

X-RAY VISION

X-RAY VISION
A Way of Looking

RICHARD M. SWIDERSKI



Universal-Publishers
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X-Ray Vision: A Way of Looking

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ANTICIPATION OF X RAYS.—In Thomas Nugent's translation of Father Isla's 'History of Friar Gerund de Campazas,' published in 1772, we are informed that there is a popular idea in Spain that certain persons called Zahoris are "born with the faculty of seeing clearly anything which is covered, even though it should be under the earth, so that it be not covered with a blue cloth" (vol. i. p. 365).
K. P. D. E.

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‡ A popular idea, that there are persons (whom they call *Zahoris*) born with a faculty of seeing clearly any thing which is covered, even though it should be under the earth, so that it be not covered with a blue cloth.

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INTRODUCTION

X-ray vision created a public vision and the threat of being seen. But X-ray vision never has existed. Why do we think it might? The spread of surveillance that accompanies X-ray vision intimates the all-seeing eye and recalls the anxious subjectivity of the observed viewer.

The discovery of X-rays did not introduce a new way of seeing. It introduced a new way of looking. News of the discovery spread more quickly and more widely than the images themselves. The first newspaper notice of X-rays was accompanied by an X-ray photograph, of Berthe Roentgen's right hand, still the most reproduced X-ray image ever. The hand was a simple demonstration of the force of the method. Other medically useful images might not be so readily recognized. Artistic X-rays of animals, again obvious by the correspondence between external and internal structure now visible, made an occasional appearance in printed media. And of course there was the novelty of X-ray calling cards.

Most of those who learned of X-rays learned from written descriptions or word of mouth. They were known to reveal interiors living, dead and never living. The closest epistemology was that of anatomy, and the most accessible anatomy was that of the skeleton. X-rays had to spread out the bones of the body in their natural order. X-rays were rapidly and variously equated with a way of looking that already incorporated considerable information about the body's structural insides.

The knowledge of the anatomist and the physician was scrolled into the X-rays. Genuine X-rays are shadowgraphs that have to be interpreted by those knowledgeable both in the technology of image formation and the internals of the body represented. For most peo-

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ple X-rays were a form of light that lit up the body like an opening page of an anatomy book.

This awareness of X-rays fostered X-ray vision. It was a way of assimilating the technology to eyesight and of registering the fears that such an eyesight stirred. A case study of X-ray eyes and X-ray vision begins with an automatic assumption of how X-rays acted when directed at a body, and continues in social and cultural developments of that theme apart from the actual applications of X-ray imaging technology.

X-rays were assimilated directly to eyesight, and they were pictured in the process of being a form of eyesight. Seeing with X-rays was referred to the subjective experience of those who could do so, or who gave evidence of being able to see by X-ray light. The act of seeing with X-rays was itself imaged, as a form of illumination described as a normal act of sight extending inward, or a through a surrogate technology giving an impression sufficiently like the idea of X-ray imagery to take its place.

X-rays were a beam aimed at the person or object being X-rayed, without thought to the screen or photographic plate that had to be on the other side of the subject. They were taken to be like a directed beam of light aimed into the darkness to light up what could not be seen by present illumination. X-ray vision was beam-like looking parallel to the gaze, the stare, the inquiring eye. It therefore aligned with the existing social forms of the gaze and was fraught with danger beyond the inherent harmfulness of ionizing radiation. The evil eye, the voyeur and the spy were aligned with X-ray vision from the start. Its look was seen.

X-ray vision was and is an image-idea not strictly bound to the natural force and the technology that name it. There always is a sense of the elements of the idea, of being able to look through the barriers of bodies and objects that preceded the discovery of X-rays. This is evident from the residue of ancient vision beliefs and of the folklore of vision present in X-ray vision narratives. It is also evident from the occasional attempt to reconcile X-ray vision with the physics of X-rays, or to invent a dream physics that would make X-ray vision possible. Just as common are the explanations of why it would not be possible as a form of human eyesight. X-ray vision is

an image-idea tending toward an image, which frees it from X-rays and returns it to the antique light of its real origins.

That antique light, which opened darkness of the earth and the body, was much sought in the early twentieth century, as night was made day and secret cells were mercilessly flooded with brightness. X-ray vision achieved that sudden illumination. It recovered the experience of first light abolished by electric light fixtures replacing gas light on city streets and in houses. As artificial light displayed more detail and greater expanse than it was comfortable to see all the time, so X-ray vision could not be shut off once it was aimed at its object. The solid bone structure promoted by anatomy liquefied before the X-ray eyes. Acquiring X-ray vision was a new caption for an old tragedy. The supposition of its presence was a new caption for an old comedy.

This book is an excursion into the manifestation and development of X-ray vision and X-rays eyes from their first naming to their widespread acceptance as an image-idea. X-ray knowledge really was a new use for an existing technology and was spurred in its course by medical, industrial and security needs. X-ray vision also spread rapidly, following pathways and currents traced in these pages.

The first chapter recovers two of the shaping antecedents of X-ray vision. In the dance of death and then the phantasmagoria, the skeletons of the dead summoned up for final judgment became living skeletons going about daily business. This display taken up by the cinema mimics a world made transparent by the fall of X-rays. The individual eye of the zahori saw into the earth to water, precious metals and graves with valuables. Both visions were summoned up anew by X-ray vision.

The first fictional registers of X-ray vision came within weeks of Roentgen's January, 1896 announcement. A retired British India administrator imagined how a retired British India administrator might concoct eyedrops that made his eyes X-ray eyes, and recoiled from the result, which he did not consciously equate with the living skeletons made by the famines passing through the country under British rule.

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X-rays might be able to penetrate or bypass the normal route of light through the eye and carry shapes and ideas directly into the optic nerve. Seeing X-rays or seeing with them was a possibility to be explored. The rays beamed into the eyes of the sighted and the blind from Roentgen onward did or did not register visibly. Perhaps X-rays caused the interior of the eye to fluoresce and thus make objects held in the beam into visible shadows. No one who attempted looking into X-rays during this brief period of experimentation claimed that the interiors of objects were visible. What would always be understood as X-ray vision was not accomplished with X-rays.

An edgy play of the spirit began the new century's beliefs about seeing with X-rays, all the way through to unpleasant truths. X-rays must be part of the light and vibrations always present and visible with the right apparatus. X-ray opera glasses were rumored to be available: the audience in the theatre and the crowd on the street would be stripped bare in the new light. Legislation was proposed, impenetrable underwear was advertised, perhaps as a joke, to stop this ocular invasion of privacy. Edison was supposedly about to issue X-ray spectacles. Cartoons made light of the look through the skull into the very thoughts of another. Even the blind might see if X-rays were beamed directly into their eyes.

A pacifist artillery officer imagined the next step in X-ray vision: the evolution of a being with wooden eyes, who therefore would see only by the ambient X-rays. The fanciful portrait of the Xylope's beloved, a romance become gelatinous, brought exclamations of disgust from commentators who stopped at that. A French socialist doctor cultivated a working class woman's ability to see through paper, which was taken to be X-ray vision after X-rays were discovered.

X-ray eyes were claimed by women who earlier would have been labeled medical clairvoyants. The eyes themselves with a little training saw as an X-ray apparatus did, and the claim was verified by the diagnoses the "girl with the X-rays eyes" uttered as she looked into her client. The look of the eyes, pupils dilated by belladonna, was sold in X-ray beauty parlors together with the ability of those eyes to see the innermost desires and troubles of future girls with

X-ray eyes. The inner experience of an X-ray eyes beauty was expressed only when a fictional plastic surgeon of body and soul invented Roentgenol and allowed a young woman to see the void in the heads of the rich, whom she joined.

The see-through abilities of the eyes alone merged briefly with the tradition of the gifted dowser-zahori appearing briefly in the United States-Mexico border states. The X-ray rubric conveyed news of one young man's ability to see water and valued fluids within the ground among hopeful entrepreneurs across the nation. A South African man possessing comparable talent rejected the X-ray eyes designation of an American journalist, but was proclaimed under that title just the same.

The inclination to emphasize the eyes over the X-rays continued with other fictions that began as the adventure of a man given cosmetic radium treatment and able to generate the rays from his brain. The man who could see through walls and detect plots on the other side became in the passage from France to America the man with the X-ray eyes illustrated with beams streaking out to render evil secrets plain to his view. The viewpoint of X-ray eyes was ambiguous: the unusual sight for him is usual for those he spies upon. Outsiders must see the process of viewing, the wall dissolved as well as what is happening on the other side, for the viewer truly to have X-ray eyes.

The individual gift of eyes able to see vibrations of force above and below visible light would uncover forms of life that move about unseen, much as scientists with their microscopes and telescopes detected extraordinary invisible everyday creatures and energy centers. These other worlds accessible to those with radiant vision remained potentially present in any view. Instruments that gave access to these nearby worlds were imagined as X-ray remote seeing and magnifying devices. They eventually were realized as television and nanovision, at first assembled from X-ray apparatus components.

The ability to see with X-rays alternated between a personal endowment and an instrumentality. At first the personal endowment replicated the capacities of X-ray equipment, but being human was superior. Young Leo Brett, the son of a physician was able to

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see into bodies from an early age when his father (and he alone) placed him in a hypnotic trance. Leo saw anatomical diagrams inside people, much clearer than X-ray photographs and in color. Beulah Miller from childhood saw into playing card hands and people's pockets, a claimed clairvoyance labeled X-ray vision.

Tests administered to Leo and then Beulah by a scientist of phenomena assumed to be psychic and then by an early experimental psychologist were the source of a slightly sustained newspaper renown for them as the psychic scientist tried to preserve his X-ray vision contention against the psychologist's materialist conclusions. While the psychologist's view has prevailed, that Beulah's vision was a matter of reading subtle cues, her performances of detailing concealed markings and objects became the standard for individual X-ray vision.

Houdini readily unmasked a Spanish X-ray vision performer in the 1920s, which did not discourage others from attempting to advance their acts. The Kashmiri virtuoso Kuda Bux, who shifted from firewalking to blindfolded readings, spanned the variety stage and early television with his acts of self-proclaimed X-ray vision. His technique never was revealed. He attributed his abilities to spiritual discipline, which he offered to teach without anyone taking him up on the offer. Other Indian yogis included X-ray vision among the powers their teachings could induce. Easier to copy were the packaged magic tricks that democratized X-ray vision in popular manuals.

X-ray eyes, like the title "Chief", were imposed on the major league baseball player of Chippewa descent, Albert Bender. The pitcher's familiarity with the preparations for the pitch enabled him to read the signs given by the opposing team's pitcher to the catcher. This wasn't called sign stealing or considered unacceptable at the time as it is now. A baseball writer combined Bender's insight with his dark eyes and his Indian background to give him a form of individual X-ray vision and X-ray eyes. His sight was visible to others and so were his eyes. Like other professional attributions this was applied to few other ballplayers after the unique instance.

The shower of ambient X-rays exposing the innards of buildings and at times people in the form of X-ray fashions, was sustained as

a transparent world exposed at times in clothing design, painting, architecture and films. A few artists, Frantisek Kupka and Naum Gabo, for instance, fashioned their works as X-ray passages through matter without claiming X-ray vision. Houses and rooms losing their walls was a standard of cinema not ascribed to the activity of X-rays or the audience's ability to envision them. Architects designed glass houses generally without an X-ray reference. The filmmaker Sergei Eisenstein sketched an X-ray inspired film project named *Glass House*: a building entirely of glass where human cruelty was acted out with no barriers. The screenplay never was completed nor has there been any such film. The considerably less ambitious reality television series that unrelentingly follow people in their struggles for acceptance and cash don't look through walls.

X-ray vision and the transparent world came together in the figure of the superhero, an extraordinary individual whose powers had to be viewed in their exercise. They were viewed first in comic strips, which show Olga Mesmer, a product of her Venusian mother being exposed to X-rays by her scientist father, looking with a burst into walls but not what she sees on the other side.

Superman did less when he first made use of his X-ray vision in the early years of his comic. He only alluded to what he saw with his "X-ray eyesight". As the strip continued readers see inside enclosures as Superman does often with beams from his eyes breaking open the barrier. His vision acquires the X-ray accompaniments of telescoping and microscopy with the addition of heat vision.

The spectrum of media hosting Superman, his companions and antagonists, were a site for old and new forms of the transparent world as techniques improved. The method of simply running footage of what Superman saw with his X-ray vision was replaced by a return to the phantasmagoria and the anatomical diagrams of earlier transparency, following by moving X-ray like shadows. Successive iterations of the Superman type gather the modes of envisioning X-ray vision into diverse packages.

X-ray spectacles were revived in the 1950s using as a surrogate diffraction imaging which had been patented decades earlier but never successfully commercialized. These cardboard spectacles sold cheaply in comic books and popular science magazines were both to

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see and be seen (one design had swirling spirals around the peephole). The immemorial X-rayed hand appeared in some ads, a woman silhouetted inside her dress in others. The X-ray specs were an invitation to baiting girls with the signal that juvenile voyeurism was going on. They contributed a field of nostalgia for those who recalled they actually worked.

Like the later Superman spectacles the film *The Man with the X-Ray Eyes* reviewed all the forms of public X-ray vision, but in the tragic mode, from the individual point of view of a doctor who experimented with eyedrops. This film added the X-ray spectacles diffraction grating vision to the implicitly naked bodies, the skeletons and anatomy diagrams. Individual X-ray vision reviewed and replaced the transparent world of phantasmagoria, X-ray skirts and glass houses seen by all.

Men who witnessed nuclear and thermonuclear test blasts unintentionally attained the truest X-ray vision when they raised their hands to shield their eyes, yet they did not use that phrase to name what they saw. X-ray vision was extended from the X-ray realms to peoples who did not themselves evoke the label. Western commentators saw both individual X-ray vision and the transparent world in social practices and imagery of the Hopi, !Kung, Maya, Yoruba, Akan, Wana and Ojibway among others.

X-ray vision and especially the Superman model is used to introduce technology for high degrees of magnification such as dichroic microscopes and the Chandra X-ray observatory. The very small and the very remote once believed to be accessible through X-rays finally were accessed through X-rays and acknowledged as such, though the object seen does not resemble the object imagined. X-ray vision as attained is not X-ray vision at all.

The flux of X-ray vision as imagined is replayed in the stories of tabloid newspapers that recast it in fictions reflecting current news stories. The force of lightning imprints the capacities of an infrared surveillance camera on the brain of a police officer. He solves crimes, locates lost keys and celebrates the long-standing voyeuristic potential of his gift. The other tabloid accounts have a similar bent whether through eyeglasses or special abilities except for the

one reporting at third hand about the children living in a village near Chernobyl after the meltdown of nuclear reactor.

The voyeur content of X-ray vision dominates the next surrogate technology, infrared video cameras that are able to record the skin within the clothes. They are removed from the market for publicized reasons, increasing the sales of similar cameras and the appeal of websites and booklets that instruct users how to modify the present camera for daytime infrared recording. This is an attempt to privatize the transparent world and mechanize the X-ray eye to make it universally available. But then, it only works for you if you think it does, like all X-ray vision.

X-ray vision and X-ray eyes passed through phases of simulation and acceptance. A parallel history of X-ray simulation technology accompanied improvements in X-ray imaging, free from constraints on the authentic technology necessitated by its demonstrated deadliness.

Diffraction grating, bird feathers, infrared filters and ultrasound all provided substitute visions safer than genuine X-rays. X-ray vision technology underwent its own evolution independent of X-rays and their imaging.

The interiors X-ray eyes saw were not X-rayed interiors. The problem was put aside by those who performed having X-ray eyes. They simply reported information that could not have been delivered to them by normal senses. As X-ray vision ceased to be a novelty it became a party game reduced to a set of rules for general consumption. That only encouraged the emergence of a virtuoso or two.

The mystique of unresolved social insight could not be dismissed so easily. The ability to look into people and enclosures, whether explained by a pseudo-technology or not, was impelled by the anxiety of that vision and framed by the regret of having used it. In an age of secrets and thickening walls around them X-ray vision was compensation for the inability of most people to breach those walls in any other way. For the inability of humans to change bodily in tandem with their technology.

With time X-ray vision aggregated many themes of extraordinary powers focused on entertainment. New devices for seeing the

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very small and the very far made use of the metaphor, X-rays themselves or both. Ideas of how we see had to make their apologies to X-ray vision. New devices permitting X-ray vision were invented in that space where their success cannot be denied because it has been purchased.

Having adapted old beliefs in penetrating vision to the new technology, X-ray visionaries assumed that a technology could be created to fulfill the beliefs.

X-ray eyes embody a longing for universal surveillance, a force in itself, and a fear that universal surveillance might be achieved. They are an index of the growing subscription to surveillance that should be universal. X-ray eyes are sent away always looking back, like an abandoned pet on the road behind us or a probe headed toward other galaxies.

1

ANIMATED SKELETONS AND THE TREASURES OF THE EARTH

The world-wide spread of X-ray knowledge in the early twentieth century was the culmination of a development that began with the magic lantern. X-ray photographs displayed the interiors of animals, humans and objects while light-based photographs (and of course sight itself) displayed their exteriors. Light projected solid and moving forms; X-rays projected static shadows. X-rays were a disadvantaged marvel.

There was Thomas Edison's fluoroscope first exhibited at an exposition of electrical technology in 1897. The passing audience watched a screen as they extended their hands to the other side and saw the bones inside the flesh. Individual entrepreneurs sold the opportunity to look into a hand or shoe. Hands are flat and easy to read. Disclosing their bones was the inescapable subject of early X-rays. An X-ray projection spectacle of the entire body was easy to imagine. It left the living body open. The skeletons of the past gained new life.

Moving skeletons were sometimes realized in magic lantern shows. Christiaan Huygens, the main inventor of the magic lantern, was intrigued by Hans Holbein's animated skeletons in his series of engravings *The Dance of Death* (1538). The skeletons dance and caper as they interrupt bishop and pauper in their activities and lead them off to death.¹ Huygens painted the skeletons life-size on a wooden fence in his yard. He also made a series of ink sketches of standing skeletons (1659), their multiple limb positions and dotted lines indicating motion.² One of the skeletons bends forward as the

¹ Holbein (1971)

² Mannoni (2000: 38-39)

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lines seem to indicate his skull has fallen into his right hand; another tosses the skull upward as he bends back, his left hand rising to keep his own skull from falling.

Laurent Mannoni theorized that Huygens meant the drawings to be on separate glass sheets, one slid over the other while the projector's light beam shines through them. Sequence of slides or articulated parts conferring motion became a practice of projection mechanics. Huygens himself used his projections to amuse friends and family. In the hands of professional projectionists who perfected the equipment and slides during the century that followed the magic lantern made its way around the world.

The early cinema reflected Huygens' wish to make the skeletons move. A 45 second short by the Lumière brothers, *Le Squelette Joyeux*, *The Happy Skeleton* puts the bouncing puppet through many of the same paces Huygens sketched out almost 250 years earlier. The skeleton drops and recovers an arm and a leg. He collapses in a heap but his legs rise dancing. Erect again, his head flies off and returns, and he finishes his dance with a few high music-hall kicks. The dance of life preserves the dance of death.



1. Still from *Le Squelette Joyeux* (1897), Lumière

Lantern shows were genre projections of everyday life, of quarrels and romance, and educational projections of plants and animals, butterflies, worms and tadpoles, some of them living as long as they could survive encased between glass plates with a light beam passing through them. Liveliness again betokened death. Apparitions and skeletons emerging from crypts remained part of the repertory.

Etienne-Gaspard Robert, best known as “Robertson,” an innovative organizer of projection events during the late eighteenth-early nineteenth century, claimed expertise in “phantasmagoria,” “a science which deals with all the physical methods which have been misused in all ages and by all peoples to create belief in the resurrection and apparition of the dead.”³ Robertson was the forerunner of other magician expositors of frauds upon the credulous, Robert-Houdin and Houdini, to name two-who made the exposure part of their own deft shows achieved entirely by human means.

By abjuring miraculous powers Robertson freed himself from scrutiny by church authorities and laid a claim, not generally accepted, of being a scientist. His technical innovations included projectors that could be moved to enlarge or reduce an image while keeping it in focus, well suited to form environments of the dead rising and spirits gathering in capacious darkened spaces, as the chilling glass harmonica sounded and powerful artificial winds blew.

Religious background and gothic literary atmosphere predisposed his audiences to react spontaneously to the rising skeletons and flying demons while conscious it was a paid performance. The recent overthrow of the French monarchy had worked to Robertson’s advantage, increasing anxiety and making religious properties available for secular entertainments. An often reproduced engraving of a 1797 phantasmagoria portrays the audience seated in pews raising their arms at the approach of the winged death’s head and hovering hermaphrodite. One man reaches for his sword, another cowers on the floor, as the censers pour out smoke.⁴

Robertson kept his apparatus out of sight. It was the mechanism that had become esoteric.

³ Quoted by Mannoni (2000: 148) from Delrée (1954: 19)

⁴ Robertson (1834)



2. Phantasmagoria of Robertson in the Capucine Cloister, 1797. Robertson(1831: frontispiece)

Among Robertson's surviving painted glass plates are a death's head image between two wings that could be worked to flap, a shrouded skeleton that is housed in a crypt in one slide and stands on a nearby tomb in another, a skeleton holding the hourglass and scythe of Death, and a skeletal rider seated atop a skeletal horse, one of the Horsemen of the Apocalypse. In the static glass paintings they still appear to be arriving from the beyond.⁵ An 1840s version of Robertson's Fantoscope projector owned by a Belgian collector includes a projectable mechanical puppet of a skeleton that turns its head and moves its mouth as the operator cranks a handle.⁶

After Robertson the funereal and otherworldly subjects of projection shows diminished in number as the techniques of imparting motion to the figures proliferated. Whenever active skeletons appeared they were the reanimated dead, not skeletons of the living. The phantasmagoria mode of displaced necromancy persisted in the successor of the magic lantern shows, the cinema, from the many skeletons of the early trick filmmakers to the musical skeletons of Disney's 1929 *Silly Symphony*, *Skeleton Dance*, to the warrior skele-

⁵ Reproduced in Remise, Remise and van de Walle (1979: 47, 50 and 53)

⁶ Described by Mannoni (2000: 156-57)

tons of Ray Harryhausen's figure animation for *Jason and the Argonauts* (1963), to the still-corroding stop-motion characters of *The Corpse Bride* (2005).

X-rays did not expose full skeletons, but death and the cinema did. An eye able to see with X-rays as with light might also see live, moving skeletons. Independent of the skeleton show and converging with it under the X-ray beam was a penetrating eye and a way of looking. The alignment of this eye with the skeleton show was a promise X-rays threatened to keep. It was a promise made long before X-rays were known, long before the phantasmagoria was staged.

Pedro de Hoyo, from 1556 to 1568 head of the authority servicing the royal residences in Philip II's Spain, wrote to the king expressing enthusiasm about a young boy who was able to see water under the earth.⁷ Only able to work on days that are sunny and bright, this boy was the best *zahorí* de Hoyo had yet employed, and he certainly would find the needed water resources. The king's scrawled reply preserved in the Spanish state archives gives royal assent to the project, but de Hoyo's account of the results is fraught with disappointment. These *zahorís* are not always right, he dejectedly recorded, after the boy kept urging the official to have his men dig deeper at a spot where no trace of water appeared.

The king may have lent his authority to this *zahorí's* search, but others making the same claims of seeing water, minerals, and the buried dead within the earth were interrogated and sentenced by the tribunal of the Inquisition to corporeal punishment and improving instruction. The Jesuit theologian Tomás Sanchez allowed that *zahorís* might be harmless fakes who if they did succeed in locating earthly riches were under demonic influence, their immortal souls imperiled. Benito Feijoo, a Benedictine theologian, dismissed the *zahoris'* claims because light cannot penetrate the ground.⁸

A celebrated *zahori* named Pedegache in Portugal was revered for her eyes' sight and the prosperity she brought to treasure finders. A Portuguese woman in seventeenth-century colonial Peru

⁷ Goodman (2002: 17-18)

⁸ Feijoo (1739: 2, 325-26)