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Rubens Peale's Spectacles: An Optical Illusion?

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Abstract. The painting *Rubens Peale with a Geranium* (1801), by Rembrandt Peale, has earned a reputation as a masterpiece of early American portraiture. In recent years the painting has also been the source of controversy, because Rubens was depicted with two pairs of eyeglasses at a time when most people would not have been portrayed with spectacles at all. Scholars of American art history and ophthalmology have studied the painting and have promoted various theories for this peculiarity. A combined study of the painting, historical documentation, and optical effects in the painting, however, sheds new light on the answer to this mystery. (*Surv Ophthalmol* 41:417-424, 1997. © 1997 by Elsevier Science Inc. All rights reserved.)

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In 1801, 23-year-old Rembrandt Peale asked his younger brother Rubens to pose in his studio for a portrait. The work that the young artist produced, with its well-balanced composition and fine detail, its pleasing use of color and close attention to the effects of light, clearly displayed Peale's technical mastery of painting. *Rubens Peale with a Geranium* (Fig. 1) is recognized today as one of America's finest nineteenth-century portraits.

The painting presents the viewer with an untraditional version of portraiture. While this is a sensitive portrayal of the 17-year-old Rubens, an aspiring botanist and museum director, almost half the canvas is occupied by the carefully depicted geranium plant. Portraits of the nineteenth century often show the sitters with objects representing their occupations, but the role of this geranium goes beyond mere symbolism; not only is the plant closely observed, but it is highlighted as well, placed slightly forward of Rubens. The painting is as

much a portrait of the geranium as it is of the young man.

Further, Rubens and the geranium interact in the painting in a lively, intimate manner. They lean away from each other slightly, but the two subjects are tenderly connected: Rubens' hand affectionately touches the soil within the ceramic planter, while the plant extends a branch of leaves up to touch Rubens' brow and two seed pods reach down to stroke his curls. The result is an innovative combination of portraiture and still life.

One reason Rembrandt gave special emphasis to the geranium in *Rubens Peale* might lie in the importance of the plant itself. Scholars have identified the plant as a species of *Pelargonium*, an "aristocrat" among geraniums.^{8,17,20} Peale family documents attest that Rubens was adept at cultivating difficult and exotic plants,^{19,31} and this was the first such geranium in America to blossom from seed.^{26,41} As such, *Rubens Peale with a Geranium*

Fig. 1. Rembrandt Peale, Rubens Peale with a Geranium, Oil on Canvas, 1801. National Gallery of Art, Washington, DC, Patrons' Permanent Fund 1985.59.1



serves not only as an example of Rembrandt's great skill in painting, but also as a testimony to Rubens' prowess in his intended career.

Rubens Peale and the Spectacles

An intriguing peculiarity of *Rubens Peale with a Geranium* is Rembrandt's choice to depict Rubens with spectacles. Rubens' eyeglasses could be interpreted as another attribute of his scholarly occupation, but like the geranium, they are given unusual importance in the painting: Rubens is shown with not just one, but two pairs of eyeglasses—one pair is prominently displayed on his face and the other pair is held in his left hand. This is an enigmatic portrayal; people of that era would seldom be painted with their glasses at all, much less with two pairs. Scholars and connoisseurs alike have puzzled over this discrepancy.

This curious aspect of the painting might be partially explained by the condition of Rubens' eyesight, which was unusually poor. Rubens' serious visual deficiencies are well-documented in the family papers, and Rembrandt even described his brother's affliction in a published article:

I was never near-sighted, but could see distinctly across

the Delaware, and now can do so with my fifteen-inch glasses; but a younger brother was so near-sighted, that I have seen him drawing, with pencils of his own manufacture—small sticks burnt in the candle and dipped in its grease—looking sometimes with his left eye, and then turning to look with his right eye, the end of his nose was blackened with his greasy charcoal. He was slow in his progress at school. . . . At ten years of age, he only knew two letters, *o* and *i*, never having distinctly seen any others, because his master, holding the book at a distance to suit his own eye, his pupil could see nothing but a blurred line—and only learned by rote.²⁹

Rembrandt's reference to Rubens as "near-sighted" explains, in part, why Rubens' eyesight went uncorrected throughout a large part of his childhood: opticians of the time automatically presumed young persons with vision problems to be myopic, while only elderly people would be considered in need of strong magnifying lenses.¹⁵ Although cases of "presbyopia" among young subjects had been recorded by the late eighteenth century, the true nature of hyperopia was not elucidated until the latter half of the nineteenth century, by Franz Cornelis Donders.^{12,11}

Rembrandt went on in his article to describe

how Rubens himself discovered the lenses that would correct his vision:

No *concave* glasses afforded him the least relief; but at Mr. M'Allister's, the optician . . . there lay on the counter several pairs of spectacles, which had just been tried by a lady 90 years old. Taking up one of these and putting it on, he exclaimed in wild ecstasy, that he could see across the street—"There's a man!—there's a woman!—there's a dog!" These glasses were double convex of four and a half inch focus, and enabled him rapidly to advance in his studies. He has continued the use of them, of the same strength, to the present time, being seventy years old—putting them on the first thing in the morning, and taking them off the last thing at night.³⁰

Rembrandt also contrasted Rubens' use of one pair of strong eyeglasses to the many different pairs he required to correct his own vision.³⁰

Rubens recorded a slightly different version of how he discovered the proper correction for his eyes in his autobiographical *Memorandum of Rubens Peale*:

My sight has always been very bad and it was not until [sic] I was about 10 or 12 years of age, that I could procure any glasses that aided my sight. I had to put the book or paper so close to my face that my nose would frequently touch the book. It was always thought that I required concave glasses and every degree of concavity was tried in vain. At last I happened to take a large burning-glass and placed it to my eye and to my great astonishment I saw at a distance every thing distinctly. . . . My father then went with me to . . . McAlister's store in Chestnut near 2nd St. He had no spectacles of so high a power. He then set in a frame glasses of 4 1/2 inch focus. With these spectacles I could see to read and even to read the signs across the street. This surprised him very much. He had never met with such a case before. (Strange to say, I still continue to use glasses of this same focus ever since.) It was not until this discovery was made, that I could read a newspaper or other small print.^{33,37}

These precise accounts of Rubens' prescription reveal that he was extremely hyperopic. With eyeglasses of "four and a half inch focus," his prescription would be +8.75 diopters, and the extent of his farsightedness would have been so great that he would not have been able to see clearly at any distance without his glasses. This prescription would also explain the appearance that Rubens was nearsighted: in order to magnify objects, he would have brought them as close to his face as possible, but his efforts still would not have allowed him to focus and see these objects clearly.²

Other Peale family papers attest that Rubens' poor vision was decisive in his career, discouraging any early interest in art.²¹ It is, therefore, not surprising that Rubens' visual difficulties were empha-

sized and made an important characteristic of his portrait. However, the family literature, including Rembrandt's article and Rubens' *Memorandum*, indicates a strange contradiction in the painting: Rubens was known to wear only one, extremely powerful prescription throughout his life, yet he is portrayed in *Rubens Peale with a Geranium* with two pairs of eyeglasses.

Theories on the Two Pairs of Spectacles

Scholars have suggested various theories on the presence of this second pair of glasses. Because of Rembrandt's description of Rubens as "nearsighted," some have suggested that Rubens was not only myopic, but prematurely presbyopic as well.¹⁰ The two pairs of spectacles, therefore, would indicate his need for extra correction—the pair on his face, concave lenses to correct his myopia, and those in his hands, convex lenses to correct his presbyopia. In light of Rubens' prescription, of course, this argument is untenable. As Rubens was an absolute hyperope, his affliction would have been so extreme that, at any range, concave lenses would only have worsened his vision.^{2,29,32}

Other scholars have suggested that the extra glasses are simply a good-humored pun on Rubens' poor eyesight and the omnipresence of his spectacles or that they were simply meant to emphasize his thoughtful nature.^{9,5} The Peale family documents, however, supply a much more compelling explanation.

The records of Rubens' daughter, Mary Jane Peale, indicate that the two pairs of spectacles in the painting were not part of the work's original conception. Mary Jane acquired *Rubens Peale with a Geranium* from James C. Copper, a close friend of Rembrandt's to whom the painting had been given,²⁶ and she referred to the portrait several times in her personal documents. In her will, Mary Jane stated that the painting was "first painted without the spectacles and afterwards put on."²⁵ She elaborated upon this explanation in her "List of Pictures I Own, 1884," written when she was 57 years old, asserting that the portrait "was first painted without glasses, but as my father never went without, they were afterwards put in—and as he had the glasses in his hand—they did not have them taken out."²⁶ Finally, in her "List of Pictures I Own; 1885," Mary Jane cited the painting again and recorded that "at first he was painted without his glasses—he held them in his hand—Afterwards the spectacles were painted on him—and this accounts for the two pair of glasses in the picture."²⁷

Despite the sometimes confusing wording in Mary Jane's personal records, the explanation they provide for the two pairs of eyeglasses is clear: the

painting was first painted with only the glasses in his hand, but the portrait proved unsatisfactory to the viewers, who felt that Rubens should be portrayed with his characteristic spectacles. Rembrandt complied, adding the second pair of eyeglasses to Rubens' face, but he decided against trying to remove the pair of glasses from Rubens' left hand.

Nevertheless, the validity of Mary Jane Peale's records has been disputed. In reference to Mary Jane's will, previously believed to be dated 1883, one art historian has contended, "Here it may be argued that a familial recollection late in life of an event that occurred over three-quarters of a century before was devoted but faulty."⁴² This scholar also argued that "the upper eyeglasses . . . seem so integral to the entire effect and meaning of the painting that they must have been part of the intention and composition from the start."⁴²

Although the spectacles on Rubens' face do create great visual appeal in the painting, these assertions are weakened by additional documentation about *Rubens Peale with a Geranium* in Mary Jane's records. An entry in Mary Jane's diary on April 20, 1854, when she was 27 years of age, stated that her father's portrait "was first painted without spectacles & then to make it more perfect it was painted with spectacles on the eyes as he always wore them & then the others were left in order not to mar the picture."²⁸ Further, in her notation to a letter of April 28, 1854, from James Copper, Mary Jane related that *Rubens Peale with a Geranium*:

. . . was first painted without the glasses on but in the hand. . . . They thought it would look better with them on, and they were painted . . . but Uncle Rembrandt who painted it thought it would spoil the painting of the hand to take the others out, so they did not.¹

Thus, on at least five different occasions Mary Jane consistently recorded the same explanation for the extra eyeglasses. In addition, when she received the painting in 1854, her uncle Rembrandt would have been 76 years old and her father Rubens would have been 70 years old. Not only would both have been alive and available to discuss the history of the painting with her, but Rembrandt came in direct contact again with *Rubens Peale* at that time: Mary Jane stated in her 1884 list of pictures that her uncle cleaned and put a new back on the painting when she received it from Copper.^{18,26}

Conservation examination of *Rubens Peale with a Geranium* reveals little to confirm or to contradict Mary Jane's explanation.³⁹ X-radiographs show that there was no underpainting, so it is not evident whether the original conception was with or

without the second pair of eyeglasses. No pentimenti, or residual marks of dried brushstrokes, are visible under the eyeglasses on Rubens' face; however, pentimenti would not have occurred if Rembrandt had added the glasses within a month, before the oil paint had dried. Finally, there is no evidence of reworking or changes in paint thickness in the area of the eyeglasses, but such traces would be apparent only if Rembrandt had been uncharacteristically sloppy in his work.

Some conservation evidence supports Mary Jane's explanation, although not conclusively. The eyeglasses on Rubens' face are painted over highlights on his lower eyelids, and this establishes that at least this part of his face was completely finished before the glasses were added. However, artists of Rembrandt's era frequently concentrated on finishing one area of a painting at a time; conservation study cannot distinguish whether these spectacles were originally painted as part of Rubens' portrait or added to his face shortly after the painting was completed.³⁹

Thus, while the physical evidence does not confirm that the second set of eyeglasses was added to the painting later, it does definitively leave this possibility open, and Mary Jane's explanation remains the most plausible theory. Moreover, the family account provides a solution for yet another curious discrepancy in the painting: The lenses of the eyeglasses in Rubens' hand noticeably magnify the folded sidebars behind them; however, there is a complete lack of distortion behind the lenses that Rubens wears on his face—the edges of his lower eyelids align perfectly on either side of the eyeglass frames.³⁹

As Rembrandt Peale was meticulous about detail,⁴ under normal circumstances he certainly would have noticed and recorded the obvious distortion of facial features that would appear behind strong eyeglass lenses, just as he recorded the subtle distortion of the sidebars folded directly behind the spectacles in Rubens' hand. If the eyeglasses on Rubens' face were his true prescription, at the level they are placed along his nose, the lenses would enlarge the features behind them 20–30% and slightly displace these features from their normal positions.² If we assume the eyeglasses shown on Rubens' face to be functional, these lenses appear to be at most a weak concave prescription—a sort of lens for which Rubens had no use.

Further optical study reveals an even larger discrepancy: Despite the lack of distortion behind these eyeglass lenses, bright pools of refracted light fall across Rubens' cheeks, indicating strong lenses. Even if these spectacles were presumed to have functional concave lenses, this depiction could not

possibly be that of a real pair of lenses and their refraction; concave lenses diverge rather than concentrate light, and they would cast slightly dark, oval shadows rather than the darkly outlined, bright ovals shown on Rubens' cheeks.² Thus, the lenses depicted and the refracted pools of light on Rubens' face in this painting simply do not coincide.

If Rembrandt had indeed added the glasses to Rubens' face after *Rubens Peale with a Geranium* was completed, this would explain a lack of distortion behind the lenses when the pools of light imitate Rubens' true prescription: it would have been simple to paint in the contrasting highlights and shadows on Rubens' cheeks; however, it would have been too difficult for Rembrandt, who was meticulous in mixing precise colors for his paintings,^{6,22,24} to match exactly the tints needed to repaint the area behind the lenses. Further, a later addition of the glasses would explain why the frames on Rubens' face have much smaller lenses than those in his hand, and why they were placed rather low on his nose, with the lenses over only Rubens' lower eyelids: Rembrandt would have wanted to minimize the obvious lack of distortion behind the lenses as much as possible. In any case, the smaller glasses, perhaps Rubens' spare set, would also have been much less disruptive to a portrait than the larger pair would have been.

As confirmation for this theory, the correct distortion and refraction of light that would be caused by Rubens' true prescription is readily apparent in a second portrait by Rembrandt, painted only six years later in 1807⁷ (Fig. 2). In this painting of an older, more self-assured Rubens, he is depicted in a technically challenging, three-quarter view. Eyeglasses are again placed prominently on Rubens' face and they again throw bright ovals of concentrated light on his cheeks. The areas behind the lenses in this painting, however, are grossly enlarged. Behind the left lens, the inner juncture of the eyelids is magnified to a huge size, and the lens shifts the position of this feature slightly; the edge of Rubens' face and the right sidebar of his glasses, perhaps an inch behind the right lens, are extremely fuzzy and distorted.

Because the distortion caused by the lenses is so marked in this second portrait, it is unlikely that Rembrandt could have been unaware of such effects, or that he might simply have ignored them, in his earlier painting of Rubens. The eyeglasses on Rubens' face in *Rubens Peale with a Geranium*, therefore, must have been an afterthought, added when a completely accurate depiction of the spectacles was no longer possible.

Another Ophthalmological Theory About Rubens' Spectacles

Scholars of ophthalmological history have long viewed *Rubens Peale with a Geranium* with interest because of its unusual depiction of a nineteenth-century sitter wearing his spectacles. The painting is also intriguing because Rubens Peale himself was a noted oddity; not only did he suffer from severe hyperopia before the affliction was fully understood, but he also discovered the proper correction for his debility. One scholar, Dr. John R. Levene, studied Rubens' case quite extensively. In his 1977 text *Clinical Refraction and Visual Science*, Levene developed another interesting explanation for the second pair of eyeglasses depicted in *Rubens Peale with a Geranium*.^{14,16}

From essays that mention Rubens' unusual affliction¹³ and from Peale family accounts describing how Rubens discovered that he could see clearly through a magnifying glass, Levene determined that Rubens was hyperopic and that he must have worn a powerful prescription. Levene considered *Rubens Peale with a Geranium* to be certain evidence that Rubens suffered from poor eyesight, as the young man is shown wearing spectacles at a time when people would not be portrayed with eyeglasses. Levene described the painting as "unique" not only for its display of Rembrandt Peale's technical mastery, but also for how it represents Rubens:

The portrait does not depict powerful glasses being worn, but remarkably the portrait exhibits the 17 years old Rubens with two pairs of spectacles, one pair being worn, a second pair being held in the hand. Rubens may well have preferred a weaker pair for cosmetic purposes, at that time. Any extra magnification required could readily be supplied by the additional pair of spectacles. The hand-held pair have conspicuously larger lenses and a wider bridge. Perhaps the reason for the wider bridge was so that the spectacles could be worn further down the nose, for reading or close work purposes, while at the same time wearing the 'distance' glasses (thus providing a 'two focal' system).¹⁵

Scholars who question Mary Jane Peale's accounts have welcomed Levene's explanation as substantiating proof that the painting was originally conceived with two pairs of spectacles.^{40,43} The difficulty of using this explanation as such evidence, however, is perhaps best revealed by Levene's own astonishment that Rubens is depicted with the two pairs of spectacles in this portrait.

Levene's references included none of the later family documents, and more importantly, they did not include Mary Jane Peale's records describing the history of the painting; he neither mentioned

Fig. 2. Rembrandt Peale, *Rubens Peale*, Oil on Canvas, 1807. National Portrait Gallery, Smithsonian Institution, Washington, DC, gift of Mrs. James Burd Peale Green and Gallery purchase. NPG.86.212



her explanation nor attempted to discredit it. Without this historical information, Levene nevertheless astutely noted an optical discrepancy in the painting—that the lenses in the glasses portrayed on Rubens' face are not at all powerful. Because weak lenses of any sort are inconsistent with the hyperopic correction that Rubens would have required, Levene could not help but express surprise that such lenses appear on Rubens' face in the portrait, and it is natural that he would try to suggest some sort of explanation for this curious depiction.

Levene's theory about these eyeglasses, therefore, was a valiant attempt to resolve why two pairs of spectacles, one of them a very weak pair, might appear in a portrait depicting a young man suffering from severe hyperopia. Scholars wishing to use Levene's theory as evidence to argue against Mary

Jane Peale's records, then, use a circular argument: they use Levene's explanation of the painting to prove that Rubens wore two pairs of eyeglasses, while Levene developed his theory only to explain how this hyperope could possibly be using the two pairs of eyeglasses in the painting. Additional study reveals that, while Levene's speculations are plausible ophthalmologically, they are unlikely for a number of reasons.

First, the eyeglasses on Rubens' face are unlikely to represent weak magnifying lenses. Not only would such lenses be inconsistent with the bright pools of refracted light on his cheeks, but even weak convex lenses would show some distortion behind them, especially at the distance the glasses are placed from Rubens' face. Further, because Rubens' hyperopia was so severe, he was not likely to

prefer weaker lenses for cosmetic purposes. With a prescription of +8.75 diopters, Rubens' focusing abilities would have been extremely deficient; he would have experienced great difficulty trying to see when wearing lenses that were any weaker than full strength.³

In addition, claims of vanity on Rubens' part, especially in regard to any psychological discomfort he might have had with his spectacles, are contradicted by the Peale family literature. Family accounts consistently relate Rubens' great joy in finally being able to see clearly; they also state repeatedly that Rubens never went without his eyeglasses. Further, in a letter to Rubens' younger brother, Rubens' father Charles Willson Peale recorded Rubens' staunch refusal to allow even his adolescent classmates' taunts make him stop wearing his spectacles:

As to the scoff or ridicule of foolish people, take the example of your brother Rubens, when I found that his Eyes required spectacles, at the early age of 12 or 13 years, and I gave him a pr. of Spetacles [sic], I asked him if he could bear the laughter of his young companions, his reply was, 'since I find them useful I do not regard any thing [sic] they can say about my use of Spectacles.'^{23,38}

Also improbable is Levene's suggestion that the construction of spectacle nosebridges indicated different placement on the face. As is apparent in self-portraits by Rembrandt Peale and by his father Charles Willson Peale, glasses with such nosebridges and lenses were worn high up on the nose. In addition, a study of eyeglasses at the turn of the nineteenth century shows that both of the pairs in *Rubens Peale with a Geranium* were common models of eyeglasses of the time, and that regular eyeglasses were made with a variety of different nosebridges.^{34,35,36}

Thus, Levene's explanation of the two pairs of spectacles in *Rubens Peale with a Geranium* is not supported in a careful examination of his evidence. However, Levene did describe the history of the elucidation of hyperopia in his text and he clearly understood the affliction. Had he known of Mary Jane's records and the literature describing Rubens' exact prescription, Levene's conclusions about the painting's second pair of eyeglasses almost certainly would have been different.

Conclusion

Thus, it is clear that Mary Jane Peale's account is the most logical explanation for the appearance of two pairs of eyeglasses in *Rubens Peale with a Geranium*. Not only was Rubens known to have used just one prescription of eyeglasses throughout his

life—a prescription for extremely strong convex lenses, such as those depicted in his hand—but he had no use for an extra, very weak pair of lenses such as those represented on his face in this portrait. Further, the combination of non-distorting lenses with the strong convex lens refractions shown on Rubens' cheeks is clearly inconsistent—an absurdity in an otherwise faithful, verisimilar portrait by an artist who was known to be meticulously accurate. The best explanation for this second pair of eyeglasses, and for the lack of distortion behind them, therefore, is that Rembrandt was compelled to insert them into the painting after the portrait had already been completed.

Nevertheless, while the glasses on Rubens' face were not part of the painting's original conception, they are an integral component of the final work. The glasses help to unite the composition; as oval shapes within an oval face, they echo the rounded forms of the geranium leaves, of Rubens' coat buttons, of the glasses in his hand, and even of the cylindrical planter. Further, the spectacles help to add a psychological dimension, indicating Rubens' shy character, emphasizing his scholarly devotion to the plant, and underlining his serious ambitions to be a botanist and a museum scientist. That Rembrandt was able to add the glasses to the portrait so convincingly, even with their inconsistencies, is a great credit to his skill as a painter as well. The addition of the eyeglasses, thus, emphasizes the talents of both the painter and the sitter.

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