CONTENTS

1

Introduction

THE HIDDEN HISTORY OF RULES

Clues to a Hidden History

This is a short book about a vast topic. We are, all of us, everywhere, always, enmeshed in a web of rules that supports and constrains. Rules fix the beginning and end of the working day and the school year, direct the ebb and flow of traffic on the roads, dictate who can be married to whom and how, situate the fork to the right or the left of the plate, score the runs and walks of baseball games, tame debate in meetings and parliaments, establish what can and cannot be taken on a plane as hand luggage, specify who can vote and when, parse the grammar of a sentence, channel customers into the proper lines at the grocery store, tell pet owners whether their animals are welcome or not, lay down the meter and rhyme scheme of a Petrarchan sonnet, and order the rites of birth and death. And these are just examples of explicit rules, the sort to be found written down on signs and in manuals, handbooks, sacred texts, and legal statutes. Add implicit rules, and the web becomes so densely woven that barely any human activity slips through the mesh: there are the unwritten rules about whether to greet with outstretched hand or two pecks on the cheek *à la française* (or one, *à la belge*), how many miles per hour over the posted speed limit will be tolerated without incurring a traffic ticket, how much to tip

at what kind of restaurant, when to raise (and lower) one's voice in conversation, who should open doors for whom, how often and how loudly an opera may be interrupted with cheers and boos, when to arrive at and when to leave a dinner party, and how long an epic should be. Cultures notoriously differ as to the content of their rules, but there is no culture without rules, lots of them. A book about all of these rules would be little short of a history of humanity.

Rules are so ubiquitous, indispensable, and authoritative that they are taken for granted. How could there ever have been a society without rules, a time before rules? Yet the universality of rules does not imply their uniformity, either across cultures or within historical traditions. Rules exhibit vertiginous variety not only in their content but also in their forms. The former has been grist for the mill of travelers and ethnographers ever since Herodotus's (c. 484–c. 425 BCE) tales of how, from an ancient Greek perspective, in Egypt everything is reversed (though no less regular): the men stay home and weave, while the women go to the market; women urinate standing up, men sitting down; even the Nile runs backwards, from south to north.[1] The latter unfurls in the long list of species that belong to the genus of rules: laws, maxims, principles, guidelines, instructions, recipes, regulations, aphorisms, norms, and algorithms, to name just a few. The variety of these species of rules is a clue to a hidden history of what a rule is and does.

Since Greco-Roman antiquity, three principal semantic clusters have mapped out the meanings of rules (Chapter 2): tools of measurement and calculation; models or paradigms; and laws. The subsequent history of rules is one of proliferation and concatenation, yielding ever more species of rules and ever more exemplars of each species. The result is a cat's cradle of complexity almost as complex as culture itself. The three Ur-meanings of rules nonetheless spin out scarlet threads that wind their way through the historical labyrinth over millennia. By adopting a *longue durée* perspective and canvasing rules from many diverse sources, from monastic

orders to cookbooks, from military manuals to legal treatises, from calculation algorithms to practical how-to instructions, this book traces the long career of this ancient trio of meanings in the learned and vernacular traditions that share Greco-Roman roots and that have evolved together over more than two millennia. Chapters 2 and 3 reconstruct how rules functioned as supple models from antiquity through the eighteenth century; Chapters 4 and 5 describe how algorithms of calculation worked in practice from ancient times until the rise of algorithms and mechanical calculation during the nineteenth and twentieth centuries. Chapters 6 and 7 contrast rules at their most specific, as nitty-gritty regulations, with rules at their most general, as Olympian natural laws and laws of nature, from the thirteenth through the eighteenth centuries. Chapter 8 examines how moral, legal, and political rules bend and break in the face of recalcitrant exceptions, from the sixteenth through the twentieth centuries.

Three oppositions structure this long history of rules. Rules can be either thick or thin in their formulation, flexible or rigid in their application, and general or specific in their domains. These oppositions can overlap, and some are more relevant than others, depending on which of the three kinds of rule is in question. Rules understood as models tend to be thick in formulation and flexible in application (Chapters 2 and 3). A thick rule is upholstered with examples, caveats, observations, and exceptions. It is a rule that anticipates wide variations in circumstances and therefore requires nimble adaptation. Thick rules incorporate at least hints of this variability in their very formulation. In contrast, rules understood as algorithms tend to be thinly formulated and rigidly applied, though they too can sometimes thicken (Chapters 4 and 5). An algorithm need not be brief, but it is seldom designed to deal with unusual or simply diverse cases. Because thin rules implicitly assume a predictable, stable world in which all possibilities can be foreseen, they do not invite the exercise of discretion. This is unproblematic when the thin rules are confined to solving textbook problems—for example, in simple arithmetic. But the annals of

computer algorithms are by now full of cautionary tales about programs for everything from facial recognition to paying your taxes that were tailored too thinly and enforced too rigidly to fit a more variegated reality.

Both thick and thin rules can be either minutely specific—a model for making this kind of table out of this kind of wood, or an algorithm for computing the area of this irregular polygon only— or sweepingly general. Rules understood as laws can also run the gamut from specific regulations governing parking on this street on Sundays to the generality of the Decalogue or the second law of thermodynamics (Chapters 6 and 7). Both specific and general laws can be applied either rigidly or flexibly. Rules that teem with specifics, like the sumptuary regulations discussed in Chapter 6, may need some give in application, if only because the specifics change so quickly. And even the most general laws of all, understood as divine commands that are eternally and universally binding, may also on occasion be bent (Chapter 8).

These oppositions should be understood as marking the extremes of a spectrum of possibilities rather than as all-or-nothing complements. The chapters that follow illustrate how rules, whether conceived as models, algorithms, or laws, differ by degrees in thinness and thickness, rigidity and flexibility, specificity and generality. Although not all combinations are equally possible, a long history like this one can stretch the present-day imagination with examples of rule regimes that have become rare, such as algorithms formulated thickly and applied flexibly (Chapter 4).

Rules are a betwixt-and-between category. In ancient and medieval schemes of knowledge, they occupied the middle territory between lofty sciences like natural philosophy, which aimed at certain knowledge of universal causes, and the most lowly, mindless, repetitive gestures of unskilled workmen. The province of rules was the arts, those branches of practical knowledge and know-how that blended reason and experience, guidelines that could be taught and savvy that could only be acquired through practice (Chapter 3). In early modern polities, rules were situated

between local regulations overflowing with local specifics and universal natural laws valid for everyone, everywhere, always. Analogously, rules in early modern science were regularities too specific to qualify as grand laws of nature but too general to count as isolated observations: for example, the rule that water expands rather than contracts when it freezes versus the law of universal gravitation, as valid for the remotest planets as for the apple that falls from this tree (Chapters 6 and 7). Rules define both social and natural orders of a middling sort, always mediating between extremes of certainty and chance, generality and specificity, perfect order and utter chaos.

All of these contrasts boil down to one big contrast: a world of high variability, instability, and unpredictability versus one in which the future can be reliably extrapolated from the past, standardization insures uniformity, and averages can be trusted. Although the episodes recounted in this book trace a rough historical arc from the former world to the latter, there is no inexorable dynamic of modernity at work here. An island of stability and predictability in a tumultuous world, no matter what the epoch or locale, is the arduous and always fragile achievement of political will, technological infrastructure, and internalized norms. At any moment it can be suddenly overwhelmed by war, pandemic, natural disaster, or revolution. In such emergencies, thin rules suddenly thicken, rigid rules become rubbery, general rules wax specific. It is telling that such explosions of uncertainty are called "states of exception" (Chapter 8)—states in which rules temporarily lose their hold. If rules are changed too often and too quickly to keep up with dynamic circumstances, the very idea of a rule can start to wobble (Epilogue).

Rules as Both Paradigms *and* Algorithms

Rules provide a rich vein to be mined for philosophical problems and projects. The most ancient and enduring problem inspired by rules is how universals can be made to fit a potential infinity of

particulars that cannot be foreseen by the rule-maker. This problem is as old as philosophy itself and still very much with us. All the chapters in this book describe how this problem was addressed in different settings and in different periods, whether in the law court, the artisan's workshop, or the confessional. I turn to this problem in the next section. But first I must answer a question key to understanding a second, more modern philosophical problem about rules that readers will have no doubt posed themselves by this point. Algorithms and laws are still central to our understanding of rules, but whatever happened to the third member of the ancient trio, models or paradigms?

Right through the end of the eighteenth century, this now-extinct meaning of rules was robust in both precept and practice. In the course of the nineteenth and twentieth centuries, however, rules-as-algorithms increasingly edged out rules-as-paradigms. This shift spawned a second modern philosophical problem about thin rules: can rules be followed unequivocally, without interpretation or contextualization, and if so, how is this possible? As we shall see in Chapter 5, this is a problem that can hardly even be formulated until the prototypical rule shifted from being a model or paradigm to being an algorithm, especially an algorithm executed by a machine. This shift is remarkably recent, and its consequences are still reverberating in philosophy, administration, military strategy, and the ever-expanding domains of daily life conducted online.

Although algorithms are as old as the operations of arithmetic and the associations of rules with quantitative exactitude stretch back to Greco-Roman antiquity and beyond, algorithms were rarely the primary sense of rule in the intellectual traditions stemming from ancient Mediterranean cultures, even in mathematics. When dictionaries of European vernaculars began to be published in the seventeenth and eighteenth centuries, algorithm featured as the third or fourth definition under the lemma "Rules"—if it appeared at all. The most comprehensive mathematical encyclopedia of the nineteenth century, a seven-volume German behemoth, did

not even contain an entry for "Algorithm."[2] Yet only a few decades after its publication, algorithms had become central to understanding the essence of mathematical proof, and by the mid-twentieth century they were powering the computer revolution and conjuring dreams of everything from artificial intelligence to artificial life. We are now all subjects of the empire of algorithms.

This empire was barely a dot on the conceptual map until the early nineteenth century. Algorithms play an important role in many mathematical traditions all over the world, some quite ancient, and material aids to calculation such as pebbles, counting rods, and knotted strings are also widespread (Chapter 4). But the idea that many forms of human labor, including mental labor, might be reduced to algorithms, much less algorithms mechanically executed, seems to have taken hold only in the nineteenth century (Chapter 5). Before remarkable experiments applied the economic principles of the division of labor to monumental calculation projects during the French Revolution, the mechanization of rules, even the humble algorithms of arithmetic, had seemed a doomed project. The calculating machines invented by Blaise Pascal (1623–1662), Gottfried Wilhelm Leibniz (1646–1716), and others in the seventeenth century remained little more than ingenious toys, finicky and unreliable.[3] The improbable rise of the algorithm and its transformation from trivial arithmetic operation to safeguard of mathematical rigor to endlessly adaptable programming language for computers is a story that has been told often and well.[4] However, the triumph of algorithms-for-everything has obscured how narrowly algorithms were still associated with calculation as late as the mid-twentieth century, even by computer pioneers such as the American physicist Howard Aiken (1900–1973), who famously opined that a few computers ought to suffice for the needs of the nation—by which he meant the needs of massive calculation for undertakings like the U.S. census.[5] One aim of this book is to throw light on a crucial earlier episode in this rags-to-riches history: how mathematical algorithms intersected with political economy during the Industrial Revolution, a story that is

as much about the history of work and machines as it is about the history of calculation.

Rules were many things before they became first and foremost algorithms, i.e., instructions subdivided into steps so small and unambiguous that even a machine could execute them. Some of these earlier genres of rules would still be readily recognizable as such, including laws, rituals, and recipes. But perhaps the most central meaning of rule from antiquity through the Enlightenment is no longer associated with rules at all: the rule as model or paradigm. Indeed, in twentieth-century philosophy, this once-primary sense of rule, listed first in dictionary entries well into the eighteenth century and still invoked by Immanuel Kant (1724–1804), is diametrically *opposed* to rules.

What kind of model could serve as a rule? The model could be a person who embodies the order rules sustain, such as the abbot of a monastery in the Rule of Saint Benedict (Chapter 2), or a work of art or literature that defines a genre by exemplum, in the way that the *Iliad* defined the epic in the tradition from the *Aeneid* to *Paradise Lost*, or a well-chosen example in grammar or algebra that teaches the salient properties of a much larger class of verbs or word problems. Whatever form the model takes, it must point beyond itself. Mastering the competence embodied by the model goes well beyond being able to copy the model in all its details. Models are to be emulated, not imitated. A writer who reproduced a famous work of literature word-for-word, as in the Borges story in which the protagonist attempts to produce parts of Miguel de Cervantes's *Don Quixote* verbatim,[6] would not be following but rather repeating the rule-as-model. To follow such a rule involves understanding which aspects of the model are essential and which are merely accidental details. Only the essential features can forge a reliable analogical chain between the rule-as-model and new applications. Reasoning from precedent in common law traditions supplies a familiar example of rules-as-models in analogical action. Not every past case of manslaughter can be plausibly presented as a precedent for the one at hand, and not every detail of even a

convincing precedent will match up with the present case. The way seasoned jurists deliberate over legal precedents highlights the difference between a mere example (this or that manslaughter case) and a model or paradigm (a load-bearing precedent with broad implications for many manslaughter cases). The serviceable paradigm must exhibit a high ratio of essential to accidental details and radiate as many analogies as a porcupine does quills.

The modern locus classicus for the opposition between rules and paradigms in philosophy is historian and philosopher of science Thomas Kuhn's (1922–96) influential *Structure of Scientific Revolutions* (1962), a book that sold hundreds of thousands of copies and was once a fixture in university courses across the disciplines.[7] It was also the book that turned *paradigm* into a household word and the stuff of *New Yorker* cartoons. (Fig. 1.1.) According to Kuhn, a science becomes worthy of the name when it acquires its first paradigm; scientists learn how to solve problems and indeed what constitutes a problem by textbook paradigms; scientific revolutions are nothing more or less than the dethronement of one paradigm by another. Just because it was such an all-purpose tool, the word *paradigm* had many meanings in Kuhn's book, twenty-one by one count.[8] There was, however, one sense of *paradigm* that Kuhn himself consistently underscored as the most important, namely paradigms as exemplars, as *opposed* to sets of rules. In his 1969 postscript to *The Structure of Scientific Revolutions*, Kuhn described this sense of paradigm as "models or examples, [that] can replace explicit rules as a basis for the solution of the remaining puzzles of normal science" as philosophically "deeper" than the others,[9] even though he was at a loss to explain exactly how it worked. Forestalling charges of irrationalism and woolly-mindedness, he stoutly defended the knowledge transmitted by paradigms as genuine knowledge: "When I speak of knowledge embedded in shared exemplars, I am not referring to a mode of knowing that is less systematic or less analyzable than knowledge embedded in rules, laws, or criteria of identification." But to date, neither Kuhn nor anyone else has succeeded in clarifying that

"I'm afraid you've had a paradigm shift."

FIGURE 1.1. Kuhn's paradigm shifts become proverbial, *The New Yorker* (17 December 2001). J. C. Duffy / The New Yorker Collection / The Cartoon Bank.

alternative mode of knowing, a "perplexity," philosopher Ian Hacking concluded, "in the nature of the beast."[10]

Kuhn's perplexity about how to reconcile the knowledge of paradigms with that of explicit rules already had an illustrious philosophical pedigree by 1969. In his *Philosophical Investigations* (1953), Ludwig Wittgenstein (1889–1951) famously argued for the incorrigible ambiguity of even mathematical rules: how is it possible to follow rules, he asked, even the most formal and algorithmic rules, without setting off an infinite regress of interpretations of the rule? Wittgenstein concluded that to follow a rule is a practice, taught by example rather than by precept within a community of users: "To obey a rule, to make a report, to give an order, to play a game of chess, are *customs* (uses, institutions)."[11] Ironically (and possibly unwittingly), Wittgenstein's proposal returns the rule

back to its original meaning as a model taught by practice rather than by precept. But for his many readers, including Kuhn, explicit rules, epitomized by the mathematical algorithm, were the polar opposite of paradigms and practices.

So it comes as something of a shock to learn that for most of its history, the word for "rule" and its cognates in ancient and modern European languages, from ancient Greece and Rome through the Enlightenment, were synonymous with *paradigm*.[12] Here, for example, is the Roman encyclopedist Pliny the Elder (c. 23–79 CE), upholding the Greek sculptor Polykleitos's (c. 480–c. 420 BCE) statue *Doryphoros* (*The Spear Bearer*) as the *canona* (the Latinized version of the Greek word for rule, *kanon*), the model of male beauty worthy of imitation by all artists: "He also made what artists call a 'Canon' or 'Model Statue,' as they draw their artistic outlines from it as from a sort of standard."[13] (Fig. 1.2.) Or Dionysius of Halicarnassus (c. 60–c. 7 BCE) praising the fifth-century BCE Attic orator Lysias (c. 445–c. 380 BCE) as the *kanon* of rhetoric, immediately glossed in the next sentence as the paradigm (*paradeigma*) of excellence.[14] Or, fast-forwarding almost two thousand years to Enlightenment France, here is the *Encyclopédie*'s sample sentence for its first definition of the entry "*Règle, Modèle*": "the life of Our Savior is the *rule* or the *model* for Christians."[15] In both ancient Greek and Latin grammars, the words *kanon* and *regula* were used along with *paradeigma* to denote that paradigm of paradigms, the patterns of inflections such as verb conjugations intoned by schoolchildren over the centuries: *amo, amas, amat*, etc.

At first glance, this may seem to be yet one more intriguing example of the *bizarrerie* of languages, in which words occasionally flip-flop into their opposites, but no more than that. Once upon a time, long ago, a word meant *A*; now it means not-*A*. Rule (*kanon, regula*) once meant model or paradigm; now it means exactly the opposite: hence Kuhn's conundrum of how to clarify paradigms without reducing them to rules, i.e., without reducing *A* to not-*A*—and also the provocatively paradoxical quality of Wittgenstein's equation of rule-following with usage and custom.

FIGURE 1.2. Roman copy of Polykleitos's *Doryphoros* (The Spear Bearer, 1st c. BCE), called the "canon" of artists by Pliny the Elder. Courtesy of the Ministry of Culture, National Archaeological Museum of Naples. Photo by Giorgio Albano.

But the etymology of the pre-modern cognates for "rule" is both richer and more unsettling than this developmental account from meaning *A* to meaning not-*A* would suggest: the more familiar modern associations of the word are *also* part of the definition of the pre-modern cognates of "rule." The ancient Greek word *kanon*, for example, connoted painstaking exactitude, especially in connection with the arts of building and carpentry, but also in a figurative sense when applied to other domains such as art, politics, music, and astronomy. The same Polykleitos who fashioned the *Doryphoros* statue was the author of a lost treatise entitled *Kanon* in which he allegedly specified the exact proportions of the human body to be followed by artists; such prescriptive measurements of classical statues were still on display in the eighteenth century. (Fig. 1.3.) Via Greek physician and philosopher Galen's (129–c. 210 CE) reference to Polykleitos, the word and concept of a canonical body was taken up by Andreas Vesalius (1514–1564) and other early modern anatomists.[16] (Fig. 1.4.) Variants of the word *kanon* also turn up in ancient astronomy and harmonics, both mathematical sciences. The range of the Latin *regula* followed that of the Greek *kanon* closely.[17] This cluster of meanings evokes the rigor of mathematics, both as the geometric doctrine of proportions and as the tool of measurement and computation—meanings that happily co-existed with the cluster centered on models and paradigms. In short, for several millennia, in various ancient and modern European languages, the word *rule* and its cognates meant, at least according to modern lights, *A* and not-*A* simultaneously. This is no longer just a linguistic curiosity; it is mind-boggling.

A second aim of this book is to reconstruct the lost coherence of the category of rule that could for so long and apparently without any sense of contradiction embrace meanings that now seem antonymical to each other (Chapters 2 and 3). In many ways, this is the obverse of the first aim, namely to follow the spectacular career of the algorithm since the nineteenth century. Algorithms not only replaced paradigms as the quintessential rules; they also increasingly made the workings of paradigms seem inscrutable,
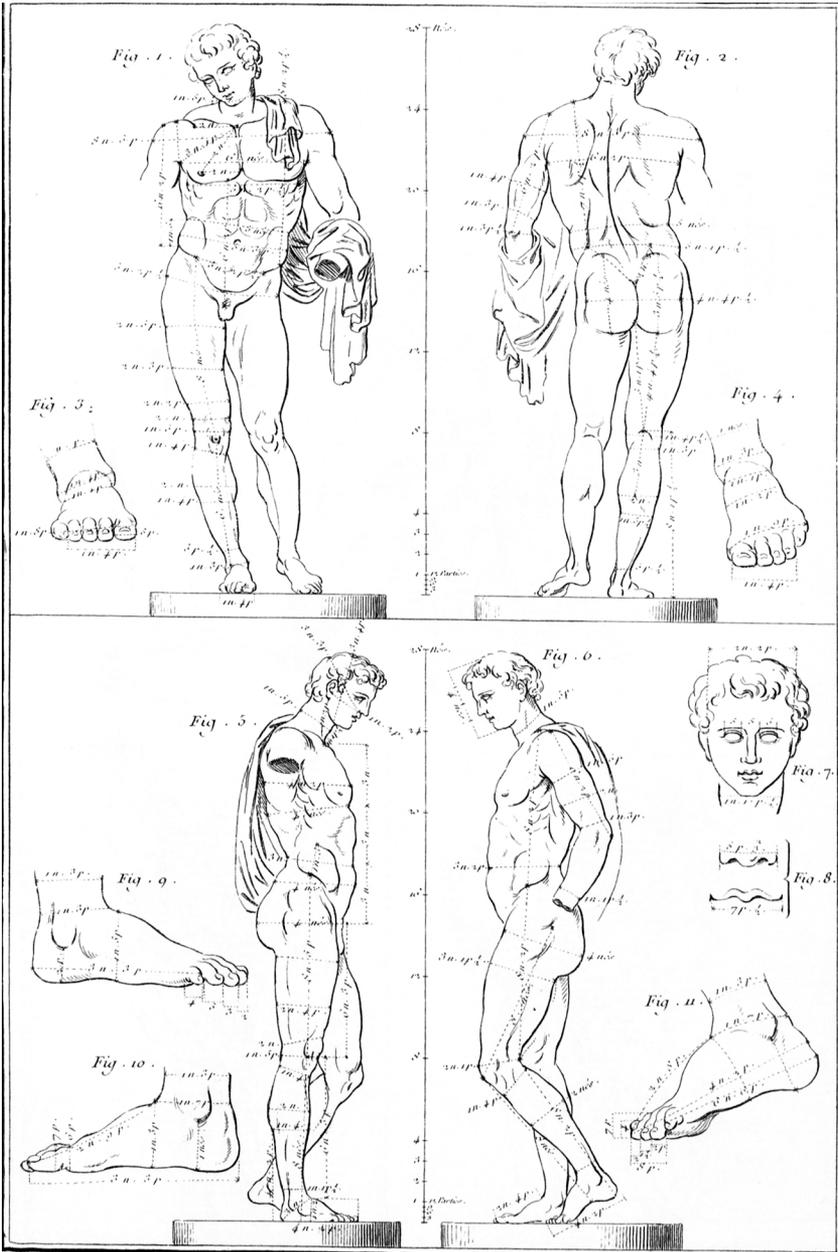
Dessein,
Proportions de la Statue d'Antinoüs.

FIGURE 1.3. Measured proportions of the statue of Antinous (article "Dessein"), *Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers* [Encyclopedia, or systematic Dictionary of sciences, arts, and trades], ed. Jean d'Alembert and Denis Diderot, vol. 3 (1763).

intuitive, and opaque to rational scrutiny. These were the disreputable associations against which Kuhn struggled as he defended the centrality of paradigms to successful science, and they continue to vex all attempts to defend the prerogatives of judgment against more mechanical modes of assessment. It is extraordinary that the faculty Kant asserted to be the precondition for understanding the unity of nature in time and space[18] should instead come to be belittled as "merely subjective." In contemporary parlance, a "judgment call" is one without firm grounding in public reason, only a step away from private whim. The flexible rule became the flabby rule—or no rule at all. Seen in the broader context of the demotion of judgment from exercise in reason to indulgence in darkling subjectivity, this episode in the history of rules forms part of the modern history of rationality, itself now defined by rules.[19]

Universals and Particulars

Rules rally judgment because their application must bridge universals and particulars. First, we must judge whether *this* rule subsumes *this* particular—or should we apply another rule altogether? This is the dilemma confronted by a judge seeking apposite precedents in the common law legal system or the doctor making a diagnosis from equivocal symptoms or even the math student seeking the integral of a novel function. Although in many cases the choice of which rule fits this instance is clear-cut (meter maids are seldom in doubt as to which traffic law applies to which parking violation), in many other cases there is an *embarras de règles*—and still more frequently, a welter of particulars that don't seem to fit any rule. Second, even if rule and particular clearly match, they almost never align perfectly. To a greater or lesser extent, tailoring and tweaking will be necessary to smooth over the gap between universal and particular. Whole specialties of learned practice have taken root and blossomed in this gap: equity in the law, casuistry in theology and ethics, case histories in medicine, discretion in administration.
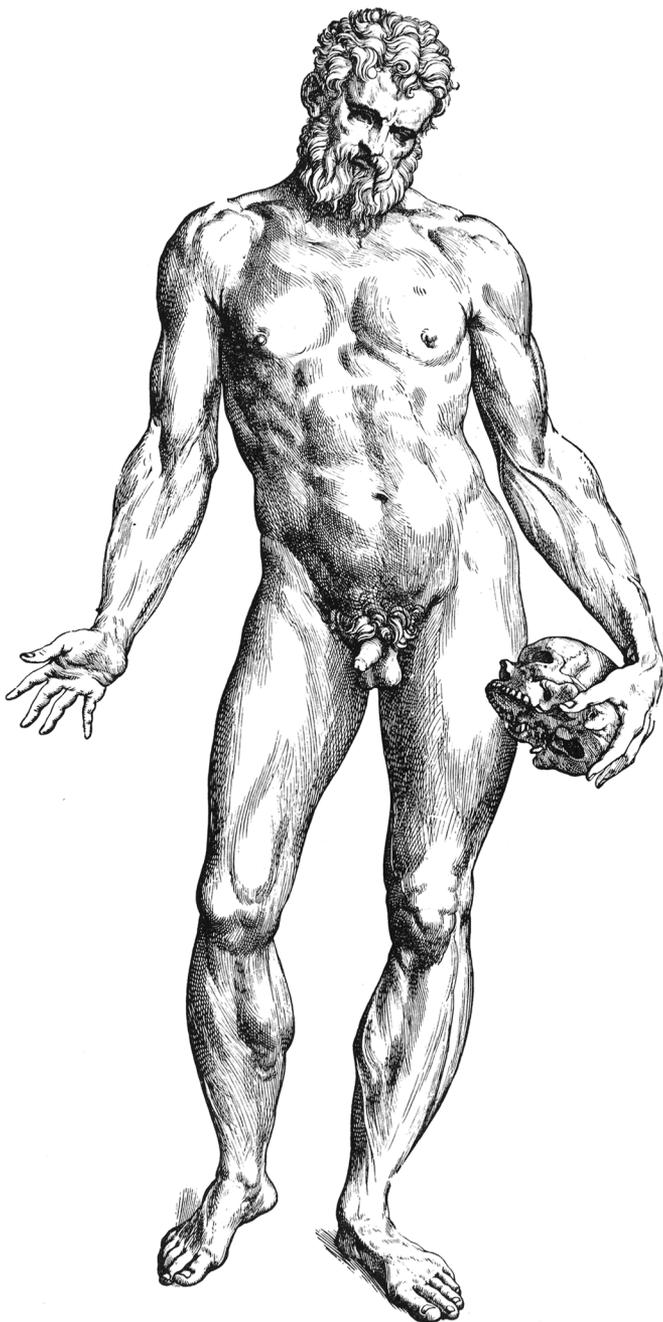
FIGURE 1.4. Andreas Vesalius's canonical male and female bodies, *De humani corporis fabrica. Epitome* [Brief summary of *On the fabric of the human body*] (1543).
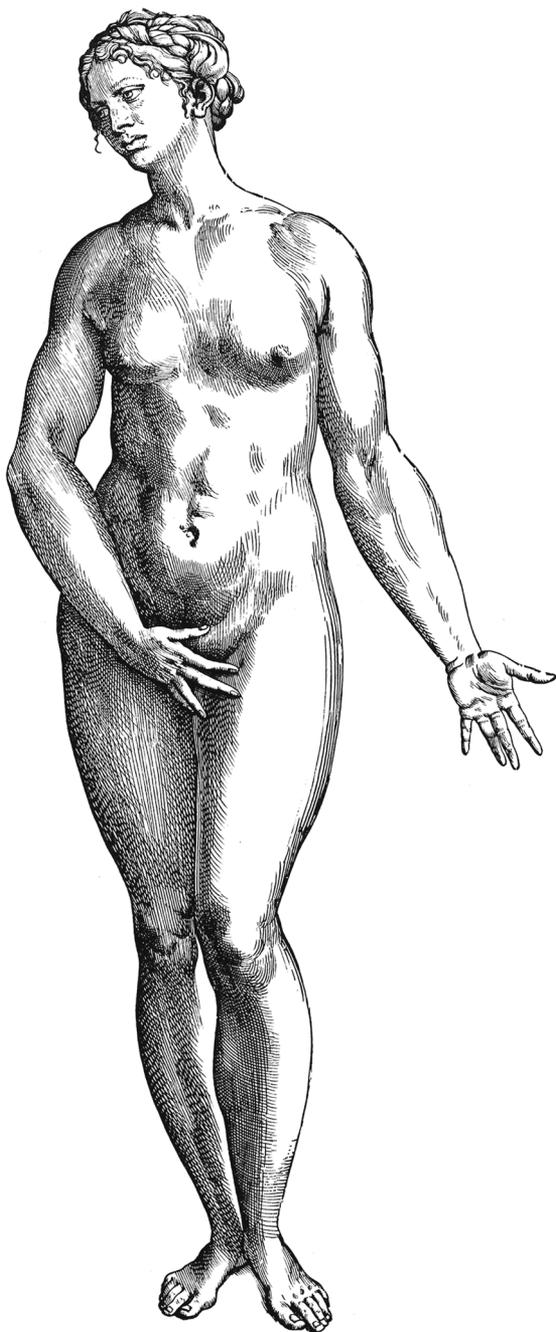
FIGURE 1.4. (*continued*)

The third aim of this book is to examine how rules were framed in order to anticipate and facilitate bridge-building between universal and particulars. This investigation calls for casting nets wide in order to catch many different kinds of rules for the sake of comparison: rules for monastic orders, games, parliamentary procedure, cooking, waging war, composing rondos and canons, converting weights and measures, etiquette, traffic circulation, who can wear what kind of luxury garment and when. In addition, there are the laws of nations and the laws of nature, both significant ideals but also counter-ideals to the more mundane and less general rules known as regulations. In contrast to the remote majesty of laws, both human and divine, regulations hug the terrain of practice, which is parceled into distinct domains of application. This rainbow of rules—from the laconic to the loquacious, the local to the global, the specific to the general—applies pressure to the bland philosophical categories of "universals" and "particulars." Some universals are more universal than others, and some particulars more particular. Both *modus ponens* in logic and the sumptuary laws promulgated by the Italian city-state of Ferrara in 1460 are rules, but whereas "if p, then q; p; therefore q" holds everywhere and for any and all p's and q's, the Ferrarese ban on silk and ermine in women's clothing is at once more specific, local, and lengthy than the terse generalities of propositional logic.[20] We will need a more refined taxonomy of both universals and particulars in order to understand the differences between the bridges that span them, some as simple and supple as rope bridges and others as rigid and sturdy as a steel-girdered monument to modern engineering.

More specifically, close attention to just what kind of bridge connects what variety of rule to what manner of case will illuminate the contrasting intellectual and cultural preconditions for rules-as-paradigms and rules-as-algorithms. Because these kinds of rules coexisted for so long—and arguably still do so today, despite the ascent of the algorithm—these preconditions cannot be mutually exclusive. Nonetheless, certain historical trends, such as the standardization of everything from weights and measures to

spelling to time zones, have also favored the standardization of rules: artificially imposed uniformity can mimic natural universality, at least under the historically exceptional conditions of stable infrastructure and sturdy international agreements. Other trends, such as the increasing rationalization of work in industrialized societies, as well as ideals of natural law imported from theology into natural philosophy and from there into jurisprudence and ethics, have also promoted rules of ambitious globality and exactitude. Proliferating especially (but not exclusively) in urban settings in the modern era, these rules appeal ever more to universal principles (whether of the market or the rights of man) and ever less to local context and background knowledge. Not coincidentally, the rise of such ambitious rules begins with the expansion of trade and empire to global dimensions in the sixteenth century, which created both the need for and the means to enforce rules that transcended any one locality.

Whether such rules actually achieve the universality and precision to which their framers aspire is a question furiously debated within the human sciences, the economists and many sociologists arguing forcefully for the affirmative and the historians and anthropologists just as vehemently for the negative.[21] My position is that even if the historians and anthropologists are correct in their claim that the efficacy of rules that purport to transcend context and interpretation is an illusion, it is undeniably a mighty and widespread illusion, one that cries out for explanation—all the more so if it is indeed contradicted by reality. This book gives both sides of the argument their due by showing that the degree to which rules can (or cannot) transcend local context depends on the historical preconditions that do (or do not) sustain islands of stability, uniformity, and predictability in an intrinsically uncertain world. The historical preconditions that link these islands into a far-flung archipelago, whether by empire, treaty, or trade, are even more precarious. Even the most routinized and reliable global rules can without warning shrink to local dimensions, as the havoc wrought with international air travel during the outbreak of

the SARS-CoV-2 pandemic in 2020 illustrates. When rule-
governed world orders do come into being, the rules depend on
the order just as crucially as the order does on the rules.

A History of the Self-Evident

Debates about rules overflow the academy. We fret endlessly about
whether there are too many rules or not enough, whether rules are
too stringent or too lax, when they apply and who decides, and the
optimal balance between predictability and spontaneity. The vary-
ing frequency and intensity of such debates are themselves histori-
cal phenomena, prima facie evidence for the multiplication and
stiffening of all kinds of rules in societies that depend on the intri-
cate coordination of innumerable actors, whether drivers on the
highway, voters in national elections, or everyone from meteo-
rologists to farmers to truckers to salespeople in long-distance
commerce. Rules choreograph what ought to be a ballet but some-
times looks more like a free-for-all—or a tableau vivant of figures
frozen into position like statues. Sociologists of bureaucracy have
invented terms like "rule strain" and "rule drift" to describe pa-
thologies of highly regulated polities;[22] ingenious public sector
employees have exploited those same pathologies by the work-to-
rule strike, in which scrupulous adherence to all the rules brings
all business to a screeching halt.[23]

No doubt there have always been complaints about specific
rules and their enforcement. What is novel about the modern pre-
dicament are complaints about the sheer number and inflexibility
of rules, whether the rules in question are the overt regulations of
government or the covert algorithms of computer search engines.
We moderns cannot live without rules. But we also cannot live
with them, at least not comfortably. Twentieth-century imagina-
tive literature has given us adjectives like *Kafkaesque*; social theory,
images like Max Weber's "iron cage," both referring to modern
bureaucracies. Twenty-first-century writers and theorists fantasize
about a brave new world run by computer algorithms that infil-

trate every aspect of life, down to our very thought processes.[24] Are there qualities of modern rules—their alleged complexity, inflexibility, inefficiency, and sheer prolixity—that notch up the ubiquitous tensions between imperious universals and recalcitrant particulars, between order and freedom? And whether or not this is fact or simply perception, what historical shifts in how we make rules and think about them explain our current anxious preoccupation with them? The shift from rule-as-model to rule-as-algorithm offers at least partial answers to these questions: by driving the exercise of discretion underground, rules-as-algorithms blow up the bridges that connected universals to particulars in rules-as-models.

This book is a history in both ancient and modern senses of the word.[25] It is an inquiry, in the far-ranging sense in which Herodotus used the term *historia*. Moreover, despite the universal pretensions of its subject matter, it teems with particulars, as in Aristotle's (384–322 BCE) sense of *historia*, which he opposed to the universals of philosophy (and poetry). Finally, it is a history in the more familiar sense of a narrative that unfolds in time. But it is an incomplete history on all three counts. An inquiry that pursues so gargantuan a topic over more than two millennia and several languages will be of necessity selective. Even the multitude of particulars served up in these pages is only a sliver of the universe of possibilities. The scope of the narrative is regrettably and regretfully limited to what is somewhat misleadingly called the Western tradition, simply because it is the one I know best. But I have tried to draw upon comparative scholarship about other traditions, rich in their own fascinations, wherever it seems illuminating to do so. If readers are prompted to ask about rules of other kinds, in other times and places, so much the better: the book is an invitation to further inquiry and debate about rules at their most diverse. Chronological coverage is also spotty, for much the same reasons. In order to discern the arc of *longue durée* developments, I have been obliged to hopscotch among centuries and genres in a fashion that will probably induce a certain queasy motion sickness

among my fellow historians, accustomed for good reason to settle into one period and place. I must, however, crave their indulgence. Only by taking a panoramic view can I sharpen contrasts, pinpoint moments of transition, and, most important, use the resources of history to query the self-evidence of our contemporary habits of thought.

One of the uses of history, especially history pursued on a longer time scale, is to unsettle present certainties and thereby enlarge our sense of the thinkable. It is a curious property of the reigning conceptual milieu to appear coherent and inevitable to its inhabitants, in much the way that local customs seem self-evident to provincials who never leave home. Simply knowing in principle that the way we think now is the product of historical contingency rather than of logical necessity is rarely sufficient to lift the blinders imposed by history and habit. The mental world we happen to inhabit contracts the imagination to its own cramped dimensions. One epoch's self-evidence—how could anyone think otherwise?—is another's perplexity—what *were* they thinking? Vivid counter-examples drawn from other times and places must often be enlisted to drive a wedge between concepts that are routinely conflated in current usage: between the universal and the uniform, the specific and the rigid, the algorithmic and the mechanical, the mechanical and the mindless, the discretionary and the subjective. Examples can also help to reunite what modern philosophy has put asunder: rule and paradigm. Here history makes common cause with philosophy in the work of clarifying, expanding, and opening up conceptual possibilities. Philosophy faces the further daunting challenge of originating new concepts, not just criticizing old ones. The concepts of the past can seldom be stretched far enough to cover the needs of the present, just because they are the creations of and for the past. But although history can no more resurrect dead concepts than it can dead people, it can briefly reanimate them: revenants, who trouble the complacency of the living with their revelations.

INDEX