

## List of Artifacts

### LOCOMOTIVE SYSTEM

#### **Shake Hand Body (Ligament Body)**

Natural ligaments hold this skeleton together. The bones, which are linked via the joints, provide the body with a system of levers and pincers that enable it to run, dance and carry out a variety of tasks — some simple, such as picking up a pen, some more complex, like pole-vaulting. The intercostal muscles, which facilitate respiration together with the diaphragm, are shown on the right side of the body.

#### **Muscle Only Body (Muscles, Skeleton, Baby Skeleton)**

The adult specimen shows the skeleton and the muscular system of one and the same body. When standing next to one another, the two systems can be compared easily and blended to one functional locomotive system within the mind's eye of a visitor. The specimen of a child comprises the natural bones with their natural ligaments. Cartilage-growth zones are located at the ends of the long, tube-like bones, which allow the bones to continue to grow.

#### **Pitcher**

With this whole body plastinate, the muscles have been separated from their origins at the bones, combined into functional groups and turned in such a way that the musculature and skeletal systems are simultaneously visible. Moreover, this plastinate permits us to look into all of the bodily joints. The lower jaw has been cut into two halves and shifted upwards.

#### **Orthopedic Body**

This body shows a variety of orthopedic and surgical operations.

#### **Javelin Thrower**

Both sides of the thoracic and abdominal walls have been opened out like doors. All organs have been removed. The pelvic part of the hip joint has been cut off and shifted upwards, exposing the femoral head of the left leg. The right side of the head shows the muscles for facial expressions, whereas the left part is dissected down to the skull bones.

#### **The Skeleton**

The skeleton reveals the body's internal framework, consisting of more than 200 bones and 100 moveable joints.

#### **Showcases**

The body's movements, including both stationary and forward motion, are made possible by what is known as the locomotive system. On display in showcases are bones, muscles and joints of the locomotive system, which all

work together to make movement possible. Also, pathological findings such as arthritis and artificial joint replacements can be seen.

## **NERVOUS SYSTEM**

### **Central and Peripheral Nervous System**

#### **Man at Leisure**

All major nerves are shown. The raised arms completely expose the nerves of the upper extremities. The nerves of the autonomic nervous system can be seen in front of the vertebral column. They pass their signals to the abdominal organs, which have been removed in this specimen.

#### **Showcases**

On display in four showcases are 14 displays of brain slices and segments revealing the interior of the brain.

## **RESPIRATORY SYSTEM**

#### **Showcases**

Smoker and non-smoker lungs are displayed, showing the effects of respiratory diseases such as emphysema and lung cancer. Thoracic organs of a child with thymus and cross-sections of a thorax with extensive tumor growth can also be seen.

Organs including the lungs, tongue, pharynx and slices of the thorax, which work together to provide the continuous supply of oxygen required for life, are shown. Without this function most of the body's cells would be unable to survive more than a few minutes.

## **CARDIOVASCULAR AND CIRCULATORY SYSTEMS**

#### **Thinker**

The skeleton and arteries of the vascular system are shown together in one plastinate. Arteries of the skull reveal the presence and thickness of the soft tissue of the scalp; conversely, the head, which the thinker is looking at, only consists of arteries.

#### **Showcases**

Specimens revealed inside these showcases include the inside of the heart and arteries that function in the body's major transport system. Not only does the circulatory system distribute nutrients, oxygen and hormones to individual regions of the body; it also collects metabolic by-products, which are then eliminated. The heart is the engine of this system, and the dense network of blood vessels form the transport routes.

## DIGESTIVE SYSTEM

### The Digestive System

The digestive tract is shown stretched out, as you might see in a textbook diagram, with the segments identified: the mouth, esophagus, stomach, duodenum, liver, pancreas, small and large intestines, and the rectum.

### Showcases

Showcases contain plastinated specimens of the stomach, liver, pancreas, and small and large intestines. These body parts and organs work together in the digestive tract to break down food both mechanically and chemically in a way that allows the nutrients to pass into the blood, where they can be transported to each individual cell.

## UROGENITAL TRACT AND REPRODUCTIVE SYSTEM

### Showcases

On display are plastinated specimens showing the body system involved in filtering, dissolving and discharging waste. Plastinated female and male genitalia illustrate the reproduction system, essential to creating new life. A mammary gland with breast cancer and a female genital tract with an ovarian tumor are shown.

## PRENATAL DEVELOPMENT

### Beauty

A female whole-body plastinate shows a five-month-old fetus through an opening in the uterus. At this stage of the pregnancy the fetus is six and a half inches from head to tail, which causes the abdomen to bulge. The superficial muscles have been exposed on the front side of this body, while the back shows the deeper muscles. On the left side of the back, the thoracic cavity has been opened, revealing a smoker's lung, as can be clearly seen by the black pigmentation. On the right side, the torso has been opened to show the right kidney.

### Showcases

Showcases display preserved placentas, embryos and fetuses to present the major stages of life inside the womb.

## INTERNAL ORGANS

### Male Torso

This torso displays a rare anatomical variation, known as *situs inversus*. Here the organs of the chest and abdominal cavities are transposed through the sagittal plane, showing a reversed mirror-image: the apex of the heart points to the right instead of the left; the liver is on the left side of the body while the spleen is on the right; and the pancreas extends from left to right across the spinal column instead of vice versa. This anatomical variation does not cause any disorders. The incidence of this phenomenon is approx. 1:25,000.

### **Female Torso**

This opened torso shows the internal organs of the chest and abdominal cavities in their proper positions. The stomach as well as the large and small intestines have been almost completely removed to permit a view of the organs located between the abdominal cavity and the wall of the back, known as the *retro peritoneum*. These include the uterus, the aorta, and the lower vena cava as well as the pancreas and the duodenum. In the small pelvic cavity, the bladder can be seen, and behind it, the uterus, which is inclined forward with the fallopian tubes emerging from the sides. The large intestine extends downward behind the uterus.

### **Lassoer**

In this body several expansion techniques were combined. To turn the head left it was not simply rotated, but it was opened to offer a view inside of it. The resulting fragments were then fanned out like an accordion. The view into the torso was made possible by swinging out the three segments of the torso. In order to show the large finger and foot muscles with their marionette-like tendons, the tendons of both forearms and of the right lower leg were separated from their attachments and then, together with the venters of the muscles were twisted laterally in such a way that the elbow joints and the knee joint could serve as pivots.

### **3-D Body Slices**

This specimen presents the human body as a series of thick sagittal slices. Nevertheless, not all of the tissue and organs have been sliced through, but instead protrude three-dimensionally from the surface. These body parts are missing in the neighboring slices and leave only gaps in those places that reflect the size and shape of the organs and other structures (e.g. muscles) that have been removed. The resulting negative and positive reliefs provide an instructional pattern of complimentary protrusions and hollow spaces.

## **GENERAL ASPECTS OF ANATOMY**

### **Suicide by Fat, Obesity Revealed**

These specimens are the first of their kind. Due to a breakthrough in polymer technology for plastination, it is now possible to preserve fat tissue in its natural white color. Comparing the sagittally cut slices of an obese person (300 pounds) to those of a slim one (120 pounds) shockingly reveals the burden that the inner organs endured during this person's shortened life. As obvious from the enlarged heart and supported by his clinical data, the heart was finally not able to supply the body with uninterrupted blood flow. The person died of a malfunction in his heart at the age of about 50.

### **Ring Man**

The thick body slices demonstrate the compactness of tissue and the close proximity of individual structures to one another. Sections of the skeleton as well as blood vessels and nerve pathways can be seen between the slices. The body cavities (cranial, thoracic and abdominal cavities) show the space that is available for vital organs.

### **Fragmented Body**

Inside the body all of our organ systems are packaged tightly together without much space in between. To illustrate this compactness of bodily interiors, fragments have been drawn out of this body's insides or have been swung open like doors.

### **Surgical Body**

On this body 'anatomical surgical windows' have been dissected on the right side of the body; they represent standard surgical incisions to access the respective regions of the body. At each incision, all of the important structures have been dissected; to which a surgeon would normally have to pay particularly careful attention. On the left side the skin has been completely removed to reveal as many anatomical structures as possible in their respective spatial relationships to one another.

### **The Totally Expanded Body—The Anatomical Big Bang**

To offer a clear view of the different parts of our body and of their relationships without taking parts away, spaces were created between them. Here, our otherwise very well packed body appears exploded, enabling the viewer to engage into a virtual journey through the body.

### **Soccer Player**

While striving to score a goal, this specimen shows the superficial and intermediate layers of muscles in action. Contrary to the classical study of muscles in a reclined position, this plastinate shows that muscles in action have different length, according to their contracture degree. The stronger a muscle contracts, the shorter it becomes. The leg muscles needed for sustaining the body and for kicking the ball are much stronger than those of the arms, which serve here for maintaining balance.

### **Skateboarder**

Because of his upside-down position, a rather unusual insight is given into the anatomy of the buttock region. The strong gluteus muscles, responsible for the upright position, are flapped aside to reveal the sciatic nerve passing beside the sitting bone of the pelvis. The knee joints are stressed heavily during skateboarding. In order to gain insight, the patellar tendons have been cut and the kneecaps lifted.

The skull has been opened and the right side of the brain has been removed. Superficial back muscles have been shifted aside to show the deeper layers with their corresponding nerves.

### **Yoga Lady**

The yoga lady shows surprisingly strong musculature all over her body. A combined dissection of the extremity muscles was performed by lifting the superficial muscle layers off the deeper layers to reveal their complexity.

### **Death Spiral: Elegance on Ice**

In pairs figure skating, the Death Spiral is true elegance on ice. In horizontal position, the girl is spiraling on one skate in circular motion, with her body low and parallel to the ice. Her partner acts as a pivot, retaining virtually the same pose while holding her with one or both hands. As a result of the very different

pose, these specimens demonstrate the complexity of functional muscle interaction, which involves virtually all muscles of the body. This can be easily grasped by comparing the slightly bowed trunk of the man with the twisted trunk of the spiraling lady. The legs are in full support of the body, while the grasping arms act as a vital connection between the skaters. The free arms enhance the aesthetic appeal of the skating pair.

### **X-Lady**

The X-Lady was named for the X-like crossing of her straightened legs. These are parallel to her lower arms, which are continuous to her back-flapped gluteal muscles. The opened gluteal region allows full view of the sciatic nerve, which travels down on the posterior side of the thigh. The trunk has been split open in midline to allow the heart to be seen as it rests on top of the diaphragm. The intestinal tract has been removed to allow a view of the kidneys and the abdominal aorta on the posterior wall of the trunk. Both the facial tissue layer and the mimic muscles of this plastinate have been separated to both sides.

The dissection of the head in this plastinate is unparalleled in its kind. In order to gain insight into the complex anatomy of the pharynx, the cranial base serves as a resting plate for the brain, with the eyes still attached. To reveal details such as the auditory tube, the bones of the facial cranium have been opened like a book to both sides.

### **Angel**

The Angel shows a superficial dissection of her entire body. She received her name from her two wings. The rear body wall has been opened longitudinally with two parallel incisions, one in the median axillary line, and another one through both sides of the vertebral column. After raising the wings, we now have full view of the Angel's inner organs such as the lungs, the diaphragm, kidneys and intestines. The opening of the gluteal region reveals the complexity of the anatomy of the small pelvis.

### **Baseball Player**

The Baseball Player's pose is caught in full swing, right after he has hit the ball. Therefore his body is twisted, with his right shoulder rotated to the left side to such an extent that the flat muscles of the trunk, such as the latissimus dorsi, for example, are on one side extremely stretched, but contracted on the opposing side. The different positions of the shoulder blades are further evidence for the tension in this pose. The skull cap has been opened in order to reveal the Baseball Player's brain, while the head is slightly raised in order to let the eyes follow the baseball that is still up in the air.

### **Camel with Baby Camel**

Camels are ruminants. Their stomachs consist of a complex system of several compartments or chambers, arranged one behind the other. Food is not completely chewed before passing to the rumen (first chamber) where it is then partially broken down with the aid of bacteria. Reciprocal muscle contractions in the vestibule of the rumen and the muscular reticulum (second chamber) cause a constant back and forth action, thereby ensuring that the food, or cud, is well mixed and ground up. The cud is now regurgitated from

the reticulum back to the oral cavity (mouth) via the esophagus where it is thoroughly chewed and salivated before being reswallowed and passed on to the omasum (third chamber). There the cud is thickened and finally enzymatically digested with the aid of pepsin and hydrochloric acid in the abomasum (fourth chamber).

### **Colt with Internal Organs Separated**

Compared to the horse, human musculature is rather puny, while on the other hand, the larger human brain permits significantly higher intelligence. In humans, the humeri (long bones of the arm) and thighbones are relatively long, while the hands and feet are relatively short. With horses, the bones of the forelimbs and the hind limbs by contrast are relatively short and closer to the trunk; conversely, the cannon bones, fetlocks, pasterns and hoofs are relatively long, and the number of phalanges of the toes is reduced so that the joints of the limbs have different positions. This colt (young horse) shows the rich musculature of the horse. The abdominal cavity has been opened and the organs have been removed. They are shown separately.

\*\*Please note the above list is an excerpt and subject to changes or substitutions.