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Kirsten Hoving: Joseph Cornell and Astronomy

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CROSS-INDEXING THE COSMOS

THE AMERICAN ARTIST JOSEPH CORNELL (1903–72) devoted his career to constructing collages and assemblage boxes that juxtapose pictures and objects in playful and poetic ways. He created boxes with butterflies and birds, ballerinas and actresses, children from Renaissance paintings and characters from eighteenth-century books, and, above all, the Moon and the stars. He produced hundreds of works with references to astronomy: enigmatic early collages, found-footage films, three-dimensional “space-object boxes,” and late collages combining science and popular culture. Cornell called the tiny kitchen where he sometimes worked at night his “observatory,” and in his diaries he often recorded sightings of the stars from his backyard.¹ He amassed a large collection of books about astronomy, ranging from eighteenth-century European texts to recent works, and throughout his life he was a dedicated clipper and organizer of newspaper and magazine articles about new discoveries. His interests were broad, although far from technical, and he was as fascinated by cosmic metaphors as he was by astronomy’s facts and figures.

From his own stargazing, he developed a deep knowledge and love of the stars, and in his art he sought to convey the historical constancy that astronomy represented to him. He studied star lore and knew the myths behind even the most obscure constellations, many of which appear as details in box constructions and collages. He admired famous astronomers of the past, saving pictures of and articles about the great men of astronomy—Nicolaus Copernicus, Tycho Brahe, Johannes Kepler, and Galileo Galilei—and he alluded to their contributions in his works. At the same time, like many of his contemporaries, he was caught up in the excitement surrounding twentieth-century findings that offered new conceptions of the cosmos.

In the literature and lore about Cornell, the artist is often presented as a shy recluse, a nineteenth-century romantic trapped in a twentieth-century

body, an individual out of touch with reality and living in a fantasy world. To be sure, Cornell loved nineteenth-century literature and culture, and his papers are filled with references to figures such as poet Stéphane Mallarmé and ballerina Fanny Cerrito. However, he was equally intrigued by his own era, especially by new discoveries expanding our understanding of the universe. Cornell came of artistic age in the 1930s, a golden decade in the history of astronomical research marked by such milestones as the discovery of Pluto, verification of Albert Einstein's general theory of relativity, and confirmation that the universe is expanding. From the early years of his career until his final days, his fascination for astronomy fueled his art. Far from being vaguely "eccentric," "nostalgic," "magical" creations, as critics and art historians have described them, Cornell's astronomy works reveal a direct and profound engagement with modern science.

In 1949 Cornell scribbled the following description: "fleecy clouds bringing an opening sprinkled with stars the moon thru the dark green leaves over the houses. A moment of supreme and transc[endent] beauty."² This book investigates Cornell's efforts to capture the "supreme and transcendent beauty" of the cosmos in his art. It examines specific works of art against the backdrop of the history of astronomy and contemporary explorations of the universe. It considers the importance of science in Cornell's creative process and positions his astronomy works within the contexts of significant individuals and movements in modern art. Above all, it seeks to convey the deep connection the artist felt to the stars and to the scientific and spiritual forces that determine their paths.

COLLECTING ASTRONOMY

Apart from a high school physics course, Cornell had no formal education in astronomy. Instead, he taught himself by reading and observing. Over the course of four decades, he gathered more than a hundred books about astronomy for his library. Initially he turned to nineteenth-century volumes on natural philosophy, physics, and astronomy, although he was probably more attracted by their detailed engravings than he was to the science explained in exhaustive detail. After the Second World War, his book collecting escalated. Around midcentury, he began purchasing children's books expressly to be cut up for collage materials, including over two dozen copies of the little Golden Nature Guide, Herbert Zim and Robert Baker's *Stars: A Guide to the Constellations, Sun, Moon, Planets, and Other Features of the Heavens*.³ He updated his library with recent publications for adults about the history and philosophy of astronomy, including Arthur Koestler's biography of Johannes Kepler, *The Watershed*, published in 1960, and Max Planck's meditations on the metaphysical implications of modern astrophysics, *The New Science*, published in

1959. From notes he penciled in the margins, underlined sentences, and pages marked with scraps of paper, it is clear that he read these books carefully. However, the majority of astronomy books in his collection were directed to children or young adults, with simple explanations of complicated phenomena and colorful illustrations.

At some point in the late 1920s or 1930s, Cornell began to amass clipping files filled with illustrations cut and torn from old science books and magazines.⁴ He compiled collections on “Natural Philosophy,” “Natural History,” “Astronomy,” and “Instruments,” with pictures illustrating such subjects as electricity, optics, magnetism, and gravity. Astronomical topics received special attention, with numerous clippings showing astronomers, instruments, lunar and solar phenomena, characteristics of planets, shapes of nebulae, and the positions and configurations of the stars. The visual compendium ranges from old telescopes to modern observatories, from ancient astronomers to Einstein, from entries in old German encyclopedias to recent explanations about modern science, from serious studies to cartoons and advertisements. Throughout his life he added to these files, later updating them with articles from *Scientific American*, *The Sky Reporter*, and *National Geographic*, as well as from daily newspapers. Together with his books, these files constitute an impressive, if idiosyncratic, collection of data about the history and science of astronomy (fig. 1.1).

Cornell was particularly interested in celestial maps. His collection ranges from reproductions of constellation charts from early printed celestial atlases, Johann Bayer’s *Uranometria* of 1603 and Johannes Hevelius’s *Uranographia* of 1690, to modern diagrams made using the latest technology. In addition to hundreds of star maps clipped from books and magazines, he owned a complete edition of Elijah Burritt’s *Atlas of the Heavens*, first published in 1825 and based, in turn, on Johann Bode’s *Uranographia* published in 1801 (fig. 1.2).⁵ Bode’s *Uranographia* featured familiar ancient constellations, alongside more recently devised ones describing modern objects, such as the constellation Telescopium Herschellii, Herschel’s Telescope, located above Gemini. Although these newer constellations were discredited in 1922, when the International Astronomical Union codified the eighty-eight constellations recognized by astronomers today, from Burritt’s atlas and other sources Cornell knew these obsolete star formations and incorporated them in his works.⁶

He also collected other kinds of charts, some illustrating single constellations, others presenting entire cosmological systems. He owned a set of nineteenth-century celestial maps for children, with constellation figures punctuated by pinpricks marking stars that could be seen when the maps were held up to light. He also acquired a group of large, beautifully hand-colored eighteenth-century French engravings depicting theories of the cosmos, such as “Le Système de Descartes,” which appear as backdrops in several assemblage boxes (see figs. 6.2 and 6.3). He tore and clipped charts from books and



FIGURE 1.1. Miscellaneous books, clippings, and printed materials, Joseph Cornell Study Center, Smithsonian American Art Museum. Mark Gulezian/QuickSilver Photographers.



CHAPTER I



FIGURE 1.2.
Constellation chart,
engraved by W. G. Evans
under the direction of
E. H. Burritt, from
E.H. Burritt,
*The Geography of the
Heavens* (New York:
F. J. Huntington, 1835).
Joseph Cornell Study
Center, Smithsonian
American Art Museum.
Mark Gulezian/
QuickSilver
Photographers.

magazines illustrating a broad spectrum of topics, from Newton's theories to the paths of satellites in outer space. With materials as diverse as detailed scientific diagrams and pictures removed from children's books, he assembled a rich visual data bank from which he chose, reproduced, and manipulated items in a variety of forms.

Cornell embraced the age of mechanical reproduction with enthusiasm. In many instances, in boxes and collages he used black-and-white photographic copies in place of actual illustrations and charts. Not a photographer himself, he would take pictures he wished to consider as collage elements to a professional photostat maker for reproduction in negative or positive form on thick, slightly glossy paper.⁷ Working with photostat technicians, he experimented with varying levels of contrast until he was satisfied with the result,



sometimes reversing an image or radically altering its size. While his familiarity with photostat reproduction probably stemmed from his work as a commercial textile designer at the Traphagen Commercial Textile Studio from 1934 through 1940 and from other commercial work he did as a magazine layout artist (fig. 1.3), he found the photostat process well suited to his artworks, which he often made as nearly identical multiples. In his files, along with the

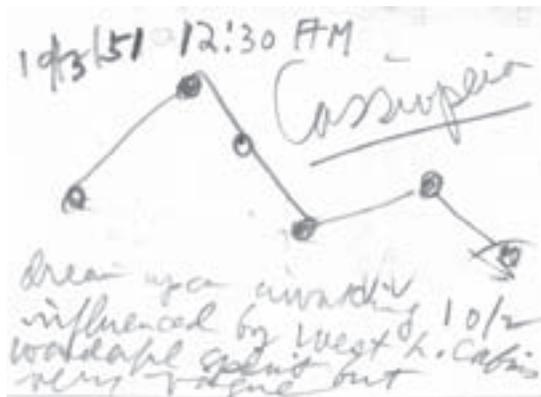
FIGURE 1.3. Joseph Cornell, cover design for *Town and Country*, March 1939. Joseph Cornell Study Center, Smithsonian American Art Museum. Mark Gulezian/QuickSilver Photographers.



FIGURE 1.4. Trimmed photostat reproductions of Hevelius constellation figures of Andromeda and Auriga, from Camille Flammarion, *Les Etoiles* (Paris: C. Marpon et E. Flammarion, 1882). Joseph Cornell Study Center, Smithsonian American Art Museum. Mark Gulezian/QuickSilver Photographers.

items cut and torn from books and magazines, are scattered photostat copies of the original sources, such as those illustrating personifications of the constellations Andromeda and Auriga (fig. 1.4).

In addition to visual material about the cosmos, Cornell also collected a broad range of articles from the popular press. He was a dedicated reader of the *New York Times* and *Christian Science Monitor*. Over the years, as he browsed through newspapers and magazines, he tore and clipped articles on a wide variety of subjects, including astronomy, and he added them to piles of newspaper articles he saved and periodically reviewed.⁸ Often he circled headlines, paragraphs, or poems of special interest and penciled notes in the margin (fig. 1.5). Until he began to read *Scientific American* on a regular basis in the 1950s, articles in the *Times* and *Monitor* were Cornell's most important source of information about recent developments in astronomical research and



technology, and the care that he put into reading and collecting articles from these publications attests to their significance. Examination of contemporary newspapers and magazines reveals that his fascination for astronomy was directly in line with popular interests of his day, and the metaphors he used to construct a visual poetry of the stars are ones that would have been familiar to anyone who read the daily papers.

Cornell's involvement with the stars is also evident in diary entries that he made throughout his life, although the term "diary" is somewhat misleading when it comes to Cornell. Rather than keep an organized record of daily experiences in a bound book, he jotted notes on scraps of paper and old envelopes, in the margins of newspapers and magazines, even on the backs of collages. Usually dated, these notes provide a glimpse into Cornell's daily life, his creative process, and even his stargazing (fig. 1.6). Although they occasionally mention books, music, movies, and other artists and their work, for the most part his diary notes chronicle transformative moments when simple experiences became special, even otherworldly. Often astronomical elements played a part in his articulation of these ineffable moments. Take, for instance, an entry written on October 8, 1968:

*"Lesser Dog" treading the pinnacle of
a maple-top out front, part of him
through the leaves. . . .
the thrice-familiar proffering revelation
again in the night skies

but nearing time of fade-out now at 6—
the brighter of the Twins will linger as morning star⁹*

Such musings demonstrate how important "revelation," to use Cornell's term, was for him. In his notes, he translated the astronomical information

OPPOSITE PAGE:

FIGURE 1.5.
Georgie Starbuck
Galbraith, "Enigmas,"
Christian Science Monitor,
March 4, 1958, as noted
by Joseph Cornell. Joseph
Cornell Study Center,
Smithsonian American
Art Museum. Reproduced
with permission from the
March 4, 1958 issue of *The
Christian Science Moni-
tor*. © 1958 *The Christian
Science Monitor*. All
rights reserved. Mark
Gulezian/QuickSilver
Photographers.

FIGURE 1.6.
Joseph Cornell, Cassiopeia
diary notation, 1951.
Courtesy of the Joseph
Cornell papers, 1804–1986,
Archives of American Art,
Smithsonian Institution.

that filled his clipping files into evocative moments of companionship with the stars. He refined this process in his collages and box constructions, creating works that place the facts of science at the service of the imagination.

THE FLAMMARION YEARS

When did Cornell first see the stars as more than just scattered points of light in the night sky? Perhaps as a child he learned to pick out a constellation on the lawn beside his family's elegant home in Nyack, New York. Perhaps as a student he marveled at the physics of astronomy at Phillips Academy in Andover, Massachusetts, where he was sent in 1917 after the death of his father. Perhaps as a young man he considered the poetic aspects of the night sky while trudging the sidewalks of Manhattan as a textile salesman after financial losses necessitated his family's move to small houses, first in Bayside, Queens, and then on Utopia Parkway in Flushing, New York. Perhaps as a budding artist he realized that the stars could set off chain reactions of associated meanings. One thing is clear: from an early moment the stars stimulated his imagination in ways that nourished him throughout his life.

Ironically, Cornell's first recorded response to the cosmos was fear. According to his sister Betty, after having returned from Andover for a Christmas vacation, he woke her one night, "shaking like a leaf," and stood at the window while confessing his anxiety about the concept of infinity. He had just started to study astronomy. After returning to school, she recalled, "he really got into astronomy. And he loved it."¹⁰ There are no records at Phillips Academy of Cornell having taken a specific course in astronomy; indeed, none was offered. He did follow the science curriculum, and, since the school had no observatory, he may have studied the stars in classes that used the telescope at Abbott Academy, a nearby girls' school. Among his books are a number of textbooks about natural philosophy and astronomy, perhaps kept from his student days. However, it was not until the 1930s, when he began producing small collages made of engravings cut from old books, that his interest in astronomy manifested itself in a tangible form.

Cornell's works are difficult to date and title. Often scholars are content to fit them into a decade, but that broad dating can be tentative or incorrect. Even when he affixed dates to the backs of boxes or collages, those are not always trustworthy, since he frequently returned to a work years later, sometimes making slight revisions, sometimes major ones, sometimes destroying a work altogether and creating a new one from the remains. Titles, too, pose problems. He often assigned various titles to a work, changing the title presented in a rough exhibition checklist, to that appearing in printed form, to the title used in his own notes, to pet names he sometimes devised. His alternate titles sometimes appear in parentheses in titles of his work.

Complicating things further, Cornell regularly produced variants of works, using the same title for several nearly identical boxes, distinguishing between them with numbers. Sometimes he titled works by a general category, such as “soap bubble set,” rather than giving a specific name to a specific work. Occasionally titles have been assigned after the fact by curators or collectors, simply on the basis of a fragment of material pasted on the back of a box or collage; these assigned titles appear in brackets. In some instances, however, a title could be of great importance to the artist, and he would be consistent in his use of it for a unique work of art. Even the question of whether or not a work should be considered finished is problematic: the artist often dithered for months or years before deciding a box or collage was done, only to change his mind and return to a work again, sometimes after several more years had passed. For Cornell, creation was a fluid process, enriched by the passage of time. Assigning specific titles and dates could impede that flow.

Nevertheless, it is possible to consider some of Cornell’s earliest astronomy-inspired work. In the early 1930s he began producing small collages made of pictures clipped from nineteenth-century books and mounted on paperboard. When gallery owner Julien Levy examined a few of these in 1931, he recognized Cornell’s potential and invited him to exhibit at the newly opened Julien Levy Gallery in New York. Although Levy inaugurated his gallery with an exhibition of nineteenth- and twentieth-century photographs, he soon expanded his scope to include showings of avant-garde art, especially Surrealist works.¹¹ Cornell became one of Levy’s most frequent exhibitors, as one of only a few Americans whose work was compatible with that of such cutting-edge Europeans as Max Ernst and Marcel Duchamp. Levy included several of Cornell’s collages, as well as an assemblage of objects covered with a glass bell, in *Surréalisme*, an exhibition that opened in January 1932, for which Cornell designed the announcement.

Levy’s importance for Cornell has been widely acknowledged by scholars, who have underscored the introduction Levy’s gallery provided Cornell to the international avant-garde art scene. What has gone unnoticed, though, is the important part Levy played in the imagery of astronomy in Cornell’s art. In 1961 Cornell recorded an early memory in a diary note:

Julien + Allen unpacking outside on sidewalk—602 Madison Ave. no coats in cold weather [flashing imagery retiring to bed 1 am] took FLAMMARION ASTRON. Bks from up in Gallery—notified Julien who nodded + went on working—~~no coats in cold weather~~ it must been the dream feeling—FEMME CENTS TETES (strong at time) lending to the unexpectedness of the scene its own character.¹²

Thus it was Levy who provided Cornell with what would become his most significant source of information and imagery about astronomy: books by the nineteenth-century French astronomer and popular writer Camille Flammarion.

CHAPTER I

OPPOSITE PAGE:

FIGURE 1.7.

La Cassiopée de l'atlas de Bayer (1603); Le Bouvier de l'atlas de Bayer (1603); Constellations zodiacales.—Le Taureau.—Les Gémeaux; Constellations zodiacales.—Les Poissons.—Le Bélier; in Camille Flammarion, Les Etoiles (Paris: C. Marpon et E. Flammarion, 1882).

Born in 1842, Flammarion was the author of more than seventy books that did more to encourage public interest in astronomy than any other publications of his day. Based for many years at the Paris Observatory and at the French Bureau of Longitudes, as a respected astronomer he participated in the cataloguing of more than ten thousand double stars. In his writing, however, he combined impartial scientific research with passionate speculation about life on other planets. Flammarion's first book, *La Pluralité des mondes habités*, published in 1862, established his reputation as an advocate and popularizer of pluralism, the conviction that other worlds harbor intelligent life. In subsequent publications he expanded his belief in extraterrestrial life to include the notions of the transmigration of souls and the reincarnation of human souls on other planets. In 1880 he published *Astronomie Populaire*, a richly illustrated, fact-filled tome about the history and current state of astronomy. Two years later he added a weighty supplement, *Les Etoiles et les curiosités du ciel*. Both books include detailed explanations of astronomical facts, as well as speculation about life in outer space. In 1884 he added *Les Terres du ciel*, further marshalling scientific information to support his pluralist beliefs.¹³ Each more than seven hundred pages long, with hundreds of engravings, maps, color charts, and photographs, these books constituted a sumptuous trilogy designed for serious amateur astronomers. Although Flammarion also wrote science fiction and, shortly before his death in 1925, published studies about psychic research, his reputation rests on *Astronomie Populaire*.

Astronomie Populaire, *Les Etoiles*, and *Les Terres du ciel* were probably the "Flammarion Astron. Bks." that Cornell obtained from Levy, no doubt chosen by the art dealer to appeal to Cornell's Francophile interests. Clipped illustrations from each of these books made their way into the artist's astronomy files, along with chunks of a battered copy of *Les Etoiles*. In all likelihood, Levy brought these books from Paris for Cornell to cut up for collages, which he seems to have promptly proceeded to do. Thus began a lifelong creative process of appropriating for his own works constellation charts from Flammarion's books (fig. 1.7). Among Cornell's early works is a collage created from Flammarion's reproduction of the constellation Boötes, the Herdsman or Ploughman, originally published in 1603 in Bayer's *Uranometria* (fig. 1.8).¹⁴ Cornell hand-colored the figure's tunic and added two collage elements: a box into which Boötes places his right foot and a box containing a loaf of bread in the upper right corner.

Irrational as these minor manipulations may seem, they demonstrate how carefully Cornell considered his subject. According to one of the legends of Boötes's origin in the sky, Ceres, the goddess of agriculture, was so pleased with Boötes's invention of the plow that she asked Jupiter to place him among the stars in gratitude. Another story explains that Boötes is the guardian of the Ursa Major, the Great Bear, and Taurus, the Bull. Bayer pictures Boötes in these roles, holding a crook and sickle and wearing his signature boots. Further

en lui présentant la tête blessée de Médon, et de dériver Andromède



Fig. 35. — La Cassiopeïde de l'école de Bayer 1603. Crénomie. C'est un effet de scène dont la peinture a été peinte dans

ses changements de mode. — Cette figure est très accrétée quant au Bourvier, entre les jambes duquel on voit briller Arcturus. Il ne faudrait pas croire cependant que la Gerbe ou la Chevrière n'existât pas avant cette époque, car, sur un autre ouvrage de nos bibliothèques, la *Prosaica astronomica d'Huygens*, imprimé à Venise en 1685, c'est-à-dire aux premiers temps de l'imprimerie, soixante-quatorze ans



Fig. 36. — Le Bourvier de l'école de Bayer 1603.

avant l'ouvrage précédent, cette même constellation de Bourvier est dessinée telle qu'on la voit (fig. 87), avec une faucille à la main et une gerbe à ses pieds. L'Atlas de Bayer (1603) a consacré la même tradition (fig. 36), et même représenté le personnage dans l'attitude d'un mineur qui vient de couper la gerbe; ici, ce n'est plus le gardien des bœufs, « le Bourvier », ni le gardien de l'Ourse « arctophylax », comme on l'appelle. Son caractère change de nouveau dans l'Atlas d'Hevelius, qui, dessinant là les deux Chiens de chasse, vultes



Fig. 38. — Constellation zodiacale. — Le Taureau — Les Gémeaux.

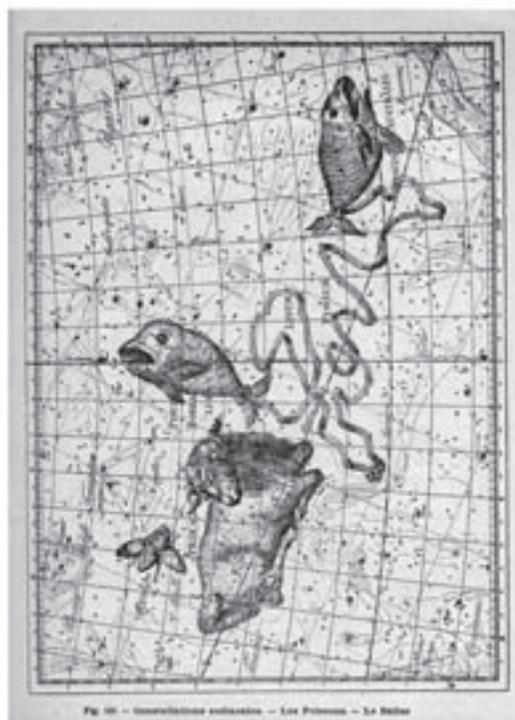


Fig. 39. — Constellation zodiacale. — Les Poissons — La Balance.



FIGURE 1.8.
Joseph Cornell, untitled,
c. 1934. Collage, 9 × 7 in.
Estate of Joseph
Cornell, courtesy L&M
Arts. Photo: Christopher
Burke Studio.

underlining the constellation's association with agriculture is a sheaf of wheat to the right of the figure. In his collage, Cornell went a step further, turning the wheat into the loaf of bread in the box at the upper right. Moreover, in Cornell's version, Boötes places his boot into a box, perhaps signifying the constellation Mons Menalus, the Mountain of Menalus, on which Boötes stands in later atlases, including Johann Bode's *Uranographia* of 1801, illustrated in Flammarion's *Les Etoiles* (see fig. 4.8).

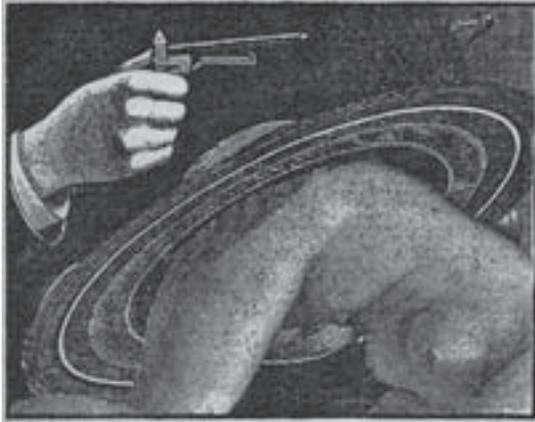
In this unassuming early collage, Cornell already associated the stars with boxes. In addition to serving as visual puns for objects ("breadbox" and "shoebox"), the boxes contrast the concept of containment with the limitless expanse of outer space. Like the polygon created by the grid overlaid on the figure in Bayer's chart, the shoebox cannot fully contain Boötes, who easily exceeds its boundaries. Indeed, the perspective system used to create the illusion of a three-dimensional cube is strangely at odds with the two-dimensional grid lines of the celestial map. After adding his boxes to the illustration of Boötes, Cornell was careful to continue the lines of the map over them, to show that the boxes are behind (and in dialogue with) the overlay of the grid.¹⁵ The two spatial systems intersect: the two-dimensional attempt to impose abstract order on the vastness of the night sky and the three-dimensional attempt to create the illusion of objects as we see them. But an expanding universe can be measured or mapped only for a moment, and there are no vanishing points in an infinite cosmos. These little boxes not only act as metaphors for the limitations of Renaissance geometrical perspective systems in depicting a boundless universe, but they also symbolize the limitations of human knowledge when facing the four-dimensional complexities of a universe predicated on a continuum of space and time.

Along with adding the boxes, Cornell colored the clothes of the figure in Flammarion's illustration. The choice of reddish-pink and yellow for Boötes's garments may reflect Cornell's early awareness of the importance of the colors of stars. After Joseph von Fraunhofer mapped the dark lines in the solar spectrum in 1814 and Gustav Kirchoff and Robert Bunsen discovered that each chemical element was associated with a set of spectral lines in the 1850s, spectral analysis of starlight preoccupied astronomers throughout the nineteenth century. Among the stars in the constellation Boötes is yellow-orange Arcturus, the fourth brightest star in the sky, a point that Flammarion emphasized as part of an extended discussion of the ways in which the brightness of various stars in the constellation has changed over time. In *Les Etoiles*, Flammarion included a chart showing different types of colored double stars, including yellow stars in Boötes, as well as a colored chart of spectral light from various stars, comets, and nebulae, as part of his discussion of the composition of starlight.

Flammarion's books provided other sources of information and inspiration for Cornell. The artist collected numerous portraits of astronomers from *Astronomie Populaire* and *Les Etoiles*, mounting some of them on paperboard without further manipulation: a long-robed stargazer in ancient times, a medieval astrologer with his charts, Tycho sighting the nova that still bears his name, Galileo presenting his telescope to the doge of Venice, Isaac Newton and his apple, and William Herschel discovering Uranus (fig. 1.9). Cornell also removed and mounted illustrations that envisioned impossible sights: Earth as seen from outer space, the rings of Saturn observed from the surface of the planet, and a close-up view of the mountains of the Moon. With their combination of carefully presented scientific data and imaginative speculation, Flammarion's books intrigued Cornell, who shared their author's fascination with fact and fantasy throughout his life. Especially in the early years of his career—"the Flammarion years" as Cornell later called them—the texts and their illustrations provided him with ample raw material from which to construct his own visions of the cosmos.

As Cornell himself readily acknowledged, his collages and even the act of clipping and combining prints from old books were inspired by the work of the German artist Max Ernst, particularly his collage-novel, *La Femme 100 Têtes*.¹⁶ As art historians have shown, Ernst frequently turned to magazines and old science books, including ones by Flammarion, as starting points for his art.¹⁷ In his collages, Ernst transformed the dispassionate visual language of science into a vehicle for eroticism, creating sexy codes for aspects of astrology, alchemy, and the occult.¹⁸ For instance, in *Mon Petit Mont Blanc*, an illustration in Ernst's and poet Paul Eluard's collaborative book, *Les Malheurs des immortels*, published in 1922 (fig. 1.10), the artist contrasts the clothed arm of a man holding a dart pistol with the crouching nude body of a woman whose vulnerable posterior pokes up through the rings of Saturn, an engraving of the planet perhaps appropriated from Flammarion's *Les Terres du ciel*. As William





Camfield has proposed, here the erotic encounter may function as a metaphor for alchemical transformation, with the taboo subject of anal intercourse justified by its symbolic alchemical subtext.¹⁹

Cornell admired Ernst's collages; however, the erotic and alchemical content must have disturbed the reticent American. When he created a series of sixteen collages in homage to Ernst in the 1930s, he, too, turned to the planet Saturn, although in place of Ernst's bold erotic statement he offered a gentle fantasy about space travel (fig. 1.11). A giant bird pokes its head through the rings of Saturn, as if propelling the planet past the Moon, the stars, and a distant spiral nebula. Cornell was no doubt referring to the role played in Ernst's creative process by Loplop, the birdlike character that frequented his paintings and collages, including *La Femme 100 Têtes*, between 1928 and 1932.²⁰

From Ernst, through the intermediary of Levy, Cornell realized that old science texts could provide a treasure trove of collage materials, which, when taken out of context, offered innumerable opportunities for wonderful juxtapositions of strange objects and marvelous ideas. In fact, Cornell even utilized some of the very same clipped items that Ernst did. The impetus underlying each artist's results differed, however. Ernst's appropriation of the cool visual language of scientific illustration for erotically charged subjects was, in large part, a confrontational attack on the intellectual establishment, originating with Dada notions of challenging authority. Cornell's incorporation of physics illustrations originally stemmed from a desire to achieve a certain Surrealist "look" in his art, with unexpected encounters between systems of knowledge leading to heightened states of awareness. Realizing that he could not simply mimic Ernst's style, and probably discomfited by the German artist's erotic and confrontational content, Cornell soon abandoned flat collage in favor of box constructions and object sculpture. Nevertheless, for the remainder of his life he remained deeply indebted to Ernst's example of using material clipped from science texts in his art.

OPPOSITE PAGE:

FIGURE 1.9.
 Left to right: Galilée présentant la première lunette astronomique au doge de Venise, in Camille Flammarion, *Les Terres du ciel* (Paris: C. Marpon et E. Flammarion, 1884); Apparition subite de l'étoile nouvelle de 1572, observé par Tycho Brahe; Un jeune homme de 23 ans, Newton, rêvait un soir, and William Herschel découvrant la planète Uranus in Camille Flammarion, *Astronomie Populaire* (Paris: C. Marpon et E. Flammarion, 1880).

FIGURE 1.10.
 Max Ernst, *Mon Petit Mont Blanc*, 1922. Photo-mechanical reproduction, 9¾ × 7½ in. Reproduced in Max Ernst and Paul Eluard, *Les Malheurs des immortels* (Paris: Librairie Six, 1922). Metropolitan Museum of Art. © 2007 Artists Rights Society (ARS) / ADAGP, Paris. Photograph, all rights reserved, The Metropolitan Museum of Art.



FIGURE 1.11.
Joseph Cornell, *Story
without a Name—for
Max Ernst*, c. 1934–35.
Reproduced in *View* (April
1942). Number 10 of 16
collages on paperboard,
10 × 7½ in. Private
collection. Photographer:
Hickey-Robertson,
Houston, TX.

CORNELL AND SURREALISM

Cornell liked his things in piles. Photographs of his basement studio show shelves filled with boxes of source material perched on top of each other, with labels indicating contents as varied as “Plastic Shells,” “Bottle Museums,” and “Flotsam and Jetsam.” Balanced on studio shelves are games and toys and balls and tubes of glitter and porcelain parrots. Photos of his living room reveal more piles. There are stacks of old newspapers, towers of books, and, tucked nearly out of sight, vast hoards of pages and clippings from newspapers, magazines, and books. The sheer quantity of stuff is staggering. The newspaper piles imply an inability to discard the past; the naked dolls and box labeled “Mouse Material” (clumps of dust) border on the perverse.

Cornell lived and worked in a *merzbau* constructed of ready-made items, each one of which, on its own, had little meaning beyond itself, but when combined artistically with other objects or ideas could participate in a kind of mental pinball game of ingenious associations. “Go thru everything in house creatively,” he ordered himself in a note written in 1961.²¹ From the start, Cornell’s artistic mission was to find unlikely links between things and ideas and to suspend them in delicately arranged collages and assemblages. It is a creative process derived from Surrealism’s delight in the mental charge that could

result from the juxtaposition of apparently unrelated things, and it sustained Cornell for his entire career. In his notes, many terms describe the piling up and interconnectedness of associations in his work: sprinkled throughout are references (some borrowed from the language of science) to “unfoldment,” “illumination,” “enrichment,” “distillation,” “extensions,” “sparkings,” “quickenings,” and “crystallization.” He marvels at “sublime ethereality” and “compounded interest.” In one note he describes a “ricocheted” conceptual encounter; in another he fumbles to express the “transcendent something that comes with object activity”; in yet another he records, “Had satisfactory feeling about clearing up debris on cellar floor—‘sweepings’ represent all the rich cross-currents ramifications etc. that go into the boxes but which are not apparent (I feel at least) in the final result.” Above all, his process was one of “cross-indexing”—piling up associations to create a visual poem that exceeds the sum of its individual collage and assemblage elements.²²

Cornell’s relationship to Surrealism is complex. His entry into the world of art was via the Julien Levy Gallery, where he found his niche as a maker of Surrealist collages and objects.²³ His work was viewed and reviewed along with that of other important European Surrealists, including Ernst, Salvador Dalí, and American expatriate Man Ray, and Cornell knew these artists personally. However, his frequent attempts to distance himself from the Surrealist movement have all too often led scholars to discount the role of Surrealism in his work. To be sure, he had little desire to be pigeonholed as a Surrealist, writing Alfred Barr, Jr. in 1936, “I do not share in the subconscious and dream theories of the Surrealists. While fervently admiring much of their work, I have never been an official surrealist, and I believe that surrealism has healthier possibilities than have been developed. The constructions of Marcel Duchamp who the surrealists themselves acknowledge bear out this thought, I believe.”²⁴ In particular, he did not want to be associated with the “black magic” of French Surrealism, preferring the “healthier possibilities” of his own “white magic,” which skirted the emphasis on the occult and the perverse found in certain strains of Surrealist art and literature. Significantly, he associated his own interest in “healthier” alternatives with Duchamp, whose work also creatively merged science and art.

But Cornell’s denied identity as a Surrealist was probably more complicated. By the later 1930s, when the artist was most directly associated with the movement, Surrealism was equated with Communism in the minds of many Americans. A writer in the *Christian Science Monitor* put it succinctly: “Should the Surrealists adhere to their love of wonder and the marvelous, their irrationality and fantasy, we would acknowledge them, but their insistence upon a social program and a logical basis is beyond the understanding of this reader. The authors have attempted too emphatically to establish a link with Freud and Marx.”²⁵ Most likely it was the politicization of Surrealism in the 1930s that Cornell wished to avoid, especially its associations with

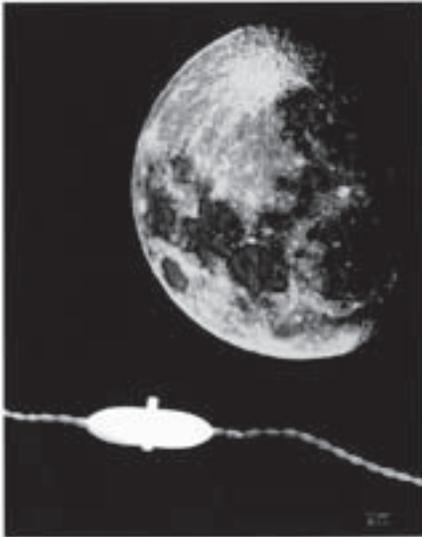
Communist atheism that conflicted directly with his deep-seated religious faith, reflected in his adherence to the teachings of Christian Science.

While Cornell's negative comments about Surrealism were directed toward its identity as a movement, Surrealist creative process was something quite different, and to it he readily acknowledged his profound debt. Throughout his career, he remained steadfastly true to his interest in Surrealist art, clipping and annotating articles about artists (for instance, snipping bits about René Magritte, Joan Miró, Jean Arp, Alberto Giacometti, and Dalí), making diary notes about books he was reading (Marcel Jean's *History of Surrealist Painting* in 1960 and Anna Balakian's *Surrealism, The Road to the Absolute* in 1965), and commenting on the poetry of André Breton and Eluard well into the 1960s.²⁶ Over thirty years after the fact, he still mourned his loss of a particular issue of the journal *Documents*, edited by dissident Surrealist Georges Bataille.²⁷

Despite his protestation to the contrary, Cornell was particularly drawn to the Surrealist belief in the power of the unconscious, as expressed in dreams and visions. He bookmarked and annotated his copy of Freud's *The Interpretation of Dreams*, and his long-standing recording of his own dreams and "hypogogic musings," as he called them, was, in fact, a common Surrealist practice.²⁸ For instance, late in life he reminisced about his walks down "nightmare alley" on lower Broadway in the 1930s, filtering his experience through the nineteenth-century writer Gérard de Neval, also admired by Breton and Eluard. Typical of Cornell's vexed relationship with Surrealism, his "nightmare alley" memory begins with the uncanny and ends with the spiritual:

[a strong sense of having witnessed these areas illuminated (also in waking hours just as much as dream) in the same way as Gérard de Nerval but without his classical sense of form + genius of expression to help out.] But this dormant and latent force must have some kind of present significance to evoke images of such splendid terror. Not just "going back" to the "Chien Andalou" days but feeling this renewal albeit tinged by Pascal's well known feelings about the "abyss."²⁹

Cornell also embraced other aspects of Surrealist creative process. In particular, his fascination with layers of meanings and his juxtaposition of seemingly unrelated subjects have their roots in Surrealism. He acknowledged this, for instance, on a label accompanying his dossier "Ondine," in which he explained that work's "subtle evocative development reminiscent of the associative theme process as often revealed in surrealist art."³⁰ Like other Surrealist artists and writers, Cornell saw vast creative potential in the concept of "chance encounters" first articulated by the proto-Symbolist writer Isidore Ducasse (better known by his nom de plume, le Comte de Lautréamont), later adopted as a creative creed by Surrealists. References to Lautréamont are sprinkled



throughout Cornell's notes.³¹ Cornell credited the importance of Surrealism's validation of the poetic object for his own work, writing in 1967, "Exposure to Surrealism's philosophy relative to, concern with, the 'objet,' a kind of happy marriage with my life-long preoc. with things."³² Indeed, it was with sincere appreciation that he looked back on the "revelation world of surrealism—a golden age—one of white magic without which I don't know where in the world I'd be to-day without it."³³

Surrealism not only provided Cornell with a framework for his creative process, it also offered ways to link art to science. In addition to Ernst's example, Cornell was familiar with works based in science and technology such as Man Ray's Rayograph series, *Electricité*, exhibited at the Julien Levy Gallery in 1932 (fig. 1.12), as well as paintings such as Pierre Roy's *Electrification of the Country* (fig. 1.13), reproduced in *Creative Art* in 1931 and on view in New York in the early 1930s.³⁴ Perhaps he even heard talk of an early work by Dalí, *The Marriage of Buster Keaton*, in which photographs of the film star are combined with clippings of astronomy charts showing solar eclipses, the phases of the Moon, and the relationship of the planets to the Sun.³⁵

Astute American followers of Surrealism were keenly aware of the pairing of science and art to be found in Surrealist quarters. As Dorothy Adlow wrote in 1936 in a review of the Boston showing of the Museum of Modern Art's landmark exhibition *Fantastic Art, Dada, Surrealism*, "The [Surrealist] artist has furthermore been influenced by scientific and pseudo-scientific ideas in relation to thought and the study of mental processes. He has explored his thoughts, analyzed his dreams. Ideas of the universe promulgated by such thinkers as Jeans and Eddington have excited further still the imagination of

FIGURE 1.12.
Man Ray, *Electricité—The World (Electricité—Le Monde)*, 1931. Photogravure, 10¼ × 8⅞ in. The J. Paul Getty Museum, Los Angeles. © Man Ray Trust ARS-ADAGP.



FIGURE 1.13.
 Pierre Roy, *The Electrification of the Country*, 1930.
 Oil on canvas,
 28 $\frac{3}{4}$ × 19 $\frac{7}{16}$ in.
 Wadsworth Atheneum
 Museum of Art, Hart-
 ford, CT, The Ella Gallup
 Sumner and Mary Catlin
 Sumner Collection Fund.
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 Society (ARS), New York /
 ADAGP Paris.

the artist."³⁶ Adlow referred to astronomers Sir James Jeans, whose popular book *The Universe Around Us, Through Space and Time* traced the evolution of theories of the universe from Galileo to the present, and Sir Arthur Eddington, whose book *The Nature of the Physical World* also explained scientific principles to general readers. That Adlow linked both of these important scientists with Surrealism indicates how clear the connection between science and Surrealism was to the general public, as well as to Cornell.³⁷

PLAYFUL ASTRONOMY AND SPIRITUAL SCIENCE

In the art of Marcel Duchamp, Cornell had an especially important model for avant-garde statements built upon the language of science. Although Cornell probably met Duchamp at a Brancusi exhibition held at the Brummer Gallery in 1933, their close association did not begin until August 1942, when Cornell began assisting with the assembly of miniature versions of Duchamp's works, known as the *Boîtes-en-valise*, an edition of reproductions of sixty-nine principal works by the artist, mounted on paperboard and housed in a small leather valise. Cornell worked with Duchamp until January 1946, and his frequent

personal interaction with Duchamp and intimate acquaintance with Duchamp's works resulted in an artistic give-and-take that Cornell experienced with no one else. He paid homage to their interaction with a boxed collection of his own: a "Duchamp Dossier" consisting of objects, notes, and scavenged detritus commemorating their artistic collaboration and friendship.³⁸

Among the many things they had in common was their shared interest in the ways in which the visual, verbal, and conceptual aspects of science could enrich a work of art. As art historian Linda Dalrymple Henderson has shown, Duchamp's notion of "playful physics" undergirds his most important works, especially *The Bride Stripped Bare by Her Bachelors, Even (The Large Glass)*.³⁹ Fascinated by revolutionary discoveries, like X-rays and radioactivity, and new ways of understanding such physical forces as electricity, magnetism, light, and gravity, Duchamp engaged in a rigorous, yet ironic, dialogue about physics and metaphysics in his art. Culminating with the creation of the *Large Glass*, he produced works that function according to their own scientific laws, with physical forces and chemical reactions demonstrated by the imaginative invention of anthropomorphized laboratory instruments and machines. Cornell, too, found in the languages of science vocabularies for artistic expression, although he tended to illustrate known principles of science in his art, rather than imagine new ones as Duchamp did.

Both artists anthropomorphized science for the purpose of art: Duchamp, through his creation of human analogies for scientific actions and principles; Cornell, through his appropriation and transformation of age-old anthropomorphic star constellations. Both artists' scientific methods led to erotic results, although Duchamp's erotic content is more overtly sexual than Cornell's. Both sought to visualize the invisible: Duchamp, by giving form to unseen physical laws, principles, and phenomena; Cornell, by envisioning patterns and meaning in the apparent chaos of the cosmos. Both used the scientific vocabulary of diagrams, charts, and graphs, with their depersonalized lines and mechanistic forms, to endow their works with the aura of the laboratory and textbook. Both artists found more inspiration in repositories of science and technology than in art museums: Duchamp, at the Musée des Arts et Métiers, and Cornell, at the Museum of Natural History and the Hayden Planetarium. Both found an important precursor in Leonardo da Vinci, and both paid homage to the Renaissance master in their art and identities. And, like Leonardo, Duchamp and Cornell were both interested in mathematics, especially geometry and perspective.

But there are significant differences. Duchamp's intense investigation into modern science peaked in the 1910s, and, as Henderson points out, after World War I new scientific advances made much of Duchamp's knowledge outdated. Cornell's interest in astronomy lasted throughout his life, and he kept abreast of recent discoveries and technological advances and incorporated them into his art. As an artist-*cum*-scientist and engineer, Duchamp was primarily drawn

to the microcosmic unseen world of X-rays, radioactivity, magnetism, electricity, and subatomic particles. As an artist-astronomer, Cornell focused on the universe, making works of art that combined the history of astronomy with current findings. Whereas Duchamp indulged in “playful physics” in his works, by creating ironic transformations of the language and principles of science, Cornell countered with what we may call “playful astronomy,” by couching references to astronomy’s rich past and exciting present in terms of metaphor and metamorphosis. Nevertheless, Cornell learned many important lessons from Duchamp: how to use found objects to create works of art; how to appropriate the language and methods of science for aesthetic effect; and how to make artworks that could be both densely cerebral and whimsically witty.

Like many artists, writers, and even physicists of his day, Duchamp blurred the boundaries between science and the occult, finding in the language and metaphors of alchemy ways to conceptualize new discoveries such as X-rays and radioactivity.⁴⁰ Perhaps following Duchamp’s lead, Cornell also dabbled in astrology and alchemy, filing away articles about Paracelsus and the history of alchemical traditions, saving packs of tarot cards, and designing a commercial layout for *Harper’s Bazaar* about astrological signs of movie stars.⁴¹ He clipped an article entitled “The Poet’s Alembic” from the *Christian Science Monitor* in 1953, and in 1967 he wrote a diary entry entitled “The Chemistry // Alchemy of Collage.”⁴² However, in comparison to the vast quantity of materials about and references to the science of astronomy in his papers, these encounters with the occult are extremely rare, indicating only passing interest in subjects that were far more important to artists such as Ernst and Duchamp.

Even though Cornell did not share the deep-seated interest in alchemy demonstrated by his contemporaries, he did have a metaphysical framework in which he placed his art, his understanding of science, and, indeed, his very soul: the religion of Christian Science.⁴³ He became a Christian Scientist long before he emerged as an artist, first turning to the church between 1925 and 1926 after a healing experience. He taught Sunday school and worked in a Christian Science Reading Room. Although the intensity of his involvement with the church waxed and waned, his beliefs were an ongoing source of spiritual nourishment. A constant refrain in his notes are references to hymns, biblical texts, and the writings of the faith’s founder, Mary Baker Eddy. On its most basic level, Christian Science provided Cornell with a belief system that superficially intersected with the interest in alchemy and the occult shared by scientists and artists, who likewise turned to metaphysics to understand the transformations of subatomic particles and the evolution of galaxies.

Throughout her writings, Eddy asserts that the material world should be viewed as a collection of symbols representing greater immaterial realities, and that life is a process of transmutation from substance to spirit. Like the language of alchemy, Christian Science discourse relies on symbols and



analogies, with frequent recourse to physical science to explain the metaphysics of the spirit. In the central text of Christian Science, *Science and Health with Key to the Scriptures*, published in 1875, Eddy writes, “Copernicus mapped out the stellar system, and before he spake, astrography was chaotic, and the heavenly fields were incorrectly explored.” Like Copernicus, Eddy presents a new cosmology. In it, astronomy is a metaphor for God. She observes, “astronomical order imitates the action of divine Principle; and the universe, the reflection of God, is thus brought nearer the spiritual fact, and is allied to divine Science as displayed in the everlasting government of the universe.”⁴⁴

In Christian Science, objects and ideas are symbols for greater metaphysical transformations. Consider, for example, lines from one of the many poems that Cornell clipped from the *Christian Science Monitor* for his files: “Symbol may be a refuge / for the substance meant / and parable—the passage / of truth from prisonment.”⁴⁵ Among those symbols and parables were the stars and the scientific facts associated with them. As Eddy writes in *Science and Health with Key to the Scriptures*: “As astronomy reverses the human perception of the movement of the solar system, so Christian Science reverses the

FIGURE 1.14.
Maud Granger as
Astronomy, Joseph Cornell
Study Center, Smithsonian
American Art Museum.
Mark Gulezian/QuickSil-
ver Photographers.

seeming relation of Soul and body and makes body tributary to Mind."⁴⁶ With its concern for the immaterial, or, to use a favorite term of Cornell's, the "ineffable," Christian Science offered him a model for using the facts of science as transcendent symbols.

* * * * *

Among the many nineteenth-century photographs in Cornell's papers is a cabinet card portraying a woman holding a globe and pointing heavenward (fig. 1.14). An inscription on the back confirms her identity as the actress Maud Granger, posing as Urania, muse of astronomy. Perched on a rocky throne with her head among the stars, she is an intermediary between Earth and the heavens. The photograph was but one of many pictures of Urania that Cornell collected over the years, attesting to the figure's relevance to him as a cross-indexer of a number of important concepts. From a historical perspective, she embodies *Astronomia*, one of the seven liberal arts, with roots in astronomy going back to antiquity. As an allegory of science, she links the known, mapped Earth and the unknown, uncharted distances of the universe. Seen through the lens of Surrealism, she presents a bizarre merger of popular culture and science in the form of a character who seems to have stepped out of a dream. From a spiritual standpoint, like a Christian Scientist she turns her attention away from worldly things and focuses on infinite Heaven above. All of these meanings resonated with Cornell, who found an enduring source of symbols for physical and metaphysical existence in his lifelong engagement with astronomy. In his art and in his life, the stars were his guide as he investigated the far reaches of his own creative cosmos.