

# DIAGRAM

# 2

How do diagrams work as objects? How can diagrams be objects to think with? These are large questions and difficult to broach in the abstract. To approach them means attending to the perceptual skills and habits with which we apprehend and understand representations in general. Treating diagrams as things in themselves means giving up the notion that they are simply abstractions of reality, stripped down versions of the world of experience. In this chapter we want to situate diagrams within experience and to map the chain of thoughts and gestures of attention that give them meaning.

We begin with an information-rich painting by François Desportes (FIGURE 5 / PLATE 3). Desportes sets before our eyes a richly carved silver dish with fruit reflected panoramically in two highly polished silver platters. A luxurious, marble-topped commode visible at the lower right forms a table of presentation. A thick velvet curtain disguises most of the table and rises behind the arrangement to merge with the vertical planes of the spatial container. The slightly chipped stones of a wall suggest an architectural opening toward the right, but three dead partridges discourage us from penetrating this space. An elaborate ewer backed by a platter further



FIGURE 5

François Desportes, *Silver Tureen with Peaches*, n.d. Oil on canvas. Stockholm, Nationalmuseum, inv. NM 800 (91 × 118 cm). Photo: © The National Museum of Fine Arts, Stockholm.

limits our exploration of the surrounding context. Desportes completely fills the spatial box of the picture with an intelligible arrangement of things: his presentation of the peaches is staged with an artifice quite unlike everyday appearance. The still-life—a delicious object in itself—orchestrates a wealth of visual information. Yet every element is returned to a single point of view from which we could choose a peach at the back of the dish without changing position. This implied facility of movement only obscures the absolute fixity of our placement before the picture. By contrast, a real bowl of peaches can be approached from literally hundreds of directions.

Most visual diagrams are ranged upon a flat planar surface similar to Desportes's canvas, but they multiply points of view by presenting arrays rather than legislating the single view of a replete spatial environment. Diagrams incite a correlation of sensory data with the mental schema of lived experience that emulates the way we explore objects in the world. They are closer to being things than to being representations of things. Consider the *Encyclopedie's* plate of a pastry-maker's shop (FIGURE 6) alongside the aestheticized and sealed world of Desportes's peaches.<sup>1</sup> The upper part offers a view of the workroom in which many objects and ingredients—including game birds and a wild hare—are arranged on tables, displayed on shelves, and hung on the walls of a clearly articulated spatial box. The sheer number of things produces an orderly clutter, but there are very many spatial voids: the empty foreground; the implied openings both left and right; and the measurable distances among work stations where each figure performs a specialized task. Desportes's still-life closely links a cohort of adjoining objects to produce a claustrophobic space. The components of the pastry shop are isolated spatially and functionally from one another; they offer themselves to multiple regards and users, and they generate an emptiness that invites movement.

In the lower part of the pastry plate one re-encounters up close, and from several different angles, some implements visible in the workroom's overall view. The kneading station, nearly hidden in the general tableau, appears below in a three-quarters view that clarifies its size and features of use. The kneading station is seen in perspective, but its relationship to the spatial box of the upper tableau must be extrapolated. Conventions of rendering appear to capture the object's three-dimensionality, but without displacing any measurable volume: there is



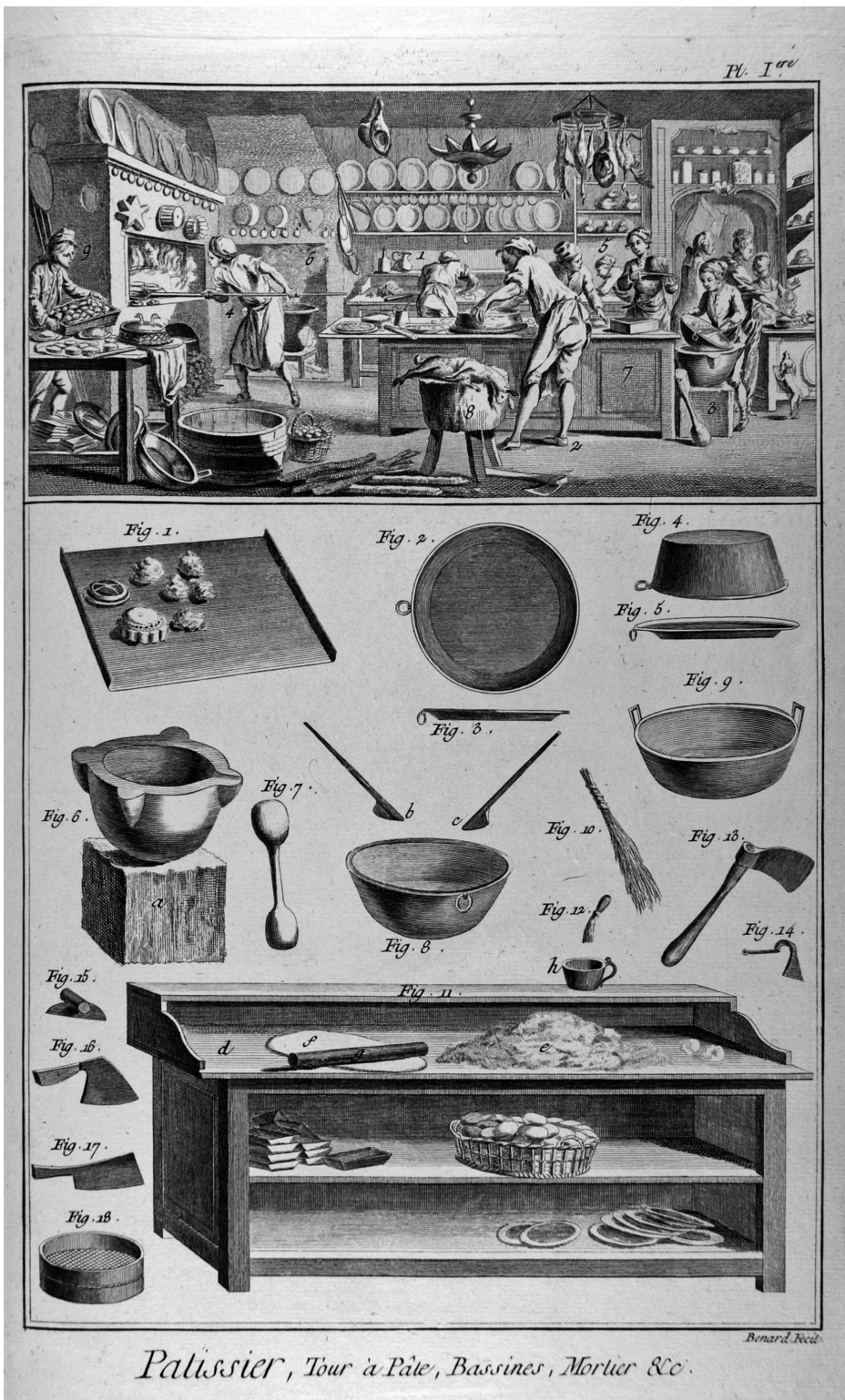


FIGURE 6  
 “Pâtissier, Tour à Pâte, Bassines,  
 Mortier, &c.,” pl. I. Engraving by  
 Robert Bénard for Diderot and  
 d’Alembert, *Recueil des Planches*,  
 vol. 8. Courtesy Department of  
 Special Collections, Stanford  
 University Libraries.  
 Photo: Marrinan.



no place to stand before the kneading station and it casts no shadows onto the surrounding white surface. This paradoxical notation signals to an attentive viewer that the white of the page is neither a void nor a space but simply a material whiteness.<sup>2</sup> This whiteness is an arena of potentiality that fosters connections without fixing them or foreclosing thought experiments. Numbers near objects lie on the white surface and index explanations in the accompanying legend. Volumetric renderings perforate the whiteness with the materiality of things in space and promote visual correlations with their appearance in the general view.<sup>3</sup> This whiteness permeates the plates of the *Encyclopedia* and characterizes their mode of description. It serves as the medium for mimetic simulations inside perspective tableaux, and as a neutral field of presentation for the floating world of visual catalogues that makes up the other sectors of the plates. This whiteness is the field of Diderot's *rapport* that we call correlation. We take it to be a virtual space whose material presence—which joins together the disparate parts of the *Encyclopedia* plates—provides support for the composite play of imagery and cognition that is the motor-energy of diagram.

The *Encyclopedia's* preoccupation with technique privileges an imagined, tactile manipulation of things as a powerful mode of correlation. The plate on pastry-making specifies correct practical applications of its tools, and we do track the kneading stand and other objects in use as specified in the legend. At the same time, correlation permits flexibility, both in our passage through the white field of display to the space of use and in our awareness of the creative misuse of tools. The heavy stone mortar on its wood block, for instance, becomes in the image of the shop a perfect support for the copper basin in which a young man beats egg whites. The white field of display below and the white space of work above are conceptually discontinuous, yet the whiteness joining them supports projections and correlations that would otherwise escape the habits of normal use.

The spaces of work depicted in the plates of the *Encyclopedia* recall mimetic representations in genre painting, alongside objects catalogued in white fields of display. We do not naturalize the plates in this way. Rather, we underscore the separateness of their visual compartments to keep alive the idea that diagrams de-naturalize things in order to open

up spaces for creative misuse. A picture like Jean-Baptiste-Siméon Chardin's *The Copper Fountain* (FIGURE 7 / PLATE 4) shares accidental affinities with the plates, for it also sets objects on a simple table of presentation against a nearly flat, undifferentiated field of color. Nonetheless, contrasts between the plate and the Chardin can sharpen our argument about diagram. Color is the most salient difference, but closely associated is the play of light and shade, which shapes Chardin's intimate cor-

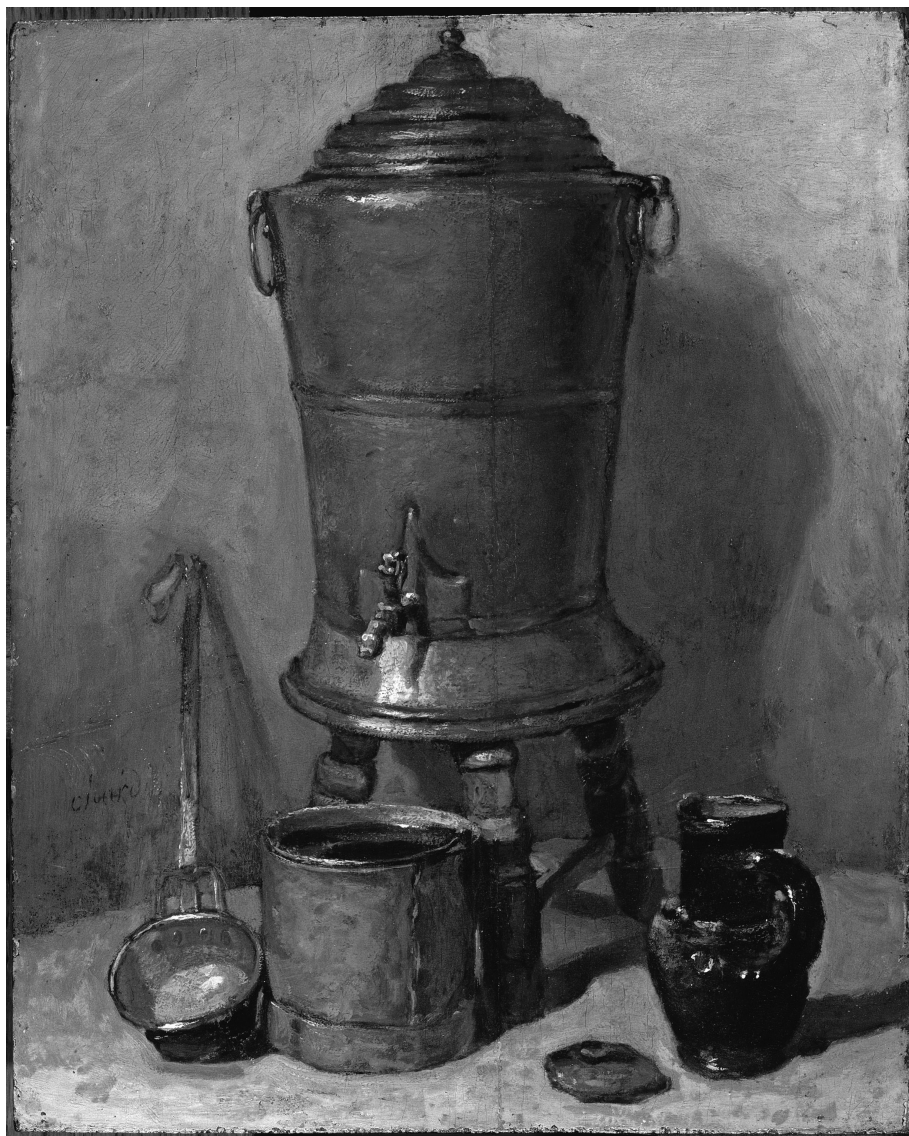


FIGURE 7

Jean-Baptiste-Siméon Chardin,  
*The Copper Fountain*, n.d. Oil on  
wood. Paris, Musée du Louvre, inv.

MI 1037 (25.8 × 23 cm). Photo:

© Réunion des Musées Nationaux / Art Resource, NY / © Gérard

Blot / Hervé Lewandowski.

ner of the world more subtly than strict geometric perspective. Chardin's light falls evenly across everything, casting shadows that relate objects to one another and to their shared space before the background wall. Light in the pastry plate diffuses differentially. It enters strongly from the right and casts a pattern of commonsense shadows throughout the workshop, but no such regularity prevails in the section of whiteness below, where each tool receives its own light and casts no shadows. Chardin's objects live within a fixed formal order where the cistern and its attendant objects describe an obvious pyramid of shapes. They also imply a story of everyday use. As we scan from the dipper at the left, to the bucket under the spigot, and onto the pitcher and its cover at the right, the activity comes to mind of filling a water pitcher for use at table.

Chardin's pointed rendering of a dull sheen on the surfaces and edges of each object suggests the patina of wear produced by repeated enactments of such ritual gestures over many years. The picture is a still-life [nature morte], but its visual markers activate the objects with an aura of past history and distant times. The pastry plate (FIGURE 6) actually depicts the use of objects, yet its several activities are not choreographed into a coherent narrative thread. The workers perform their separate tasks with such great attention that they are almost oblivious to one another's presence—an effect of isolation broken only at the far right where an attendant cuts a pâté for a customer. The plate freezes several discrete actions as if in an instant, denying the passage of time and the physical contingencies of production.<sup>4</sup> Unlike Chardin's objects, those of the *Encyclopedia* plate show not the least sign of wear. This lack of patina is a striking erasure within the *Encyclopedia*'s plates, an absence that suggests these images do not index a past time but activate the here and now of present encounter. To imagine dipping water from Chardin's bucket to fill the pitcher associates us with the history of those who have done so before or will come after. By contrast, the plate engages us with techniques stripped of a visible history, practices that start afresh each time and remain perpetually new.

## II

Dislocating the plates from the task of representation to an existence akin to objects places them in a visual culture of print media not circumscribed



by the demands of technical illustration, not dominated by the structure of language, and not isolated as aesthetic objects. The distinctive gain of this approach becomes clear if we consider Roland Barthes's discussion of the pastry-making plate.<sup>5</sup> In the lower part of this image he finds "the ensemble of various instruments necessary to the profession," each "inert, frozen in its essence . . . analogous to the quasi-academic form of a verbal or nominal paradigm." By contrast, the vignettes present the object and its varieties "in a lively scene . . . linked to other objects within a real situation: here we rediscover the syntagmatic dimension of the message."<sup>6</sup> Barthes's view of the plates is built upon a structuralist theory that maps language along two axes: a paradigmatic axis that allows for substitutions and metaphors; a syntagmatic axis that makes possible the expression of time and action. "The *Encyclopedic* image," he writes, "is human not only because man is represented in it but also because it constitutes a structure of *information*. This structure, though iconographic, is articulated in most instances like real language (the one which, in fact, we call *articulate*), whose two dimensions as revealed by structural linguistics it reproduces."<sup>7</sup> Barthes's linguistic model of the *Encyclopedia* plates effaces their problematic visual fissures. In his account, they display neither more nor less discontinuity than everyday language, despite a later declaration about their monstrous poetics.

Barthes never sacrifices the "progress of reason." The plates retain a "logical character" in which "the image analyzes, first enumerating the scattered elements of the object or of the operation and flinging them as on a table before the reader's eyes, then recomposing them, even adding to them the density of the scene, i.e., of life." Barthes begins by asserting, in the tradition of Lessing, that the plates differ from the texts of the *Encyclopedia*. The plates mobilize reading without the single logical vector that the linearity of language requires.<sup>8</sup> He claims for the plates "a precious circularity: we can read them starting from the experiential or, on the contrary, from the intelligible: the real world is not reduced, it is suspended between two great orders of reality, in truth, irreducible orders."<sup>9</sup> Although the plates are visual forms, they are suspended—like language—between the two great orders of experience and intelligibility. This is why Barthes breaks them down into paradigmatic and syntagmatic components. His homology betrays a deep-seated bias for *reading*

the plates, regardless of the order in which they are perceived. Readability—indeed, *narrativity*—is, for him, the essential component of their value as information.

Barthes eventually develops a “poetics” for the plates, by which he means “the sphere of the infinite vibrations of meaning, at the center of which is placed the literal object.” The images repeatedly animate a vibration of astonishment in viewers, an effect he characterizes with a specific example:

Consider the astonishing image of man reduced to his network of veins; here anatomical boldness unites with the great poetic and philosophic interrogation: *What is it?* What name to give it? How give a name? A thousand names rise up, dislodging each other: a tree, a bear, a monster, a hair shirt, a fabric, everything which overflows the human silhouette, distends it, draws it towards regions remote from itself, makes it overstep the divisions of Nature; yet, just as in the sketch of a master, the swarm of pencil strokes finally resolves into a pure and exact form, perfectly signifying, so here all the vibrations of meaning concur to impose upon us a certain idea of the object.<sup>10</sup>

Barthes’s question “what is it?” before the *Encyclopedia*’s rendering of the human venous system (FIGURE 4) quickly becomes a problem of *describing* the graphic image: “What name to give it? How give a name?” Faced with a set of bewildering marks on the page, Barthes recognizes that many names are possible, but he avoids open-ended reading by adopting a vocabulary of connoisseurship —“just as in the sketch of a master.” After a moment’s hesitation he accedes “to that great undifferentiated substance of which verbal or pictorial poetry is the mode of knowledge,” and he concludes, “the iconography of the *Encyclopedia* is poetic.”<sup>11</sup> In the end, Barthes’s appreciation is aesthetic.

Despite his best efforts to locate and to name an underlying unity in the plates of the *Encyclopedia*, Barthes often lingers on their peculiar discontinuities. He notes that the plates transgress nature by offering monstrosities in the guise of explanations, yet he de-radicalizes the implications of monstrosity: “all these transgressions of Nature make us understand that the poetic (for the monstrous can only be the poetic) is never established except by a displacement of the level of perception.” Paradoxically, Barthes brackets these variations with normalizing

aesthetic categories, even while recognizing “it is one of the *Encyclopedia*’s great gifts to *vary* (in the musical sense of the term) the level on which one and the same object can be perceived, thereby liberating the very secrets of form.” He is fascinated by the shifting scale and points of view within the plates, such as the monstrous flea or labyrinthine snowflake, but he confines his responses to the closely guarded enclave of the aesthetic: “is poetry not a certain power of *disproportion*, as Baudelaire saw so well, describing the effects of reduction and focusing that hashish induces?”<sup>12</sup> Many plates do juxtapose sensibilia—as if recorded by instruments or from synthesized points of view—to data of a human scale and range. These visual arrays of new and sometimes surprising forms of knowledge need not be perceptual, much less aesthetic.

Barthes does acknowledge the disruptive epistemology of the plates:

It is the *Encyclopedia*’s wager (in its plates) to be both a didactic work, based consequently on a severe demand for objectivity (for “reality”), and a poetic work in which the real is constantly overcome by *some other thing* (the *other* is the sign of all mysteries). By purely graphic means, which never resort to the noble alibi of *art*, Encyclopedic drawing explodes the exact world it takes as its subject. . . . In its very order (described here in the form of the syntagm and the paradigm, the vignette and the bottom of the page), the Encyclopedic plate accomplishes this *risk* of reason.<sup>13</sup>

For Barthes, the two-part visual structure of many plates produces a transcendent “opening up” of Nature and generates “a kind of wild surrealism” at the heart of an ostensibly didactic program. Yet their disruptive, mixed-up world, their fascination with the “*wrong side* of things,” never escapes intelligibility, because Barthes frames their two-part visual arrays—the vignettes and the analytic images—as simply mirroring the double articulation of language.<sup>14</sup>

A lens of astonishment, wonderment, and violence is one device to understand a plate like the anatomized hand and foot (FIGURE 8). A linguistic paradigm might also work here because of the need to decipher the nearly unintelligible view of a foot’s underside. The letters and numbers keying individual parts to the printed legend also imply decipherment. Surely, paradigmatic and syntagmatic dimensions are at work, though not in Barthes’s favored configuration with a tableau at the top and a visual



catalogue below. Our understanding of diagram expands Barthes's ability to read across a variety of plates. We do not focus on individual images or localized groupings, but emphasize improvised visual comparisons among them. Such correlations, which leap across categories and break out of the discrete parcels of plates in related groupings, test the limits of Barthes's treatment.

The plates on "Dessein" are examples that fit neither with Barthes's system of astonishment and violence nor with his linguistic paradigm. He is little interested in such plates. Our visual theory of diagram attends to the nearly invisible internal ruptures in the plate showing legs and feet (FIGURE 9). Two separate renderings of legs in space merge imperceptibly as if they formed one tableau, while front and profile views of a foot are presented above in annotated drawings. The scaled measurements under the pair of feet at the top of the page imply a realm analogous to the visual catalogue of more overtly divided plates, but this domain bleeds across the whiteness to merge with the highlighted mass of a three-dimensional leg. Just as in the pastry-making plate, a material whiteness posits diagrammatic potential and permits a leap from the plate of legs and feet to that of hands (FIGURE 10). In this plate, four disembodied hands caught in different gestures are rendered in localized spaces: truncated shadows situate the fragment and shape physical volumes modeled by light. But the shadows dissolve almost immediately into white and are linked across the blank field, both to one another and to a fifth hand modeled in light, annotated with letters, yet casting no external shadows. The whiteness provokes an almost imperceptible switching between tableau and visual catalogue—Diderot's *rapport* in action. It also enables an even greater leap—back a full two volumes of plates—from the "Dessein" rendering of hands (FIGURE 10) to that of "Anatomie" (FIGURE 8). When diagrams are treated as material objects, their entire surface plays a role and whiteness is never a void. Switching between disciplines like drawing and anatomy becomes standard procedure in a process of correlation that produces new forms of knowledge and understanding. When anatomy's insider view of the hand is put against the surface we live with in daily life, the user is reminded of his or her physical being and cognitive activity: this awareness is located in neither of the images separately, but only comes alive in the activity of correlation.

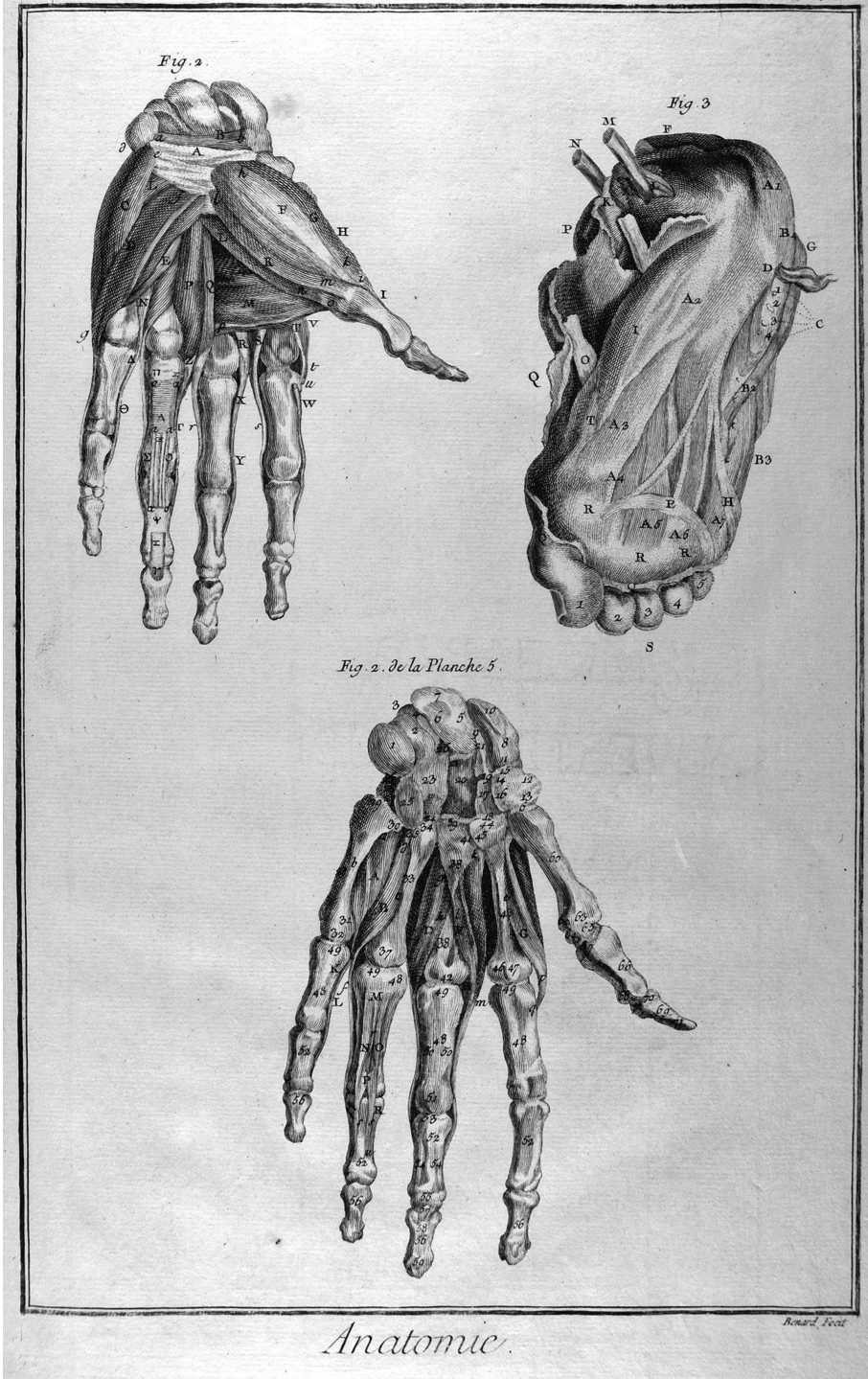


FIGURE 8  
"Anatomie," pl. Seconde IV.  
Engraving by Robert Bénard for  
Diderot and d'Alembert, *Recueil  
des Planches*, vol. 1. Courtesy  
Department of Special Collections,  
Stanford University Libraries.  
Photo: Marrinan.



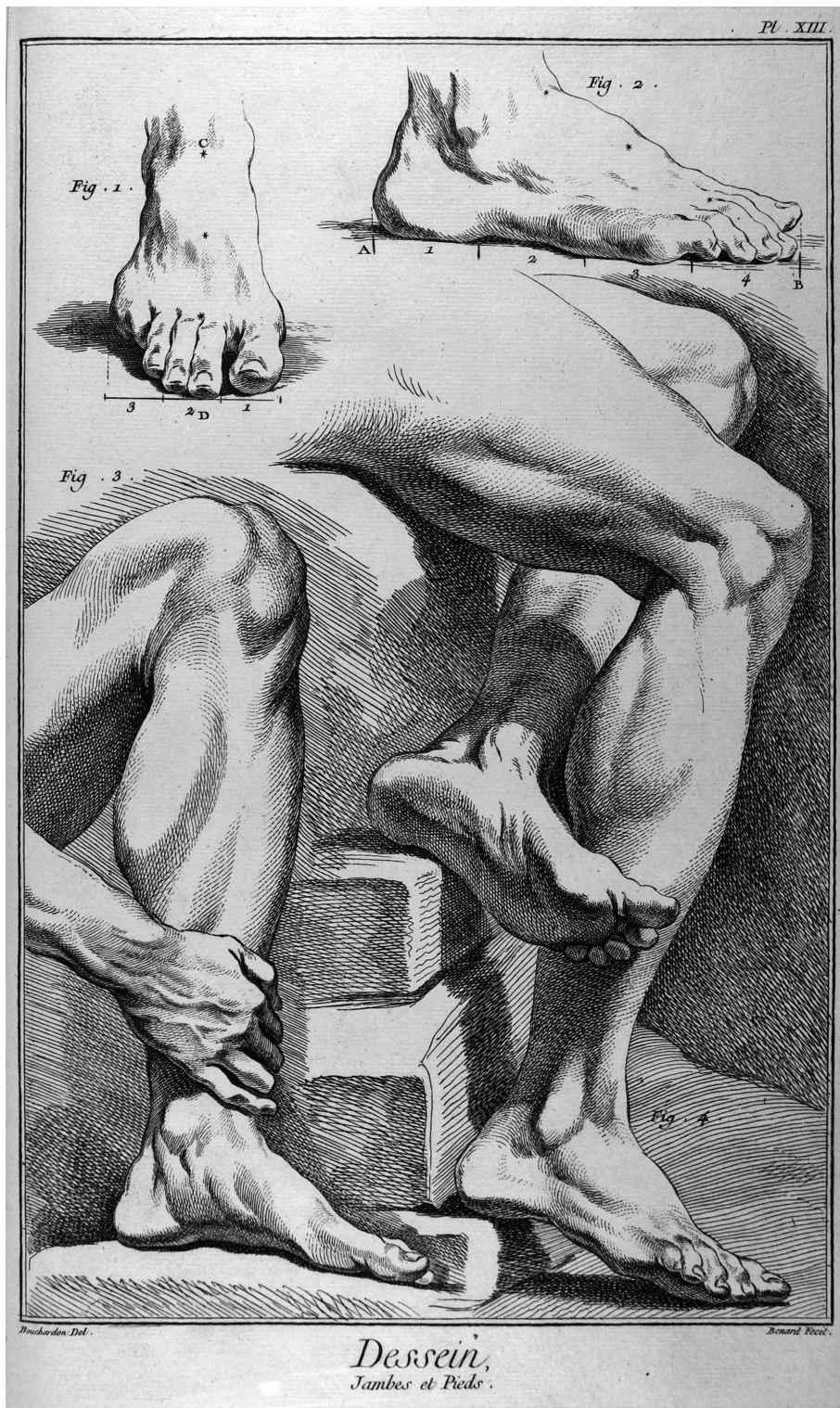


FIGURE 9  
“Dessein, Jambes et Pieds,”  
pl. XIII. Engraving by Robert  
Bénard after a design by Edmé  
Bouchardon for Diderot and  
d’Alembert, *Recueil des Planches*,  
vol. 3. Courtesy Department of  
Special Collections, Stanford  
University Libraries.  
Photo: Marrinan.



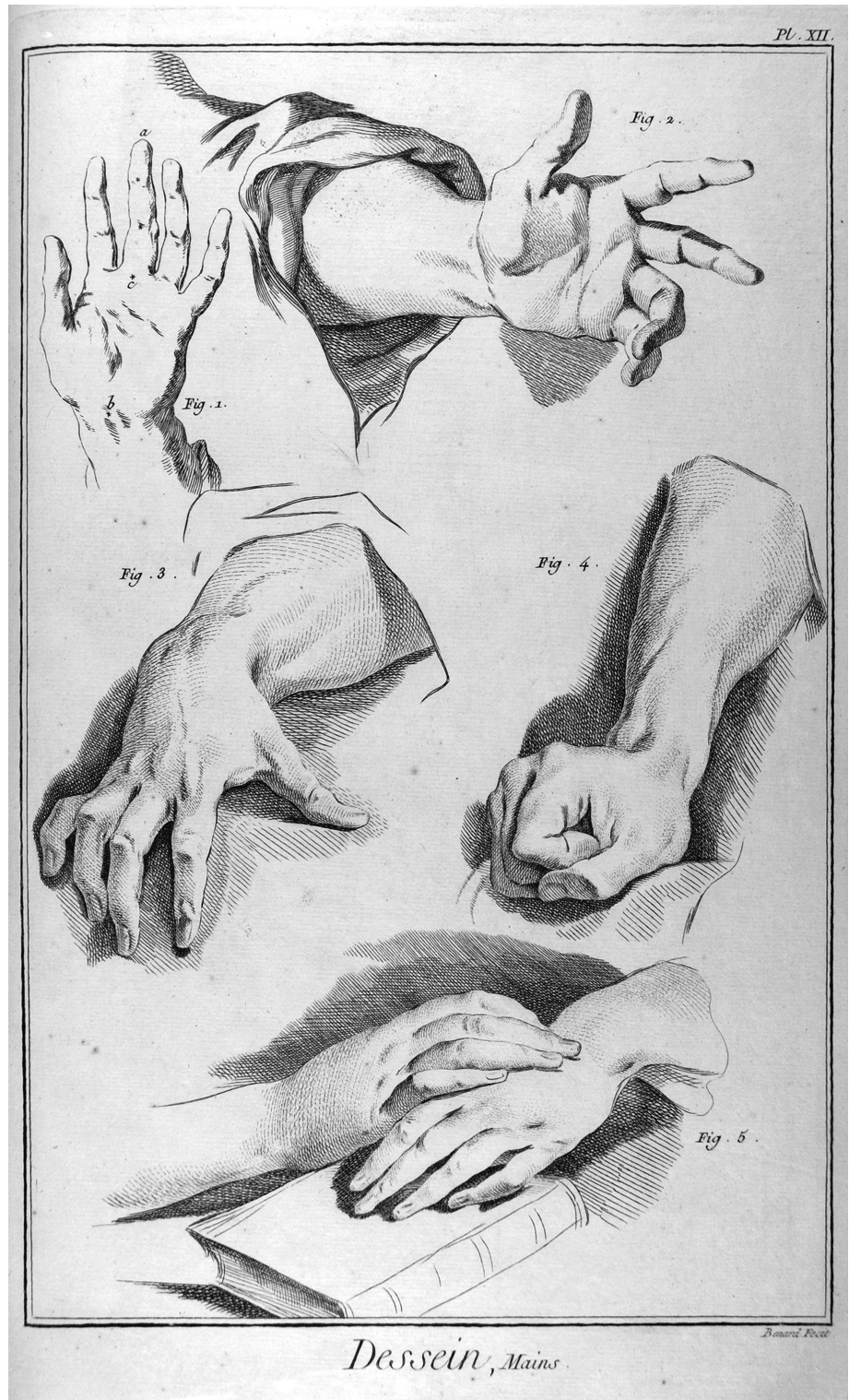


FIGURE 10  
“Dessein, Mains,” pl. XII. En-  
graving by Robert Bénard for  
Diderot and d’Alembert, *Recueil  
des Planches*, vol. 3. Courtesy  
Department of Special Collections,  
Stanford University Libraries.  
Photo: Marrinan.

Barthes asked, confronting the plate of the human venous system, “How give a name?” We want to name such images *diagrams*, an ordinary term that offers a powerful tool for articulating the radical nature of description within the pages of the *Encyclopedia*. We take diagrams to be visual forms of description that make few concessions to imitation, meaning by “imitation” a staging of content as if belonging to a world both contiguous with and similar to our own. Our view of diagrams aligns them functionally with the “working objects” of late-eighteenth-century atlases discussed by Lorraine Daston and Peter Galison. “If working objects are not raw nature,” they write, “they are not yet concepts, much less conjectures or theories; they are the materials from which concepts are formed and to which they are applied.”<sup>15</sup> Daston and Galison are concerned with the specific genre of scientific atlases as part of a larger project to “chart the emergence and nature of new conceptions of objectivity and subjectivity” across the nineteenth and early twentieth centuries. Their account underscores the period’s attempts to achieve the balance between individual and type that was deemed essential for an effect of “objectivity.” Eighteenth-century atlas-makers short-circuited the idealization and aesthetic interpretation of artists by enlisting grids, measurements, and devices like the camera obscura. Daston and Galison suggest that atlases “be seen as a hybrid of the idealizing and naturalizing modes: although an individual object (rather than an imagined composite or corrected ideal) is depicted, it is made to stand for a whole class of similar objects.” The hybrid of “idealizing” and “naturalizing” seen by Daston and Galison in atlases corresponds historically to the productive discontinuity established by the use of visual catalogues and tableaux in the diagrams of the *Encyclopedia*. This point will become clear after we explain the stakes involved in these terms.

### III

Both visual catalogues and tableaux present information in iconic form. Both organize their information according to some internal hierarchy of importance. Both establish a sense of scale relative to other things in the world. And both assume some kind of viewer or perceiver of the information presented. Tableaux, as in the example of Chardin’s *Copper Fountain*, characteristically locate this information in a fictive world that

resembles in space and scale the world of human experience. Tableaux assume that viewers are human beings endowed with normal perceptual skills. More important, tableaux maintain a fixed and stable relationship among hierarchies of importance, scalar references, and assumed viewers. Visual catalogues, in contrast, vary the constituent elements of hierarchy, scale, and subjective orientation independent of one another. They provide information about things that lie outside the range of normal human perception, draw parallels among things that vary widely in size or function, and report data indifferently, like instruments.

Diagrams align, juxtapose, and contrast two kinds of information: on the one hand, the autonomous bursts of data that characterize visual catalogues; on the other, the uniform flux of homogenous information provided by tableaux. Explanatory texts keyed to the imagery may attempt to stabilize this flux of information and may be an integral element of diagrams. But language cannot fully specify all of the ways in which users employ diagrammatic material. This unspecified interaction of varied components generates kinds of knowledge impossible to infer from any one element: the pastry-making plate as a whole is a *diagram* of the trade, not simply a genre-like rendering of its practice nor an inventory of its specialized implements.

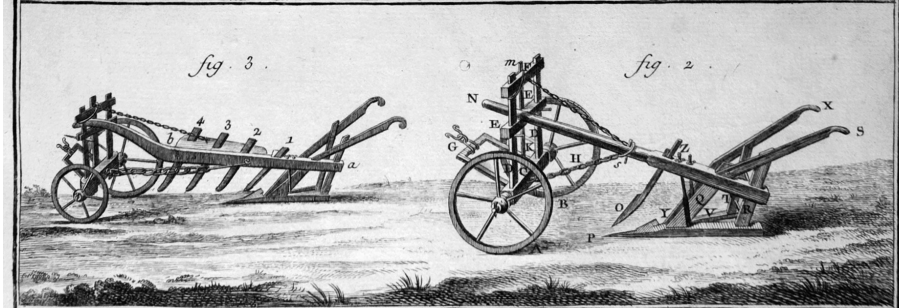
Our scheme, which places visual catalogue and tableau under the aegis of diagram, establishes a new context for the idea of tableau. The illusionist “spatial box” of post-Renaissance Western European painting has been the dominant form of visual organization in Europe since the late Middle Ages, and remains a preferred model for presenting visual information.<sup>16</sup> To chart the affinities between visual catalogues and tableaux is to recognize that the geometric armature of one-point perspective theorized by Leone-Battista Alberti, along with the distant-point perspective systems favored by Dutch artists, are themselves diagrams. Alberti’s theory synchronizes assumptions of hierarchy, scale, and the coherence of a viewer’s perceptions of the world to promote a humanist subject for whom visual information is organized.<sup>17</sup> The Albertian diagram of vision was peculiar, for it closed down rather than opened up the possibilities of correlation by replacing the plenitude of the world with a geometry of sight, a conic field of vision imprisoned before a peep-hole: the user of his diagram has but one choice.<sup>18</sup> The distance-point system of perspective

dispensed with the absolutism of Alberti's conic scheme to offer a wider range of descriptive possibilities that attends to individual objects rather than ordering empty space. It does not refer the world to a single point of vision, but assumes that the world is ordered and offers users several avenues of correlating and understanding that order. By contrast, the diagrams deployed in the *Encyclopedie* present phenomena of everyday life without foreclosing the potential for many views, thus leaving open numerous opportunities for users to make personalized correlations.

The complexity of diagram in the *Encyclopedie* unfolds in the images on "Agriculture" that launch the entire collection of plates with the fundamental life activity of plowing and sowing. The series opens with a tableau much larger than the vignettes typical of the *métier* plates (FIGURE 11). This image vacillates between a distance-point rendering of space in the manner of Dutch landscapes and a visual catalogue, grounded on whiteness, where two stages in the development of agricultural technology are presented. At first glance, the landscape seems to unfold from near to far with a conventional foreground, middle ground, and background. Ruins of a fortress on the hill establish an historical past as well as the horizon. The village nestled beneath signals contemporary habitation. But this smooth progression of historical time is interrupted by another chronology: in the middle ground appears a cluster of figures far too large for their placement in perspectival space. Legends help us to understand these anomalies of scale, but they interject a present time of reading that collapses temporal distance. Here, men plant crops in three independent operations: one casts the seed by hand, one guides a harrow, and a third compacts the ground with a roller. A row of bushes and a dilapidated fence separate the middle from the immediate foreground. In this sector, two even larger figures appear in profile across the plate and, as the legend declares, practice a new form of planting. The woman guides a device designed by the abbé Soumille that drops seeds at regular intervals in a straight line. A man with a modern plow traces the same line to cover the seeds immediately.

The picturesque inhabitants of the plate appear to domesticate a natural environment that is coherent in time and space, like a painting by Ruisdael (FIGURE 12 / PLATE 5). But such a comparison underscores how Ruisdael's corner of the world is knit together as an organic whole that





*Agriculture, Labourage.*

Bénard Sculp.

FIGURE 11  
 "Agriculture, Labourage," pl. I.  
 Engraving by Robert Bénard for  
 Diderot and d'Alembert, *Recueil  
 des Planches*, vol. 1. Courtesy  
 Department of Special Collections,  
 Stanford University Libraries.  
 Photo: Marrinan.





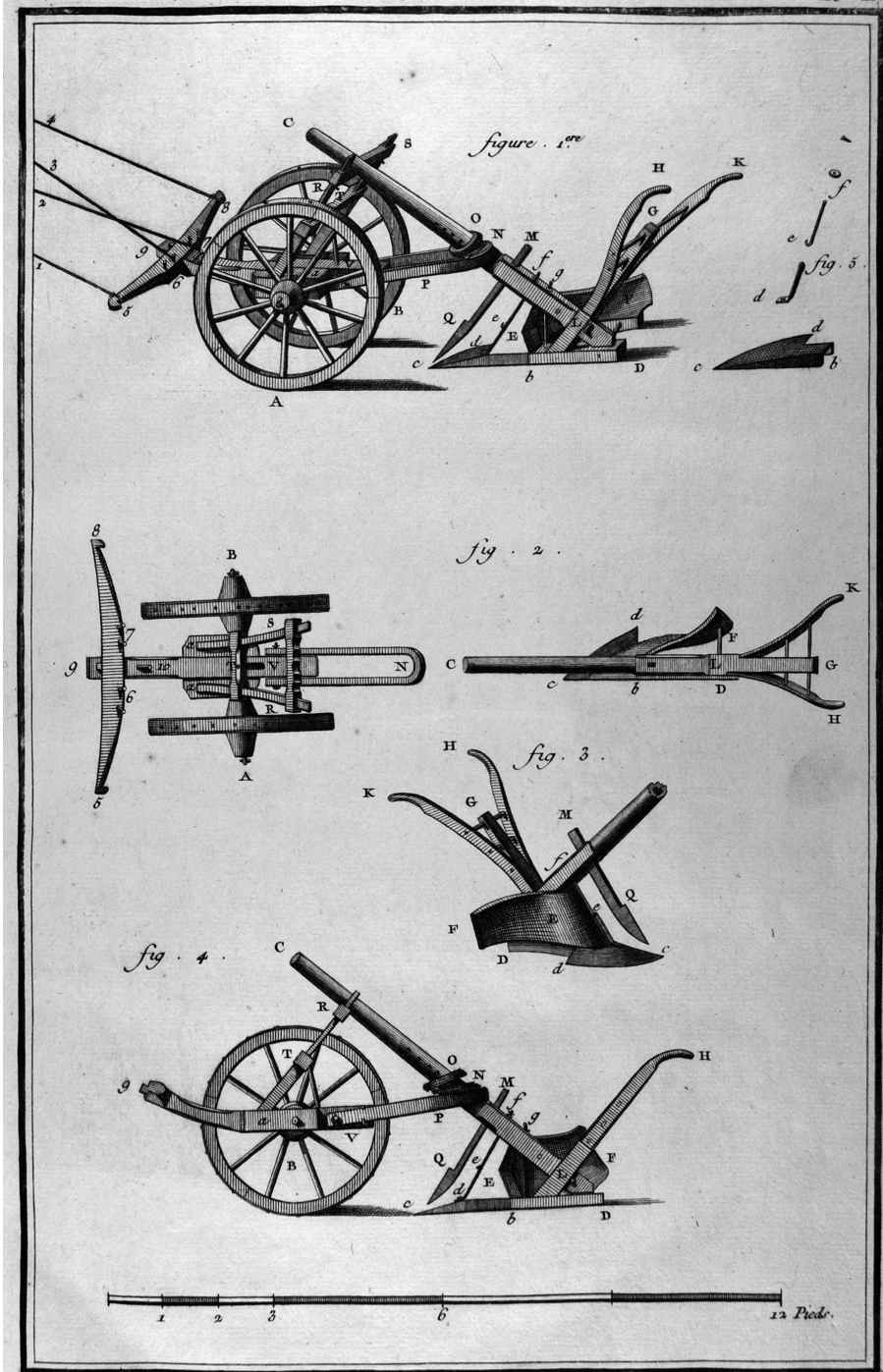
FIGURE 12

Jacob van Ruisdael, *Landscape near Muiderberg*, ca. 1652. Oil on canvas. Oxford, Ashmolean Museum, inv. A875 (66 × 75 cm). Photo: Ashmolean Museum, Oxford.

resists analytic parsing: his picture offers a complex play of light and shade animated by the natural forces of wind and water. By contrast, the pastoral unity of the plate fractures visually into two zones of bright light—separated in time and space—where the progress of agricultural technology is catalogued and demonstrated. Here, in the first image among the *Encyclopedia*'s thousands, the framing devices and visual unities of landscape representation yield to the formal requirements of a correlation designed to explain. This upper segment achieves at a stroke the double optic united by whiteness of the bi-partite pastry-maker's plate (FIGURE 6).

The lower section of the first "Agriculture" plate both reveals and extends the complications implicit in the upper part. Two examples of plows—an "ordinary" type and an "improved" version designed by Monsieur Tull—are situated on a ground plane marked by tufts of grass upon which they cast shadows. In this part of the plate the whiteness hovers in a state of suspended reference: are we to connect it to the areas of pure white in the image above and read it as infinite space, or should we relate it to the pervasive whiteness of plate II (FIGURE 13) and understand it as the virtual space of a visual catalogue? The choice is left open. We can read the *dédoublement* of signification in either direction, but doing so relativizes our physical relationship to the objects: passing from the upper section of the first plate to the scaled images of plate II, by way of the lower section of plate I, carries us across a continuum of whiteness that releases us from a single point of view. In the second plate the space-making effects of directed light and shadow are almost eliminated, leaving only a few odd and schematic shadows to erupt sporadically from beneath the plows. As we move through plates II, III, and IV (FIGURES 13, 14, 15), the equipment demonstrated in the first loses its context of use. In plate IV (FIGURE 15) it is disaggregated into component parts and revealed in multiple points of view upon the whiteness of a page conceptually resized by scales of reference. Here, the physicality of objects and their use is leached away and natural light struggles to cast token instances of shadow. We, however, are allowed to see with a clarity and precision not part of everyday life. Whiteness, the catalyst that binds tableau to visual catalogue, enables a trenchant knowledge that is the descriptive gain of the graphic economy of diagram.





Goussier Del.

Bénard Sculp.

*Agriculture, Labourage.*

FIGURE 13  
 "Agriculture, Labourage," pl. II.  
 Engraving by Robert Bénard after  
 a design by Louis-Jacques Goussier  
 for Diderot and d'Alembert,  
*Recueil des Planches*, vol. 1.  
 Courtesy Department of Special  
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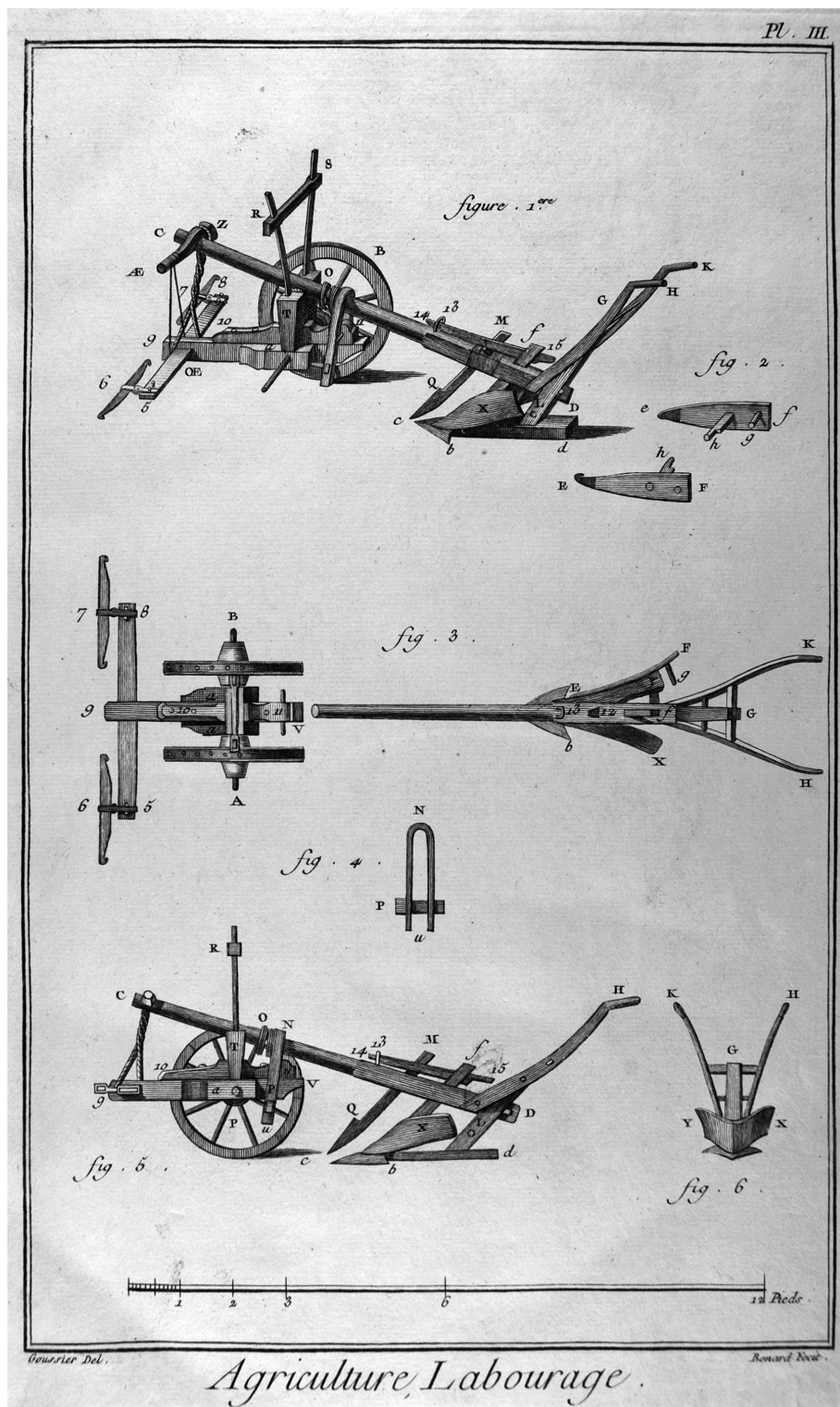
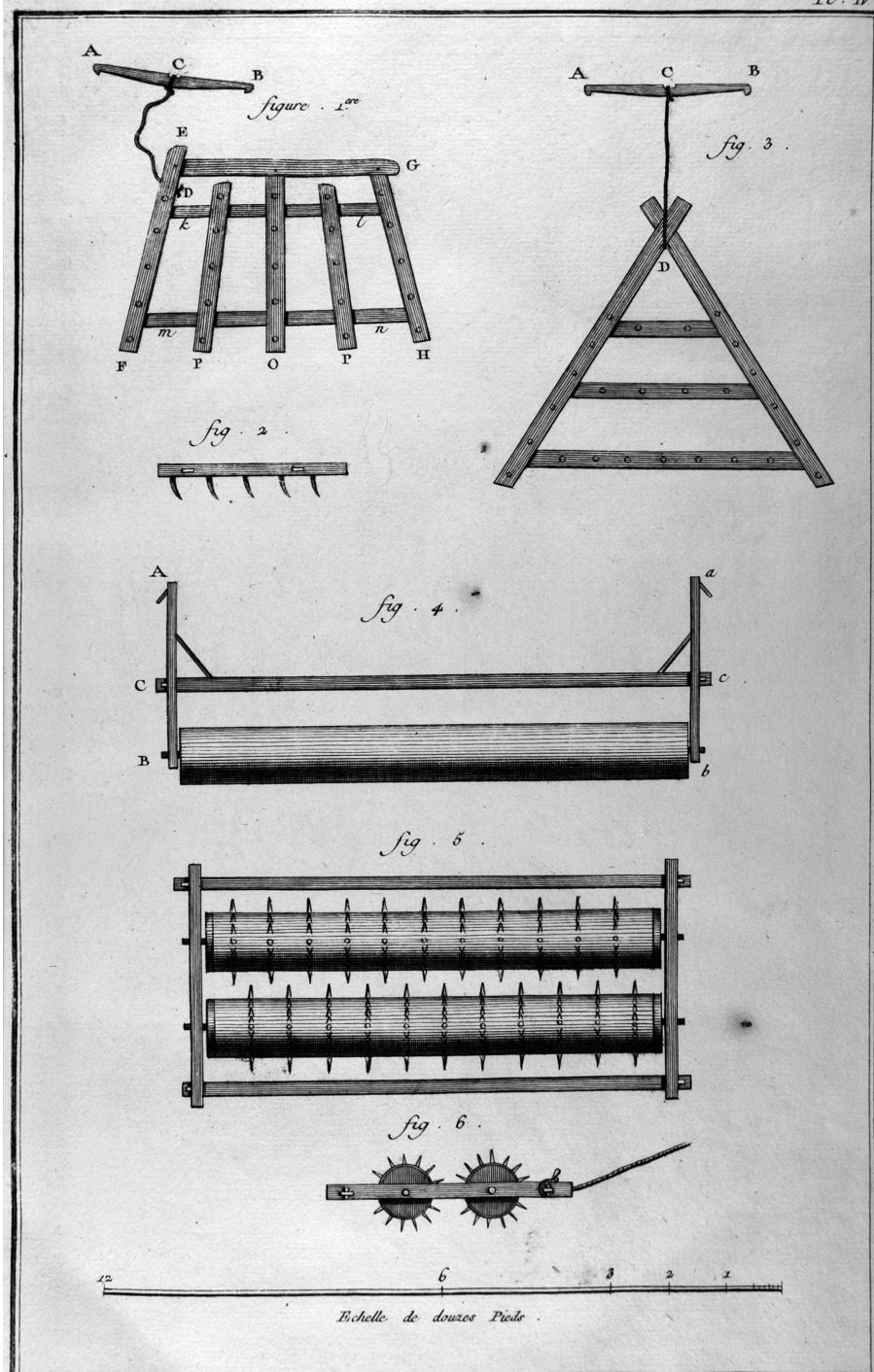


FIGURE 14

"Agriculture, Labourage," pl. III.  
 Engraving by Robert Bénard after  
 a design by Louis-Jacques Goussier  
 for Diderot and d'Alembert,  
*Recueil des Planches*, vol. I.  
 Courtesy Department of Special  
 Collections, Stanford University  
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*Goussier del* *Bénard fecit*

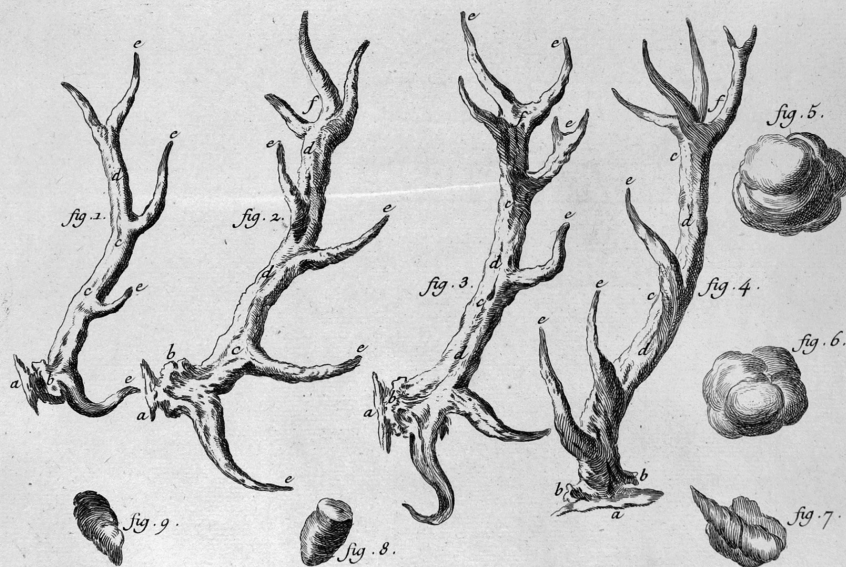
*Agriculture, Labourage.*

FIGURE 15  
 "Agriculture, Labourage," pl. IV.  
 Engraving by Robert Bénard after  
 a design by Louis-Jacques Goussier  
 for Diderot and d'Alembert,  
*Recueil des Planches*, vol. 1.  
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 Collections, Stanford University  
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Although it is commonplace to dwell on the plates rendering métiers such as pastry-making, the *Encyclopedie*'s diagrammatic strategies appear most vividly in hybrid examples such as those dedicated to hunting, choreography, and military maneuvers. The plates of "Chasse, Venerie" (FIGURES 16, 17, 18) mark a clear-cut departure from the word-image dichotomy usually associated with annotated illustrations.<sup>19</sup> The descriptive density of these plates links vignette, writing, and notation into a web that demands intricate, highly interactive decipherment, pushing the graphical medium to its diagrammatic limits. Each plate consists of a conventional tableau at the top, strongly marked off from the rest of the image by an inner frame. The conceptual insularity of these vignettes is underscored by the absence of annotations keyed to texts or legends. Crossing the internal frame of these plates is akin to moving from a realm of visual illusion to a domain of indexical allusion and pure notation. Unlike the isolated kitchen tools or dismantled farm implements displayed in plates about pastry-making or plowing, the largest areas of the hunting plates record signs: antlers and piles of dung dropped in the forest by stags of different ages; the graphic evidence of hoof prints left in the forest by their passage; the engraved musical scores of notes sounded at different stages of the pursuit. Sentence fragments above the musical staves indicate when the various tones should be played, but taken as a whole the hunting plates offer few clues for reading their complex hybrid of imagery and notations as an ensemble. In this case, diagrammatic whiteness cannot mediate the conceptual discontinuity of the parts. As if signaling this failure, the three plates of stag hunting are accompanied by a long expository account that requires nearly ten pages of printed text. The *Encyclopedie*'s treatment of stag hunting is extraordinary for mobilizing a full range of written language, abstract and arbitrary notations, indexical icons, and pictorial tableaux in an attempt to diagram the highly ritualized, courtly craft of tracking animals under the Ancien Régime.

Surprisingly, the long narrative attached to the hunting plates hardly mentions the musical scores that figure so prominently in the images. In contrast, the hoof prints, feces, and antlers are subject to detailed analyses with instructions about how to read the age and health of the animals from these indexical signs. Why are the scores so visually important and so narratively neglected? One possible answer is to see them as attempts to



*Chasse, Venerie, Quête du Cerf.*

FIGURE 16

“Chasse, Venerie, Quête du Cerf,” pl. I. Engraving by Robert Bénard after a design by Louis-Jacques Goussier for Diderot and d’Alembert, *Recueil des Planches*, vol. 3. Courtesy Department of Special Collections, Stanford University Libraries. Photo: Marrinan.



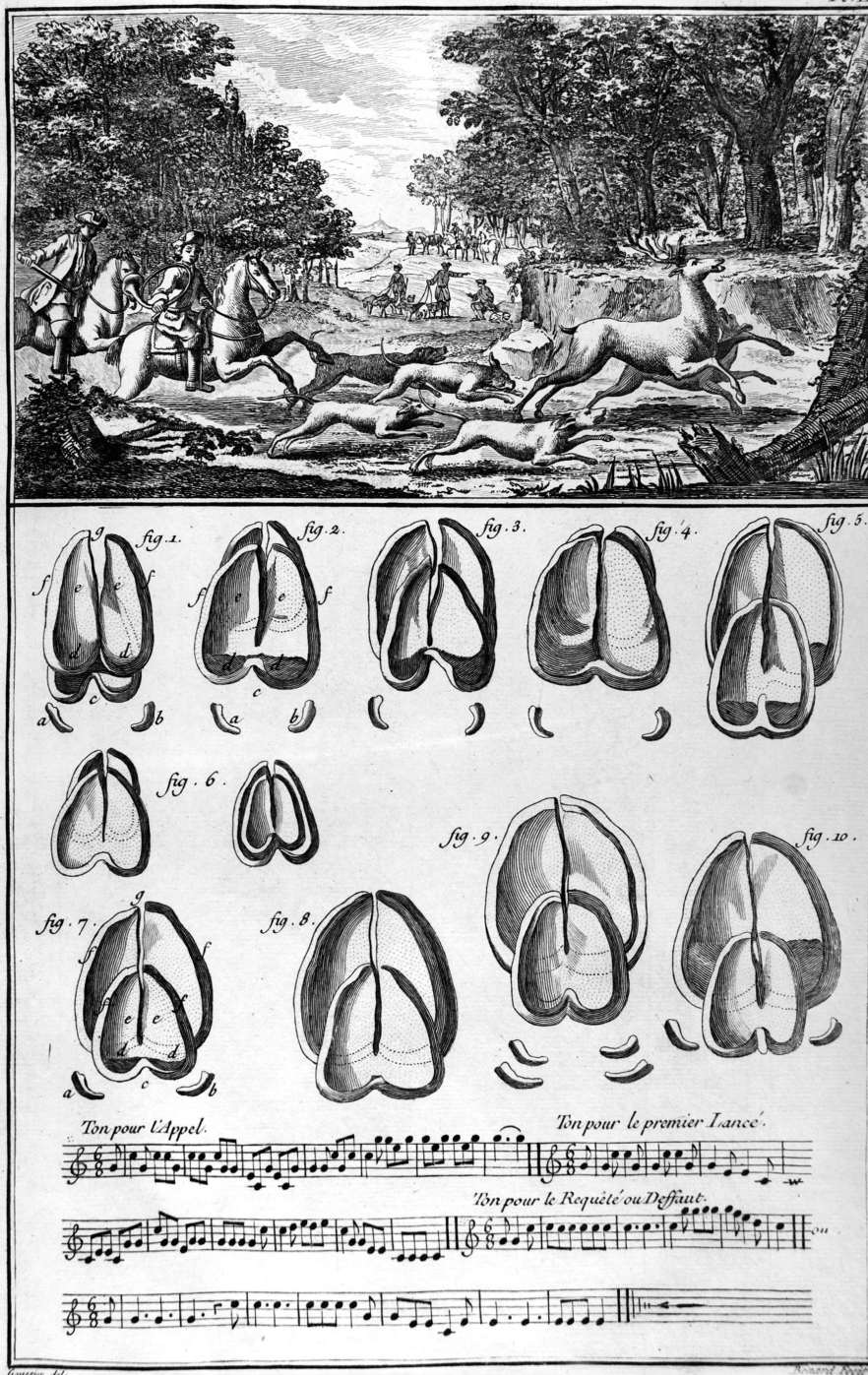
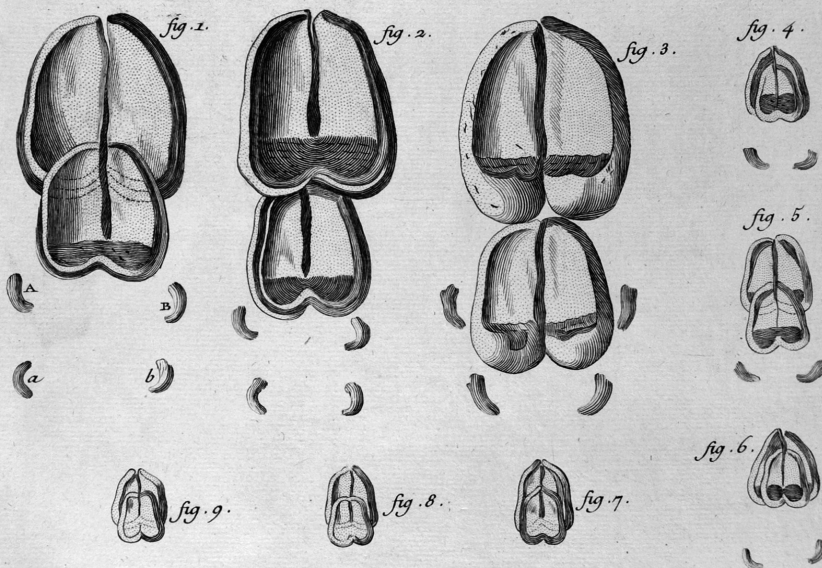


FIGURE 17

“Chasse, Venerie, la Chasse par Force,” pl. II. Engraving by Robert Bénard after a design by Louis-Jacques Goussier for Diderot and d’Alembert, *Recueil des Planches*, vol. 3. Courtesy Department of Special Collections, Stanford University Libraries.  
Photo: Marrinan.

*Chasse, Venerie, la Chasse par Force*



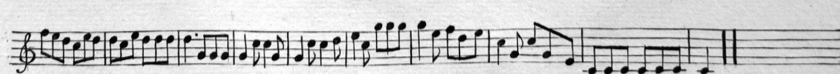
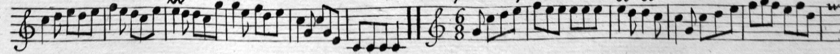


*Ton pour le Porcu.*

*Ton lors que les Chiens vont bien.*



*Ton pour la premiere voie.*



Goussier Del.

*Chasse, Venerie, la Curée.*

Bénard Scul.

FIGURE 18

“Chasse, Venerie, la Curée,”  
pl. III. Engraving by Robert  
Bénard after a design by Louis-  
Jacques Goussier for Diderot and  
d’Alembert, *Recueil des Planches*,  
vol. 3. Courtesy Department of  
Special Collections, Stanford  
University Libraries.  
Photo: Marrinan.

invest the static, graphic image with two essential elements of narrative—episode and duration—without completely succumbing to the power of language. Words are used above the staves to mark off parts of the musical score according to the formal sequence of the hunt. The musical notes add a dimension of time's passing that is rigorously non-narrative and non-linguistic. The musical score implies an auditory—even haptic—physical experience different from the optics of vision. Descriptive labels on the staves connect pure musical notation to specific elements of the upper tableaux: they refer to dogs, and several figures in the plates actually sound horns. Music invests these plates with episode, duration, and an aural resonance to secure for their visual presence the right to narrate before the overwhelming, non-visual textual weight of the extensive legends.

The musical staves with their non-narrative representation of time and process offer a clue to understanding the emergence of a powerful type of correlation only partially exploited by the *Encyclopedia's* plates: the ability of notation to describe time in abstract terms. Operating at the outer limit of diagram in a print culture, the hunting plates push, in their insistence on the indexical and notational, toward mathematics. The overflow of explanatory text suggests a breakdown of graphic intelligibility in complex diagrams. We find a parallel development in more technical spheres, where the informational yield of notational schemes begins to take precedence as evolving standards of adequacy force description to shift from text-based expositions of observable events to mathematical functions and graphic notations. Predictive formulas and repeatable patterns augment the density and variability of everyday experience: diagram allows verbal, graphic, and mathematic commentaries to coexist.

The plates devoted to military exercises reveal this shift of description to a non-linguistic register in their treatment of drill formations. The paucity of explanatory texts relative to the lengthy narratives accompanying the hunting plates is a sign of the weight borne here by notation. Three kinds of images make up this section. The first group of five plates depicts soldiers in specific formal postures, including presenting arms, firing their weapons, and tearing open a cartridge with the teeth (FIGURE 19). These are fully trained soldiers who demonstrate positions as discrete gestures rendered in stop-action, but arranged on the sheet sequentially as notations. Summary ground lines and shadows are the

token relics of a spatial world, while the rigorous arrangement of the figures in three registers—analogue to musical scoring—dictates lateral comprehension. Yet reading these first plates as illustrating bodily discipline in the manner of Foucault oversimplifies their role in the matrix of images that diagrams the military arts.

The second group of plates halts our attention, for they are stark images of purely graphic notation with no reference to a world of experience (FIGURE 20). They dispense with individual, idiosyncratic bodies for reasons explained by a note at the head of the accompanying text:

In this and the following plates, soldiers are noted by black dots designating the center of the space they occupy. Since one assumes that the soldiers touch one another, there should be no space between the points; but, in that case, the illustrations would be too confusing and the movements the plates ought to represent too difficult to study.<sup>20</sup>

Soldiers are reduced to points, with a small line indicating the direction of their attention. White dots indicate recently vacated spaces and dotted lines the trajectories followed when taking up the positions marked in black. This recourse to a graphic notation makes visible both time (prior placement versus new placement) and movement (dotted lines), and it holds the two together with an underlying geometry of implied gridlines and regular curves mapping the white field of visual presentation. The notations are not easy to read: even having mastered the visual code, one needs to consult short texts keyed to each plate in order to interpret the arcane patterns of marks. The process is like a shuttle, for the texts can obscure more than clarify. The user is quickly involved in back-and-forth comparisons between the words and the images when attempting to correlate the two. Even more dramatically than the hunting plates discussed above, these works mobilize our attention across the word–image divide, and reward us with a comprehension that is not ordained, but is actively produced. When effecting this passage of correlation between word and image—or between soldiers in formal postures standing on the ground and soldiers rendered as dots—the user is forced to change frames of reference. The *Encyclopedia* invented a material structure to manage these transitions surreptitiously, by taking the white space of diagram as a constituent element.



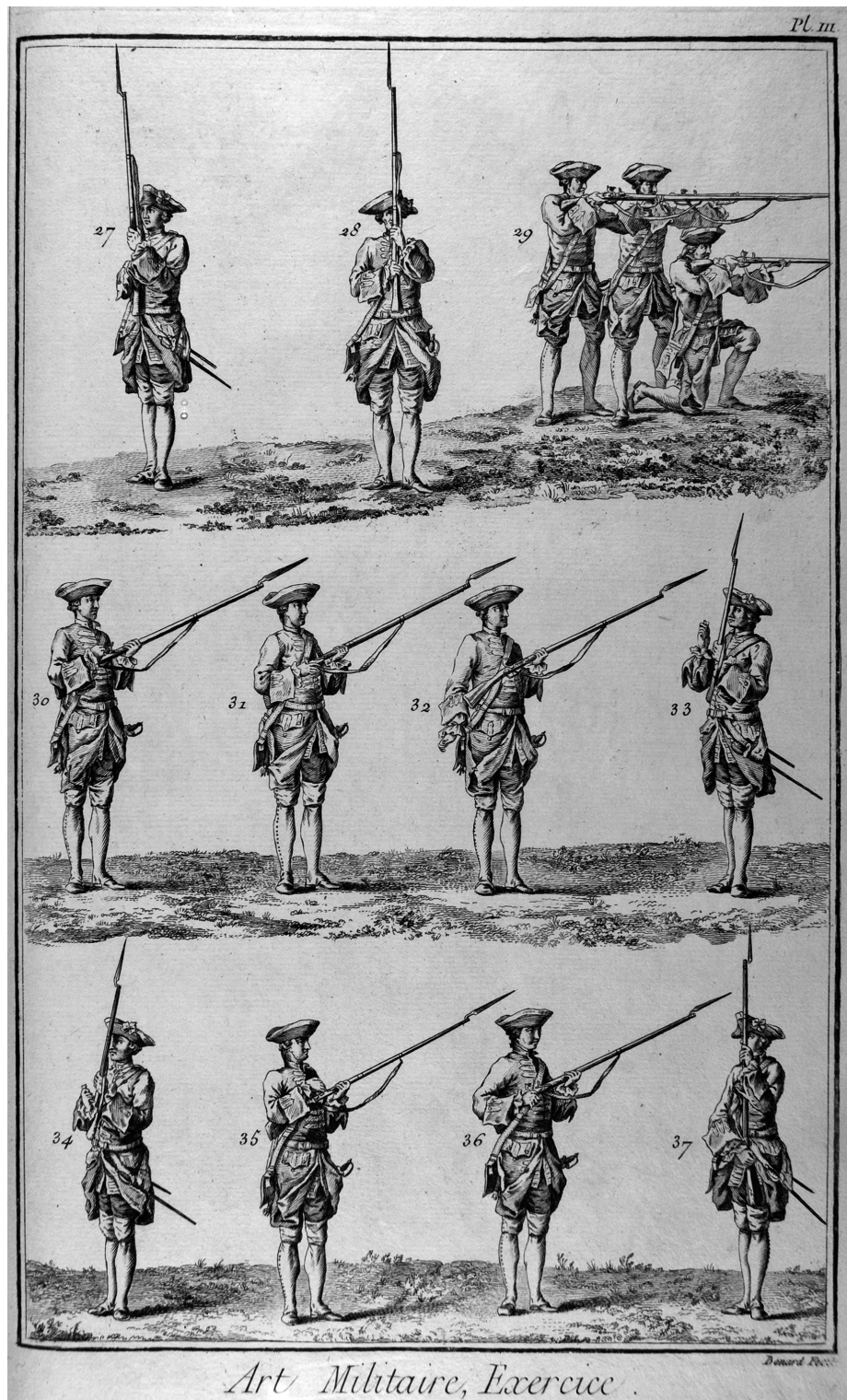


FIGURE 19  
 “Art Militaire, Exercice,” pl. III.  
 Engraving by Robert Bénard for  
 Diderot and d’Alembert, *Recueil  
 des Planches*, vol. I. Courtesy  
 Department of Special Collections,  
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 Photo: Marrinan.

Fig. 43.

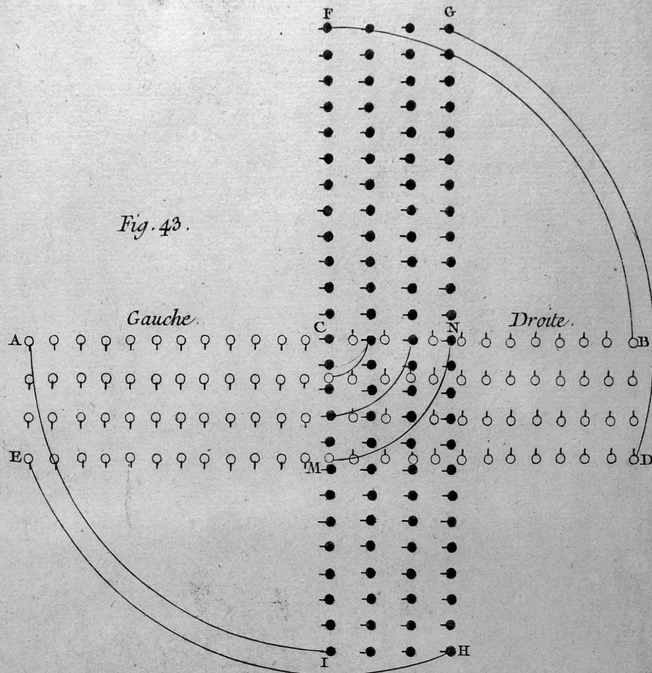


Fig. 44.

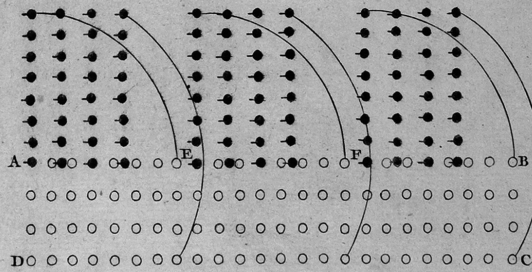
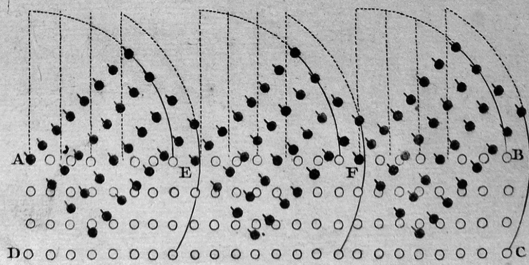


Fig. 45.



*Art Militaire Evolutions.*

Bénard fecit.

FIGURE 20

“Art Militaire, Evolutions,” pl. VII.

Engraving by Robert Bénard for

Diderot and d’Alembert, *Recueil*

*des Planches*, vol. 1. Courtesy

Department of Special Collections,

Stanford University Libraries.

Photo: Marrinan.



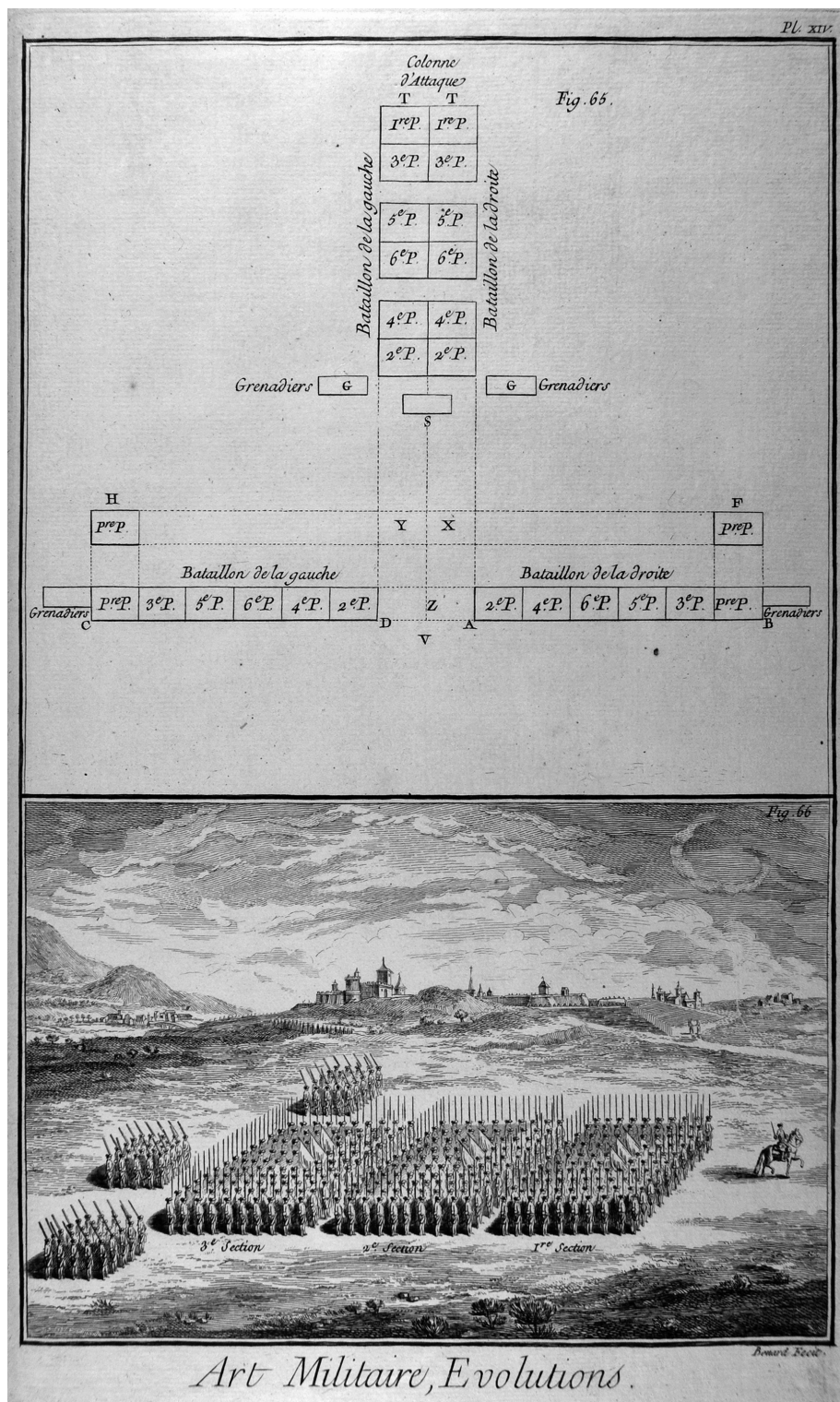


FIGURE 21  
 “Art Militaire, Evolutions,”  
 pl. XIV. Engraving by  
 Robert Bénard for Diderot and  
 d’Alembert, *Recueil des Planches*,  
 vol. I. Courtesy Department of  
 Special Collections, Stanford  
 University Libraries.  
 Photo: Marrinan.



The last plate on tactical exercises for infantry demonstrates the yield of correlation when diagrams become working objects (FIGURE 21). Here the double structure affords the user two distinct views that emulate how a commander sees his troops: reviewing them in abstract upon a table covered with charts, and observing them in the field from an overlook. The text explains how troops are to fall out in ranks from a defensive line into a tight, triple formation designed to spearhead an attack. The whiteness dominating the upper sector of the page is both a leaf in a military portfolio and a non-representational *champ* or field of action. Crossing the frame of the plate, the graphic whiteness of the chart becomes the ground plane of the battlefield below. The vignette's seemingly unified perspective, with its tight blocks of troops arranged like the paving stones of a city square in a Renaissance painter's manual, actually is delusional, because the soldiers are far too large for the spatial recession implied by the foreground details or buildings of the hill town in the distance. The vignette subverts strict perspective to align itself graphically with the notations of the chart, and subordinates imitation to analysis. The tableau-like presentation of troops in the vignette approaches the character and function of a visual catalogue from which one could derive the chart above. But the move from one to the other would be almost impossible to grasp were it not for the preceding plates in which the physical bodies of soldiers had become points in space, their trajectories marked by dotted lines. Between the soldiers presenting arms of the opening plates and the attack column of the final image, a graphical rendering has evaporated physical presence into mathematical plots—ideal bodies moving through time along geometrically determined paths. The conceptual re-framing is profound, and its efficacy depends entirely upon a material ground of whiteness that unites the plates to one another.

The amalgam of information staged by the *Encyclopedia's* diagram of infantry exercises would probably be of little value or interest to professional soldiers or field commanders. By contrast, curious users of Diderot's compendium would learn from the to-and-fro of attention among images and legends something of the complexity and discipline of modern warfare. The same might be said about professional hunters relative to the hunting plates, or about farmers and the plates on agriculture. What is at stake here is not farming, pastry-making, hunting,

or soldiering; the diagrams of the *Encyclopedia* are not manuals. The descriptions they produce are new objects. They do not merely catalogue individual parts, but generate understanding by eliciting a study of those parts in new and unpredictable re-formations shaped to a large extent by the user's orientation and expertise. Curiosity, the hunger to know, is the motor force that brings to life the *Encyclopedia's* inert materials of ink and paper. Correlation was a powerful tool for exploring new ideas that challenged established categories and expectations. In the next chapter we sketch the historical moment of its emergence from the energy released when dynamic processes of analysis encounter prior, static models of understanding. How does the *Encyclopedia* deal with the challenge of describing the world?