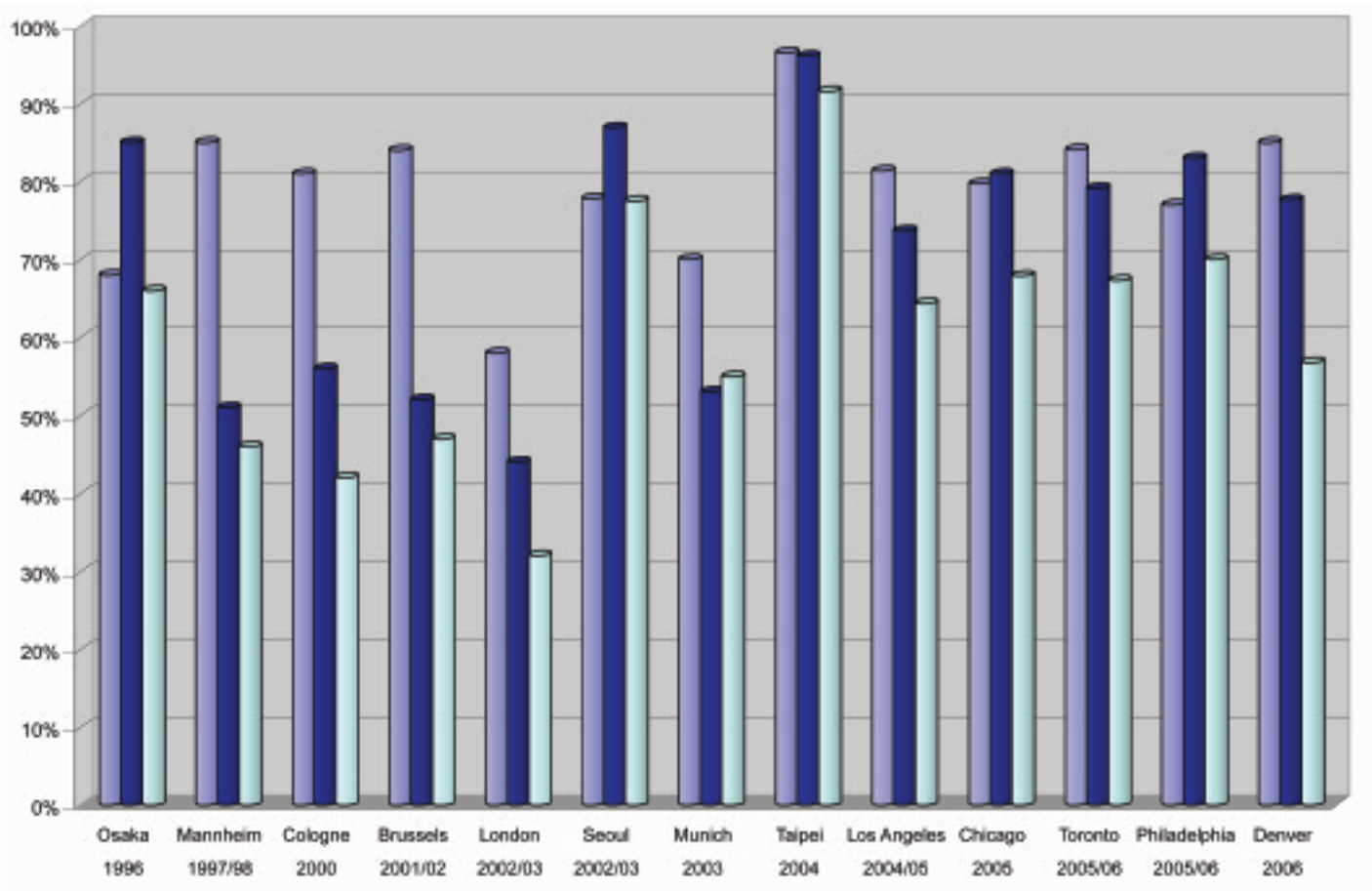
Smoker's lungs

Six months after attending the exhibition, 9% of those interviewed in a follow-up survey indicated that they had smoked less or had given up smoking altogether since then.

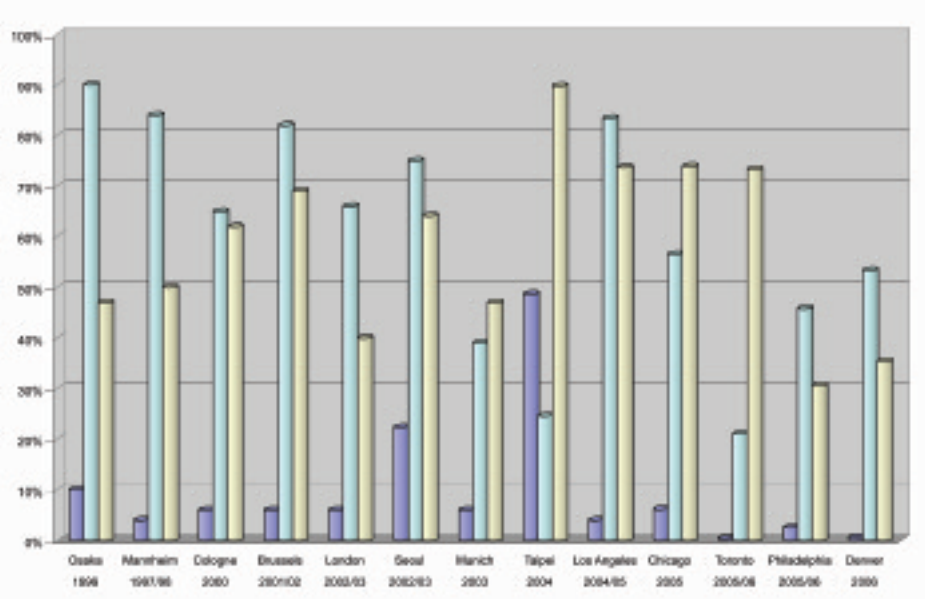
poll at many exhibitions with the goal of neutralising the public debate. This was intended to create as objective a snapshot as possible of the visitors' expectations, motives, and impressions of the exhibition, and of how people planned to behave in the future as a result of seeing *BODY WORLDS*.

The survey showed that hardly any other exhibition has met with such approval. A total of 60% of those who attended the exhibition stated that the authenticity of the specimens on display had a great impact on their understanding of the body, and 58%

Immediate Didactic Success of Attending the BODY WORLDS Exhibitions



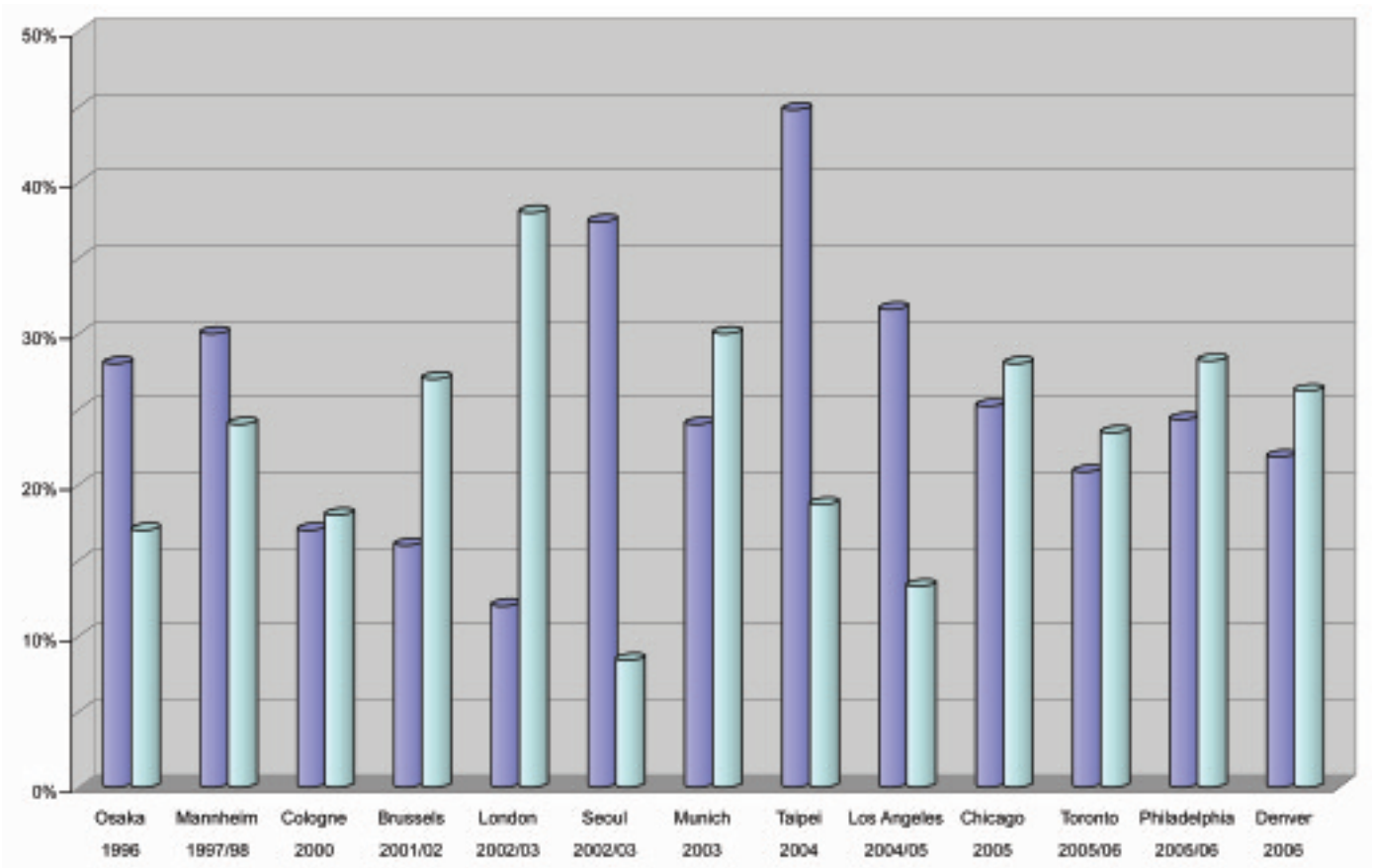
Assessment of Plastinates as Genuine Anatomical Specimens



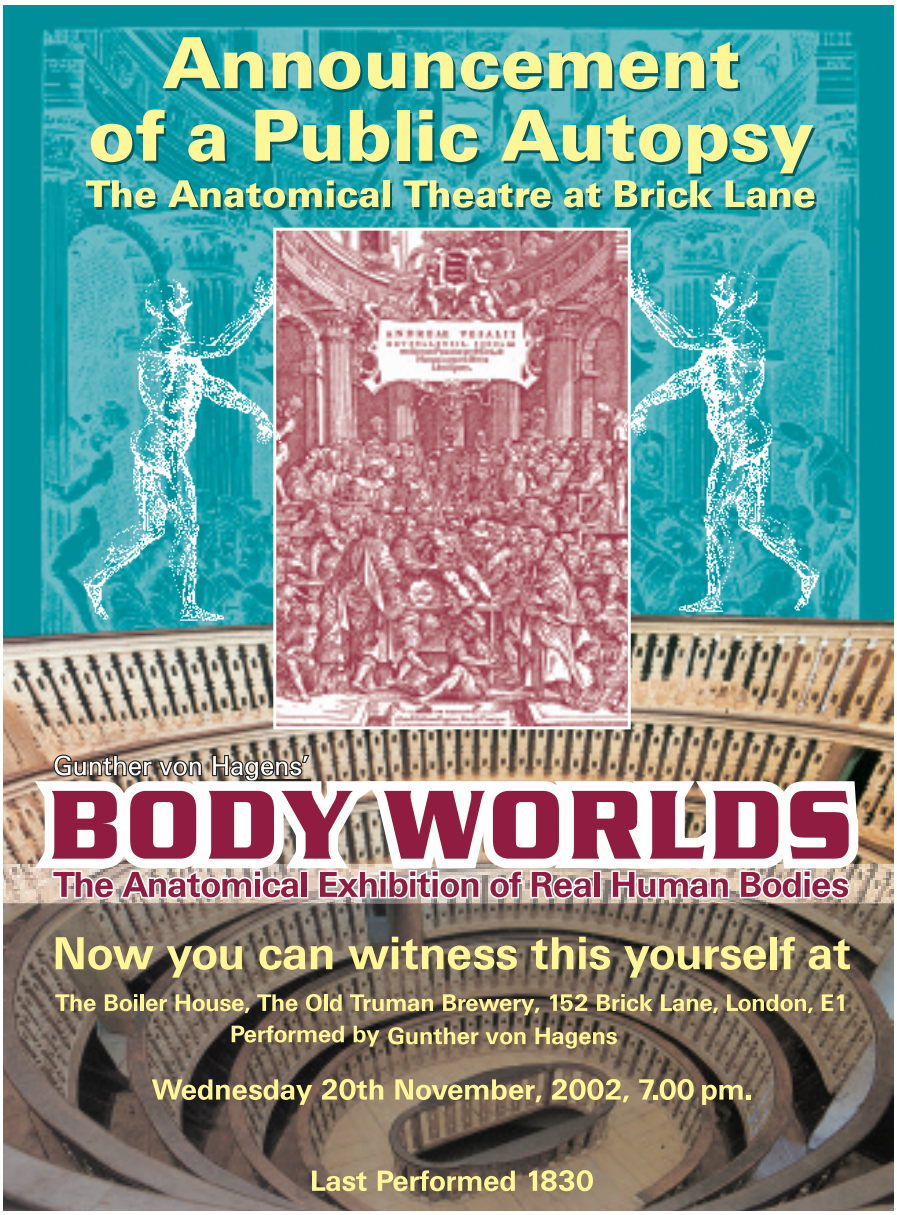
Moral opinions offended Aesthetic appeal
Authentic specimens important to gain insight

of them said that they found the specimens aesthetically stimulating. Only a minority (5% on average) said that they felt it violated human dignity to show such specimens of people's bodies. After the exhibition, 88% of the visitors said that they now knew more about the human body, and more than 60% of them felt "more pensive about life and death." Altogether, 79% expressed "immense respect for the miracle of the human body," and 71% said that they were inspired tremendously to lead healthier lives in the future. Furthermore, half of those surveyed stated that they appreciated their bodies more after having attended the exhibition. Overall, the largely positive expectations that people had before seeing *BODY WORLDS* were universally upheld, while only a small minority

Potential Personal Consequence of Attending the Exhibition



More willing to donate organs than before More willing to donate body



Advertisement for the first public autopsy since 1830, performed by Gunther von Hagens.

felt that their negative expectations were confirmed. A total of 71% of those polled said that they were determined to pay more attention to their physical health in the future. The exhibition also brought 26% of the visitors to see the act of donating organs in a more positive light. Of those attending the exhibition, 23% could imagine donating their bodies for plastination after death, and 32% indicated that they would now be more willing than before to "permit an autopsy to determine the cause of death more precisely." In terms of the impact on changing visitors' attitudes, the *BODY WORLDS* exhibition has had a lasting and – in our opinion – extremely positive effect on those who have seen it. Three-quarters of the visitors said that they wanted to spend more time thinking about the insights and impressions that they experienced by attending the exhibition.

To determine the extent to which visitors have acted on their resolutions after seeing *BODY WORLDS*, another survey was conducted in Vienna six months after the exhibition ended. Of those who saw *BODY WORLDS* in Vienna and participated in the survey (over 30%), 9% said that they had smoked less and had drunk less alcohol after having seen the exhibition. Almost 33% had begun to eat more healthily, 25% exercised more, and 14% paid more attention to their physical well-being.

Publicity campaigns

As part of his constant efforts to democratise the field of anatomy, Gunther von Hagens also works with posed plastinates at public events in an attempt to create points of reference to everyday life. This includes placing the figures in public places or juxtaposing them with living persons (which is also one of the events held at *BODY WORLDS*).

Another public event Gunther von Hagens has held was a public autopsy performed in London in November 2002 – the first public dissection in almost 180 years. His aim here was to revive the tradition of an anatomical theater and present an insight into the everyday work of a pathologist. The public autopsy of a German body donor was conducted with the same solemnity and following the same medical procedures as it would have if it had been performed behind closed doors. The audience also followed the event with proper respect and great interest.

The general public, however, objected strongly, even though the event did not violate any legal guidelines, and Gunther von Hagens acted in absolute compliance with the law. He plans to conduct other events of similar nature in the future.

The human museum – a future project of the Institute for Plastination

In every major city in the world, there are countless museums that exhibit the products of human culture, sometimes featuring highly unusual themes. However, there is not a single museum about humans themselves –

Public Autopsy, Gunther von Hagens, London 2002

an institution that exhibits the anatomy of healthy and unhealthy human bodies in an aesthetically pleasing way using authentic specimens. The lungs, liver, kidneys, heart – the vital organs in our bodies without which we would die – are never made visible to the public.

One reason for this is that before plastination was discovered, there were not any suitable exhibits that would have been able to present a realistic but aesthetic and authentic depiction of the human body without eliciting a sense of disgust and decay. Anatomical diagrams or models can only give an impression, in the same way that looking at a painting of a landscape or artificial trees cannot really tell you what it is like to be in a forest.

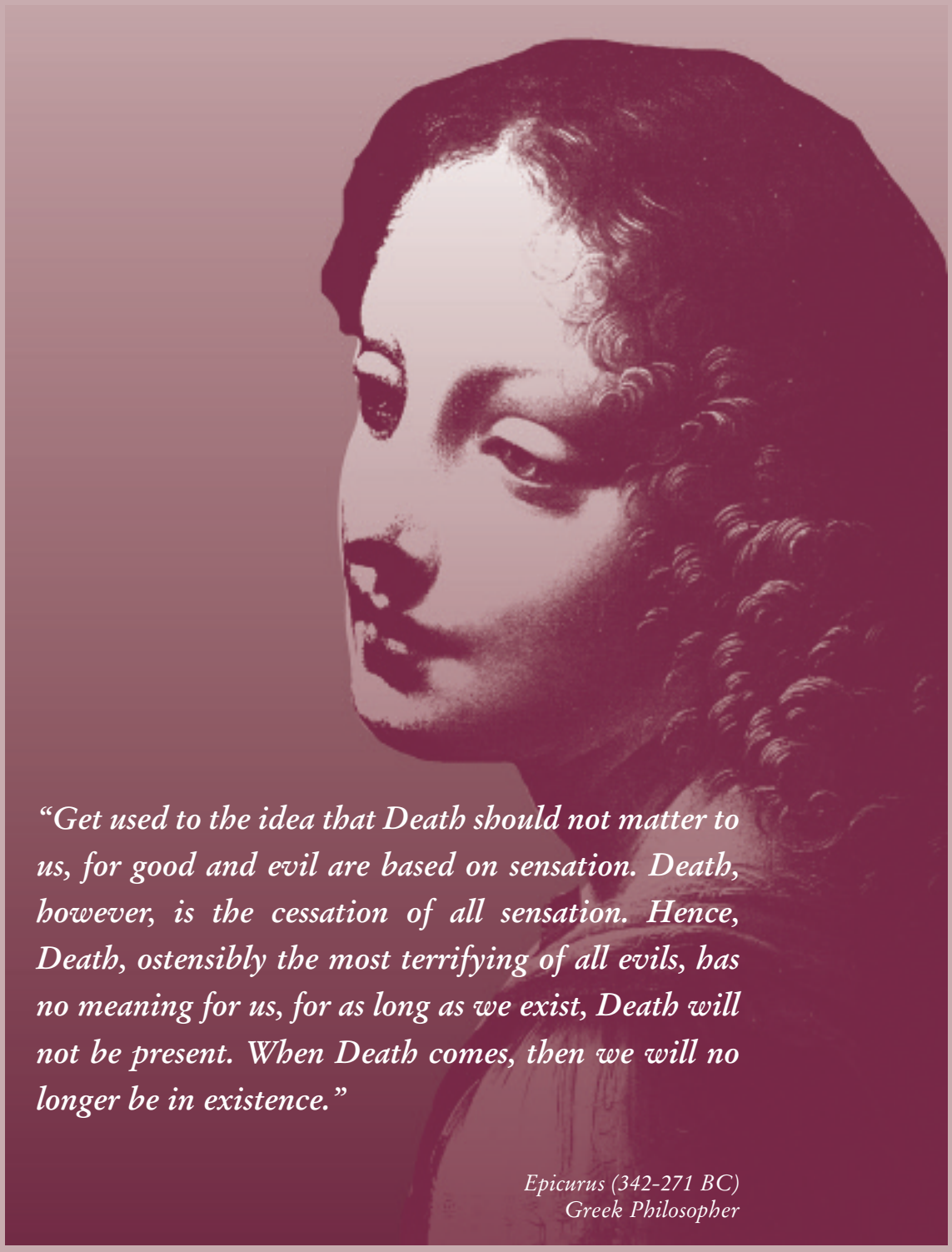
"The Basketball Player," Gunther von Hagens, photographed in Munich (Art Museum), 2003

People also have genuine inhibitions about dealing with human specimens. When people see real anatomical specimens, they are confronted with their own mortality and with death. There is also a dichotomy between finding thoughts of death offensive and an honest sense of curiosity about the topic. As a result, specimens produced from those killed in traffic accidents, for example, can act like a magnet to some people who respond with horror and disgust but are unable to look away. Exhibitions on such controversial themes are often described as pure "sensationalism and voyeurism." However, are these reactions not an indication of people's genuine curiosity and their wish to know more about life, death, and how the human body works? Death stimulates equal measures of revulsion and fascination in most people and in society as a whole. This could be one reason for the theory proposed by some medical experts that lay people should not be confronted with human specimens – it would be too macabre, too unethical. The counter-argument to this reasoning would be that every year, thousands of students in medical professions work with cadavers to study human anatomy and are not traumatised by it.

For this reason, a long-term goal of the IfP is to establish a museum about the body at a permanent location.

"The Javelin Thrower," Gunther von Hagens, 2002

4. Donating Your Body



"Get used to the idea that Death should not matter to us, for good and evil are based on sensation. Death, however, is the cessation of all sensation. Hence, Death, ostensibly the most terrifying of all evils, has no meaning for us, for as long as we exist, Death will not be present. When Death comes, then we will no longer be in existence."

Epicurus (342-271 BC)
Greek Philosopher

Motivations and Thoughts of Body Donors

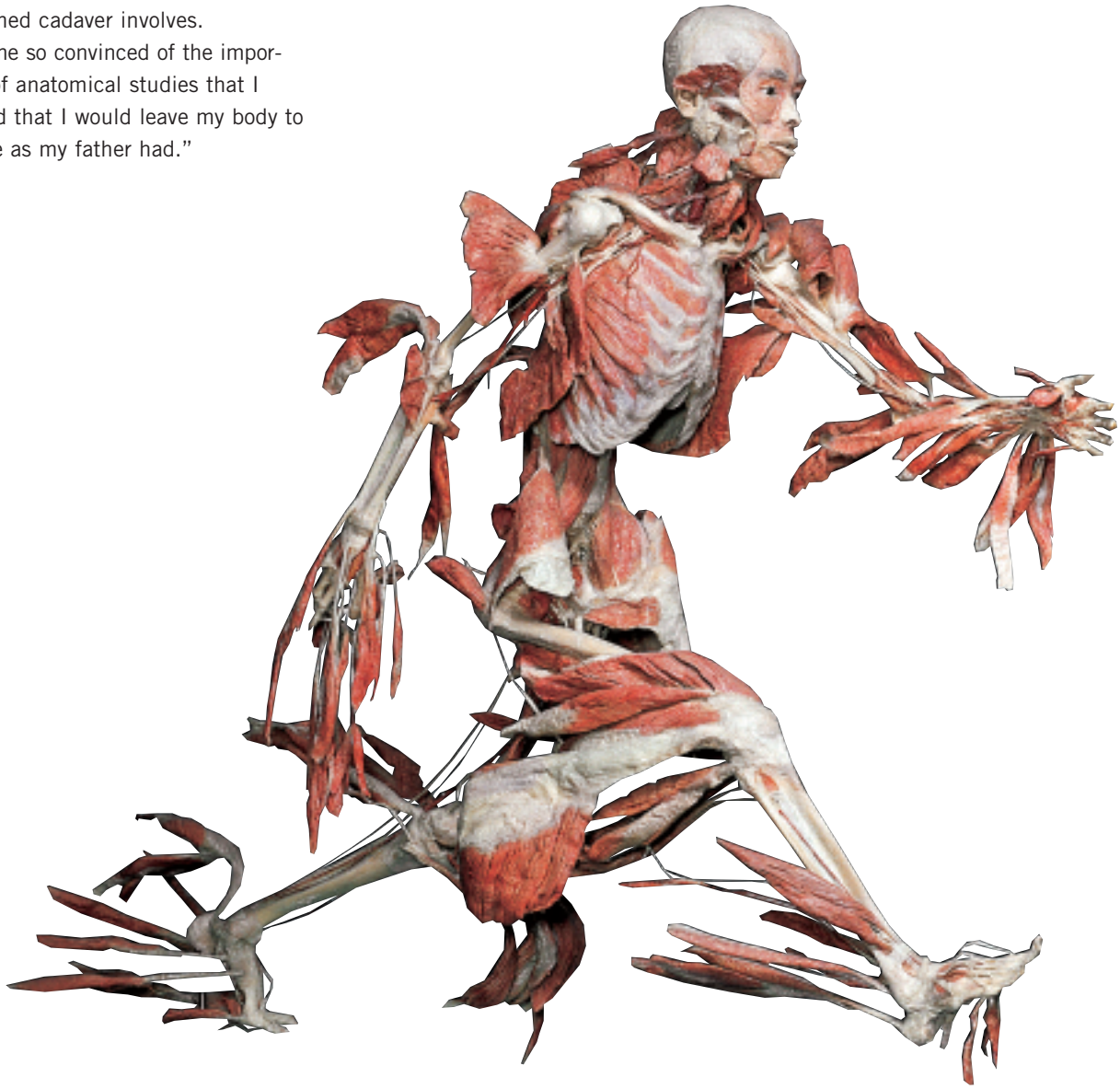
People want to be plastinated after their death for a number of reasons. The predominant desire is to serve medical research. The following is a small selection of quotations from talks and letters about becoming a body donor for plastination.

"I am following my father's example: I want to make myself useful, even after death. There are several doctors in my family; this meant that I had a chance to attend an anatomy course with my sister when she studied medicine at the University of Frankfurt am Main and was allowed to experience for myself what the dissection of an embalmed cadaver involves.
I became so convinced of the importance of anatomical studies that I decided that I would leave my body to science as my father had."

"I am fascinated by the thought of living on as a plastinate and being preserved for posterity – rather like the mummies in ancient Egypt. And it would not bother me if people at the exhibition touched my plastinated body, because I know how curious people are. Even the thought of travelling around as a plastinate is appealing – from exhibition to exhibition. From city to city. From country to country. From continent to continent! Or finding a new home in a museum. Or a university! The only thing that remains after death is a body that was a home for our souls, and they have moved on. And the body may not have been the best home for the soul anyway."

"Both of my brothers died at a very early age. When I was a 14-year-old girl and watched as they were laid in a grave and buried, it was perfectly clear to me: 'I don't ever want to be buried!'

But there are not many other options. So when my little sister told me about your work, I said right away, 'That's it! That's how you will be able to confront



"The Runner," Gunther von Hagens, 1997

the thought of dying.' Until then, the topic of death had been taboo for me ever since my two brothers had died. And when my mother decided to donate her body to your Institute as well and I saw your wonderful exhibition in Hamburg, I knew that it was time for me and my husband to make arrangements to get a donor identification card. Thank you."

"In the course of my training as a teacher for pre-schoolers and the handicapped, part of my studies involved auditing classes at the university's pathology department. The impressive skills that the pathologists demonstrated in their work with cadavers made it clear to me how important these kinds of exhibitions are for our training as well as for science and research. Even at that time, I felt inspired to donate my body to the university for scientific research after my death. The discovery of plastination and its development is a great step forward for us."

"The time has come for medicine to be accessible to a wider audience as well, and not only to doctors. We are all people with the same anatomical structures, and we all have the same right to understand our bodies."

"I went to the exhibition in Hamburg. I was very moved by the exhibits, and I made a firm decision: I, too, want to be plastinated. The thought of being buried in the earth after my death is a horrible one as far as I'm concerned, because I am completely disgusted by worms and grow panicky when I think of them. Now I can relax about the issue, though, since I can stay above ground after my death and may even have a chance to "experience" trips (i.e. exhibitions) to many different places. As far as I'm concerned, the icing on the cake is the money you can save if you don't have to be buried and maintain a plot for years and years."

"I saw the exhibition in Berlin and came away with a different attitude about many issues involving the body. The perfect mechanism of the human body's functioning should be given more attention and kept in better shape in terms of prevention and exercise, stress, relaxation, and disease. People who have health problems because of their own unhealthy choices (smoking, obesity) ought to have to pay more for their health insurance. In this day and age, every phase of development that the human body undergoes ought to be treated as a perfectly normal part of life that is equal to every other. There should not be any moralising on the knowledge available to us about the ramifications and about death as the final phase. Family members should be accorded proper respect while they are still alive; it is difficult to keep up family burial plots after death."

"Death is part of life, but it is still a taboo. Personally I have been thinking for quite some time about what ought to happen to my body when I'm gone. I never wanted a regular funeral. Unfortunately, there is little information to be found about alternatives. Right after I saw Gunther von Hagens on television, I decided to be plastinated. Both of my sons have accepted my decision wholeheartedly."

How Can I Donate My Body for Plastination?

First of all, by giving your consent to donate your body for plastination, you are not signing any sort of contract, merely a declaration of intent. No fees must be paid for a body to be donated, and the donor will not receive any money.

There are a few steps that you can take to ensure that your body is donated for plastination after your death. You must make the following arrangements:

(1) Complete the "Donating Your Body for Plastination – Donor's Consent" form in duplicate, sign both copies and return them to us.

(2) For better preservation results, educational and research purposes, it is helpful for the IfP to know details about the kind and course of disease(s), if any are known, and to have permission to access the health records of body donors after their death.
If you agree to making these available, you will have to authorise the IfP accordingly in writing. For your convenience, you may fill out and submit the Medical History Release Authorisation form with your Donor Consent form.

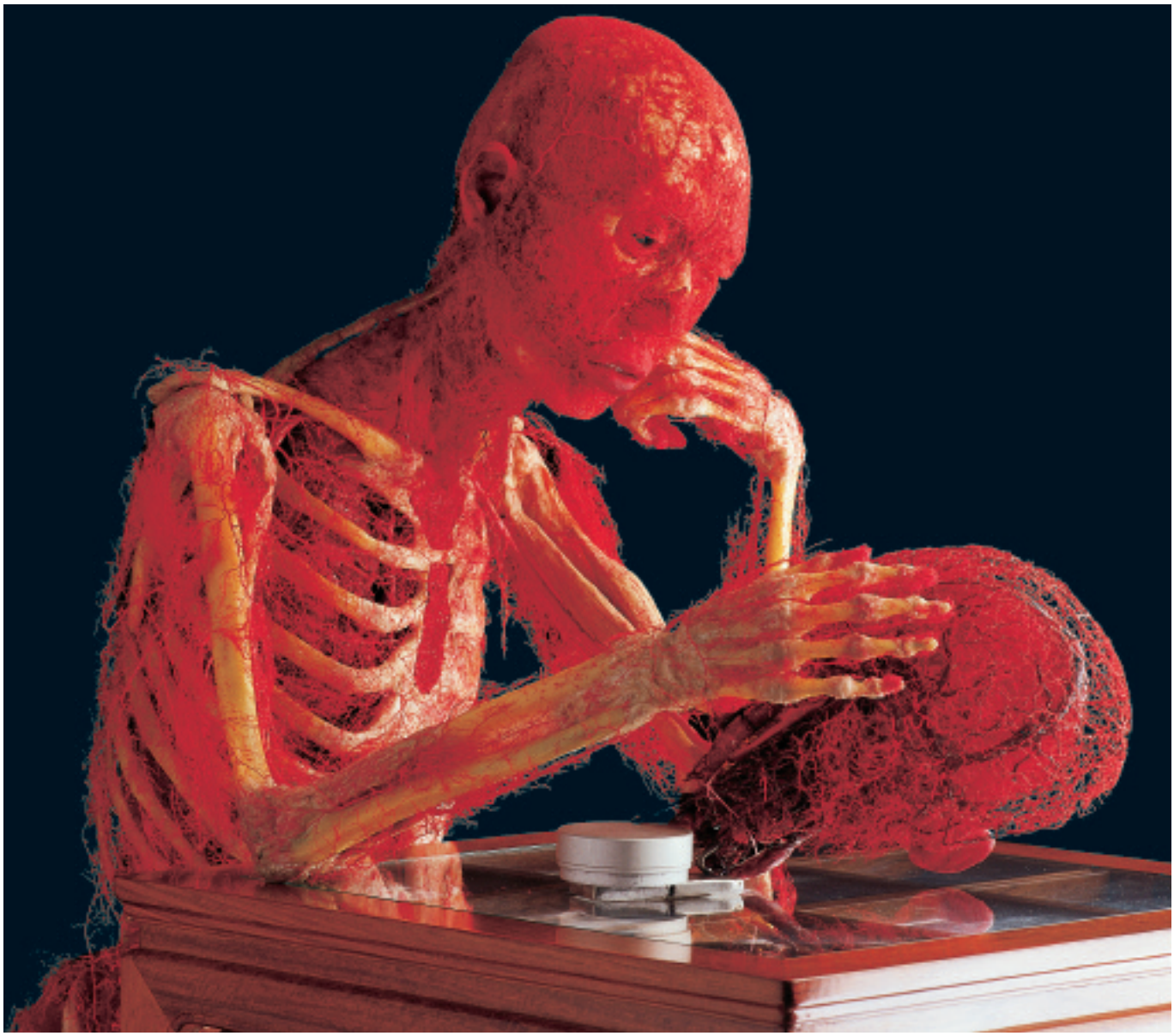
(3) Have at least one of your family members or relatives sign the Donor Consent form. If they are not in favour of your body donation, then your signature must be witnessed by an attorney on both forms.

(4) We will countersign one of the forms and return it to you to confirm its receipt. You should file this with your personal documents or give it to a relative for safekeeping. You will also be given an identification card as a body donor.

Are There Conditions for Donating My Body?

A few conditions must be met for a donation, but there are not as many as you might think:

- The age of the body being donated does not matter. On the one hand, the shape of the organs does not vary much with age, and on the other hand, medical students will probably have to treat patients of all ages when they are qualified physicians.
- It is also possible to be a regular organ donor in addition to donating your body for plastination. Donating an organ can save lives and is therefore always given priority over donating a body.
- The presence of a disease is not generally detrimental to donating your body; after all, medical students must learn to recognise these conditions. The differences between organs from



"The Thinker," Configuration of Blood Vessels, Gunther von Hagens, 2002

one body to the next are essential for proper anatomical training, and this is where genuine, permanent specimens truly have an advantage over artificial models.

- Amputated limbs also do not represent an obstacle to becoming a body donor.

The IfP is grateful to receive your donated body. The following conditions must be fulfilled:

(1) The donor has to have died of natural causes.

(2) The body must be largely intact, i.e., it cannot have been subjected to a postmortem examination for pathological or forensic reasons. The IfP is also unable to accept bodies that have been severely disfigured as the result of an accident. If a fatal accident does occur and parts of the body are severed as a result, the body will have to undergo a postmortem examination in any case. This is usually necessary to clarify issues relating to liability and/or insurance claims.

(3) We must have written consent from the donor (the signed form "Donating Your Body for Plastination – Donor's Consent") or, if applicable, a relative. There is no fee for donating your body. If the IfP receives a body from relatives or the authorities without having written consent from the deceased, the body can only be accepted if neither the deceased nor any relatives have voiced any objections.

(4) By giving consent, a body donor also agrees that he or she will not be buried, as the whole body is used for plastination.

If the body is not suitable for plastination, e.g., because decomposition is too advanced, it will be used for instructional specimens to whatever extent is possible, e.g. for producing bone or ligament specimens.

The IfP will make a decision on an

individual basis in the event of any of the following: the deceased has died of a highly contagious or infectious disease; it is not clear who will pay for the transportation costs; or any other unforeseen circumstances that may arise. We are under no legal obligation to accept a body.

How Does My Body Get to the Institute for Plastination?

When a donor dies, the next of kin should notify the nearest body donor office and make arrangements with a funeral home for the body to be transported to the IfP as soon as possible. In warm seasons, arrival at the IfP should not take longer than two or three days after death; during the colder months, the interval can be up to ten days.
The regular formalities that arise when someone dies must be handled before the body can be transferred. Please refer to a separate leaflet provided by the IfP for specific contact details regarding body donation in Europe. If death occurs on a Sunday or a holiday when the Institute for Plastination is not open and if the deceased died at home, local undertakers can be called in and asked to take the body to their mortuary for the time being. The next of kin or the funeral home should then contact the IfP in a timely fashion so that the necessary arrangements can be made.

What Happens to a Body during Plastination?

We have already discussed the process of plastination in this brochure. When a body reaches the IfP, the first step is to stop the decomposition process, either by deep-freezing the body or by injecting a fixing agent into the blood vessels. Ideally, the next stage is to consult the deceased's medical records to plan how to proceed. A decision is reached as to how the organs, parts of the body, or even the whole body will be plastinated, bearing in mind any medical conditions, cause of death, and the wishes expressed by the deceased. Other preparatory work will include injecting the vessels with contrasting plastics, emphasising the muscles or internal organs, or producing large slices that will subsequently be made transparent.
In principle, the whole body can be used for plastination, as all of the organs and parts of the body, whether healthy or diseased, are important for medical training. The remains that are not required such as connective tissue, parts of the skin, and bits of bone are incinerated in the same way as surgical waste and amputated body parts are. This means that virtually nothing will be left behind. If, under exceptional circumstances, large parts of the body cannot be plastinated, there is also the option of cremation and anonymous burial at the cemetery.
Scientific postmortem examinations that the IfP perfoms deal with the normal anatomy of the human body. Diseases and causes of death are only investigated with respect to their significance for medical training. As a result, when it comes to issues such as the cause of death, the IfP cannot provide conclusive and complete information similar to that which is determined in the course of an autopsy.

What Costs Are Incurred?

The donors or their next of kin must pay for the body to be transported to the German border or a German airport, from where it will be picked up by the IfP. The IfP does not charge a fee for donating bodies or for plastinating them; there are also no burial costs.

Where Can I Obtain Further Information?

Body donor meetings
The IfP hosts regularly scheduled informational events for those who want to donate their bodies for plastination. This is an opportunity to view specimens, learn more about new developments in plastination, and network with each other. All donors are warmly invited to attend and will receive advance notice in writing about the dates.

Contact the IfP
You are welcome to contact the IfP directly if you have any questions or concerns that have not been covered in this brochure. In addition, our website, www.bodyworlds.com, serves as a further source of information about body donation, the plastination process, and the Institute for Plastination.

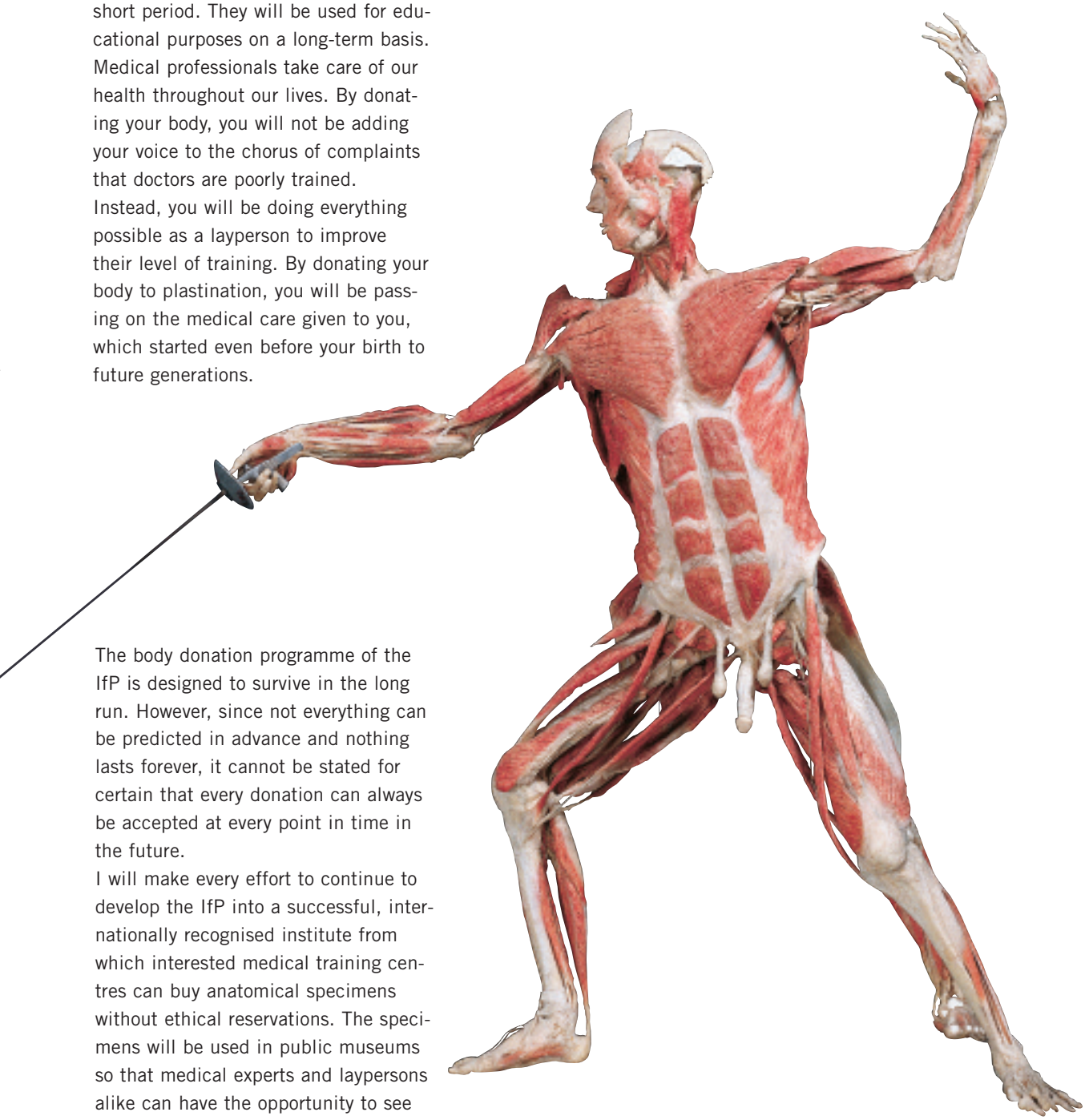
"Cartilage-Ligament Skeleton," Gunther von Hagens, 1996

Postscript by Gunther von Hagens: Ensuring the Future of IfP's Body Donation Programme

Like anatomy lessons at universities, plastination is dependent on people who are willing to donate their bodies after death. By donating your body for plastination, you can make a very special contribution both to the training of future physicians and other medical professionals and to the education of the general public, because the specimens will not only be available for a short period. They will be used for educational purposes on a long-term basis. Medical professionals take care of our health throughout our lives. By donating your body, you will not be adding your voice to the chorus of complaints that doctors are poorly trained. Instead, you will be doing everything possible as a layperson to improve their level of training. By donating your body to plastination, you will be passing on the medical care given to you, which started even before your birth to future generations.

The body donation programme of the IfP is designed to survive in the long run. However, since not everything can be predicted in advance and nothing lasts forever, it cannot be stated for certain that every donation can always be accepted at every point in time in the future.
I will make every effort to continue to develop the IfP into a successful, internationally recognised institute from which interested medical training centres can buy anatomical specimens without ethical reservations. The specimens will be used in public museums so that medical experts and laypersons alike can have the opportunity to see normal anatomy and diseases of the human body with a previously unattainable level of authenticity. Furthermore, the IfP will continue to develop and perfect the art of plastination. At the same time, I assure you that I will do everything in my power to make certain that every body donated is used to its greatest potential in order to enhance knowledge about the healthy and diseased anatomy of the human body among laypeople, students, and medical professionals and to foster medical research. The scientific work of the IfP will certainly continue after the end of my career or the event of my death. Finally, I would like to thank you for your interest in donating your body for plastination. I would be happy to welcome you among the circle of donors, which includes my family and myself.

Dr. Gunther von Hagens



"The Swordsman," Gunther von Hagens, 2000

Appendix

Dr. med. Gunther von Hagens,
Curriculum Vitae

1/10/45	Born in Alt-Skalden/Posen, former Eastern Germany
1965–68	Studied medicine at the Friedrich Schiller University in Jena, former Eastern Germany
1968–70	Imprisoned in Gera and Cottbus after a failed attempt to defect; liberated as a political prisoner by the West German government in August 1970
1970–73	Completion of medical studies at the University of Lübeck, Germany
1973–74	Internship at the Helgoland hospital
1974–75	Internship and doctorate completed in the anesthesia and emergency unit of the University of Heidelberg, Germany
1975–77	Resident at the Anatomical Institute, University of Heidelberg, Germany
1977–78	Resident at the Pathological Institute, University of Heidelberg, Germany
1978–95	Anatomist at the Anatomical Institute, University of Heidelberg, Germany
1977–95	Discovered and developed plastination process
1979–94	Organized and held plastination courses in German and English
1980–95	Numerous lectures about plastination in over 25 countries
1982	Began the Body Donation Programm for Plastination
1984–96	Served as keynote speaker at 8 international plastination conferences in the US, Germany, Canada, Austria, and Australia
1993	Established the Institute for Plastination in Heidelberg, Germany; Scientific Director
1996	Appointed visiting professor at the Dalian Medical University, China
1996	Founded a plastination center at the State Academy in Bishkek, Kyrgyzstan and at the Dalian Medical University, China; Scientific Director
1999	Named honorary professor at the Kyrgyz State Medical Academy, Kyrgyzstan
2001	Founding of the "Von Hagens Plastination (Dalian) Co. Ltd." in Dalian, PR China
2004	Named visiting professor at the New York University College of Dentistry, USA
2006	Founding of the Gubener Plastinate GmbH and opening of the PLASTINARIUM in Guben, Germany, a plastination workshop and anatomical exhibition open to the public.

Gunther von Hagens is a member of the following organisations:
German Anatomical Society, International Society for Plastination (honorary member), Rumanian Anatomical Society (honorary member), American Association of Anatomists

Institute for Plastination

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Literature

Patents

German patent 27 10 147 (1978), British patent 1 558 802 (1984), Belgian patent 863.949 (1978), South African patent 78/1330 (1980), Austrian patent 360 272 (1980), American patents 4,205,059 (1981), 4,244,992 (1981), 4,278,701 (1982), 4,320,157.

Major Scientific Publications

G. von Hagens: "Verfahren zur verbesserten Ausnutzung von Kunststoffen bei der Konservierung biologischer Präparate" ("Process for Improved Exploitation of Polymers in the Preservation of Biological Tissue"). Specification DE 32 32 756 A1, German Patent Office, Munich (1982).

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Related Literature

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"BODY WORLDS: The Original Exhibition of Real Human Bodies," exhibition catalog, Heidelberg, 14th edition 2004: Institute for Plastination.

F. J. Wetz/B. Tag (Ed.): "Schöne Neue Körperwelten – Der Streit um die Ausstellung," ("Brave New Body Worlds: The Controversy surrounding the Exhibition") Stuttgart 2001: Klett-Cotta publishers (ISBN 3–608–94311–0); in particular, the essay by G. von Hagens entitled: "Grim and Gruesome Corpses, Posed Plastinates and Mandatory Burial," p. 40–84.

F. J. Wetz: "Tote hoch zu Ross. Vom Triumph der Statue zum Verbot des Plastinats," ("Corpses Tall in the Saddle. From the Triumph of Statues to a Ban on a Plastinate") Heidelberg 2003: Arts & Sciences Publishers (ISBN 3–937256–00–8).

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Links

www.koerperwelten.com	www.bodymobil.de	www.biodur.de
www.bodyworlds.com	www.plastinarium.de	www.koerperspender.de

"The Autopsy Body," Gunther von Hagens, 2003

"What can I know?
What should I do? What may I hope for?
What is man?"

Immanuel Kant (1724 - 1804)
German Philosopher

Institute for Plastination