Maria Sibylla Merian in Picture Books: Metanarratives about Science and Religion

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Abstract: This article considers three picture book biographies of the artist and scientist Maria Sibylla Merian, and the metanarratives on science and religion that are embedded in each. Merian is famous for her detailed drawings of the lifecycle of insects within their ecosystem and for rejecting the old theory of spontaneous generation, which still had currency in Europe. The picture books bring to the fore Merian's scientific curiosity and her skills of observation that swept away old superstitions about insects. The metanarratives cued through the visual imagery of her picture books ignore the underpinnings of Merian's Calvinist faith in her commitment to portraying the details of insect ecosystems. These metanarratives also ignore Merian's emergence as an entrepreneur within Protestant society and her contributions to the commodification of "exotic" nature in a colonial context.

Keywords: Calvinism; entomology; insects; Merian; metamorphosis; picture books

Maria Sibylla Merian (1647–1717) lived in Germany and the Netherlands in the period after the European Thirty Years' War (1618–1648). Even though she was a woman with no formal training and had less

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access to artistic resources than her male peers, she became famous for her detailed drawings of the lifecycle of insects in their natural environments. Merian completed her work at a time when Europeans were moving away from old ideas about spontaneous generation and metamorphosis. This article will undertake an analysis of three picture book biographies of Merian's life: *The Bug Girl: Maria Merian's Scientific Vision*, by Sarah Glenn Marsh and Filippo Vanzo (2019); *The Girl Who Drew Butterflies: How Maria Merian's Art Changed Science*, by Joyce Sidman (2018); and *Summer Birds: The butterflies of Maria Merian*, by Margarita Engle and Julie Paschkis (2010). The analysis of these biographies aims to identify the contemporary metanarratives that seek to present a relationship between religious belief and science as it existed in the early modern period.

Metanarratives are the "implicit and usually invisible ideologies, systems, and assumptions which operate globally in a society to order knowledge and experience."[1] The metanarratives at play portray Merian as a kind of secular saint who helps the modern world move out of superstitious darkness. They draw on figurative connotations from her work and ideas about metamorphosis and transformation to suggest a move to a world of science without superstition or magic. This way of telling Merian's life for a young audience can be understood as secular hagiography. If we understand a religious hagiography as a categorical lens through which we can study "the construction and promotion of embodied perfected ideals of religious truth,"[2] then the picture books can be seen as construing and promoting Merian as an "embodied perfected ideal" of the modern scientific method. The metanarratives that are at play largely ignore the theological resources that Merian brought to her vocation, as well as the religious beliefs that informed the approaches to entomology in Merian's time. It is important to note

1 John Stephens and Robyn McCallum, *Retelling Stories, Reframing Culture: Traditional Story and Metanarratives in Children's Literature* (New York and London: Taylor and Francis, 1998).

2 Massimo A. Rondolino, "Some Foundational Considerations on Taxonomy: A Case for Hagiography," *Religions* 10:538 (September 2019): 5.

that this article is concerned primarily with the ideological effects of the text, rather than the intention of the author. It may be that a text incorporates the unexamined assumptions of the author, or that there are inconsistencies that betray an unconscious bias. What I assert is not that any author is "anti-theological," but that the interplay of word and image in these picture books proposes a certain story about the relationship between science and religion in the early modern period. The three sections that analyse the picture books will be followed by a discussion of the theological stories that may have been overlooked in the retelling of Merian's life. I will then undertake to find out how these overlooked stories nuance our understanding of the emergence of modern science.

Maria Sibylla Merian: Background

Merian grew up in a Calvinist household in Frankfurt, Germany. Her stepfather, Jacob Marrel, was a still life painter and included Merian in the lessons he gave to his students.[3] From around 1600, insects had started to be incorporated prominently within still life paintings.[4] Merian also learnt the process of copper engraving with her half-brothers at the family's printshop.[5] Merian noted of her upbringing that "I was always encouraged to embellish my flower painting with caterpillars, summer birds [butterflies] and such little animals in the same manner in which landscape painters do in pictures, to enliven the one through the other, so to speak."[6] Merian would have had access within Marrel's household to dead, dried insect specimens stuck on pins for artists

3 Sarah Pomeroy and Jeyaraney Kathirithamby, *Maria Sibylla Merian: Artist/Scientist/Adventurer* (Los Angeles: The J. Paul Getty Museum, 2018), 13.

4 Eric Jorink, "Insects, Philosophy and the Microscope," in *Worlds of Natural History*, ed. Helen Anne Curry, Nicholas Jardine, James Andrew Secord, and Emma C. Spary (Cambridge University Press, 2018), 131–48.

5 Joyce Sidman, *The Girl Who Drew Butterflies: How Maria Merian's Art Changed Science* (Boston and New York: Clarion Books, 2018), 31.

6 Pomeroy and Kathirithamby, *Maria Sibylla Merian*, 15.

to use as models.[7] Merian became fascinated by insects in their natural environment, and she began observing and drawing the lifecycle of the silkworm within its own ecosystem. She also began observing the butterflies and moths that emerged from other caterpillars. At age thirteen she made the following decision: "I set aside my social life. I devoted all my time to these observations [of insects] and to improving my abilities in the art of painting, so that I could both draw individual specimens and paint them as they were in nature."[8]

Merian married one of her stepfather's apprentices, Johann Andreas Graff, and moved to Nuremberg in 1668. Their place had a garden, where Merian grew flowers and observed and collected insects.[9] She painted and drew on silk and linen, as well as on vellum, decorating tablecloths with painted birds and butterflies.[10] She taught embroidery and painting to the daughters of several wealthy Nuremberg families, referring to these students as her "company of maidens," and she worked with them on projects that used techniques she had devised for colourfast painting onto fabric, including a tent for an army general who "desired to have his field quarters designed to give him the illusion of living in a garden house full of birds and flowers."[11] In 1675, Merian published her *Neues Blumenbuch* (New Flower Book), the first of a three-part series of illustrated floral designs for use in embroidery and needlework design.

Merian continued to breed and draw insects after she moved with her husband and two daughters to Amsterdam.[12] In 1679, her first *Der Raupen* (caterpillar) book was published: *Der Raupen wunderbare Verwandelung und sonderbare Blumennahrung* (The Wondrous Transformation of Caterpillars and Their Remarkable Diet of Flowers). A sec-

7 Pomeroy and Kathirithamby, *Maria Sibylla Merian*, 15.
8 Pomeroy and Kathirithamby, *Maria Sibylla Merian*, 15.
9 Pomeroy and Kathirithamby, *Maria Sibylla Merian*, 26.
10 Pomeroy and Kathirithamby, *Maria Sibylla Merian*, 26.
11 Janice Neri, *The Insect and the Image: Visualizing Nature in Early Modern Europe 1500-1700* (Minneapolis: University of Minnesota Press, 2011), 139.
12 Grace Touzel, "Maria Sibylla Merian: Artist and Explorer," in *Nature's Explorers: Adventurers Who Recorded the Wonders of the Natural World* (London: Natural History Museum, 2019), 8.

ond part of this was published in 1683. Merian dismissed spontaneous generation in the foreword to her first *Raupen* book, stating that all animals that she had studied were the result of sexual reproduction, and that was the end of the matter.[13] Merian and her husband separated, and for six years Merian lived in a Labadist religious community in Friesland along with her daughters, her mother, and her brother. Merian compiled her *Study Book* with notes and observations, pasting in earlier material.

In 1699, Merian and her youngest daughter Dorothea travelled to Surinam in South America. They visited sugar plantations and wilderness areas to sketch local insects and plants. When they returned to Amsterdam, in 1701, Merian set about producing a book with coloured prints of her Surinam observations. She noted her desire to produce a work to "please both the connoisseurs of art and the amateur naturalists interested in insects and plants."[14] *Metamorphosis insectorum Surinamensium* was published in 1705. It was published in Dutch and Latin, and measured twenty-two inches high.[15]

Contemporary scientists treat Merian's naturalist drawings as accurate portrayals of insect metamorphoses and ecosystems, and the drawings have been used as the basis for the scientific classification of species. Carl Linnaeus, for example, based several classifications solely on Merian's work when he classified the 4,400 insect species known to him in his work *Systema Naturae* (1758).[16] In the past decade, there has been a renewed interest in Merian's life and work, with art and natural history museums exhibiting and publishing books on her life and contributions.[17] The three picture book biographies function to induct

13 Hans Mulder, "Spontaneous Generation and Miraculous Transformations: Reproduction and Growth of Crawly Creatures," in *Crawly Creatures: Depiction and Appreciation of Insects and other Critters in Art and Science*, 93–102, ed. Hans Mulder, Jan de Hond, and Eric Jorink (Amsterdam: Rijksmuseum, 2022), 97.

14 Touzel, "Maria Sibylla Merian," 14.

15 Sidman, *The Girl Who Drew Butterflies*, 110.

16 Tony Rice and David Bellamy, *Voyages of Discovery* (London: Allen and Unwin, 2008), 91.

17 For example, Pomeroy and Kathirithamby, *Maria Sibylla Merian* and Touzel, "Maria Sibylla Merian."

children into this museum culture. They draw on the ideas implicit in the material produced for adult audiences and present them in a format designed for a younger audience.

A Metanarrative About Personal Transformation

The Girl Who Drew Butterflies is a 120-page picture book biography of Merian that incorporates reproductions of her work alongside a detailed written biography and historical and scientific notes and images. The "Author's Note" at the end of *The Girl Who Drew Butterflies* describes how Sidman, a poet, tries to "follow in Maria's footsteps" and remove some of Merian's "enigma" by raising caterpillars and attempting to take photos of each stage of their metamorphosis.[18] Each chapter is preceded by a photograph and poem. The photos are labelled with the relevant point in the butterfly lifecycle that is represented. The poems represent a conceptual blending of Merian's work with the lifecycle of a butterfly, and project Sidman's own personal values and experience as bound up with the production of this biography. What is being projected in these photographic and poetic texts at the beginning of each chapter is *parabolic* in the sense of being a story projected from another story (that is, the story of Merian's life). [19] This picture book is not "anti-theological": it notes Merian's motivating belief that all creatures "reflected God's glory … in the infinite variety of his creation."[20] However, the parabolic shape given to this biography by the lifecycle of a butterfly emphasises the self-determination of Merian, and tends to subordinate the importance of faith to her commitment to "her bright spirit"

18 Sidman, *The Girl Who Drew Butterflies*, Author's Note.

19 The concept of "parable" here comes from the cognitive linguist Mark Turner: "Parable begins with narrative imagining—the understanding of a complex of objects, events, and actors as organised by our knowledge of *story*. It then combines story with projection: one story is projected onto another. The essence of the parable is its intricate combining of two of our basic forms of knowledge—story and projection. This classic combination produces one of our keenest mental processes for constructing meaning." Mark Turner, *The Literary Mind* (New York: Oxford University Press), 5.

20 Sidman, *The Girl Who Drew Butterflies*, 64.

and curiosity about butterflies; Sidman sees this as passing "from one generation to the next".[21] Chapter 9, which projects the eclosing of a butterfly onto Merian's time within a religious community, is central to the humanist metanarrative.

Chapter 9 is titled "Eclosing, 1685 Waltha Castle, Wieuwerd, Netherlands." *Eclosing* is the emergence of the adult insect from its chrysalis, and the chapter details the period in which Merian and her daughters entered and then left the Labadist religious community. A note on "Religion in the 1600s" within the chapter concludes with the observation that, "in the 1600s, choosing religious seclusion was a way to flee an intolerable living situation—such as a painful marriage."[22] The concluding pages of the chapter mention that "life in the Labadist community was unravelling. Religious leaders squabbled and left, and money grew tight."[23] Merian "took a hard look at her life," realising that both her daughters had "grown up" over their six years within the community, and that even her youngest, Dorothea, was at "the brink of womanhood" at the age of thirteen.[24] As a result, Merian is said to have "turned her sights on Amsterdam," to consider whether she and her daughters could make a living trading, painting, and selling.[25] The closure of this chapter—Merian "packing up her daughters, her art supplies, and her precious study books" and heading to Amsterdam—is implied to be a form of human eclosing.[26] Merian is emerging from the claustrophobic chrysalis and into the bustle and stimulus of Amsterdam, the implication being that she and her daughters emerged from an immature and passive "pupa" state and into a more self-determinate and creative stage of life.

The photographic image above Chapter 9 and its associated poem use Merian's story to create a parable of self-determination and independence. The photographic image is captioned as showing "a

21 Sidman, *The Girl Who Drew Butterflies*, Author's Note.
22 Sidman, *The Girl Who Drew Butterflies*, 65.
23 Sidman, *The Girl Who Drew Butterflies*, 72.
24 Sidman, *The Girl Who Drew Butterflies*, 72-73.
25 Sidman, *The Girl Who Drew Butterflies*, 73.
26 Sidman, *The Girl Who Drew Butterflies*, 73.

butterfly emerging from its chrysalis," and incorporates the following poem:

> Within
> a shriveled shroud
> I melt, shift,
> change.
> And from darkness
> I wake.
> Crumpled and raw,
> I crawl my way out
> into the light.[27]

The use of the first person in this poem blends three perspectives: that of the butterfly emerging from its chrysalis, Merian and her daughters, and the narrator-poet. The verbs "melt, shift, change" give a sense of mysterious alchemy, and the sibilant alliteration of "shrivelled shroud" gives a sense of degenerate magic or witchcraft. The "darkness" of life in the chrysalis is implied to align with the darkness of life for Merian and her daughters within the Labadist community, and also for a darkness that exists for the narrator poet where there is no "light" illuminating scientific understanding and removing the darkness of superstitious belief. This image and its poem are parabolic in that it appears to provide the gist or the meaning that Sidman has projected from this period of Merian's life, presented in a concise poetic and visual format. The photographic image is labelled simply as "a butterfly emerging from its chrysalis," but the surplus of poetic meaning in the poem invites the readers to project a similar trajectory of transformation from superstition to science and from darkness to light, onto their own life story.

There is some unintentional irony in that Sidman's retelling incorporates a verbal parable from the insect world. It is ironic because Merian's work can be understood as a move away from an "emblema-

27 Sidman, *The Girl Who Drew Butterflies*, 61.

tic" form of insect representation that used the insect world to make a moral or religious point.[28] While Merian was not known to accompany her published illustrations with extensive verbal text, others who were interested in illustrating the insect world took different approaches. In 1590, the artist Joris Hoefnagel compiled his album *The Four Elements*, containing 277 watercolours of living creatures, including insects, and used an emblematic worldview to project meaning from the insect world to the human world. In this worldview, butterflies referred to Christ's resurrection, as the butterfly was believed to arise from the dead caterpillar, and the stag beetle was presented as a reference to Christ himself.[29] The first European to undertake a systematic study of the generation of insects was Johannes Goeddart (1617–1688), and he also took the butterfly as a sign of the resurrection.[30] Jan van Swammerdam (1637–1680) was trenchantly opposed to the depiction of insects in this symbolic manner, and asserted that Goeddart's observations were "foolish," "laughable," and "ridiculous."[31] Merian's work does not engage verbally in the debate about the figurative use of insects but was itself a non-emblematic depiction of insects.

The metanarrative presented in *The Girl Who Drew Butterflies* is one of personal transformation, a transformation necessary to escape the constrictions of a conservative religious community and a difficult marriage. The metanarrative valorises Merian's self-determination in her will to leave the community and strike out on an independent existence on her own. The implication is that Merian left her faith behind, too. However, Merian's period within the Labadist community can be understood as a more complex interaction of religious belief, artistic production, and scientific observation within the community. It is not clear that Merian made an effort to extricate herself from this commu-

28 Eric Jorink, "Between Emblematics and Argument from Design: The Representation of Insects in the Dutch Republic," in *Early Modern Zoology: The Construction of Animals in Science, Literature, and the Visual Arts*, ed. Karl A. E. Enenke and Paul J. Smith (Leiden and Boston: Brill, 2007), 147–75.

29 Jorink, "Insects, Philosophy and the Microscope," 131–48.

30 Jorink, "Between Emblematics and Argument from Design," 158.

31 Jorink, "Between Emblematics and Argument from Design," 162.

nity. Rather, the community's financial woes and some internal conflict may have required its members to disperse and make their own financial way.

For Merian, the link between her engagement with the natural world and her faith seems uncomplicated, as demonstrated in her simple exclamation, "With God!"[32] at the beginning of her *Study Book.* For others, the relationship between this engagement and faith was more problematic. Goeddart quoted 1 Timothy 6:15–16 as a warning against inappropriately penetrating the divine with *curiositas*.[33] Like Merian, Jan Swammerdam studied and recorded the lifecycle of insects, and like Merian, he also spent a period within a religious community, the Schleswig community founded by the mystic Antoinette Bourignon. Swammerdam joined this community after having a religious crisis. While he had originally felt that his empirical investigations were a tribute to God, he now felt that he was worshipping the "idol" of *curiositas* and abandoned his empirical research. Swammerdam had attended meetings of Cartesian rationalists in Utrecht, an activity that would have been frowned on by orthodox Calvinists at the time. Jorink considers that Bourignon's teachings on the importance of self-denial and the imitation of Christ would have been attractive to Swammerdam. Swammerdam had become worried that his adherence to rationalism and fixation on immutable laws of nature had crowded out grace and personal devotion to God.[34] When Swammerdam left Bourignon's community, he took up empirical research again and meditated on the importance of following Christ. Swammerdam's personal rupture be-

32 Tomomi Kinukawa, "Art Competes with Nature: Maria Sibylla Merian (1647–1717) and the Culture of Natural History," PhD diss. (University of Wisconsin-Madison, 2001), 138.

33 Jorink suggests that Goeddart's hesitancy to use *curiositas* to penetrate the marvels of God could explain why he did not use a microscope. Jorink, "Between Emblematics and Argument from Design," 157–58.

34 Eric Jorink, "Maria Sibylla Merian and Johannes Swammerdam: Conceptual Frameworks, Observational Strategies, and Visual Techniques," in *Maria Sibylla Merian: Changing the Nature of Art and Science*, ed. Bert Van de Roemer, Florence Pieters, Hans Mulder, Kay Etheridge, and Marieke van Delft (Tielt: Lannoo, 2022), 171–83.

tween science and faith was apparently healed; Merian seems never to have experienced such a rupture.

A Metanarrative About Social Transformation

In *The Bug Girl,* Merian is presented as a curious young girl, whose interest in insects pitch her against the superstitious adults of her time. It shows her as a teenager, watching silkworms emerging from cocoons. The text on the eighth opening notes that "Maria learned two things that day. First, that there was no such thing as 'spontaneous generation.' And, second, that grown-ups were sometimes wrong." The ninth opening then shows Merian waving and turning away from the adults behind her. This wave is to placate any suspicious adults who are "looking her way" as she tries to gather insects, but it also functions in the image as a dismissal of the old, adult world, and a movement towards something new and different.

The undulating line of grass and leaves that move from left to right across the ninth opening serves to show, visually, the left-to-right movement from the given to the new.[35] The "given" in this opening is the adult world, with its villagers and edifices. The "new" is a fresh engagement with the natural world, and the insects come into play on the right-hand side of this opening. The movement of the caterpillars is in a rightward direction, and the butterflies are shown high on a leaf and hovering above the vegetation. The butterflies on the right-hand page of this opening draw the eye upward towards the book's top right-hand corner, and this composition suggests a movement from the real to the ideal.[36] Merian's movement to engage with nature, on the outskirts of her everyday village life, is presented as something new and ideal,

35 For a description of how the movement from left to right can function as a movement from the given to the new, see Gunther Kress and Theo van Leeuwen, *Reading Images: The Grammar of Visual Design,* 2nd ed. (London & New York: Routledge, 2006), 175–85.

36 For a description of how the movement from bottom to top can function as a movement from the real to the ideal, see Kress and van Leeuwen, *Reading Images,* 186–93.

which makes the adult townsfolk nervous. It is presented as something ideal and something urgent, as though the caterpillars and butterflies risk moving out of a frame of attention if Merian gets too distracted with placating the adults in her world.

The undulating line of grass and leaves in this opening also functions as a boundary to civilisation, and her childish enthusiasm and carrying of a basket into a wooded area evokes the European fairytale scripts that make the forest a place of danger. In *The Bug Girl*, the fairytale schema is inverted by positioning Merian as someone who discovers that the insect world is not one of sinister magic. The text on the right-hand page notes that "their 'shape-shifting' was part of nature, not magic after all. It was better because the insects did it on their own, through the process of *metamorphosis*." In this picture book Merian breaks the sinister spell of superstition by crossing a boundary set by adults—a boundary discouraging curious engagement with the insect world.

The following opening shows Merian transforming society by being a teacher of other females. The left-hand page shows her addressing a company of maidens, and the right-hand page shows her with her two daughters in the forest. *The Bug Girl* depicts the transformative power of a confident teacher, who has to wait until she is an adult to transform the world, because the adult world was not ready to receive Merian's message when she was a young girl. Societal transformation is achieved by engaging young women: the company of maidens and Merian's daughters. Societal transformation is presented as best achieved by facilitating the transformation of those young women whose worldviews have not hardened into old superstition. The left-hand page notes that Merian "gave her students the tools they needed to study whatever interested them—along with a healthy dose of her curiosity." The right-hand page pictures Merian with her two daughters, bending down and showing one a butterfly, while the other daughter observes a caterpillar crawling up a tree at close vantage, touching the tree at the same time. The setting—a grassy opening—is light and open,

suggesting that this wooded area is a safe and appropriate place for an immersive and interactive learning experience.

The metanarrative that is presented in these pages valorises the role of teachers in encouraging "curiosity" and a close-up engagement with nature. This links with contemporary pedagogies, which treat "curiosity" as a virtue and an important spark for learning within the school and for advances in understanding within society. In the early modern period, however, and in Merian's Calvinist context, the concept of "curiosity" was less straightforward. Merian's religious context was the period of the *Nadere Reformatie* (Further Reformation) within Dutch Calvinism, and its emphasis on the heads of households making prudent business decisions to provide for their families. Merian's "curiosity" was inextricably linked to her business sense and her drive to provide for her daughters as matriarch of the household.

Kinukawa contends that Merian's appeal to universal and empirically established scientific truth hides the extent to which her business activities are implicated in European colonialism's racial ideologies. For Kinukawa, Merian is most properly understood as an "entrepreneur" who promoted herself as a curious naturalist, and who, through a commodified exchange of "exotic" nature specimens and her empirical work, reinforced the idea that only whites could become autonomous, private, individual property-owners of knowledge.[37] This is most starkly represented in Merian's trip to Surinam. Merian raised funding for this without any official institutional affiliation, and this form of "curious nature study freed from concerns about immediate profitability was the best method to obtain a knowledge that supported not only individual business and family, but also colonial society and the state simultaneously."[38] Merian's note about slaves in Surinam and their use of abortion herbs to prevent their children "becoming slaves as they are" is oft-quoted to position Merian as sympathetic to the slave's

37 Tomomi Kinukawa, "Science and Whiteness as Property in the Dutch Atlantic: Maria Sibylla Merian's Metamorphosis Insectorum (1705)," *Journal of Women's History* 24:3 (2012): 91–116.

38 Kinukawa, "Science and Whiteness," 101–102.

plight, but Kinukawa draws attention to the fact that Merian makes this observation only to note that slave women "must be treated well. If not, they will have no children under enslavement."[39] Thus, Merian betrays her overriding interest in maintaining a slave society through ostensibly benevolent governance. She is, in fact, channelling the approach of a former governor of Surinam, Cornelis van Aerssen van Sommelsdijk, who often advocated for a more "humane" approach to slaves as a way toward a more productive and virtuous society, and who spent private time investigating local plants and complained that he received little help from "curious" people to collect rare plants, and that there was no expert on hand in the colony to cultivate "useful" plants.[40]

Merian's background in embroidery and still life painting also gave her a visual style that contributed to the commodification of insect specimens within images, and as objects themselves in the marketplace. She presented insects as immobile and specimen-like objects among vibrant, entwining plants, and the way she presented insect lifecycles depended upon fixing insects in precise configurations.[41] The commodification of insect specimens and virtual insect specimens in books were part of a wider trade in natural specimens as objects for display within the curiosity cabinets of the burgher class and the *Kunstkammer* (chambers of art and wonder) of the aristocracy.[42] Merian herself traded in insect specimens, and the funds from this trade alongside the sale of her books allowed her to present herself as an unaffiliated "curious" naturalist in Surinam.[43] As well as selling her publications she ran a family business selling natural objects such as dead butterflies and toads from the Dutch East and West Indies preserved in jars.[44]

Merian's Labadist connections embedded her within colonialist concerns that had a vested interest in selling a version of the "exotic"

39 Kinukawa, "Science and Whiteness," 104.
40 Kinukawa, "Science and Whiteness," 101.
41 Neri, *The Insect and the Image*, 174.
42 Neri, *The Insect and the Image*, 5.
43 Kinukawa, "Art Competes with Nature," 296.
44 Kinukawa, "Science and Whiteness," 92.

to Europeans. A group of Labadists had travelled to Surinam in 1684 prompted by their belief in the imminent return of Christ and in hope of establishing a New Jerusalem on the banks of the River Surinam. This settlement was named "La Providence" and was several days' journey from the main European settlement.[45] Two Labadist expeditions were made to Surinam in consecutive years, and both ended in disaster, with disease and piracy undermining the community. The governor of Surinam at the time, Sommelsdijk, had two Labadist sisters who each went on one of the expeditions and were influential within the Friesland community where Merian lived. While she was living in this community Merian would have had access to letters detailing the misery of these expeditions, as well as the war with the indigenous populations of Arawaks and Caribs.[46] She would have also been able to inspect some specimens that Sommelsdijk had sent back from Surinam, including large azure butterflies and a large stuffed tree snake that had been caught and mounted by indigenous people.[47] When Merian visited Surinam herself she stayed for a couple of weeks with some Labadists who had been able to stay on and manage a plantation with external help, and she recorded that she "made various observations of insects."[48]

Merian's ambition to represent the insect world can thus be understood as part of an entrepreneurial drive linked to her need to provide for her immediate family and also linked to the colonial aspirations of her religious community and the commodification of insects and other specimens from nature. The metanarrative of *The Bug Girl*, with its emphasis on Merian sharing her scientific vision through her mother-daughter and teacher-student relationships, obscures this wider world of business and vested interest in producing and selling images of the natural world.

45 Ella Reitsma, *Maria Sybilla Merian and Daughters: Women of Art and Science* (Zwolle: Waanders Publishers, 2008), 93, 172.
46 Reitsma, *Maria Sybilla Merian and Daughters*, 173.
47 Sidman, *The Girl Who Drew Butterflies*,70.
48 Reitsma, *Maria Sybilla Merian and Daughters*, 192.

A Metanarrative About Historical Transformation

The metanarrative of *Summer Birds* is a story about the transformation of history from a dark, superstitious period fixated on the abject and the monstrous, towards a new illuminated, airy, and capacious historical reality. The seventh opening in *Summer Birds* moves the reader from a dark, static period, where people are entrenched in mud and surrounded by abject and sinister forms, to the sharp contrast of a representation of Merian with a pleasingly aesthetic use of negative space, as in her drawings. Merian's grasp of the plants suggests that nature is under her easy control, and indeed her grasp in both hands almost makes it look like she is conducting a symphony of nature.

Summer Birds also uses a shift from darkness to light, as depicted in the changing colour of the page backgrounds in the seventh opening. The left-hand page evokes a medieval schema with the dragon under the earth and the anthropomorphic tuberous plant. The text asserts that the teenage Merian has discovered that "the grown-ups are wrong about summer birds," and then the register shifts away from folk wisdom by referring to "insects" rather than "summer birds." The teenage Merian is said to have broken with the wisdom of her elders by her understanding that "insects are not born from mud." The stark change from darkness to light implies a sudden break in history, and the irony is that this sudden break is described as being caused by Merian's observation that "insects grow slowly, changing from one form to another." The story intimates sudden rupture and transformation into a new age, the story of an insect's lifecycle involves patient observation and slow transformation(s).

The use of white space in the right-hand page contrasts the black background of the left-hand page, but it also foregrounds Merian as a free-floating figure not grounded in the medieval mud of the previous page. The strategic use of white space, to foreground insects and vegetation too, is also a characteristic of Merian's artistic work. Merian's images often feature elements that are not to scale, in order to give them a more even representation within the arrangement of her imag-

es. There is the same lack of scale emphasised on the right-hand page, with the size of the flowers and the caterpillar being of too large a scale next to Merian's figure. Merian's own schema for illustrating the lifecycle of insects is thus evoked to give sense to a new age in which insects are not taken to be "evil."

The right-hand page has a staged and curated aspect: Merian's eyes are focused upwards, looking towards plants in her hands that are too large against the size of her body, and her arms are outstretched in an unnaturally open position. The curlicued plants at the sides of the image look more decorative than scientific. The medium for storytelling that is evoked is that of embroidery: Merian is positioned within an embroidered history, one that contains obvious differences in scale. This choice by the picture book-makers is perhaps logical given that Merian's first produced works were embroidery motifs, and Merian taught embroidery classes to groups of women in the early years of her marriage. According to Neri, Merian's work used visual strategies designed to facilitate its use as embroidery patterns.[49] One of these strategies is using scrolling stem patterns to separate and frame pictorial elements; the same strategy is seen in the seventh opening. Merian's *Blumenbuch* images could have been particularly appropriate as models for making slips, where designs were stitched onto linen canvas backing and then cut out.[50] The cut-out "slip" could be sewn onto another fabric, and the slip technique was a convenient way for rearranging elements of a composition before they were permanently attached.[51] The term "slip" derives from a gardening term describing a plant cutting.[52] In this opening, the image of Merian could function as a slip or cut-out model.

An anthropomorphic creature can be seen lying under the ground in the left-hand page, which evokes the sense of fear engendered by the old belief in insects as "evil" mentioned on the follow-

49 Neri, *The Insect and the Image*, 146.
50 Neri, *The Insect and the Image*, 146.
51 Neri, *The Insect and the Image*, 146.
52 Neri, *The Insect and the Image*, 146.

ing page. Merian herself appears to have been very careful not to have portrayed insects anthropomorphically. Her contemporary Goeddart sometimes let anthropomorphism creep into his depictions of insects, but Goeddart's overriding concern was a Christian allegorisation of the insect world rather than a concern with insects themselves being evil.

The metanarrative of *Summer Birds* implies that Merian's observation of the metamorphosis of caterpillars led to a sudden move away from the treatment of "insects as evil" and towards an understanding that nature was there to be scientifically investigated. However, this is rather a simplified embroidery of history, one that ignores the role of Merian's Calvinist theology in facilitating a move away from old Aristotelian frameworks of thinking that treated insects as being at the bottom of the *scala naturae* (ladder of nature).[53] A recuperation of Stoic thinking had already started undermining this framework of thinking, by conceiving of a divine energy at play within nature. Neostoics believed that nature was the result of God's creative spirit—*pneuma*—and that nature was uniform; there were no positions on a ladder.[54] However, Calvin goes further, asserting that:

> faith ought to penetrate more deeply, namely, having found him Creator of all, forthwith to conclude he is also everlasting Governor and Preserver—not only in that he drives the celestial frame as well as several parts by a universal motion, but also in that he sustains, nourishes, and cares for everything he has made, even to the last sparrow (cf. Matt 10:29).[55]

This perspective opened up the study of nature as a way in which these qualities of God could be revealed to the observer. The study of nature

53 Eric Jorink, "The Smallest Print in the Book of Nature: Crawly Creatures and Christian Devotion," in *Crawly Creatures: Depiction and Appreciation of Insects and other Critters in Art and Science,* ed. Hans Mulder, Jan de Hond, and Eric Jorink (Amsterdam: Rijksmuseum, 2022), 73.

54 Jorink, "Insects, Philosophy and the Microscope," 131–48.

55 John Calvin, *Institutes of the Christian Religion*, trans. Ford Lewis Battles (Philadelphia: Westminster Press), book 1, chapter 16, 197–98.

became recognised as one of two ways in which a believer could come to know God. In 1561, Guido de Brès composed the Belgic Confession,[56] a confession of faith approved by Calvin, which professed:

> We know him [God] by two means. First, by the creation, preservation, and government of the universe, since that universe is before our eyes like a beautiful book in which all creatures, great and small, are as letters to make us ponder the invisible things of God; his eternal power and his divinity, as the apostle Paul says in Romans 1:20 … Second, he makes himself known to us more openly by his holy and divine word.[57]

These two elements of God's revelation to humanity—his revelation within the "beautiful book" of nature, and his revelation within the divine word of the Bible, led to apparently confusing collections of ancient writings and natural artefacts within cabinets of curiosities in the sixteenth and the seventeenth centuries. The Protestant emphasis on accessing the Bible's text in the vernacular of the time meant that believers were now able to read for themselves about the events such as the locust plague, and locusts became a popular inclusion in cabinets of curiosities.[58] Personal observation was encouraged alongside interpretation of ancient texts, and the display of objects became a mark of piety, orderliness, and good taste within burgher households.[59] Merian's works were thus very fit for display in the living rooms of Calvinist households, an index of pious engagement with the natural world and of good taste.[60]

56 The Belgic Confession is still an active creed in contemporary Reformed Churches. For example, Christian Reformed Churches of Australia, "The Belgic Confession," available at https://crca.org.au/about-the-crca/beliefs/the-belgic-confession (accessed 19 October 2023).

57 Jorink, "Insects, Philosophy and the Microscope," 134.

58 Jorink, "The Smallest Print in the Book of Nature," 69.

59 Kinukawa, "Science and Whiteness," 91–116.

60 The coffee table books of Rien Poortvliet have served a similar purpose in pious Dutch households more recently. The *Ark van Noach: Or ere wie ere toekomt* (*Noah's Ark: or Credit where Credit is Due*, 1986) tells stories from Genesis,

Merian was content to let her pictures largely speak for themselves—to function as an invitation to meditation on the order of creation, with some descriptive language to pick out the details of the illustrations. In *Metamorphosis insectorum Surinamensium* and the Dutch translations of the *Raupen* books, the descriptions are short and there are no conclusions. Merian said that she had decided to record just what she had seen, as the "scholarly world" had heavily criticised her first two books.[61] Swammerdam and others wrote vigorously against the problems they saw inherent in theories of spontaneous generation. Swammerdam, in particular, opposed theories of spontaneous generation because they were atheistic—they relied on ideas of "pure chance" or "the blind forces of nature," rather than "a single cause" and "the unfathomable God and inimitable Maker."[62] Merian did not locate her work within these scholarly debates. Her work is important in its attention to visual detail and its concern to represent insects accurately without embedding them within the old emblematic or symbolic networks.

Conclusion

The metanarratives in these picture books hinge intensely on the idea of transformation. It is tempting to apply to Merian a metanarrative of personal transformation, given her concern to document processes of metamorphosis. However, the way this has been done in picture book format "cocoons" Merian's time within religious community, and cannot help but present Merian as a figure that needs to climb out of, or escape, the confines of religious thought. On the contrary, Merian's faith was a resource that helped her discard the old theories of spontaneous

highlighting God as creator of the natural world, and visually showcases Poortvliet's artistic process through his sketching of animals and their unique characteristics.

61 Hans Mulder, "Spontaneous Generation and Miraculous Transformations," 97.

62 Eric Jorink, "From Symbolism to Intelligent Design: The World as Clockwork," in *Crawly Creatures: Depiction and Appreciation of Insects and other Critters in Art and Science*, 93–102, ed. Hans Mulder, Jan de Hond, and Eric Jorink (Amsterdam: Rijksmuseum, 2022), 82.

generation at the beginning of her career as producer of publications on insects. Her faith also motivated her to make visual representations that honoured God as creator of intricate and wonderful creatures, that were not any less intricate or wonderful in their creation than humans and other creatures formerly at the top of the Aristotelian ladder.

A metanarrative that presents Merian as a teacher and one who passed on her unique "curiosity" to young and emerging scientists is also a tempting story to tell a young audience. Contemporary science does "trade" in an idea of curious and anticipatory engagement with the natural world, an engagement that, it is hoped, will draw young people into a STEM world of research. Educators gloss curiosity as an important virtue and plan lessons designed to provoke a curious interest in the wonders of the natural world. However, this metanarrative does capture the trading and colonial interests that Merian was embedded within, and her status as a Protestant businesswoman in this world. Her entrepreneurial drive and her "success" are bound up with the commodification of the natural world. The Calvinist context in which Merian operated helps us to understand the virtues ascribed to her business sense, and at the same time it helps us understand the colonial urges entangled with that curiosity.

A metanarrative that presents Merian as a transformer of history fails to position her within religious and scientific thought that had already moved away from the idea of insects as "evil," and that was debating the theological validity of spontaneous generation. A more Calvinist metanarrative, perhaps, would highlight Merian's work ethic over her lifetime, and her commitment to representing the intricate wonders within God's "Book of Nature." Merian's representations of the insect world did not vary in style throughout her lifetime, and the representation of the lifecycle of an insect within its ecosystem is her important contribution to science and its ordering of information about the natural world. Merian was diligent, painstaking, and hardworking, applying the same material processes of production and the same means of observation, over and over. It was this doggedness of purpose and attention to detail that resulted in her work on insect ecosystems,

which amounts to a gift to the scientific community of the early modern age. Contemporary picture book-makers accept this gift without understanding that Merian's religious faith is inextricably bound to it. They also do not see the role of religion in shaping and fostering, not inhibiting, the development of early modern scientific observation.

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