8

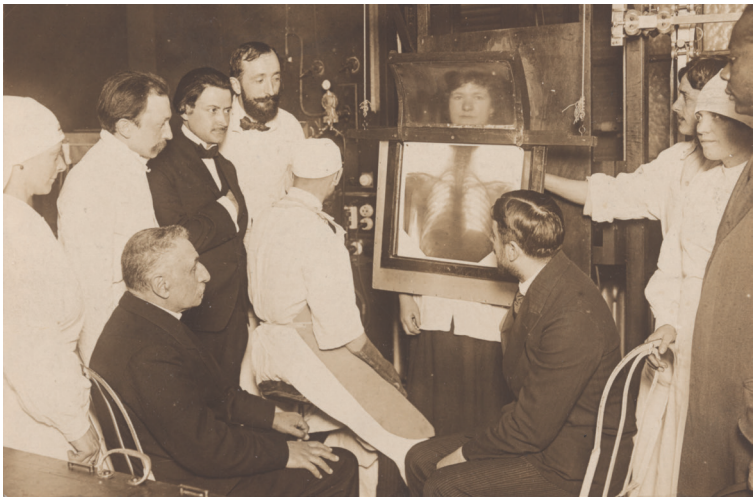
Hand eines Kindes.

Hildebrand, Scholz, Wieting-Pascha

Das Arteriensystem des Menschen im stereoskop. Röntgenbild 4. Aufl.

Verlag v. J. F. Bergmann

Wiesbaden.



Short notice
Body Double: Stereoscopic X-rays in the Rijksmuseum's Collection

• DANIEL HENDRIKSE •

For centuries most people had no idea what the inside of their body looked like. The location of organs, the course of blood vessels and the position of muscles was a mystery that was only revealed to a small group of physicians, surgeons and a few artists. Until the discovery of X-rays it was extremely difficult to look at the inside of a living person's body or to examine it. Cutting a body open was the only way to look at the intestines, for example, and for a long time that was viewed as certain death.[1] Autopsies often proved to be the only opportunity to find out about the medical and anatomical structure of human beings. The connection between what could and could not be seen and destruction, was removed through the discovery of X-rays in 1895, which literally made it possible to look inside people.

The Rijksmuseum's collection contains a number of X-rays, which are intriguing because of both their form and their content. They are part of a series entitled *Das Arteriensystem des Menschen im stereoskopischen Röntgenbild*: ten stereoscopic X-rays that show the blood vessels and arteries in different parts of the body in adults and children (e.g. figs. 1, 7). They were taken by three doctors, Otto Hildebrand, Wilhelm Scholz and Julius Wieting, from Hamburg-Eppendorf Hospital, and published by the scientific publishing house of J.F. Bergmann in Wiesbaden. The exposures were taken in 1901, only six years after the discovery of X-rays. The publication was obviously a success as various reprints continued to be produced until 1917. The examples in the Rijksmuseum's collection consist of two incomplete series, originally from the collection of the lawyer and collector B. Hartkamp and from an acquisition in 2019.[2]

< *Fig. 1*
OTTO HILDEBRAND, WILHELM SCHOLZ AND JULIUS WIETING, *X-Ray of the Blood Vessels in a Child's Hand*, 1917 (first edition 1901). Gelatin silver print, 128 x 180 mm. Amsterdam, Rijksmuseum, inv. no. RP-F-F26540.

< *Fig. 2*
ANONYMOUS, *Demonstration of Taking an X-Ray*, c. 1910. Gelatin silver print, 73 x 103 mm. Amsterdam, Rijksmuseum, inv. no. RP-F-2016-2.

Stereoscopic photographs are produced by taking one picture and then moving the camera a few centimetres to take the second. When they are placed side by side and viewed through a stereoscope or stereo viewer, the two images merge into one, creating the suggestion of depth. Stereoscopic photographs were incredibly popular in the nineteenth and early twentieth century, through the combination of the relatively new technique of photography and the perception of three-dimensionality. Tourist attractions or humorous scenes captured using this method gave birth to a huge industry. Entertainment played a major role in this. 'Shuddering and confusion are the goal; that is the heart of all attractions; the image is not an objective place, looking is not investigation; everything is dominated by a dumbfounded look,' wrote the Belgian essayist Dirk Lauwaert later about the stereo photo mania.[3] The stereo photographs presented here do

indeed offer 'shuddering and confusion', but at the same time they exude an atmosphere of objectivity, investigation and science – they are hard to fathom. They do not show the bones of a body as usual, but the blood vessels instead.

The combination of stereoscopic photographs – a relatively inexpensive mass product aimed at subjective perception – with scientific X-rays – providing an objectivity-focused analysis of the human body – raises questions. Why were these forms of photography combined? For whom was this first series intended? And what objective was in the makers' minds?

Anatomical Prints

It is hard to overestimate how revolutionary X-rays were when Wilhelm Conrad Röntgen discovered them by accident. They would go on to completely change medical science, with consequences to this very day. X-rays gave rise to a new visual language too, in which human bodies were depicted like ghostly apparitions (fig. 2).[4] At the same time, the visual culture that came about almost by chance was not born in a vacuum, but was built on a long tradition of anatomical prints. Following Andreas Vesalius, who wrote the first book on anatomy (1543), personal observation became more and more important in medical science from the sixteenth century onwards.[5] Anatomical prints often featured (as far as possible) true-to-life representations of bones, muscles or blood vessels, in combination with a degree of imagination. This gave rise to fanciful depictions such as a flayed man, who nevertheless poses *contrapposto* (fig. 3) or an arm stripped of its flesh with a pointing index finger, with the different muscles draped over it like decoration (fig. 4). These prints were largely about the skill of the

Fig. 3
PIETER DE JODE,
Drawing of a Standing Écorché, 1629.
Engraving, 281 x 180 mm.
Amsterdam, Rijksmuseum, inv. no. RP-P-1998-224.

Fig. 4
PIETER VAN GUNST,
Anatomical Study of the Tendons and Bones of the Left Hand, 1685.
Etching, engraving and stipple engraving, 320 x 475 mm.
Amsterdam, Rijksmuseum, inv. no. RP-P-OB-70.687.

printmaker and the visual appeal, not so much about anatomical completeness; this can be inferred, for example, from the fact that the genitalia were usually shown covered up. In general it is difficult to use our notions of objectivity and subjectivity for historical periods, when those terms had a different interpretation, or were not used at all.[6]

To gain insight into the packed complexity of the human body, printmakers sometimes found creative solutions. This can be seen, for example, in two prints from the early seventeenth century made by Lucas Kilian to a design by the physician Johann Remmelin (figs. 5a, b). Here we see a naked man and a naked woman, both surrounded by enlarged body parts and organs. One of their feet rests on a skull. The figures' abdominal cavities and the skull on the ground in each print are built up from several layers of paper, which can be opened so that the viewer can browse through the intestines in the abdominal cavity or through the brain in the skull.

The subject of a print could also be a single part of the body. Since the discovery of the circulation of the blood by William Harvey in 1628, attempts were made to illustrate this system for the viewer.[7] One splendid example of this is the 1685 print by Pieter van Gunst, after a drawing by Gerard de Lairesse (fig. 6) We can see the shape of a human body, although this is solely formed by blood vessels, with the heart and kidneys at its centre. All other body parts – the muscles, bones and skin – have been left out. Around it there are blood vessels and tissue structures in detail. It seems to be a mythical being, built up from twigs or coral. The makers deliberately made a radical choice to leave out the body itself and only show the

Figs. 5a, b
LUCAS KILIAN,
Anatomy and Physiology of a Male Body with Details of the Abdominal Cavity, Stomach, Kidneys, the Heart, Genitals and the Head and *Anatomy and Physiology of a Female Body with Details of the Abdominal Cavity, Stomach, Kidneys, the Heart, Genitals and the Head*, 1613. Engraving and etching, with text in letterpress and movable sections; printed from several plates, 361 x 267 mm and 361 x 269 mm. Amsterdam, Rijksmuseum, inv. nos. RP-P-1961-921 and 920.

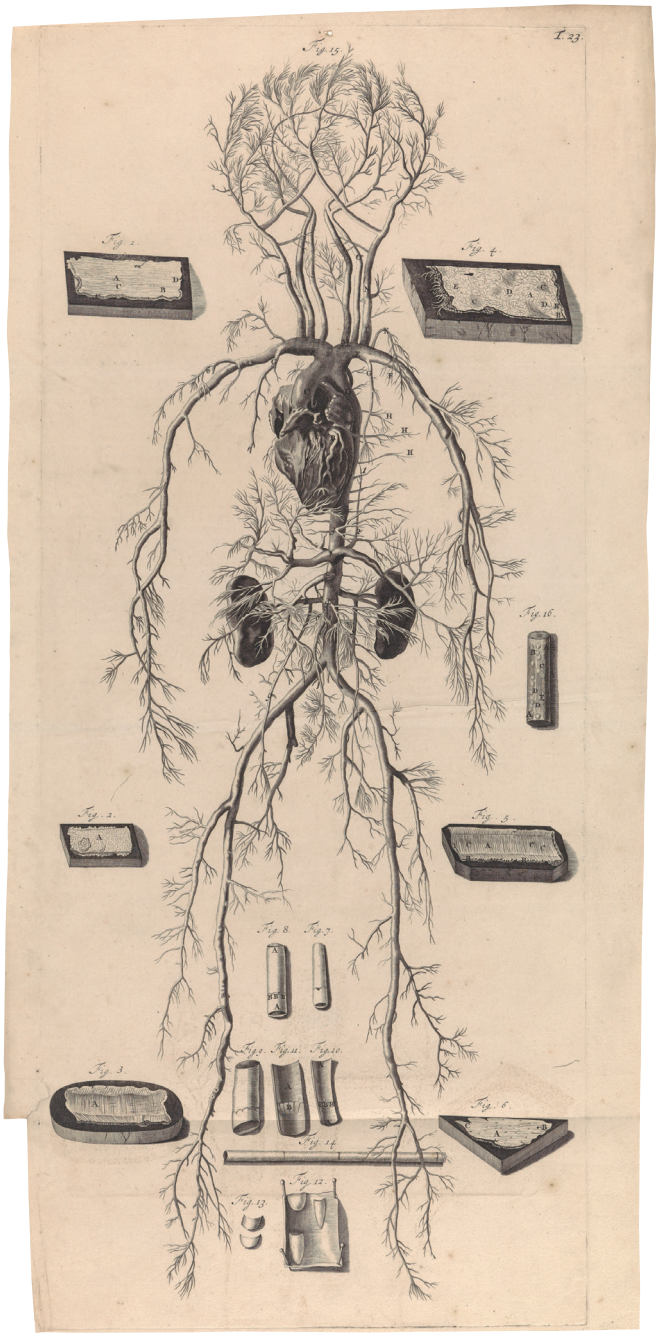


Fig. 6
PIETER VAN GUNST, *Anatomical Study of the Blood Vessels and Circulation of the Blood*, 1685.

Engraving and stipple engraving, 273 x 653 mm. Amsterdam, Rijksmuseum, inv. no. RP-P-OB-70.640.

relevant subject. The fact that this was accompanied by a certain amount of imagination resulted in an anatomical image that is not entirely correct. Nonetheless this print can be seen as an immediate forerunner of the series of stereoscopic X-rays made more than two hundred and fifty years later.

'Physically seen'

The workings of the human body, where each part has a specific purpose and everything fits together seamlessly, are made visible in the X-rays by injecting the relevant parts with a contrasting fluid. Very soon after the discovery of X-rays it was found that certain substances absorbed the rays better than the body and could therefore make organs or other body parts visible in X-rays; barium sulphate had already been used as a contrasting agent as early as 1896.[8] In the years that followed, physicians and chemists tested all kinds of substances and methods – both toxic and harmless – in order to get good results in X-rays.[9] In the introduction to the series of photographs, which is held in the University of Utrecht's library, the three doctors who had taken the stereoscopic photographs state that the opaque dye makes the circulatory system visible 'as cannot be made clear by any drawing'.[10] In this way they try 'to give a graphic insight into the interior of the human body'.[11] The photographs, which were originally published with an accompanying text, were intended for colleagues and students. They were mainly used in surgical training.[12]

The makers deliberately opted for stereoscopic photography, which was not used here as a gimmick, but served to show the three-dimensionality of the human body and the position of different parts of it. According to the introduction to the photographs, the objective was 'that one can accurately separate underlying parts from each other, in other words, that one can see

"physically"'.[13] What is precisely meant by 'seen physically' is not explained further in the introduction, but it seems to correspond with what Michel Foucault termed the 'medical gaze'. The French philosopher writes about it in his book *Naissance de la clinique:* 'the medical eye must see the illness spread before it, horizontally and vertically in graded depth, as it penetrates into the body, as it advances into its bulk, as it circumvents or lifts its masses, as it descends into its depths.'[14] For centuries this embodied the talent of doctors; to see through the mass of the human body to the disease, the point of pain or the irregularity. With the development of X-ray photography this medical view could be made visible for a wider public – although a doctor is obviously still needed to explain what is actually being seen.[15]

The doctors meticulously describe their working method in the text that accompanies the photographs. It is noticeable that all the photographs are of corpses, not of living people. After the doctors had experimented with different substances, mercury (which would have been extremely harmful to living people) proved to give the best effect in the photographs.[16] Since the contrasting liquid was injected into the veins, the stereoscopic photographs must have been taken soon after the subjects' deaths. Even more effort had been made for the photographs numbered 1 and 2, both titled 'Kopf und Hals' (head and neck): the body of a child was sawn in half and the lungs and brain were removed (fig. 7).[17] This method has more to do with the classic dissection of the human body than with the possibilities that X-ray photography offers, that is to say showing the inside of the body without surgical intervention. Here it becomes obvious that at the time that these photographs were taken medical science was in an intermediate phase, between the period of dissection and that of visibility without cutting.[18] This shift in approach becomes clear

Fig. 7
OTTO HILDEBRAND, WILHELM SCHOLZ AND JULIUS WIETING, *X-Ray of the Blood Vessels in the Head and Neck of a Child*, 1917 (first edition 1901). Gelatin silver print, 130 x 180 mm. Amsterdam, Rijksmuseum, inv. no. RP-F-F26534.

in the photographs: doctors already had the option of looking at the inside of bodies through X-rays, but they were trained and accustomed to the old regime in which cutting was the norm, so they opted for the latter. The cyanotypes of sagittal sections made by Harold Mahoney, which Lita M. Tirak researched, are other examples of the revolution also depicted in those photographs.[19]

Medical Stereoscopic Photographs

The photographs from the *Das Arteriensystem des Menschen im stereoskopischen Röntgenbild* series are the only stereoscopic X-ray images in the Rijksmuseum's collection. Sources reveal that the makers of those photographs produced more series about fractures, tumours, physical abnormalities and the hip joint. Nevertheless, the Rijksmuseum's collection does contain other medical stereoscopic photographs. *Die Arterien der menschlichen Haut* (1895), written by the physician Werner Spalteholz, features thirteen stereoscopic photographs of microscope slides of human tissue in which veins can be seen (fig. 8). However, Spalteholz did not work with X-rays and contrasting liquid, but injected his slides with a dye based on ultramarine.[20] Other medical stereoscopic photographs in the Rijksmuseum's collection are in an atlas with illustrations of dermatological disorders, an almanac with slides of the ear, a photograph of tuberculosis in the larynx and one of a surgical procedure for a vaginal rupture.[21]

Medical and scientific stereoscopic photographs are a very small part of the Rijksmuseum's collection of more than 10,000 stereographs in total. They are so small in number by comparison with those that were produced for entertainment, that they are all but disregarded. The added value of stereoscopic photography was therefore not critical for the medical world. Nonetheless this article tries to contextualize the view of stereoscopic photographs as merely a cheap source of entertainment; physicians deliberately opted for stereoscopic photographs to show the plasticity and depth of the human body.

In his famous essay *Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit,* Walter Benjamin draws a comparison between a photographer and a surgeon. Like a cameraman, a surgeon delves deep into what is depicted.[22] Even though Benjamin meant this metaphorically, it certainly applies to the stereoscopic X-rays discussed in this article. They penetrated deep into the photographed bodies, in a way that is still compelling.

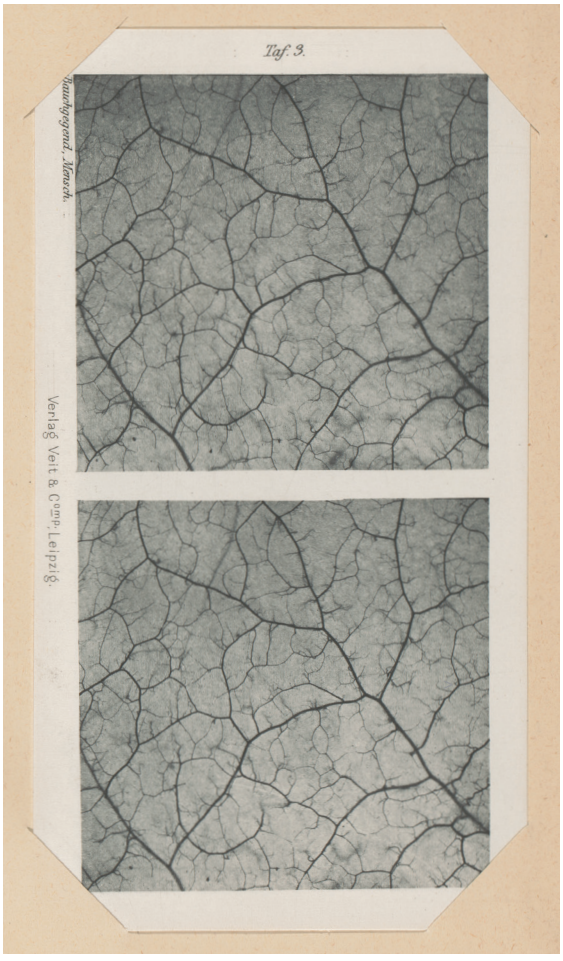


Fig. 8
E. SCHLEICHER, *Microscope Photograph of Human Skin from a Stomach*, c. 1885-95. Helio-engraving, 88 x 160 mm. Amsterdam, Rijksmuseum, inv. no. RP-F-2001-7-608-3.

NOTES

1 Nancy G. Siraisi, *History, Medicine, and the Traditions of Renaissance Learning*, Ann Arbor 2008; Luke Wilson, 'William Harvey's *Prelectiones*: The Performance of the Body in the Renaissance Theater of Anatomy', *Representations* 17 (1987), pp. 62-95, esp. pp. 62-63.

2 Amsterdam, Rijksmuseum, inv. nos. RP-F-F26534 to RP-F-F26541 and RP-F-2019-5 to RP-F-2019-8.

3 'Huiver en verwarring zijn het doel; dat is de kern van alle attracties; het beeld is geen objectieve plek, het kijken geen onderzoek, alles staat in het teken van een verbluft kijken.' Dirk Lauwaert, *Lichtpapier: Teksten over fotografie*, Antwerp 2007, p. 157.

4 Sylvia Pamboukian, '"Looking Radiant": Science, Photography and the X-ray Craze of 1896', *Victorian Review* 27 (2001), no. 2, pp. 56-74, esp. p. 65.

5 Gianna Pomata, 'Observation Rising: Birth of an Epistemic Genre, 1500-1650', in Lorraine Daston and Elizabeth Lunbeck (eds.), *Histories of Scientific Observation*, Chicago 2011, pp. 45-80, esp. pp. 65-66.

6 Lorraine Daston and Peter Galison, 'The Image of Objectivity', *Representations* (*Seeing Science)* 40 (1992), pp. 81-121, esp. p. 82.

7 Thomas Wright, *William Harvey: A Life in Circulation*, Oxford 2013, pp. 132-37.

8 Ulrich Speck, *X-Ray Contrast Media: Overview, Use and Pharmaceutical Aspects*, Berlin 2018 [5th edition, 1st edition 1991], p. 10.

9 Michael Martin and Heiner Fangerau, *Evidenzen der Bilder: Visualisierungsstrategien in der medizinischen Diagnostik um 1900*, Stuttgart 2021, p. 83.

10 'wie es durch keine Zeichnung dargestellt werden kann'. Otto Hildebrand, Wilhelm Scholz and Julius Wieting, *Das Arteriensystem des Menschen im stereoskopischen Röntgenbild, Sammlung von stereoskopischen Röntgenbildern aus dem Neuen Allgemeinen Krankenhaus Hamburg-Eppendorf*, Wiesbaden 1917 [4th edition, 1st edition 1901], p. 12.

11 'einen plastischen Einblick in das Innere des menschlichen Körpers zu gewähren'. Ibid., 12.

12 Ibid., 7.

13 'dass man hintereinander liegende Teile genau voneinander trennen kann, mit einem Wort, dass man "körperlich" sehen kann'. Ibid., 10.

14 Consulted in translation, Michel Foucault, *The Birth of the Clinic: An Archaeology of Medical Perception*, London/New York 2003 [1st edition 1963, transl. 1973].

15 Pamboukian 2001 (note 4), pp. 59-60; Frank W. Stahnisch, 'Nosologie der dritten Dimension: Albert Neissers (1855-1916) Stereoscopischer Medicinischer Atlas zwischen Repräsentation, Ikonografie und vergleichender Pathologie', in Lena Bader, Martin Gaier and Falk Wolf (eds.), *Vergleichendes Sehen*, Paderborn 2010, pp. 147-68, esp. pp. 155-58.

16 Hildebrand, Scholz and Wieting [1901] 1917 (note 10), pp. 14-16.

17 Ibid., pp. 18-21.

18 John Pearn, 'The Discovery of X-rays: Challenges to Societal Beliefs and Professional Paradigms', *Health and History* 17 (2015), pp. 53-72, esp. pp. 54-55.

9 Lita M. Tirak, 'Black and Blue: Revelations in Harold Mahoney's X-rayed Anatomical Sections', *The Rijksmuseum Bulletin* 69 (2021), no. 1, pp. 26-49.

20 Werner Spalteholz, *Die Arterien der menschlichen Haut*, Leipzig 1895, p. 13.

21 A. Neisser, *Stereoscopischer medicinischer Atlas*, 1894, letterpress and helio-engraving, 190 x 135 mm, Amsterdam, Rijksmuseum, inv. no. RP-F-2001-7-609; Ludwig Katz, *Stereoscopischer Atlas des menschlichen Ohres nach durchsichtigen macroscopischen Praeparaten*, Leipzig (August Hirschwald) 1895, letterpress and albumen print, 206 x 194 mm, Amsterdam, Rijksmuseum, inv. no. RP-F-2001-7-606; Dr Garel, *La photographie des objets immergés*, 1901, autotype, 252 x 164 mm, Amsterdam, Rijksmuseum, inv. no. RP-F-2001-7-120-28; Anonymous, *Repair of lacerations of the perineum*, 1914, gelatin silver print, 87 x 170 mm, Amsterdam, Rijksmuseum, inv. no. RP-F-2018-81.

22 Walter Benjamin, *Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit*, Frankfurt am Main 1977 [1st edition 1936], p. 32.