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The Pleasure of Describing: Art and Science in August Johann Rösel von Rosenhof's *Monthly Insect Entertainment*

Brian W. Ogilvie

Now, instead of a worm we consider ugly, we have a butterfly; instead of a crawling creature, a flying one; instead of an insect that lives on and eats the willow-tree, another one that dwells near flowers. But we must consider it more closely.

—AUGUST JOHANN RÖSEL VON ROSENHOF, *Monthly Insect Entertainment*

When the Nuremberg miniature painter August Johann Rösel von Rosenhof (1705–1759) issued the first *Insecten-Belustigung* (*Insect Entertainment*), a quarto-sized copperplate engraving with a quarto sheet (eight pages) of accompanying German text, in 1741, he had little idea whether the German public would take pleasure in the display in image and text of insects' metamorphosis and behavior.¹ Insects were scarcely a new subject for the artist's pencil and the engraver's burin; Joris Hoefnagel (1542–1601) and his son Jacob (1575–ca. 1630) had painted and engraved them in the late sixteenth century, while the first illustrated natural histories devoted to insects had been published at the beginning of the seventeenth. Maria Sibylla Merian (1647–1717) had made a name for herself illustrating caterpillars and their metamorphoses, while only seven years earlier the first volume of memoirs on the history of insects by the French academician René-Antoine Ferchault de Réaumur (1683–1757) had appeared from the presses of the Académie des Sciences in Paris.² The Lutheran pastor Friedrich Christian Lesser (1692–1754) had published an *Insecto-Theologia* (*Insect Theology*) in 1738. Rösel could count on a certain level of interest in insects from his contemporaries. Yet still he was taking a gamble.

He need not have worried: the publication sold well enough for him to decide to issue every month another two insect engravings, each accompanied by the creature's description. By 1746 Rösel had produced enough of these images and texts to issue a compilation, the first of what would become the four volumes of the *Monatlich herausgegebene Insecten-Belustigung* (*Monthly Insect Entertainment*). Two more followed during Rösel's lifetime, in 1749 and 1755, while a final compilation appeared posthumously in 1762, edited by Rösel's son-in-law, Christian Friedrich Carl Kleemann (1735–89). Kleemann, himself an artist, continued the series for another three decades.³

The success of the *Insect Entertainment* underscores the importance of insects in the culture of Enlightened Europe. Rösel's work both drew on and reinforced a view that human beings could learn much from insects while at the same time finding recreation in their display. In order to explore what insects meant to Rösel and his contemporaries—how and why they studied, described, and depicted them—we begin with a brief overview of artists' and naturalists' approaches to insects from the late sixteenth century to Rösel's day. We then turn to how Rösel studied, hunted, and collected insects, for his working methods help us understand how and why he chose to display them in sober engravings accompanied by detailed text. Like his contemporaries, Rösel took particular interest in showy, colorful insects such as caterpillars, butterflies, and beetles; unlike many of them, his interests ranged more widely.

After exploring how Rösel displayed his insects to his audience, we will examine the aestheticization of insects in Rösel's publications and the Protestant natural theology that underpinned them. Both were powerful motivations for his work, and both contributed to its enthusiastic reception. As Rösel continued his *Insect Entertainment*, he occasionally adopted the tools of contemporary naturalists: the microscope and the dissecting table, for example, which he used to explore crayfish (classified among the insects by many of his contemporaries) and freshwater polyps. Nonetheless, both the title of the *Insect Entertainment* and Rösel's continued self-identification as a "miniature painter" on its title page suggest that even in Enlightened Germany, it would be premature to draw a sharp distinction between scientific and artistic modes of knowing and displaying insects.

Rösel and His Predecessors

Rösel did not begin his career intending to study and display nature. Scion of a noble Austrian family, the Rösels von Rosenhof, who had emigrated to

Franconia during the Reformation and then fallen on hard times, Rösel had been trained as an artist by his cousin and then worked as a miniature painter and engraver before obtaining a position as court painter in Copenhagen.⁴ In the fall of 1727, on a journey to Amsterdam, he fell ill in Hamburg; during his convalescence, he happened upon a copy of Maria Sibylla Merian's folio volume *The Metamorphosis of the Insects of Surinam*.⁵

As Rösel later told the story, Merian's stunning, hand-colored engravings filled him with a desire to devote himself to studying and illustrating the insect world. Like other conversion narratives, Rösel's story of sudden enlightenment is open to question. Even his son-in-law and biographer, the artist Christian Friedrich Carl Kleemann, doubted that Rösel had undergone a sudden, miraculous transformation: the papers from his apprentice days included many studies of insects and animals. Rösel himself wrote that "from my youth I found enjoyment in insects, and paid close attention to the differences between caterpillars."⁶ Merian's book may only have catalyzed a decision that was long in the making, but its effects were clear: Rösel gave up his voyage to Amsterdam and returned instead to Nuremberg, where he settled on his plan to produce the *Insect Entertainment*.

Merian herself was by no means the first European artist to be fascinated by insects. As Marcel Dicke has shown, insects appear in medieval Western art, but they become much more frequent in the seventeenth century.⁷ In many of these cases, insects were ornamental details or appeared as part of a still life. But some artists from the late Renaissance onward took a more particular interest in insects.⁸ The self-taught miniaturist and court artist Joris Hoefnagel filled the empty pages of handwriting sample books belonging to Emperor Rudolf II with exquisite miniatures of insects, amphibians, and flowers. His series of miniatures on "The Four Elements" included a set, "Ignis" (Fire), whose subject was "Reasoning Animals and Insects."⁹ In 1592, Hoefnagel's son Jacob (and other engravers) produced the *Archetypa studiaeque patris Georgii Hoefnagelii*, a series of engravings after Joris's model books, with emblematic or allusive quotations, in which insects were a central theme.¹⁰

These engravings and others modeled after them circulated widely and inspired further artistic imitation. In particular, one of the engravings in the *Archetypa* may have encouraged a significant development. Under the heading "Nasci. Pati. Mori" (birth, suffering, and death), the younger Hoefnagel arranged several dead or dying creatures along with a numbered sequence of caterpillar, pupa, and imago of the Spurge Hawk Moth (*Hyles euphorbiae* [L.]).¹¹ For millennia, careful observers had known that some caterpillars and

“worms” transformed themselves into winged insects, but as far as I know, this is the first pictorial representation of insect metamorphosis. It may have been this engraving that inspired the first serious student of insect metamorphosis: an artist, Johannes Goedaert (1617–1668) of Middelburg in the Netherlands. For decades, Goedaert collected caterpillars, raised them in captivity, observed their metamorphoses, and described them in word and picture. He gathered these observations in a series of three small octavo volumes, published between 1660 and 1669, that combined his engravings with written descriptions.¹²

While Goedaert was observing and delineating his insects, the young Merian was doing the same. The daughter of the famous Nuremberg engraver Matthäus Merian the Elder (1593–1650), who died when she was only three, Merian was trained in drawing and painting by her stepfather, Jacob Marrel (ca. 1613–1681). From a young age, as she wrote in the preface to her *Metamorphosis of the Insects of Surinam* (1705), she was fascinated by silkworms and butterflies, and began to draw them and observe their changes. Her stepfather encouraged her to draw insects on plants as part of her artistic training, but the careful observation, she wrote, was at least partly due to a lack of friends or playmates.¹³ Somehow she found a copy of Goedaert’s book. Taking solace in the fact that her pursuit was not unique, and learning from Goedaert’s technique of raising caterpillars in jars, Merian laid the groundwork for an impressive series of studies of insects and their metamorphoses: *Der Raupen wunderbare Verwandlung* (two volumes, 1679 and 1683) and the *Metamorphosis insectorum Surinamensium* (1705), each translated and produced in numerous editions.

These artists were participating in a wave of enthusiasm for insects that also included practitioners of natural history. Conrad Gessner (1516–1565), Thomas Penny (ca. 1530–1589), Jacob Zwinger (1569–1610), and Ulisse Aldrovandi (1522–1605), among other sixteenth-century naturalists, gathered material for the natural history of insects, though Aldrovandi was the first to publish any of his work. Aside from Aldrovandi’s 1602 *De animalibus insectis* and the *Theatre of Insects* compiled by Thomas Moffett (1553–1604) and published posthumously in 1634, there were few works written by naturalists on insects before the middle of the seventeenth century. That would change dramatically as publications by Jan Swammerdam (1637–1680), Francesco Redi (1626–1697), Marcello Malpighi (1628–1694), Steven Blankaart (1650–1704), and others flooded from the presses.¹⁴

Artists and naturalists communicated and collaborated on their discoveries. Goedaert’s work was annotated by his friend, the Middelburg physician

Johannes de Mey (1617–1678), who was actually mentioned as a co-author of the work by one seventeenth-century writer.¹⁵ Merian discussed her work with Caspar Commelin (1668–1731), other Amsterdam physicians, and the famous collector Levinus Vincent (1658–1727). Naturalists, in turn, hired artists to illustrate their works, or to reproduce other illustrations, as with the Yorkshire physician Martin Lister’s (1639–1712) reorganized translation of Goedaert.¹⁶ Naturalists and artists exchanged information indirectly, too, avidly reading and critiquing one another’s work, privately or in print. In Rösel’s day, no student of insects was so specialized that he or she could ignore other experts, regardless of their background and training.

Insect Student, Insect Hunter, and Insect Collector

Rösel, too, worked closely with scholarly experts on insects. He attended lectures in German by the Altdorf professor Michael Adelbulner (1702–79), and he discussed his work frequently with Georg Leonhard Huth (1705–1761), a Nuremberg physician and naturalist. Huth translated passages from Réaumur and other authors for Rösel, who could not read French. Rösel also read works by other German insect students: above all, Lesser’s *Insecto-Theologia* and the series on German insects by Johann Leonhard Frisch (1666–1743).

Rösel’s work benefited from his reading and his conversations with Huth. But it was primarily as a careful, patient observer that he impressed his contemporaries. Like Goedaert and Merian, Rösel was an adept insect hunter. As he tromped through the woods, fields, and meadows around Nuremberg, he kept his eyes open for unusual creatures, especially larvae: being wingless, they were easier to catch, and they would allow him to observe the insect’s entire life cycle. He carefully noted the plants on which each insect lived.¹⁷ After observing a creature’s behavior in the wild, he would collect it, bring it home, observe it, and draw it in preparation for another installment of the *Entertainment*. Even when he had already carefully studied a particular insect species, though, he continued to observe it and note its behavior.

As more and more installments of the *Insect Entertainment* continued to appear, Rösel began to receive reports and specimens of peculiar insects from Nuremberg and farther abroad. But his reputation as an insect hunter could also hinder his access to unusual finds. In 1745 he received a drawing of a large caterpillar that was unknown to him and that he could not find in any insect book. He thought it might be the Death’s Head Moth (*Acherontia atropos* [L.]) described by Réaumur, but there were significant differences between the

drawing and Réaumur's illustration. His correspondent asked him to return the drawing, but before doing so Rösel made a copy.¹⁸

The following year he heard that a woman who had a garden near Nuremberg had found a beautiful caterpillar and was showing it for money: "My desire for new insects that I did not know swiftly led me to seek out this woman, but when she realized that I was the person to whom several of her supporters had asked her to bring the caterpillar, she did not want to show it to me. It cost me many flattering words to get a look from some distance. Even from afar, I recognized it immediately as the caterpillar I had been seeking for some time; I did not rest until I had acquired it, with cash and a little flattery." In this case, Rösel's reputation worked against him: fearing, rightly, that he would want to keep the caterpillar, the gardener avoided him and, when he found her, tried as long as possible to keep the insect from him. In vain: Rösel acquired it, and later that summer he was brought two further specimens.¹⁹

The drawback to receiving specimens from others, Rösel admitted, was that he could not necessarily learn every detail about the insect's life cycle. He confessed his ignorance of the early larval instars of the Death's Head Moth, because all three live caterpillars he received had already molted for the last time. Nonetheless, he was able to describe their pupation and metamorphosis into the splendid imago with eerie skull-shaped markings. In another case, he did not even have that experience. The Privet Hawk Moth (*Sphinx ligustri* [L.]), Rösel confessed, "is the first caterpillar I have described that I have not seen myself, though I have made every effort imaginable to find it."²⁰ Privet, he explained, is rare around Nuremberg. However, he decided to publish a description anyhow, based on material that he received from correspondents: a drawing of the caterpillar and pupa, sent to him from Lübeck along with an adult insect, and a description of the insect prepared by Paul Heinrich Gerhard Moehring (1710–1792), a physician based in Jever (Friesland). Rösel reproduced both caterpillar images, commenting on the differences between them as matters for further research. And he prepared engravings of two adults, sent to him through "the kindness of friends" to enlarge his collection.

Perhaps embarrassed by publishing a description of an insect he had not seen and studied while it was alive, Rösel lapsed into the subjunctive: "This would be the tenth moth in the second class," he wrote, "but I know still more, though I have not been able to find out whether their caterpillars are found around here: perhaps, though, I will find them, and then I will spare no effort to describe them and their metamorphosis."²¹ Rösel published a secondhand description for several reasons: to please the patrons and friends who

had sent him material, to entertain his readers—and perhaps also to make the month's deadline. But his goal was still to carefully describe behavior and metamorphosis that he had witnessed himself.

Displaying Insects in the *Insect Entertainment*

Rösel conceived of his descriptions as a union of image and text; each referred to the other. And though some aspects of the *Insect Entertainment's* balance between image and text derived from the technical constraints of printing, Rösel chose to deviate in significant ways from the work by Merian that had served as his inspiration. Both books were laid out so that images were displayed next to the text that commented on them, but Rösel's work did so while containing substantially more text for each image.

By the early eighteenth century, artists had developed a sophisticated theoretical discourse written by and for practitioners.²² From the fifteenth century in Italy, humanists and artists like Leone Battista Alberti (1404–1472), Lorenzo Ghiberti (1378–1455), and Leonardo da Vinci (1452–1519) reflected on the nature of artistic imitation of nature. Intellectual and artistic contacts between Italy and transalpine Europe brought those currents north in the late fifteenth and sixteenth centuries. Artistic academies soon followed.²³ While apprenticeship continued to be a significant way for artists to learn their craft, the theory of the academies filtered into ordinary artistic activity. Rösel, for instance, apprenticed to his cousin but then completed his education in the Nuremberg Academy. By the end of his studies he was well aware of debates about the nature of art, the active imitation of nature by the artist, and the effects of art on its audience, and he must have considered those debates as he organized the *Insect Entertainment*.

The results of his reflection can be seen in the divergence between Rösel and his immediate inspiration, Merian's work on Suriname. Both artists intended their engravings to be studied along with the accompanying text, and they understood that their readers would move actively between word and image. But they made different choices about the proper balance between the two. Merian chose a format without too much text. As she put it in her letter to the reader, she kept her descriptions short so they could be set opposite the illustrations, following the example of Bidloo's anatomy. As a result, they occupy at most a folio page. She referred those who wanted more to books by Moffett, Goedaert, Swammerdam, Blankaart, and others.²⁴ Hence text and image could be placed opposite each other, with engraved images bound facing the folio text. The sixty

images correspond to sixty pages of description. Merian did not give a detailed life history of the insects, mentioning instead some of the most striking aspects of their form, growth, habits, or uses by Surinamese colonists, slaves, or Indians.

Rösel, on the other hand, accompanied each engraving with a quarto sheet of text. These sheets were originally published separately with the accompanying illustration, and Rösel's printer, Johann Joseph Fleischmann, fit the text to the sheets, either filling up blank space with ornamental flourishes or switching to smaller type in the last few pages of a sheet in order to fit in the entire text. Unlike Goedaert, Rösel (or Fleischmann) gave precise instructions to bookbinders on what to do with the engravings. His "Nachricht an den Buchbinder" instructed him not to simply bind the engravings along with the text, but, depending on what the owner wants, to either bind them together at the end of the volume or in among the descriptions. In either case, the engravings were to be tipped into a blank leaf so that they could be folded out and examined while reading the text.²⁵

This format allowed Rösel to describe species at length while having the image constantly before the reader's eyes. And Rösel, unlike Merian, included in his engravings numbers or letters that were keyed to the text. Modeled after the keys that were common in works of anatomy and natural history, these cross-references linked the images closely to the accompanying descriptions.²⁶ Read and examined together, image and text formed the complete "insect entertainment," which might in turn inspire readers to seek out and observe the insects themselves.

Caterpillars and Butterflies

As Rösel organized his work with its effect on his readers in mind, he also chose to begin with insects that were beautiful and fascinating. Butterflies and moths (Lepidoptera, in Linnaean terms) occupied a significant place in his and other early modern books on insects. Even in works that addressed many kinds of insects, like Hoefnagel's *Ignis* and *Archetypa* and Goedaert's *Metamorphosis*, butterflies and moths appear frequently. Rösel's immediate inspiration, Merian, placed them front and center. Her *Metamorphosis insectorum Surinamensium* is devoted primarily to butterflies: forty-eight of the sixty plates have a butterfly or moth as the central subject, while another two plates give equal emphasis to a lepidopteran and another subject.²⁷ In the end, Rösel would address a broad range of insects in his *Insect Entertainment*. But at first he had to build a subscriber base for his work; that may be why he began with the crowd-pleasing lepidopterans.

As Anita Albus has observed, butterflies pose a challenge to the artist: their vivid, often iridescent colors took skill and care to reproduce.²⁸ Their beauty only heightened the challenge. Moreover, to artists fascinated with insect metamorphosis, lepidopterans have the added attraction that their caterpillars were themselves often strikingly colored. It is not surprising, then, that they received so much attention. Finally, lepidopterans experience full (holometabolous) metamorphosis, undergoing a radical change as they pass from larva to pupa to imago. They were considered not only things of beauty in themselves but also instructive and even edifying, in ways that were inflected differently from the late Renaissance to the Enlightenment.

Hoefnagel's engraving "Nasci. Pati. Mori," for instance, appears to allude to the parallel between the caterpillar's transformation into a butterfly and the human being's metamorphosis from earthly to spiritual life.²⁹ This interpretation, and the notion of radical metamorphosis that underwrote it, was vehemently attacked by Jan Swammerdam, whose work on insects, conducted from the 1650s until his death in 1680, aimed to show the "insensible changes" that lay behind the appearance of radical transformation.³⁰ Rösel did not take an explicit position on this question. As a visual artist and observer, his investigations and depictions began with the external surfaces and behavior of the insects. But Rösel implicitly treated egg, larva, pupa, and imago as different forms of the same creature.

In depicting this life cycle, Rösel deviated from his predecessors in a few key areas. A striking feature of Merian's butterfly and moth illustrations was their ecological context: she portrayed each stage in the insect's life cycle on the plant that she thought served them as nourishment.³¹ Rösel occasionally provided ecological settings, but in general he depicted the insect against a blank background, as did Hoefnagel and Goedaert. Unlike all three predecessors, however, his depiction of the insect life cycle was more detailed. Hoefnagel, Goedaert, and Merian (not to mention Ulisse Aldrovandi and other Renaissance naturalists) had divided the insect life cycle into three forms: larva, pupa, and imago.³² Rösel, on the other hand, often provided multiple illustrations of distinct larval instars and, in some cases, enlarged anatomical details (fig. 4.1). Like Merian, he has also portrayed both the top and the underside of the butterfly's wings—with exceeding care, as can be seen by comparing one of his engravings with a modern photograph of the species.³³ He had their engravings hand-colored in his workshop, before sale, to ensure that the engraving matched, as closely as possible, the watercolor originals on which they were based.

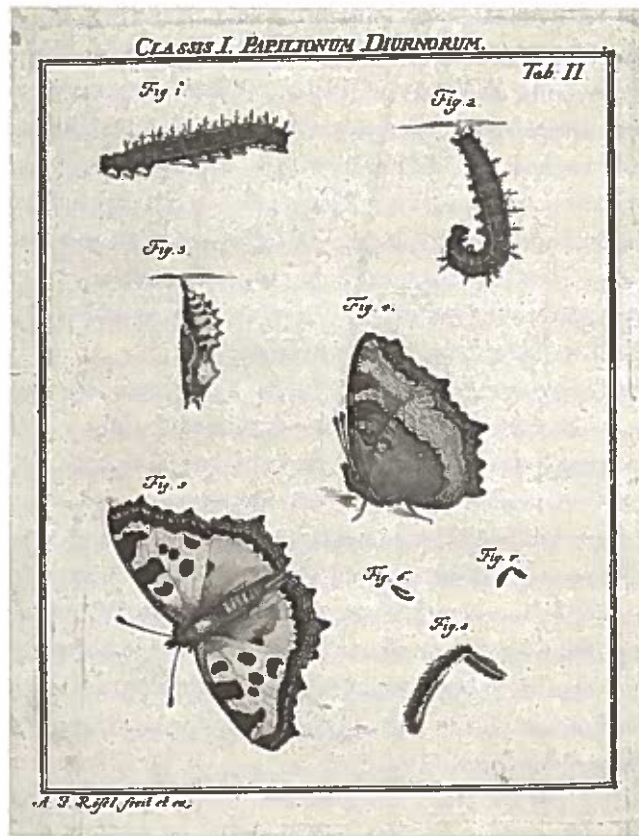


FIG. 4.1 Large Tortoiseshell butterfly. From Rösels, *Insecten-Belustigung*, volume 1. Heidelberg University Library, O 1314 RES::1, Teili_Tab2.

An Ordinate Fondness for Beetles

If butterflies and moths took pride of place in Rösels' *Insect Entertainment*, he also devoted substantial attention to beetles. This, too, is not surprising. An anecdote is often repeated about the British biologist (and atheist) J. B. S. Haldane. After a public lecture, the story goes, Haldane was approached by an audience member who asked him what his decades of studying nature had taught him about God. Haldane's response: "He has an inordinate fondness for beetles."³⁴ Haldane's remark was not random: beetles (coleoptera) constitute about 40 percent of insect species that have been described to date, and about 25 percent of *all* animal species.³⁵

Like butterflies, many adult beetles are large, brightly colored, and iridescent. Beetles also had a significant place in northern Renaissance art, in part because of the admiration for Albrecht Dürer's (1471–1528) insect miniatures. His *Stag Beetle*, as Janice Neri has shown, played a central role in the Dürer Renaissance of the late sixteenth century, a movement in which Hoefnagel was deeply involved.³⁶ And like butterflies, beetles were the subject of a developed symbolism from antiquity and the Middle Ages: the Egyptian scarab, or dung beetle, is especially notable.³⁷

Beetles range in size from tiny, nearly microscopic weevils to enormous tropical beetles. In the preface to his description of his first class of beetles, Rösels indicated this range with an engraving showing several different tropical rhinoceros beetles next to two small European dung beetles.³⁸ Not surprisingly, the largest and most elegantly colored species attracted artists' attention. The first engraving in Hoefnagel's *Archetypa* gave pride of place to the elephant beetle (*Megasoma elephas*) under the biblical quotation "Say to God, How terrible are thy deeds! So great is thy power that thy enemies cringe before thee," and above the inscription "To him who gave me the skill I shall give the glory."³⁹ Other beetles, including the stag beetle and many longicorn beetles, turn up in subsequent pages, though usually only the adult forms.

Goedaert and Merian showed relatively little interest in beetles. In Martin Lister's edition of Goedaert, only 15 of the 144 different "discoveries" involved beetles.⁴⁰ And though Merian's hand-colored engravings, based on original watercolors, were well suited to depict the splendor of certain beetles, she did so only infrequently.⁴¹ Her attention, like Goedaert's, was drawn much more by splendid caterpillars than by drab beetle grubs.

Rösels, on the other hand, was fascinated by beetles. A substantial part of the second volume of the *Insecten-Belustigung* was taken up by beetles, divided into three classes of land beetles and one of water beetles.⁴² As we will see, Rösels knew that some of his readers had little interest in insects other than butterflies, but he insisted that they were worth his, and their, attention. In some cases that came from their beauty or from the sheer magnitude of exotic species. But he was also fascinated by their life cycle, and in his descriptions he attempted to convey to his readers that fascination.

The first beetle Rösels described was, in fact, the cockchafer or Maikäfer (fig. 4.2). These well-known insects, he wrote, please everyone because after a harsh winter they are the sign of the advent of spring: "Therefore I hope that my efforts to give a complete report on the generation, growth, and metamorphosis of this insect will not be displeasing to my worthy readers. For, though there are few people in this part of the world who since their childhood have

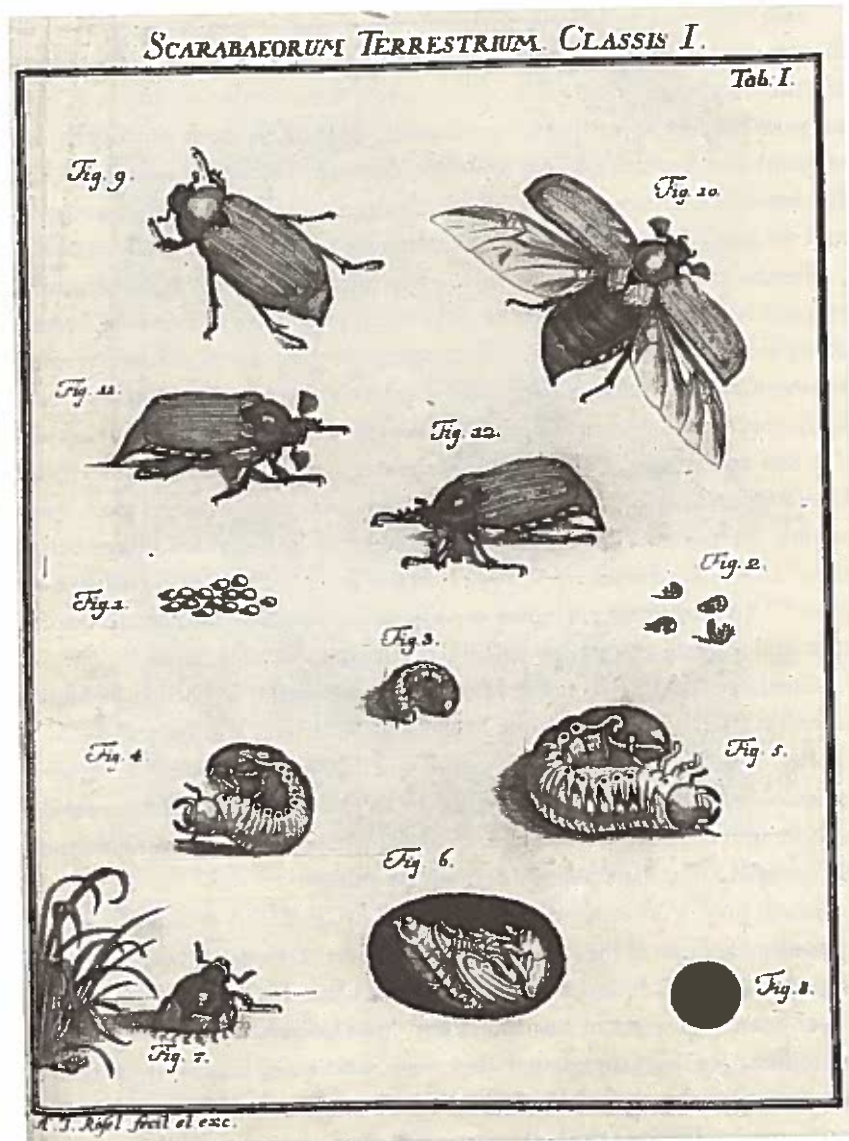


FIG. 4.2 Cockchafer. From Rösels, *Insecten-Belustigung*, volume 2. Heidelberg University Library, O 1314 RES::2, B_024a.

not been familiar with the cockchafer, there are very few who know how they are generated, how they grow, and how they transform themselves.⁴³ In this case, the "entertainment" comes from learning an unknown truth about a well-known creature.

As Rösels informs his readers, the cockchafer grows out of a grub (worm) that spends four years of its life underground. After mating, the female cockchafer lays a number of small eggs. Rösels collected some, without knowing what insect had laid them, placed them with soil in black jars, and put them in his cellar. The following spring they had hatched into small grubs that farmers knew as serious pests. He fed them first with grass and then with plant roots. As time passed they grew larger, and he moved them into clay pots. In the wild he had noticed several different sizes of such grubs, so to speed his identification of the adult insect he collected a few of the largest ones and put them in pots to observe. At the same time he kept the original grubs so he could figure out how long it took them to become adults.

The answer to that question, he reports, was four years. In the autumn of the third year the grub, now large, pupates, well below the surface of the earth (several feet deep in some instances). In the winter the adult hatches and slowly digs its way to the surface, appearing in the spring. Rösels noted that there were two commonly occurring forms of adult cockchafers in Franconia: some with a black thorax and some with a red one. They alternated years, so he concluded that each year's population was formed by the eggs that had been laid four years previously. He drew the further conclusion that, since the winter of 1740 had been long and hard, and few of the adult insects were able to emerge and mate, there would also be few adults in 1744.⁴⁴

In this instance, as in many other passages in Rösels's work, we see the artist as naturalist. Rösels gathered up eggs, hatched them, and kept pots of them around, changing their food sometimes every other day, for four years, in order to determine with certitude what became of them. To study the metamorphosis more quickly he did collect grubs that were already in a late instar, but he kept the originals both to determine how long they remained larvae and to ensure that he had identified the proper transformation. Though he continued to identify himself on the title pages of successive parts of the *Insect Entertainment* as a "miniature painter," his comportment resembled that of many naturalists, both his contemporaries and his successors.

The Aestheticization of Nature

What, then, distinguished Rösels from his contemporaries who might have identified themselves as naturalists?⁴⁵ Or rather, why did he choose to distinguish himself? Surely there was an element of advertising involved: the fine, hand-colored illustrations were the main selling point of the *Insect*

Entertainment. But Röseler responded vehemently to critics who suggested that he was not the actual author of his observations, and that he had merely provided illustrations to accompany a ghostwriter's words. Still, though, his approach to his subjects was shaped by his experience, as an artist, with aesthetic questions. His images, like those of other insect artists, were intended to evoke an aesthetic response.

In Western culture, one is tempted to say, nature is always already aestheticized through humans' immediate aesthetic response to it.⁴⁶ We may speak more narrowly, however, of aestheticization in the sense of taking *naturalia* and applying the canons of art to them. This, in turn, should be distinguished from the attempt to evoke an aesthetic response to nature in the reader. In the narrow sense, Röseler did not set out to aestheticize nature. Unlike Merian, he did not situate his insect larvae, pupae, and imagines in a carefully composed ornamental framework, though some of the illustrations in his 1758 *Natural History of Our Frogs* have a painterly composition.⁴⁷ Rather, his insect illustrations, carefully hand-colored by himself or under his supervision (as Kleemann notes, he would not have had time to do them all himself), are composed with an eye to filling out the engraving systematically, and using space well. In this case it is instructive to compare the engraved frontispieces to Röseler's first three volumes with the actual *Insect Entertainment* itself. The latter contains sober drawings, with the insects generally organized in blank space (corresponding, perhaps, to the artist's work table or his collection of dead insects). The frontispieces, on the other hand, are carefully composed. Volume 1's frontispiece is an allegorical composition by Johann Justin Preißler, engraved by Martin Tyroff (1704–1758). Röseler himself produced the frontispiece to volume 2 (fig. 4.3), while volume 3 features the work of Nicolaus Gabler (1725–1780), engraved by Michael Rösler (1705–1777). All three reveal that the sober style of the *Entertainment's* engravings was deliberate.⁴⁸

Despite this sober, technical style, Röseler clearly wanted to evoke an aesthetic response in his readers. He depicted beautiful creatures in a skillful manner. In this sense his work harks back to a 1597 cabinet miniature by Joris Hoefnagel that depicts insects and flowers with the motto "We take delight twice when we see the painted flower competing with the real: in one we admire the skill [*artificium*] of nature, in the other, the painter's ability [*ingenium*]."⁴⁹ But Röseler also depicted ugly creatures, and he was at pains to underscore that his work was not intended simply to please the senses: "Men have sharply differing inclinations: however, I hold that the more noble inclination should always be preserved. To love something only because it delights the



FIG. 4.3 Engraved title page to Röseler, *Insecten-Belustigung*, volume 2. Heidelberg University Library, O 1314 RES::2, I.

senses, without also directing one's attention to its Author or to the use that one can receive through it—that has never been what brought me to investigate insects. My intention has always been nobler; I have undertaken these investigations to praise the Creator and to be of use to my neighbor."⁵⁰

Understanding and fully appreciating the pictorial display in his *Insect Entertainment*, Röseler implied, required knowledge of its order and purpose.

Naive enthusiasm for superficial beauty was a low form of pleasure; true understanding enhanced the overall aesthetic impact of displaying nature.⁵¹ Rösel realized that his publication, with its textual excursions, would not please those “who wish only to see the bright butterflies in my collection,” but he had received enough support and praise that he was not concerned about such critics.⁵² As the reference to the “Author” of nature implies, the pious Protestant also hoped that his work, in evoking an aesthetic response, would at the same time provoke a religious response.

The Insects' God

Like many other early modern students of insects, Rösel thought that his work should lead his readers to a deeper devotion to God. Insects taught one to admire God's divine workmanship in his creation. Rösel saw the sign of divine providence in the fact that butterflies that fed on nectar in meadows nonetheless deposited their eggs on the very different plants that the hatchling caterpillars would eat.⁵³

The access to divine craftsmanship in the works of Rösel and his contemporaries was multiplex.⁵⁴ In a passage that could refer to Rösel, Heidrun Ludwig writes of Merian's *Raupenbuch* that it “opens three possibilities for devotion: (1) in considering and observing the visible world, (2) in active, artistic reflection of what is seen, and (3) in edification on the basis of the artistic reflection, whether in picture or word.”⁵⁵ In other words, the artist him- or herself performs an act of devotion, both in observing the world and in accurately describing and depicting it. The reader, meanwhile, comes to know God better by contemplating the artist's work—which may, in turn, lead him or her to the study of insects themselves in nature. The artist's skill does not attempt to emulate God, as was the case with Joris Hoefnagel; rather, it is in the *fidelity* of artist to nature, and therefore to God, that the devotional practice lies.

Rösel certainly took his natural theology seriously. Though he never learned Latin or attended university, he studied William Derham's (1657–1735) *Physico-Theology* by attending Adelbulner's German-language lectures on the book.⁵⁶ And as Sara Stebbins has shown, Rösel's natural theology forms a minor current in a broad stream of German Protestant thought in the late seventeenth and eighteenth centuries. This “physico-theology” was characterized by increasing specialization on specific parts of the world, as opposed to the general harmony of things that was emphasized in classical and Renaissance natural theology. And it moved from carefully constructed arguments, in an apologetic mode,

to evoking emotions of piety in its readers.⁵⁷ One of the leaders of this movement was Lesser, who wrote a *Litho-Theologia* (on stones) and a *Testaceo-Theologia* (on shells) in addition to the *Insecto-Theologia*. Lesser spoke highly of Rösel's *Insect Entertainment* in “Thoughts about the Insect-Entertainment,” prefaced to the work's first volume: “You present to us, dear Rösel, many little creatures / Which in turn the Creator's hand made so wonderfully.”⁵⁸

Rösel's Reception and Later Work

As Lesser's poem suggests, Rösel's combination of beautiful engravings, engaging descriptions, and conventional piety successfully reached a wide audience. The Danzig naturalist Johann Philipp Breyne (1680–1764) thanked Christoph Jacob Trew (1695–1769) for sending him some of the *Insect Entertainment*: they awoke in him a “particular pleasure,” and they by far surpassed all the other illustrated works on insects. Johann Christian Müller, pastor of Reinsdorf near Zwickau, also underscored the “pleasure” that he “discovered in your *Insect Entertainment*.” That pleasure was twofold: Müller read the monthly publication, but it also inspired him to follow Rösel's advice to investigate and experience insects and their transformations himself. “It is a special pleasure for me,” he continued, “to show many people your beautifully colored engravings and, at the same time, the original in nature.”⁵⁹

Such praise, more than he had initially hoped for, encouraged Rösel to continue his enterprise. Some critics, it is true, thought that his descriptions were too long-winded, but Rösel defended himself by pointing out that he could sell the engravings alone for the price he asked for both illustration and text. Customers who were more interested in pretty pictures than in insect behavior had no grounds for complaint—they could simply ignore the text and be none the poorer.⁶⁰

And as he continued his work, he expanded its scope. To the butterflies, moths, and beetles with which he began, he added other creatures: water bugs, dragonflies and damselflies, grasshoppers and crickets, bees and wasps, gnats and flies.⁶¹ In the third, supplementary, volume, Rösel added even more insects: “the cunning, skillful Ant-Robber” (i.e., the ant lion), water spiders, gall wasps, and—in a reminder that the term “insect” had a broader meaning for Rösel than it does for modern zoology—two kinds of crayfishes, as well as a “History of Polyps and Other Water Insects.”⁶²

As Rösel took on new insects, he also expanded the techniques he used to study and portray them. By the late 1740s he was dissecting insects and

portraying their internal structure as well as their external form. His study of the crayfish was his most sustained effort in “insect” anatomy, aided no doubt by the creature’s size. But he also dissected beetles and, in homage to Malpighi, the silkworm larva.⁶³ The stroke he suffered in the early 1750s may have encouraged his interest in dissection, since it limited his field expeditions. In the beginning, Rösel followed the example set by artists from Hoefnagel to Merian, who had depicted the insect’s exterior, leaving its interior structure to anatomists. By the end of his life, Rösel could wield a scalpel as well as he handled a burin.

As he continued, Rösel partially abandoned his decision, following Merian, to portray insects in their actual size. Most insect species that have been described have adult bodies that are shorter than five millimeters.⁶⁴ From the beginning, Rösel used magnifying glasses to examine insects’ bodily structures; he even had a sun microscope that could project images on the wall of a darkened room, so he could show small insects to an audience. But only rarely in the first decade did he show enlarged details of legs, antennae, or scales. And he did not enlarge the entire insect. In this respect, his work differed from that of microanatomists, whose books devoted quarto- or folio-sized engravings to minute organs that were invisible to the naked eye. Only in his history of freshwater polyps did Rösel systematically enlarge his subjects. The title page to this section of his work showed the creatures life-sized, while subsequent illustrations, prepared with the aid of a hand lens or microscope, depicted them at different levels of magnification.⁶⁵ When he returned to other insects, he abandoned this systematic use of magnification. And he continued to work on butterflies and moths to the end, praising their beauty to his subscribers and readers. The fascination and wonder with insects of all sorts—even spiders—that characterized his earliest monthly entertainments never left him.⁶⁶

Conclusion

Rösel’s *Insect Entertainment* is only one manifestation of the fascination with insects that characterized European culture from the late Renaissance through the Enlightenment. Merian’s work, and that of other artists and naturalists, provided one spur to his studies, but insects themselves played a central role. Rösel was intrigued by the successive transformations of holometabolous insects, especially the larger, more colorful ones like butterflies, moths, and large beetles, but also grasshoppers, crickets, true bugs, and even spiders and slugs. He devoted time and patience to them. Rösel’s jars and pots full of cockchafers took four years to cycle through, and though he speeded the work by

finding older grubs, he still followed the original set through to its final transformation. He pursued his studies despite failing health. He was no dilettante.

From one perspective, Rösel’s *Insect Entertainment* can be read, along with the works of his artist and naturalist predecessors and contemporaries, as part of the history of science: in particular, the history of natural history and entomology before their professionalization. In that framework, the contrast between Merian’s lush, carefully composed engravings and Rösel’s sober illustrations appears to mark a shift toward the modern scientific illustration. Rösel certainly has been adopted as an illustrious predecessor by modern entomologists: a cited reference search in the Web of Science database turns up nineteen articles that cite Rösel, all of them in scientific journals (published between 1907 and 2001).⁶⁷ And as I have argued elsewhere, naturalists, physicians, and artists were eagerly exchanging knowledge of nature even as they critiqued one another vehemently, thereby weaving artists’ insect books into the complex web of early modern science.⁶⁸

We should be wary, though, of imposing the modern notion of “science” on these investigators of nature, or of reducing the early modern fascination with insects to a stage in the production of systematized knowledge. As we have seen, Rösel was a careful observer, and contemporaries placed him among the “nature experts” (*Naturkündiger*) of his day. But such study was also a means to honor God by showing his providence and craftsmanship. And, it is worth noting, Rösel consistently identified himself on the title page of his works as “Miniatur-Mahler.” He suffered many reproaches for his work, but the only one that struck to the quick, according to his son-in-law and biographer Kleemann, is the charge that he had not studied and could not read Latin or foreign-language works. This led him to attend courses and to seek the assistance of scholars like Huth for his work. But he insisted on the value of his work and, against his calumniators, maintained that it was his own: that *Insect Entertainment* was the result of his own experience, the experience of a miniature painter. By displaying insects, he demonstrated both his own talent in his chosen field and the beauty and moral lessons that the Creator had placed in nature’s own miniatures, the insects.

NOTES

1. Rösel, *Insecten-Belustigung*, unpaginated Vorrede, sig. [B4]r.
2. See the discussion below for details.
3. Kleemann, *Beyträge*. Rösel also published a natural history of frogs and toads in 1758: *Historia ranarum*.

4. Unless noted, biographical data are from the life by Rösels son-in-law, C. F. C. Kleemann, "Ausführliche und zuverlässige Nachricht." Some writers incorrectly assert that Rösel was ennobled in the 1750s because "von Rosenhof" first appears on the title page of part 3 of the *Insecten-Belustigung*. In fact, as Kleemann testifies, Rösel had merely secured an imperial confirmation of his ancestors' diploma of nobility (21–22).

5. Merian, *Metamorphosis*; facsimile of engravings in Merian and Schmidt-Loske, *Insects of Surinam*. See also Reitsma, *Merian*.

6. Rösel, *Insecten-Belustigung*, 3:86. Note: the pagination of Rösels collected volumes of the *Insecten-Belustigung* is tricky. Part 1 contains six "collections," each paginated separately. Unless otherwise noted, all translations are my own.

7. Dicke, "Insects in Western Art."

8. The following brief synopsis is based on Ogilvie, "Nature's Bible." See also Vignau-Wilberg, "In minimis maxima conspicua"; Bertoloni Meli, "Representation of Insects"; and Neri, *The Insect*.

9. A selection of images from "The Four Elements," now in the collection of the National Gallery of Art in Washington, D.C., may be viewed online at <http://www.nga.gov/cgi-bin/tsearch?oldartistid=202360&imageset=1> (accessed May 29, 2010).

10. Hoefnagel, *Archetypa*; a facsimile edition with commentary can be found in Vignau-Wilberg, *Archetypa*. An annotated copy from the Bibliothèque nationale et universitaire de Strasbourg is available online at <http://imgbase-scd-ulp.u-strasbg.fr/thumbnails.php?album=865> (accessed May 29, 2010).

11. Hoefnagel, *Archetypa*, part 2, no. 8.

12. According to unpublished research by Kees Beart, summarized by Ella Reitsma, Goedaert's three volumes were published in 1660, 1664/65, and 1669, but most publications continue to give 1662 and 1667 as the dates of the first two volumes. Reitsma, *Merian*, 68n22.

13. Merian, *Metamorphosis*.

14. See Bodenheimer, *Materialien zur Geschichte der Entomologie*; and Ogilvie, "Nature's Bible." I will not address these naturalists in this essay.

15. Reitsma, *Merian*, 68. The author was Christoph Arnold, who contributed a laudatory poem to Merian's first caterpillar book, published in 1679.

16. Goedaert, *Of Insects*.

17. For example, the moth he found on willow and linden trees. See *Insecten-Belustigung*, 3:67.

18. The story of the "unusually large Jasmine caterpillar, beautifully adorned with gold and blue, and its transformation into the so-called Death-Moth," appears in *ibid.*, 3:5–16.

19. *Ibid.*, 3:6, 7.

20. *Ibid.*, 3:8, 25–26.

21. *Ibid.*, 3:32.

22. For an overview, see Williams, *Art Theory*, 54–91.

23. On some interesting consequences of the introduction of academies, see Barkan, *Unearthing the Past*.

24. Merian, *Metamorphosis*, ad lectorem.

25. Rösel, *Insecten-Belustigung*, vol. 1, final unpaginated leaf. The copy in the Heidelberg University Library, now available digitally, has the illustrations tipped into the left side of a blank leaf at the beginning of each description. The copy in the Yale University Library has the illustrations tipped into the right side of a blank leaf after each description.

26. On these keys, including their extensive use by Andreas Vesalius, see Kusukawa, *Picturing the Book of Nature*.

27. Merian, *Metamorphosis*. Plates 1, 18, 24, 27, 28, 48, 49, 50, 56, and 59 emphasize another insect, though butterflies or moths are present on some of them, while plates 21 and 54 seem to give equal emphasis to a lepidopteran and another insect. Plate 49 features the Lantern Fly, a true bug with colorful wings.

28. Albus, *Art of Arts*, 100–102, 290–91.

29. Hoefnagel, *Archetypa*, part 2, no. 8.

30. Swammerdam, *Bybel der natuure*.

31. Davis, *Women on the Margins*, 151–55.

32. See Ogilvie, "Nature's Bible."

33. See, for example, *Nymphalis polychloros*, the Large Tortoiseshell, Wikimedia Commons, photograph by user Algirdas, http://commons.wikimedia.org/wiki/File:Nymphalis_polychloros.jpg (accessed May 29, 2010).

34. The anecdote appears frequently, but without sources, in dozens of pieces on Haldane. Garson O'Toole (a pseudonym) traces its origin in print to Hutchinson, "Homage to Santa Rosalia." See O'Toole, "The Creator."

35. Bartlett, "Order Coleoptera."

36. Neri, *The Insect*, 5–10; Ogilvie, "Nature's Bible."

37. Cambefort, "Sacred Insect."

38. Rösel, *Insecten-Belustigung*, vol. 2, "Scarabaeorum Terrestrialium Praefat: Classis I.," tab. A.

39. Hoefnagel, *Archetypa*, part 1, no. 1; translations by Vignau-Wilberg in *Archetypa*, 59–60.

40. Goedaert, *Of Insects*, 101–18.

41. In four out of sixty plates of the *Metamorphosis*. See Merian, *Metamorphosis*, 24, 28, 48, and 50.

42. Rösel, *Insecten-Belustigung*, vol. 2, four sections with independent pagination. Technically, the first class of water insects included those that metamorphosed into beetles; the second and subsequent classes were not beetles. Rösels classification predates that of Linnaeus.

43. *Ibid.*, "Der Erd-Kefer erste Classe," 2:1.

44. *Ibid.*, 2:1–8.

45. On late Renaissance equivalents for the term, see Ogilvie, *Science of Describing*, 54–55.

46. For an overview on the aesthetics of nature in Western philosophy, see Parsons, *Aesthetics*.

47. On the context of Merian's work, including her flower books as well as her studies of insects, see Neri, *The Insect*, chap. 4.

48. Volume 4, published posthumously, has a portrait of Rösel as its frontispiece. Some of the engravings in the *Entertainment* depict water insects in a highly schematic ecological setting, normally showing the relationship between the aquatic and the terrestrial phases of their lives.

49. The miniature is now in the Muzeul Brukenthal, Sibiu, Romania; see Vignau-Wilberg, *Archetypa*, p. 32, fig. 9.

50. Rösel, *Insecten-Belustigung*, vol. 1, Vorrede, §4.

51. In this regard, Rösel appears to approach the position of the contemporary aesthetician Allen Carlson, but the difference is profound: whereas Carlson rejects the theistic

view that nature has a designer, emphasizing instead natural order, Rösel saw order as a consequence of divine design, as I will discuss below. However, both would agree that Noël Carroll's "being moved by nature" is an inferior form of aesthetic response. See Carlson, "Appreciating Art"; and Carroll, "On Being Moved."

52. Rösel, *Insecten-Belustigung*, vol. 1, Vorrede, §4.
53. Ibid., "Erste Classe der Tag-Vögel," 1:8.
54. On natural theology from the late Renaissance through the Enlightenment, see Stebbins, *Maxima in minima*; Ogilvie, "Natural History"; Jorink, *Boeck der Natuerre*; and Trepp, *Von der Glückseligkeit*.
55. Ludwig, *Nürnberg naturgeschichtliche Malerei*, 81–82.
56. Kleemann, "Ausführliche und zuverlässige Nachricht," 14.
57. Stebbins, *Maxima in minima*, 12. Given that Stebbins situates these works within the framework of the "early Enlightenment," this move is ironic—at least if Enlightenment means rational criticism!
58. Rösel, *Insecten-Belustigung*, vol. 1, sig. E3r.
59. Ibid., vol. 1, sig. D4v–E1r.
60. Ibid., vol. 1, sig. B4r–v.
61. Ibid., vol. 2, contains these groups.
62. Ibid., vol. 3.
63. Ibid., 3:305–50; vol. 2, "Der Erd-Kefer erste Klasse," 57–72; 3:37–62.
64. Raffles, *Insectopedia*, 9.
65. Rösel, *Insecten-Belustigung*, 3:442 and fig. 72. Figures 73, 74, and 75 show one species of polyp life-sized and at two different levels of magnification. Rösel continued this procedure throughout the history of polyps. On early attempts to describe polyps and the frustration of analogy, see Elkins, "Visual Desperation."
66. The last six plates in the posthumous fourth volume are devoted to spiders. His son-in-law Kleemann wrote that they were the last plates and descriptions that Rösel prepared shortly before his death: Rösel, *Insecten-Belustigung*, 4:264.
67. ISI Web of Science database, search criteria: Cited Author=(roesel a* OR rosel a*) AND Cited Year=(1740–1780) Timespan=All Years. Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH (accessed May 31, 2010).
68. Ogilvie, "Nature's Bible."

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Images, Ideas, and Ideals: Thinking with and about Ross's Gull

Henry A. McGhie

In culture, not all species are considered equal: some species and groups of species are more highly admired and desired than others, just as others are feared and detested to varying degrees. Some species are regarded differently by different groups of people. Some have rich cultural histories while others are more or less unknown, and there are "celebrity species" just as there are "celebrity animals" (such as the Saint Bernard dog Barry and Knut the polar bear, discussed in chapters 6 and 9, respectively). How do species develop a particular "reputation" or "persona" for groups of people? How do texts, visual representations, and museum specimens contribute to the development of that reputation? These questions form the substance of this essay and are explored through the cultural history of a single species of bird, Ross's Gull.

Ross's Gull is a small species of seabird that breeds in marshes in the northern tundra and winters at sea. Since first being made known to Western science in 1823, it has enjoyed an almost legendary reputation among ornithologists and specimen collectors. When the Norwegian scientist and Arctic explorer Fridtjof Nansen (1861–1930) first encountered the birds on his famous *Fram* expedition, he wrote the following in his diary: "Friday 3 Aug 1894. Latitude 81°5'. . . . Today at last my longing has been satisfied, I have shot Ross's Gull (*Rodosthetia [sic] Rossii*), and 3 of them in one day. This elusive, strange and

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