INTRODUCTION

IMPERIUM, METAPHYSICAL INSTRUMENTALISM, AND POTOSÍ MINING

THE METAPHYSICAL FOUNDATIONS OF IMPERIAL INSTRUMENTAL REASON

Discovered in 1545, the Cerro Rico (Rich Hill) of Potosí immediately became the main source of silver for the Spanish Empire, fueling both its political project of a Christian monarchy and the first global economy.[1] Even as they transformed Peruvian metals into the money that kept the empire together, sixteenth-century Spaniards also understood mining through long-standing metaphysical beliefs concerning the essence of matter. This metaphysical framework assumed that the natural world was composed of a raw and defective material that had to be dominated from above and directed to a higher end. Surprisingly, this metaphysics also framed the writings on natural law that were central to Spain's justification of its empire. An examination of the interactions between early political writings and writings on mining will show that the particular confluence of Iberian imperial practices and philosophical ideas in the Americas frames technological and capitalist modernity as both an imperial and a metaphysical project.

I make this argument through a contrapuntal reading of the sixteenth-century debates on Spanish sovereignty in the Americas and treatises on natural history and mining written between 1520 and 1640. Whether political or natural-historical, these texts all invoke an ontological frame derived from a "natural order" to justify (and occasionally to

question) material practices such as compulsory labor in the colonial Andes (*mita*) and refining techniques for the amalgamation of metals (*beneficio*). We trace the development of this ontological frame over the course of a century and a half, beginning with the early attempts to justify the conquest and compulsory labor in the mines and ending with texts on mining written as the Spanish Empire entered its terminal decline.

The texts along this trajectory often fall into the inherent paradox of metaphysical instrumentalism: conceiving nature as open to technical manipulation resulted in the entanglement of ends and means. For instance, Spaniards consistently justified the extraction of silver and the production of money by conceiving artificial mastery (or means) as determined by a natural teleology (or end). The metaphysical problem encountered in this collapse of ends and means was that the crass and profane material means were continually threatened with the danger of becoming an autonomous end in itself, undermining the superior ends they were supposed to obey. Thus, refining techniques and compulsory labor cost the Crown the lives of the Indian vassals, while the production and circulation of silver enriched a vast credit network that benefited competing European powers, in each case avoiding the ideal imperial end. While Spanish ideology sought to create a closed metaphysical circle that dedicated all practices to a united end, however, writers were well aware of the open-ended nature of both mining production and the global economy. As the Spanish Empire entered into decline in the seventeenth century, this dependence on material means proved ultimately incompatible with perfect ends and produced clear and endemic ideological inconsistencies.

Spanish imperial science and mining are traditionally studied separately from Spanish political theory, but here these two discourses are seen as isomorphic, interpenetrating one another at every level. By foregrounding the common Scholastic basis and the interaction between these two bodies of literature, moreover, this discussion contributes to a general reevaluation of the Scholastic roots of modernity in the fields of philosophy and the history of science. A systematic examination of metaphysical language employed in distinct disciplines allows us to narrate how the view of both nature and humans as malleable material is the result of the instrumentalist presuppositions inherent in imperial ideology. Against the assumption that scientific modernity began with the Protestant empiricists, I argue that this Western metaphysical instrumen-

talism is the origin of the contemporary reduction of nature to technologically disposable material.[2] This metaphysical ideology developed in the context of colonial Andean mining, and there was a specifically colonial indigenous attribution of life to the mineral world that was not exterior to but, rather, dialectically engaged with imperial metaphysics. This engagement still provides modern scholars with the basis for a critique of imperial metaphysical instrumentalism.

SCHOLASTICISM AND IBERIAN IMPERIAL IDEOLOGY

In order to examine the common Scholastic basis of imperial politics and mining, we must begin with attempts to ground the Spanish Empire in Aquinas's metaphysics. After the discovery and conquest the Spaniards tried to justify the appropriation of riches and the practice of mining in the New World. Scholasticism provided the theological and philosophical foundations for justifying the whole colonial enterprise.[3] The name of the movement that engaged in thinking contemporary politics through the work of Aquinas is the School of Salamanca.[4]

The founder of the School of Salamanca was the Dominican Francisco de Vitoria (1492–1546). Domingo de Soto (1494–1560), Melchor Cano (1509–1560), and Francisco Suárez (1548–1617) were also part of this movement.[5] The fundamental sources for Spanish Scholastics were Aristotle, Thomas Aquinas, Roman jurisprudence, civil and ecclesiastical law, and the *Decretales*, a collection assembled in the eighth century under the auspices of Pope Gregorio IX. Spanish Scholastics continued the tradition initiated by Cayetano (also known as Tomás Vio) of commenting on entire sections of Thomas Aquinas's *Summa Theologica.* The Aristotelian-Thomist tradition provided ways of confronting the threats presented by the *via moderna* and crystallized in Lutheranism, Machiavellianism, Erasmus's pacifism, and Ockham's nominalism.[6] Aquinas's "rationalism" was a perfect antidote to both Luther's theological voluntarism and Machiavelli's reason of state. The School of Salamanca opposed the pacifism of Juan Luis Vives, who saw in Charles V the triumphant unification dreamed of by Dante and Erasmus but condemned both Scholasticism and Spain's militarism by appealing to Augustine's *City of God*.

Francisco de Vitoria followed the model of the University of Paris that replaced nominalism with Thomism. Aquinas's philosophy was not only a christianization of Aristotle but also a synthesis of Aristotelianism and

Platonism. Aquinas metaphysics subsumed the theology of Augustine, Roman Law, and Cicero's natural right under a new paradigm. This paradigm accommodated empirical and factual knowledge of the world with the ontological realism of universal forms. Since Thomism defends the capacity to understand reality through the grasping of its essence, it proved useful for assigning sense to empirical facts. Aquinas's metaphysics and politics was a synthesis of Platonic doctrine of participation with Aristotelian causation.[7] The ultimate principles of Thomist ontology and theology were employed to assign sense and finality to a union of the factual (temporal) and the transcendent (eternal) realms in order to justify the evangelization and conquest of the New World. It provided a strong accountability to existing laws by grounding them in "rational" and "natural" finality. Therefore, Aquinas's providentialism provided a strong sense of legitimacy to the prince's authority by appealing to self-evident and ultimate principles capable of grounding the *imperium* as capacity to command. The political and epistemological power of Scholasticism depended on what can be summarized in the principle of subordination of the part to the whole, imperfect matter to perfect form, and material means to an immaterial end.

The task undertaken by the Spaniards was to justify their sovereignty over the newly discovered peoples by invoking their imperfect nature. Their imperfect nature, crystallized in their lack of civilization, had to be directed to their proper end, which was the common good, civilization, and salvation. The same procedure was applied to nature, which was understood as temporal means that could be used by directing it to humans' ends. Such a providentialist view of metals presupposed that available resources were a raw matter that could be employed to further Catholic expansion. This principle makes it possible to read both political writings and texts on mining through their common presuppositions, which is metaphysical instrumentalism—the ultimate ideology of the Spanish Empire.[8] In order to explain the instrumentalist presuppositions behind Aquinas's metaphysics, let us move now to the principle of the natural subordination of matter to form and means to an end.

PRINCIPLE AS ORIGIN OF DOMINATION

Let us start by explaining what a principle is. For Aristotle, and thus for Aquinas, a principle is a beginning or starting point that initiates the

existence or motion of something else (*Metaphysics* 5). For Aquinas, everything existing or moving owes its existence or movement to something else. For this reason, principles surpass moving or existing things in power. In Chapter 1, Book 5, *Metaphysics* 1012b34–1013a23, Aristotle explains the notion of principle as origin or inception by using different examples. In the first example, beginning means a part of a thing "from which one would start first, e.g. a line or a road has a beginning in either of the contrary distinctions" (Aristotle, *Basic Works*, 752). According to the second example, in "learning we must sometimes begin not from the first point and the beginning of the subject but from the point from which we should learn most easily" (752). In the third example, Aristotle refers to things that have their origin inside their nature, such as the heart of an animal, or "as the keel of a ship and the foundation of a house" (752). The fourth example is that of things that have their origin outside their nature, "as a child comes from its father and its mother" (752). The fifth example refers to the origin as the will that moves something else; it locates the best examples in "the magistracies in cities, and oligarchies and monarchies and tyrannies, [which] are called *archai* and so are the arts, and of these especially the architectonic arts" (752). In the sphere of knowledge, the origin is "that from which a thing can first be known—this is also called the beginning of the thing, e.g. the hypotheses are beginning of demonstrations" (752). What all these examples have in common is "to be the first point from which a thing either is or comes to be or is known" (752). In other words, a principle as origin is something that comes first and has certain preeminence because it is more important. Since a principle involves commanding and subordinating, it is useful to examine Aquinas's commentary on the fifth example.

Before analyzing this example, however, it is instructive to say that Aquinas classifies these above-mentioned examples in two categories. According to the first sense, "a principle means that part of a thing which is first generated and from which the generation of the things begins" (Aquinas, *Commentary on Aristotle's* Metaphysics, 278). The cases of the line, the road, and the foundation of the house belong to this first sense of principle. Yet there is a second sense in which "a principle means that from which a thing's process of generation begins but which is outside the thing" (279). One example of the first would be that of the father as the origin of the child. Indeed, within this category of things that have their principle outside themselves, he finds "natural beings, in which

the principle of generation is said to be the first thing from which motion naturally begins in those things, which come about through motion" (279). The second case of things that have their origin outside themselves, which is also Aristotle's fifth example, is that of "human acts, whether ethical or political, in which that by whose will or intention others are moved or changed is called a principle" (278–79). For Aquinas, both the example of the magistracies and civil power and the example of natural generation and corruptions, such as the father and the child, belong to the categories of external principles that cause the movement of something. Imperial power, which for Aquinas means sovereignty, implies this capacity to move its subjects, since "those who hold civil, imperial, or even tyrannical power in states are said to have the principal places" (279). By the will of the prince "all things came to pass or are put into motion in the states" (279). Those who have civil power "are put in command of particular offices in states as judges and persons of this kind" (279). For Aquinas, clearly, both the cases of natural movement and political subjection fall within the parameters of being moved by an external principle that precedes and exceeds the moved thing or subject. Civil power, the power of the state, is clearly an example of a principle that moves its subjects by subordinating them.

Finally, there is another example that falls under the fifth sense of principle in Aristotle and the category of external causation in Aquinas, which is the subordination of inferior arts to superior arts:

> For the arts too in a similar way are called principles of artificial things, because the motion necessary for producing an artifact begins from art. And of these arts the architectonic, which "derive their name" from the word principle, i.e., those called principal arts, are said to be principles in the highest degree. For by architectonic arts we mean those which govern subordinate arts, as the art of navigator governs the art of ship-building, and the military art governs the art of horsemanship. (279)

The example of this kind of subordination is also an example of subordination based on an external principle. This example is so important that it also appears in Chapter 1, Book 1, *Metaphysics* 981a29–981b2, where Aristotle writes, "For men of experience know that the thing is so, but do not know why, while the others know the 'why' and the cause. Hence we

think also that the master-workers in each craft are more honorable and know in a truer sense and are wiser than the manual workers, because they know the causes of the things that are done" (*Basic Works*, 690). Aquinas comments on this passage, saying that "In order to understand this we must note that architect means chief artist, from *techne*, meaning chief, and *archos*, meaning art" (Aquinas, *Commentary on Aristotle's* Metaphysics, 9). The superior art is the one that "performs a more important operation" (9). Moreover, Aquinas classifies the artist's operations between disposing the material of the artifacts and directing them to an end:

> Carpenters, for example, by cutting and planing the wood, dispose matter for the form of a ship. Another operation is directed to introducing this form into matter, for example when someone builds a ship out of wood which has been disposed and prepared. A third operation is directed to use of the finished product, and this is the highest operation. But the first operation is the lowest because it is directed to the second and second to the third. Hence the shipbuilder is a superior artist compared with the one who prepares the wood; and the navigator, who uses the completed ship, is a superior artist compared with the shipbuilder. (9–10)

Therefore, just like the natural hierarchies of the physical world and the human hierarchies of the political world, the hierarchy of the arts is an example of external subordination. The subordination of the material to the artist and then the subordination of this artist to a superior artist are based on the fact that the superior artist has a clear vision of the end of the final product. What all examples of principles share is being the first thing out of which things arise and are ruled. The principle *precedes* that of which it is a principle. It precedes everything else. It is presupposed. In the case of external causation, there is always an agent that is preeminent and superior and that *commands* what is subordinated and inferior. The very notion of principle and its ultimate metaphysical character is based on presupposing that the principle is both inception and source of domination. The principle *commands*, which means it subordinates and moves. A guiding hypothesis of the present book is that the commanding character of the principle is the result of the transposition of human technical manipulation to the realm of metaphysics. Another way of framing

this problem is, as will become evident in the following sections, that the intrinsic presupposition of this kind of movement is that of technical manipulation.

As explained above, natural, political, and technical subordinations are grounded on external principles. In Article 1, *Summa Theologica* IIaII-ae, Aquinas joins the notion of natural order and that of political subordination by grounding both in higher principle:

> In natural order, it happens of necessity that higher things move lower things by excellence of the natural power divinely given to them. Hence in human affairs also superior must move inferior by their will, by virtue of a divinely established authority. But to move by reason and by will is to command. And so just as in the divinely instituted natural order lower things are necessarily subject to higher things and are moved by them, so too in human affairs inferiors are bound to obey their superiors by virtue of the order of natural and Divine law. (Aquinas, *Political Writings*, 58)

The hierarchical division between higher (that is, moving and ruling) things and lower (or moved and inferior) things is part of a natural order. Natural subordination includes human affairs, which include politics, where rulers govern the ruled by *commanding*, or moving by reason and will. Both natural order and political subjection share in being part of providence, the divinely instituted natural order. In order to clarify the meaning of natural order or natural subordination, let us examine some key moments of Aquinas's principles of nature, also known as the doctrine of hylomorphism. In Aquinas, there are three principles in nature: matter, form, and privation. While matter and form are principles in themselves (*per se*) because they are also positive causes, privation is an accidental principle (*per accidends*) because it cannot cause anything by itself. First, I will explain the notion of matter, since this principle also involves the principle of privation.

PRIME MATTER PRESUPPOSES INSTRUMENTAL MANIPULATION

The metaphysical status of the "prime matter" is that of a pure abstraction that separates all the sensual, empirical, and singular qualities of things by focusing on what they have in common. In his commentary to

Aristotle's *Physics*, Aquinas defines "prime matter" as a lump of amorphous, plastic, raw material that has no consistency of its own since it exists only in a composite of matter. In *Physics* 191a7–15, Aristotle writes: "This underlying nature is an object of scientific knowledge, by analogy. For as the bronze is to the statue, the wood to the bed, or the matter and the formless before receiving form to any thing which has form, so is the underlying nature to substance, i.e., the 'this' or existent" (*Basic Works*, 232). Aquinas comments on this passage, saying that the above-mentioned underlying nature, "which is first subject to mutation, i.e., primary matter, cannot be known in itself, since everything which is known is known only through form" (*Commentary on* Physics, 61). This means that if matter is the imperfect, passive potency that underlies all individual material entities, form is the idea, pattern, or blueprint that gives determination and consistency to these material entities.[9] Matter is unknown and unintelligible, and only form is intelligible. This raw stuff present under every composite is pure passive potential to receive an exemplary pattern or "form" from above.[10] Aquinas continues, explaining that "prime matter is, moreover, considered to be the subject of every form. But it is known by analogy, that is, according to proportion" (61). Since this amorphous material cannot be known, it can only be understood through the mediation of analogy. The analogy of proportion can be illustrated by saying that A stands in relation to B, as C stands in relation to D. Aquinas adds, "For we know that wood is other than the form of a bench and a bed, for sometimes it underlies to one form, at other times the other" (61). We know that matter is different from form because wood is different from the bed. Aquinas thinks that experience tells us that the same wood sometimes underlies one bed and sometimes another. From there, the intellect abstracts an underlying notion of matter common to the different forms. Aquinas continues, explaining that, "when, therefore, we see that air at times becomes water, it is necessary to say that there is something, which sometimes exists under the form of air, and that other times under the form of water" (61). For something to become something else there must be an underlying substrate to both entities. Moreover, "this something is other than the form of water and other than the form of air, as wood is something other than the form of a bench and other than the form of bed" (61). The basic reasoning is an analogy according to which prime matter is other than the form, just as wood is other than the bench. Aquinas ends the paragraph saying

"This 'something,' then, is related to these natural substances as bronze is related to the statue, and wood to the bed, and anything material and unformed to form. And this is called primary matter" (61).

This is the crucial moment that explains how metaphysical thinking knows that there is an amorphous passive potential matter common to all things. It is the result of an abstraction that separates matter from all its concrete qualifications by postulating it as something that underlies already formed things. But the question that arises is, How does the intellect arrive at this idea of prime matter as an imperfect and amorphous passive potency deprived of any concreteness? By analogy with human manipulation: the prime matter stands in relation to form in the same way that bronze stands in relation to the statue. Aristotelian-Thomist metaphysics arrives at the idea of an amorphous passive raw matter by way of an analogy with human manipulation. The principle of the natural subordination of matter to form results from the transposition of technical manipulation to the natural order. Matter is subordinated to form in the same way that the bronze is subordinated to form, which is the final product, the statue:

> What is in potency cannot bring itself into a state of actuality. Bronze, for example, which is a statue in potency, does not make itself be a statue. It needs something actively working, which brings out the form of the statue from potency into act; I am speaking of the form of the generated thing, the form which we have said is the end-point of generation. . . . It is necessary, therefore that there be in addition to the matter and the form some principle which does something; and this is said to be what makes, or moves, or acts, or that from which the motion begins. (Bobik, 34–35)

Matter cannot produce anything because matter cannot bring itself into an actual object. It remains potential in the same way that bronze remains potential until the agent actualizes it by imposing a form on it. But form is the end-point of generation, or as Aquinas also says: "for form is the end of matter; therefore for matter to seek form is nothing other than matter being ordered to form as potency to act" (*Commentary on* Physics, 72). This means that the material means is subordinated to the form which is also the final cause. Therefore, Aquinas ties everything by saying that to matter, form, and privation there must be added an agent, which is the principle or "that from which the motion begins."

In Chapter 4e, Book 8, *Physics* 256a21–256b3, Aristotle sustains that, since every movement requires a mover, there must be a prime mover that moves itself in order to avoid an infinite regress. He exemplifies this argument by appealing to technical motion or instrumental manipulation:

> Every movement moves something and moves it with something, either with himself or with something else: e.g., a man moves a thing either himself or with a stick and a thing is knocked down either by the wind itself or by a stone propelled by the wind. But it is impossible for that with which a thing is moved to move it without being moved by that which imparts motion by its own agency: on the other hand, if a thing imparts its motion by its own agency, it is not necessary that there should be anything else with which it imparts motion, whereas if there is a different thing with which it imparts motion, there must be something that imparts motion not with something else, but with itself, or else there will be an infinite series. If, then, anything is a movement while being itself moved, the series must stop somewhere and not be infinite. Thus, if the stick moves something in virtue of being moved by hand, the hand moves the stick: and if something else moves with the hand, the hand also is moved by something different from itself. So when motion by means of an instrument is at each state caused by something different from the instrument, this must always be preceded by something else which imparts motion with itself. Therefore, if this last movement is in motion and there is nothing else that moves it, it must move itself. So this reasoning also shows that, when a thing is moved, if it is not moved by something that moves itself, the series brings us at some time or other to a movement of this kind. (*Basic Works*, 367–68)

Since everything that moves must be moved either by itself or by another agent, there must also be an agent that moves itself. This will become an important argument for proving the existence of God, the Prime Mover, a principle of all movements. Aquinas comments this passage by saying that "every mover moves something and moves by something, either by itself or by another lower mover" (*Commentary on* Physics, 551). For example, "a man moves a stone either by himself or by a stick, and the wind hurls something to the ground either by its own power or by a stone which it moves" (551). Aquinas continues, explaining that "it is impossible for that which moves as an instrument to move something

without a principal mover" (551). In other words, instruments do not move themselves. Aquinas goes on: "For example, a stick cannot move without a hand." Moreover, "no one would doubt that the second mover is the instrument of the first" (551). The consequence of the incapacity of an instrument to move itself is none other than the existence of a thing that moves itself: "Just as he said above that if something is moved by another there must be something which is not moved, but not vice versa, so here he says by descending that if there is an instrument by which a mover moves there must be something which moves, not by an instrument, but by itself, or else there is an infinite series of instruments. This is the same as an infinite series of movers, which is impossible, as was shown above" (551). If there are instruments, things that are moved by human hands, then there must be a first mover since it is impossible to have a series of infinite instruments. The machine of the world requires a first mover, an external, transcendent cause that moves everything else. There is a gradation of power and capacity to move that goes from God, which is absolutely perfect (self-subsistent, self-moving) to nonliving things, which are imperfect (dependent and moved by another). In the middle there are corporeal things that are composites of matter and forms. The world is a hierarchical, natural order where matter is subjected to different forms that are intellectual, sensitive, and vegetative. While God is the ultimate agent who moves instruments, matter is the lowest imperfect principle, which is itself an instrument of the form, whether it is an intellectual, vegetative, or sensitive soul: "the whole of corporeal nature is an underlying subject to the soul, and it is related to it as matter and instrument" (Bobik, 141). In sum, the principle of the natural subordination of imperfect matter to perfect form is inseparable from an instrumental understanding of nature. To recapitulate, the three examples of principles, as such, are natural, political, and technical subordination. The three aspects are joined into one principle, which is exemplified with the example of the bronze statue.

The example of bronze provided by Aquinas and Aristotle illustrating both natural subordination and political subjection is an example borrowed from the arts. In this example, an artist (efficient cause) imposes a preexisting idea (perfect form, universal pattern, blueprint, or soul) over a prime matter (pure passive instrumental potency) in order to produce a statue (the final product). Aquinas employs the metaphor of the craftsman or the architect who imposes a preexisting rational order (forms,

ideas, universal patterns, exempla) over an amorphous, chaotic, imperfect, and incomplete matter in order to achieve a perfect, complete, and self-sufficient product. Let us return to the domain of political subjection, or empire as subjection, in order to see how Aquinas joins the natural order with the compulsory character of the law. In Article 1, *Summa Theologica* IaIIae.93, titled "Whether the eternal law is supreme reason existing in God," we read:

> Just as in every craftsman there preexists a rational pattern of the things, which are to be made by his art, so too in every governor there must preexist a rational pattern of the order of the things, which are to be done by those subject to his government. And just as the rational pattern of the thing to be made by art is called art, or the exemplar of the products of that art, so too the rational pattern existing in him who governs the acts of his subjects bears the character of the law, provided that the other conditions which we have mentioned above are also present. Now God is the Creator of all things by His Wisdom, and *He stands in the same relation to them as a craftsman does to the products of his art*, as noted in the First Part. But he is also the governor of all the acts and motions that are to be found in each single creature, as was also noted in the First Part. Hence just as the rational pattern of the Divine wisdom has the character of law in relation to all the things which are moved by it to their proper end. (*Political Writings*, 102; my emphasis)

The relation of proportion here is the same as the one explained above between the bronze and the statue, where prime matter stands in relation to the final form in the same way that bronze stands in relation to a statue. Now both God and the monarch stand in relation to the subject in the same way that the artist stands in relation to the amorphous matter. These efficient causes have a preexisting end in mind that functions as a rational pattern, blueprint, or prototype. This preexisting idea lives in the mind of the Divine Artifice who then proceeds to tame the amorphous material in order to obtain a final product. In the example provided by Aquinas, the formal cause of the product of art is the preexisting idea. The efficient cause is the Divine Artifice itself. The material cause is the amorphous and plastic material, a passive potency that receives the form in the mind of the Divine Artifice.

Finally, the final cause is the product of art itself. The principle of

natural subordination implies that there is a superior power that moves things to their proper end. There is a tautological performativity at work in the capacity of the principle to command amorphous matter. This tautological character resides in the fact that ends are mandatory because they have been imposed by the principle. In order to go beyond the mere tautological relation between origin and end, and to prove that the command is not just arbitrary but both rational and natural, Aquinas, following Aristotle and Plato, has to appeal to the metaphor of the artisan. Examples similar to that of the statue appear in *De regimine principum* where Aquinas states:

> That it is necessary for men who live together to be subject to a diligent rule by someone. To fulfill this intention, we must begin by explaining how the title king is to be understood. Now in all cases where things are directed towards some end but it is possible to proceed in more than one way, it is necessary for there to be some guiding principle, so that the due end may be properly achieved. For example, a ship is driven in different directions according to the force of different winds, and it will not reach its final destination except by the industry of the steersman who guides it into port. . . . Man therefore needs something to guide him towards his end. (*Political Writings*, 5)

Here, in order to explain how guiding principles must direct things to an end and how the prince must direct men to their proper end, Aquinas employs the example of how the steersman guides the ship to its proper destination. In this example, just as in the example of the artist who makes a statue, there is a clear transposition of technique to the natural order and to politics.

As a result from the use of this example borrowed from technical mastery, there is an instrumentalist presupposition in Aquinas's principle of the natural subordination of imperfect matter to the perfect end. Natural causation is preconceived as artificial causation.[11] Natural mastery, the capacity of the principle to command, is like artificial mastery, the capacity of the artist to impose form over matter, directing it to the end.[12] The reason behind this transposition of technique to nature is that principles cannot be demonstrated, because they are the origin of the demonstration. Although principles are absolutely necessary and, therefore, presupposed, they are impossible to know or demonstrate, since

they are themselves the origin of demonstration. Therefore, they can only be illustrated by using an imperfect analogy. The principle's power to command—imperium itself—is illustrated by appealing to an example that backs up the principle itself. Within the frame of Scholastic metaphysics, the rational power to command is paradoxically understood as the capacity of human beings to mold an available raw material with human hands.

Therefore, Aquinas transfers the characteristics of instrumental manipulation to the natural world and political world. Despite appealing to instrumental manipulation in order to ground the capacity to command, Aquinas's Aristotelian philosophy relegates instrumental manipulation to the status of a mere passive, inert human extension. Scholasticism disavows its own transposition of artificial mastery to natural causality by reducing technique to a mere *medium*—a neutral, instrumental device that requires an efficient cause to be set in motion and directed to a preexisting end—since artifacts "have no inner impulse to change" (Aristotle, *Basic Writings*, 236). The principle of the natural subordination of imperfect matter to perfect form presupposes metaphysical instrumentalism. Instrumentalism is metaphysical because it supposes the preexistence of a supersensory idea independent of the material world already inscribed in the commanding origin. Metaphysics is instrumentalist because it borrows its apparently self-evident character from examples borrowed from instrumental manipulation, such as statue making, ship navigation, or bridle making. Since metaphysics wants to preserve its necessary and, above all, natural character, it subordinates technique to a preexisting master by relegating the instrument to the status of a passive medium. Metaphysical instrumentalism conceives nature and politics as a means to an end because it masters technique by presupposing a master that controls technique itself. Matter is a manipulatable stock, an available material instrument ready to be directed to a higher end.

MODERNITY AS TECHNOLOGICAL DOMINATION IN HEIDEGGER

The instrumentalist presuppositions of metaphysics were the object of Martin Heidegger's deconstruction of the history of Western philosophy. He is without a doubt the most influential philosopher of technology of the twentieth century.[13] Such an uncontested influence is partially

based on Heidegger's insight into the mutual co-constitution between metaphysical totalizations and global technological expansion. Moreover, for Heidegger, technological domination is part of self-revelation of being itself. As Arthur Bradley explains, for Heidegger "the history of the philosophy of technology from Aristotle to the epoch of contemporary techno-science effectively becomes the history of Being's own self-disclosure—a disclosure that changes radically over time—to that being who is most equipped to receive it: Dasein" (68). The history of Western metaphysics is the attempt to legitimize technological domination of nature and human beings by endowing ultimate representations of being with a commanding power.[14] These measuring principles have a history—a rise, a productive life, and a fall. Principles are not scientific since their role is to ground science. As Reiner Schürmann explains, for Heidegger the history of Western metaphysics is the history of the rise and fall of these principles, which are representations of an ontological origin that precedes and empowers being itself. In Heidegger's words, "Metaphysics is history's open space wherein it becomes a destining that the supersensory world, the ideas, God, the moral law, the authority of reason, progress, the happiness of the greatest number, culture, civilization, suffer the loss of their constructive force and become void" ("The World of Nietzsche," in *The Question Concerning Technology*, 65). Each of these epochal principles is a failed attempt to provide a ground with normative force that would legitimate technological will to power. As Schürmann maintains, Heidegger's history of Western metaphysics is structured around a central insight, which is that philosophy has been hypnotized by Aristotle's teleology from beginning to end. As a matter of fact, Heidegger decreed that "This book [Aristotle's *Physics*] determines the warp and woof of the whole of Western thinking, even at that place where it, as modern thinking, appears to think at odds with ancient thinking. But opposition is invariably comprised of a decisive, and often even perilous, dependence" (Heidegger, *The Principle of Reason*, 63). In Schürmann's interpretation of Heidegger, Western metaphysics has been held captive by a *teleocratic* design, invented by Aristotle, that reaches its point of exhaustion with Nietzsche's doctrine of the will to power: "Both Metaphysics and logic derive from the astonishment before what our hands can make out of some material" (*On Being and Acting*, 99). Schürmann contends that, for Heidegger, the Aristotelian concepts of origin and end do not result from speculation or syllogistic logic, "from the analysis of

becoming that affects material things" (99). Causality is an attempt to make intelligible becoming, or material motion. If Aristotle's *Physics* is the grounding book of Western metaphysics it is because "Causal explanation is one mode of understanding among others, although this mode has maintained its hegemony over Western philosophy" (*On Being and Acting*, 100). As Heidegger states, "the concepts of matter and material have their origin in an understanding of being that is oriented to production" (*Basic Problems of Phenomenology*, 116). Far from being an object of empirical observation, the instrumentalist gaze conceives nature in terms of making or manufacturing something out of raw materials. Matter is a basic metaphysical concept that necessarily arises when the ultimate nature of things is "interpreted within the horizon of such productive comportment" (116). From a Heideggerian perspective there is an indissoluble alliance between causal explanation and instrumental manipulation, where technical motion is initiated either by the Divine Artisan or a human subject.

Schürmann postulates that there is a third presupposition behind the Aristotelian division between self-moving things (natural, self-sufficient entities) and things moved by another (man-made, inert artifacts). The distinction presupposes causal movement and change initiated by humans that experience themselves as craftsmen, "as initiator of fabrication, that nature can in turn appear to him as moved by mechanisms of cause and effect" (*On Being and Acting*, 100). First, the philosopher finds the origin of production in himself, and then he finds it in nature and God. If the distinctive characteristic of Western metaphysics is attributing some intrinsic end to a certain origin, the "experience that guides the comprehension of origin as it is operative in the philosophy of nature is paradoxically the experience of fabricating tools and works of art, the experience of handiwork" (100). The division between things that move themselves and things that are moved by another, the division between the principle that precedes and empowers and the secondary effects that are subordinated to it presuppose the agent that moves its own hands (101). This will determine the outcome of Western metaphysics, because the foreseen end conceives the world in terms of a manipulatable stock. As Schürmann remarks, "anything, to be sure may turn into such manipulatable stock, and it may well be that, because of the exclusive emphasis on fabrication since the beginning of Western metaphysics, everything has in fact become just that" (102). The gist of Western philosophy is

a "metaphysics of handiwork," of manufacture that ends up becoming artificial manipulation (104). The metaphysics of handiwork is not only teleological but also hylomorphic, since is supposes an efficient cause (a craftsman) that imprints forms (patterns or ideas) over a matter (bronze) in order to produce a final product (a statue).

Although the "metaphysics of handiwork" is at the inception of technological domination because it preconceives the world in terms of an available manipulatable stock, technological domination proper does not take place until the triumph of technological will to power.[15] Will to power triumphs when it establishes its own conditions in "values" that come to replace the former "ends." Unlike goals or ends, a value is a value if it enhances power. Also, there is no preservation of power without the enhancement of power. This means that the will to power always wills more power. In order for a value to be a value it has to produce surplus power. Schürmann explains that for Heidegger, "the teleocracy introduced into philosophy with Aristotle's *Physics* reaches the very being of all entities. But in its fulfillment, finality cancels itself" (*Being and Acting*, 188). With this triumph of subjectivism—which is also a triumph of objectivism, being both sides of the same coin—"the will to power posits itself as its own condition in positing all things as values, that is, as its own objects, in striving after mastery over the earth, in willing that everything becomes its object, what it wills is thus itself: it wills the totality of possible objects as its immanent goal" (188–89). The outcome of Aristotelian teleology is that it cancels itself. Limitless appropriation, subjection, and technological ordering dismantle teleocracy, and all that remains is a goalless will to power that wills itself by willing only more power (189). Ends cease to be given transcendent, supersensory ideas, becoming conditions or obstacles for an ever-expanding cycle of self-overpowering through technological ordering. Heidegger identifies this process with global Western expansion that implants its technological regime everywhere, indifferent to all its consequences (189).

In this goalless process of ever-expanding technological power, humans become tools of their own tools. Heidegger calls this process "enframing," which consists in revealing reality as "standing-reserve," that is to say, in the mode of ordering that challenges not only nature but also human beings, reducing them to a manipulatable stock. In Heidegger's words, "That challenging happens in that the energy concealed in na-

ture is unlocked, what is unlocked is transformed, what is transformed is stored up, what is stored up is, in turn, distributed, and what is distributed is switched about ever anew. Unlocking, transforming, storing, distributing, and switching about are ways of revealing" (*Question*, 16). Machine technology, which makes everything available to itself, consists in arranging reality according to its orderable capacity:

> Enframing means the gathering together of that setting-upon which sets upon man, i.e., challenges him forth, to reveal the real, in the mode of ordering, as standing-reserve. Enframing means that way of revealing which holds sway in the essence of modern technology and which is itself nothing technological. On the other hand, all those things that are so familiar to us and are standard parts of an assembly, such as rods, pistons, and chassis, belong to the technological. The assembly itself, however, together with the aforementioned stockparts, falls within the sphere of technological activity; and this activity always merely responds to the challenge of Enframing, but it never comprises Enframing itself or brings it about. (20–21)

Enframing is, then, the last chapter of a history of Western metaphysics that ends up revealing everything in a one-dimensional way, reducing it to an available raw plasticity ready to be transformed, stored, and distributed. This is the defining feature of modernity, which started with the premodern metaphysics of handiwork already present in Aristotle and perfected by Scholasticism.

Heidegger provides us with a historical genealogy of the technological present in the history of metaphysics. In other words, enframing provides us with a link between technological modernity and metaphysical instrumentalism. Metaphysical instrumentalism, according to which an agent imposes a pattern over matter in order to produce a form, contains the key to understanding global technological expansion as the aimless transformation of everything into useful material. The self-expansion of the technological means becomes an end in itself. But the condition for understanding the link between metaphysical instrumentalism and modern technological reduction to standing reserve is in examining the inconsistencies that arise from metaphysical instrumentalism in its imperial dimension and colonial context. Before going into the specifics, however, let us examine another explanation that competes with Heidegger's log-

ic of domination and that is still connected to metaphysical instrumentalism. If, according to Heidegger, Western metaphysics is a handicraft metaphysics, for Karl Marx ideological mystification, especially visible in commodity fetishism, consists of attributing an inner life to the products of human brains and hands.

MODERNITY AS CAPITALIST EXPANSION IN MARX

It is well known that for Marx, being under the spell of ideology equals not knowing what one is doing. Ideology is characterized by a split between knowledge and practice: "They do this without being aware of it" (Marx, *Capital*, 1:166–67).[16] Ideological mystification implies a misrecognition that does not simply fall under the category of false consciousness because it shapes social reality itself. Another feature of ideological mystification is the fetishistic inversion according to which the result of a network of differential relations is confused with the property of one of the elements of this network. As Marx put it in a footnote, "For instance, one man is king only because other men stand in relation of subjects to him. They, on the other hand, imagine that they are subjects because he is king" (1:49). In order understand this ideological or fetishistic misrecognition that shapes reality itself it is useful to visit Chapter 1 of *Capital*, volume 1, "The Commodity," specifically the section titled "The Fetishism of the Commodity and Its Secret." There, Marx writes: "a commodity appears at first sight an extremely obvious, trivial thing" and yet "its analysis brings out that it is a very strange thing, abounding in metaphysical subtleties and theological niceties" (163). The metaphysical subtleties of the commodity derive not from the instrumental character of the thing in question but from a larger process of valorization of the thing. Before explaining the origin of the enigmatic character of the commodity, Marx depicts that which is not enigmatic, namely, the instrumental manipulation of nature itself in order to produce a final product:

> It is absolutely clear that, by his activity, man changes the forms of the materials of nature in such a way as to make them useful to him. The form of wood, for instance, is altered if a table is made out of it. Nevertheless the table continues to be wood, an ordinary, sensuous thing. But as soon as it emerges as a commodity, it changes into a thing which transcends sensuousness. It not only stands with its feet on the ground, but, in relation to

> all other commodities, it stands on its head, and evolves out of its wooden brain grotesque ideas, far more wonderful than if it were to begin dancing of its own free will. (163)

When an artisan imposes a form over a material, the product is still an "ordinary, sensuous thing." In the language of metaphysical instrumentalism, Marx seems to be saying that the telos of instrumentalism is not something transcendent, enigmatic, or "mystical." This means that the "mystical character" of the commodity is not inherent in its use value or instrumental character of the product. Only once it is inverted, when it stands on its head, does the mad dance of commodities commence. When Marx asks for the origin of the "enigmatic character" of the commodity, he unequivocally answers, "Clearly, it arises from this form itself" (164). The "form" is the form of equality that emerges through measuring commodities against other commodities and ultimately against money. The value of a commodity is expressed through the value of another commodity, and through money as the value of value:

> The coat, therefore, seems to be endowed with its equivalent form, its property of direct exchangeability, by nature, just as much as its property of being heavy or its ability to keep us warm. Hence the mysteriousness of the equivalent form, which only impinges on the crude bourgeois vision of the political economist when it confronts him in its fully developed shape, that of money. He then seeks to explain away the mystical character of gold and silver by substituting for them less dazzling commodities, and with ever-renewed satisfaction, reeling of a catalogue of all the inferior commodities which have played the role of the equivalent at one time or another. He does not suspect that even the simplest expression of value, such as 10 yards of linen = 1 coat, already presents the riddle of the equivalent form for us to solve. (149–50)

The exchangeability of the commodity is not an intrinsic property of the thing but an effect of a differential relation, which produces the perspective illusion of a thing possessing value in itself. It is useless to retranslate money into how many commodities it can buy because it still presupposes the equivalence it has to explain. In other words, the secret is the mystifying power of the form of equivalence itself.

Marx argues that "the mysterious character of the commodity form

consists therefore simply in the fact that the commodity reflects the social characteristics of men's own labor as objective characteristics of the products of labor themselves, as the socio-natural properties of these things" (*Capital*, 1:165). The sensuous products of labor become "supersensible" (165). As a result, only by analyzing the "metaphysical and theological" subtleties of money as *medium* of exchange does Marx arrive at his well-known definition of commodity fetishism: "It is nothing but the definite social relation between men themselves which assumes here, for them, the fantastic form of a relation between things. In order, therefore, to find an analogy we must take flight into the misty realm of religion. There the products of the human being appear as autonomous figures endowed with a life of their own, which enter into relations both with each other and with the human race. So it is in the world of commodities with the products of men's hands" (165). In a fetishistic transposition, the products of human brains and hands acquire a transcendent, supersensible life of their own. A commodity is both the embodiment of social relations and a magical object endowed with an autonomous life of its own. Marx's theory of fetishism is basically an explanation of how, in a bottom-up fashion, a market-based network of relations generates an economic arrangement that in the end takes on a life of its own. These economic patterns are virtual formations or metaphysical ideals that transcend the individual members of the social network, achieving a certain autonomy that subordinates these individual members to the same virtual formations. The metaphysical subtleties of the commodity arise out of the ground of material labor, the products of hands and brains. The alienating effects of capital as identified by Marx are due to the fact that social dynamics are no longer regulated by the interests of those who generated that capital in a bottom-up way but, rather, by the drive to generate money out of money. The problem is that once the fetish acquires a life of its own, it is no longer possible to reduce its "misty" theological character to the material production or the antagonisms of the social life. The point of the critique of political economy is not to reduce the fetishistic dimension to the "real," material, empirical world. The point is that we cannot understand the real, material, empirical world without grasping how it is shaped by the metaphysical and theological character of the fetish. It is necessary to go through the mystification of the form of equivalence in order to demystify commodity or money fetishism. The critique of political economy means that it is necessary to go through the metaphysical subtleties

and theological niceties that are taken for granted by an ideology that intervenes directly in reality. No empirical description, no matter how exhaustive it appears to be, can perform this critique: "Moreover, in the analysis of economic forms neither microscopes nor chemical reagents are of assistance. The power of abstraction must replace both"(1:90). Capitalism is a system of beliefs, a metaphysics that also imposes its own form over reality.

Imposing its form over reality is a process that is essential to modernity, although in a form different from that articulated by Heidegger. I am referring to the emergence of the capitalist world system in the sixteenth century. Marx explained the origin of modernity as capitalism both in terms of processes of production and in terms of processes of circulation. On the one hand, when prioritizing the process of production, he looks for the origin of capitalism in the inner contradictions of feudal society and the rise of manufactures launched by independent farmers (*Capital*, 3:455). On the other hand, Marx also prioritizes the process of circulation when he writes in Chapter 4 of *Capital*, titled "The General Formula of Capital": "The circulation of commodities is the starting-point of capital. The production of commodities and their circulation in its developed form, namely trade, form the historic presuppositions under which capital arises. World trade and the world market date from the sixteenth century, and from then on the modern history of capital starts to unfold" (*Capital*, 1:247). This world market emerged with the connection of the international economies of the Baltic and Mediterranean in the fifteenth century, and with the connection of Europe, America, and Asia in the sixteenth century (Karatani, *Structure of World History*, 159). As Paul Sweezy and Immanuel Wallerstein stress, European capitalism would have been impossible without the emergence of the world market.[17]

In order to explain the historical presuppositions of capitalism with the emergence of the world market in the sixteenth century, Marx moves on to explain what he considers to be the matrix of capitalism—the movement of money generating more money out of itself. Before going into specifics he explains that, when we disregard the material content of the circulation of commodities and consider only the economic forms, we find that the ultimate product of circulation is money (*Capital*, 1:247). Moreover, "this ultimate product of commodity circulation is the first form of appearance of capital" (247). Marx continues, analyzing the consequences of the transformation of simple exchange (where commodi-

ties are exchanged for money in order to buy commodities, C-M-C, into the circulation of money as capital, where the goal of the exchange is to produce more money, M-C-M´). On the one hand, in C-M-C, "the simple circulation of commodities—selling in order to buy—is a means to a final goal which lies outside circulation, namely the appropriation of use values, the satisfaction of needs" (253). On the other hand, Marx writes that in M-C-M´, "the circulation of money as capital is an end in itself, for the valorization of value takes place only within a constantly renewed movement. The movement of capital is therefore limitless" (253). With the inversion of C-M-C into M-C-M´ we witness the practical emergence of the fetishism of money. Money starts to occupy the place of power in the hierarchical structure. Money is not money because it possesses the quality of being intrinsically money but because we treat it as money when its accumulation becomes an end in itself. Money and commodities do not have the same power because money can buy commodities, while commodities are not necessarily exchanged for money. In other words, money has the power of exchangeability.[18] Exploitation of workers in industrial societies is structurally the same as the activity of merchants who buy and sell at different locations, since in both cases the labor commodity and the commodities in general are subordinated to the process of self-valorization of capital. As Marx would say, "we do not need to look back at the history of capital's origins in order to recognize that money is its first of appearance. Every day the same story is played out before our eyes" (*Capital*, 1:247).

The above-mentioned asymmetry between the limitless power of money and the instrumental value of commodities gives rise to the perverse drive to accumulate money for the sake of the accumulation of money, a "boundless drive for enrichment, this passionate chase after value" (Marx, *Capital*, 1:254). This drive to accumulate money produces an "increment or excess over the original value I call surplus value" (251). It is important to stress that this excess cannot be reduced to the instrumental manipulation and domination of nature or people. In other words, it is not reducible to Heidegger's logic of domination or to a logic of nihilistic equality. Moreover, the production and appropriation of surplus value escapes domination. Its excess is closer to what Deleuze and Guattari call "deterritorialization," a constant self-revolution where everything that is solid then melts into the air. Money always escapes. And it escapes by subordinating everything to itself. The logic of money-

producing-money is not reducible to technological enframing, since it involves an excessive element—surplus value, the value against which all values disintegrate—that appears to engender itself in a continuous process of self-valorization: "Value is here a subject of a process in which, while constantly assuming the form in turn of money and commodities, it changes its own magnitude, throws off surplus value from itself considered as original value, and thus valorizes itself independently. For the movement, its valorization is therefore self-valorization. By virtue of being value, it has acquired the occult ability to add value to itself. It brings forth living offspring, or at least lays golden eggs" (255). Value, as it arises out of the form itself, is *intrinsically metaphysical and theological* because it is a pure leap of faith based on the promise that the cycle of production and circulation *will produce profit*.[19] With this leap of faith, the *salto mortale* of a postponed retroactive valuation, capitalism prospers on future credit, with no guarantee in reality except the ungrounded belief that the cycle of circulation will produce more value. In other words, the leap of faith—the split by means of which something with instrumental value jumps into a commodity as a transcendent and supersensible thing—is strictly theological or metaphysical.

Until now I have been examining how Aquinas's Scholasticism, which was the metaphysical basis of imperial ideology, had instrumentalist presuppositions. I have also shown how Heidegger understands these metaphysical presuppositions as being part of a metaphysics of handiwork whose outcome is the modern drive to transform humans into tools of their tools. In addition, we have seen how this drive to dominate by means of the imposition of rational scientific patterns over the world cannot explain the emergence of an excess that escapes control such as the drive to produce surplus value. The question then arises of how to understand these two logics of modernity, with their different aims and procedures. Both logics have a common origin—transforming reality with human hands—but completely different outcomes. The logic of domination and the logic of self-revolutionizing excess are two aspects of modernity, two irreconcilable narratives that exist only by each one's ignoring the other. Capitalism is not the by-product of the technological domination of nature, because the latter is also inseparable from market circulation and the generation of surplus value. There is no superior synthesis or neutral metalanguage that would provide an all-encompassing narrative of these two contradictory aspects of modernity.[20] Heidegger provides a

history of philosophy whose outcome is will to power and technological domination, which also influenced Foucault's notion of biopolitics as the regulation and administration of life, as well as Adorno's search for answers in the logic of instrumental rationality. Marx provides a history of the excessive movement of capital that dissolves all bonds and disrupts all values by measuring them against money as the value of value. The logic of surplus power, manipulating people by apparatuses of subjection, and the logic of surplus value, the logic of production and appropriation of an excess in continuous self-revolution, are not identical and cannot be translated into one another.

Nevertheless, the wager of the present book is that the dual character of modernity, the division between the logic of domination and its logic of deterritorializing excess, emerges out of the contradictions of metaphysical instrumentalism, which can be historically articulated by examining the relations between natural law and mining. An examination of the complex interrelations and tensions between natural law and mining in the sixteenth and seventeenth centuries shows how these two logics are the two sides of the same coin, the two irreducible aspects of imperial expansion. By examining the double articulation between natural law and mining it is possible to redouble the gap between the logic of domination and the logic of capitalist deterritorialization within metaphysical instrumentalism. The Heideggerian critique of Western technological domination can be historically articulated with a Marxian critique of commodity fetishism by means of a critique of the inner impasses of Aquinas's metaphysical instrumentalism in a colonial context. The inner impasses of instrumentalism generated a certain excess—a self-valorizing value—that is impossible to control, an instrument that subordinates all instruments to itself and therefore undermines its own metaphysical presuppositions.

To recapitulate, what at first sight looks like a merely formal or logical deadlock in metaphysical instrumentalism is symptomatic of a more radical impasse that is inherent in the colonial situation itself. The two logics of modernity are narratives that still see their historical development as European achievements while foreclosing their origin in Hispanic imperial instrumentalism as applied to the lands and peoples of the Americas. The only way of explaining the historical genesis of these two logics is through the inner contradictions of metaphysical instrumentalism, but this must be on the condition that we do not consider its universal ambi-

tion as a formal, empty container but, rather, as unresolved aporias and antagonisms. The impasses of imperial instrumentalism are born in the interstices between different communities, in the conflictive and asymmetrical space of a colonial context, as a result of the attempt of one community to enjoy the property and the fruits of another community's labor. The imperial dimension of metaphysical instrumentalism remained virtual until it was actualized in a colonial relation between communities, when Spaniards saw Amerindians as an imperfect matter that should be molded and guided to the only ends common to all humanity—civilization and salvation. Although the official imperial discourse appealed to civilization and conversion as ends in themselves, an examination of the arguments invoked by the apologists of the Spanish Empire show how the aim of these ends was to mobilize the indigenous labor force and accumulate riches.

The present volume is a work of intellectual history concerning the inconsistencies behind attempts to justify the Spanish mining enterprise in its economic, political, and technological dimensions. All the texts examined here belong to the imperial school of thought and represent an imperial perspective that was later disavowed by the Enlightenment, despite being central to the development of capitalist and technological modernity. These texts were hegemonic; they created reality by influencing the Crown's policies. The decision to limit the analysis of metaphysical instrumentalism to texts that fall squarely within the imperial tradition is based on the need to find a solution to the problem of the separation between the fields of political ideology and history of science in colonial studies. The decision to focus exclusively on what is hegemonic, dominant, or the rule rather than the exception is based in an attempt examine the presuppositions of imperial reason, the consequences of which are still visible today. By examining texts that were dominant and influenced the decisions made by the Crown, it is possible to fill a gap in the study of the Spanish Empire, namely, the separation between political philosophy and history of science. While Spanish imperial science and mining are traditionally studied separately from Spanish political theory, here we make the case that these two discourses are isomorphic and intertwined. It is not simply that natural law provides the theory for mining practice in a unidirectional way, since they are both opposite sides of the same metaphysical instrumentalism. Their relation is one of dynamic interpenetration and mutual constitution. Natural law justified mining

by providing it with a goal, and mining changed natural law by becoming an end in itself. Far from limiting itself to being a material means, a passive instrument, mining proved to be more indispensable, and also more destructive, than the goals invoked by natural law. Mining literally denaturalized natural law by forcing it to face its own disavowed presuppositions.

Natural law and mining are isomorphic because they share the same hylomorphic and teleological structure based on the principle of the natural subordination of matter to form and means to an end. It is not possible to reduce natural law to a theater of appearances and mining to an objective, material, socioeconomic process. Both natural law and mining share the same metaphysical principles and presuppositions: the transposition of artificial manipulation to the sphere of natural order and political mastery. Both consider their objects (nature and human populations) as imperfect matter that needs to be directed to a final end by means of the imposition of rational patterns. The relation between both natural law and mining is one of mutual co-constitution and irreducible tension. But the irreducible tensions between them are internal to metaphysical instrumentalism itself and derive from the transposition of artificial manipulation to natural order. Metaphysical instrumentalism depends formally on the transposition of artificial manipulation to the natural order only in order to proceed to subordinate artificial subordination to a higher master. This disavowal has practical consequences: the means effectively dominate the whole process, mediating between the invoked ends and the community in which the end is to be realized. If, from an idealist or metaphysical perspective, the end dominates the means, from a materialist and historical perspective both the end and the object are materialization of the means that subordinates the end. As Heidegger would put it, the means, or the instrument, is not an inert neutral device but a process of domination over nature. As Marx would put it, the end of the whole process is not the satisfaction of needs but the endless drive to accumulate more riches. The ultimate inner contradiction of metaphysical instrumentalism is that the end is the means of the means.

THE STRUCTURE OF THE PRESENT BOOK

The present book is structured around a contrapuntal reading of this entanglement within the sixteenth-century debates on Spanish sovereign-

ty in the Americas and writings on natural history and mining written between 1520 and 1640. Each chapter shows a slight shift of perspective with respect to the previous chapter. Each shift is the result of previous failed attempts to find a solution to the problem of how to ground the Spanish dominion and the practice of mining. The Spanish dominion invoked the principle of subordination of the material means to the transcendent end, which contained irreducible contradictions. Therefore, the works discussed in each chapter brought new contradictions, which end up producing new failed attempts to cope with these contradictions. The arrangement of the chapters follows the demands of the problems addressed by each of the authors analyzed here and the various impasses generated by metaphysical instrumentalism in its imperial dimension. The chapters are also arranged chronologically, beginning with an examination of the earliest attempts to justify Spanish dominion—intellectual efforts in which mining was addressed abstractly—and ending with an overview and analysis of the crisis of the imperial enterprise that emerged from the material contradictions introduced by the mining practices founded on imperial ideology.

Chapter 1, "Grounding the Empire: Francisco de Vitoria's Political Physics," begins with the history of the principle of subordination of matter to form and of means to an end by examining Francisco de Vitoria's (c. 1492–1546) *relecciones*, key lectures that were later transcribed and edited by students. Vitoria was the jurist theologian who systematized the first attempts to justify the conquest and colonization of the New World through a discussion of the problems of the sovereignty of indigenous peoples and the appropriation of their material riches by the Spanish Empire. The chapter starts with an examination of what Vitoria considered the only valid reasons for subjecting the indigenous peoples to the Spanish Crown as they appear in *On the American Indians* (1539). In this work, he states that trade, commerce, and the extraction of metals (in places that do not belong to anybody) are universal rights grounded on the laws of nations (*ius gentium*). If Indians deny this right to Spaniards, they commit injury against the latter. As a result, Spaniards can make just war on them using the natural right to repel force with force. In *On the Law of War* (1539), Vitoria explains that only a "perfect" (i.e., self-sufficient) community with dominion and civil power over its subjects can declare war and repel force with force. The problem that arises is that of the metaphysical foundations of a civil power with self-sufficient

capacity to declare war and protect the interests of its subjects. Vitoria examined these ontological foundations of civil power in *On Civil Power* (1528) and in *On the Power of the Church* (1532). In *On Civil Power*, Vitoria grounds the legitimate power of an autonomous commonwealth on the four Aristotelian causes (material, formal, efficient, and final). Political mastery over lands and subjects depends on the principle of the natural subordination of matter to form, means to ends, and the imperfect to the perfect.

A close examination of Vitoria's arguments shows that, despite all attempts to political dominion on a natural order, this natural order still presupposes technical mastery. In other words, the principle of natural subordination presupposes artificial subordination, since God stands before the machine of the world in the same way that an architect or artisan stands in front of raw material before making a final product. In one and the same move, dominion borrows mastery and control from technique and labor and subordinates the transformative power of the craftsman (i.e., the art of bridle making) to a superior power (i.e., the art of war) to mention the examples used by Vitoria himself. Ultimately, natural right presupposes the complete opposite of a natural given order: political mastery and autonomy presuppose *technical* mastery and autonomy, artificial manipulation by human hands. Therefore, it is safe to conclude that the ultimate aim of imperial ideology is to justify the technical means it uses to achieve its ends. The law that dictates that war can be declared in order to protect trade, circulation, evangelization, and the exploitation of metals is grounded on a notion of mastery that presupposes technical mastery, which is ultimately the art of war itself. This irresolvable contradiction plagues the very ontological foundations of Iberian expansion. In the attempt to justify the subordination of one community to another, Vitoria employs all the resources of metaphysical instrumentalism. Vitoria's doctrine of just war contains a technical and instrumentalist conception of nature and law that lies at the center of Iberian imperial ideology. This fissure in the center of imperial ideology reappears in the debate of Valladolid, which is the problem of the second chapter.

Chapter 2, "The Impasses of Instrumentalism: Revisiting the Polemics between Sepúlveda and Las Casas" explores the way in which these authors attempted to fill the breach opened in the structure of Vitoria's theoretical edifice. Although Sepúlveda has often been cited for his use of philosophical arguments in order to declare that the Amerindians were

slaves by nature, scant attention has been given to his use of a Thomist vocabulary and the principle of the "natural subordination" of matter to form and means to ends. Sepúlveda considers the basis of all dominion to be the principle of the subordination of imperfect matter to perfect form. As a matter of fact, for Sepúlveda, the mere disobedience of Amerindians (who are compared with amorphous matter) to the superior command of the Spaniards (identified with forms) is sufficient reason for declaring war and correcting the deviations of natural order. An examination of Sepúlveda's *Demócrates Segundo* (1544) makes explicit the instrumentalist and imperial presuppositions of his use of this principle by which he radicalizes the line of Vitoria's thinking. For instance, while Vitoria hesitates to infer that the Indians are natural slaves, Sepúlveda does not hesitate to say it because they stand in relation to the Spaniards in the same way that "imperfect matter" stands in relation to "perfect form."

Las Casas deconstructs this argument by appealing to the literal sense of the principle of the natural subordination of matter to form. Since every individual substance is a composite of matter and form, the form of one entity cannot be imposed onto the matter of another entity because each individual entity has its own form and its own matter. This means that imperial instrumentalism cannot be used to justify the subordination of one community by another. For this reason, I argue that the Valladolid debate represents a radical impasse in metaphysical instrumentalism that was also potentially present in Vitoria. Hylomorphic instrumentalism simultaneously can and cannot be used to subject one community to another. In his attempt to grant autonomy and the capacity of self-government to Amerindians, Las Casas ignores the identification of the people with the material cause (Vitoria) and proceeds to identify them with the efficient cause. This move allows him to strengthen the conclusion of the first part of Vitoria's lecture *On the American Indians*, which argues that Amerindians were self-sufficient masters and possessors and that they should be restituted of all their stolen lands and riches. The theoretical deadlock produced by the inner inconsistencies of metaphysical instrumentalism would find more practical solutions in José de Acosta, who is the object of analysis of the third chapter.

Chapter 3, "Mastering Nature: José de Acosta's Pragmatic Instrumentalism," examines José de Acosta's *De procuranda Indorum* (1588) and his *Natural and Moral History of the Indies* (1590). Acosta's corpus includes both writings on the debates about Spanish sovereignty over the Indi-

ans and writings on science and mining techniques. Acosta's texts are an elaborate adaptation of late Scholastic principles to the evangelical mission and ideology of Spain's early-modern "universal monarchy." *De procuranda Indorum* revisits the arguments of Vitoria, Sepúlveda, and Las Casas about the conquest and colonization of the West Indies. Although Acosta accepts that the Spanish Empire is founded on unjust conquest and violence, he maintains along with Vitoria that circulation and evangelization are sufficient reasons for subjecting the Indians to Spanish rule. Moreover, he uses Thomist teleological arguments in order to justify the mita, which was a compulsory system of indigenous work in the mines of Potosí. In his *Natural and Moral History* he offers a program of rational and causal explanation of the particularities of the natural phenomena of the New World. In this work, Acosta introduces the subject matter of mining in book 4, where he discusses the composition of metals. He uses the Scholastic principle of the subordination of matter to form and means to an end in order to explain the providential role of metals, which were placed in the bowels of the earth by God in order to fulfill the ends of the universal monarchy. Acosta does not only use metaphysical instrumentalism to justify the Spanish presence in the Americas; he also uses the principle of natural subordination to provide a causal explanation of technical and material practices such as mining.

The impasses of metaphysical instrumentalism reappear in Acosta when he discusses the instrumental role of metals. While he employs the principle of subordination of matter to form to argue that metals are the lowest and least perfect entity, whose role is to serve the superior entities such as plants, animals, and humans, he also argues that precious metals are not just one particular thing among others but, instead, something that is virtually everything since it can buy all other things. Money ceases to be merely one instrument among others and becomes the measure of everything else, subordinating everything to its own power. Acosta attributes this capacity of money to the inherent qualities of precious metals, which are incorruptible and extremely negotiable, not subject to the wear and tear of all other commodities. As a result, Acosta participates in the commodity-fetishist belief in precious metals as possessing inherent value. Moreover, he argues that mining is essential for supporting the whole imperial enterprise, including its evangelical and administrative spheres. The search for profit, for surplus value, is the only glue that keeps the empire together.

Nevertheless, when he describes the interior of the mines of Potosí, he employs a gloomy language that depicts the underground world as something inhuman. For this reason, I argue that Acosta's pragmatic instrumentalism disavows the undesirable violence of mining as an essential part of Spanish dominion: at this point, the imperial subject knows very well what he is doing, but he keeps doing it. Despite appealing to Vitoria's arguments, Acosta finds out that there is no valid origin of the empire, and thus he is forced to ground it retroactively. This means that, like Vitoria, Acosta thinks it is not expedient to abandon the Indies. Yet going beyond Vitoria, he knows that the mines are what sustains the empire. The aim of the program of causal explanation by means of the principle of natural subordination is to justify the extraction of profit. Acosta fills the gap opened by the impasse between Las Casas and Sepúlveda (and present in Vitoria's inconsistencies) with the notion of money as the Spanish Empire's new end.

Chapter 4, "From Imperial Reason to Instrumental Reason: The Ideology of the Circle of Toledo," explores the ideological framework behind the reforms introduced by Francisco de Toledo, the infamous viceroy of Peru from 1569 to 1582. Toledo's fame as "supreme organizer of Peru" is based on a series of radical measures he implemented, including the introduction of the *mita* (a regime of tributary work, simultaneously obligatory and nominally remunerated), a revolutionary method of amalgamation (the *beneficio*), and the establishment of *reducciones* (places where Andeans were relocated for the purpose of introducing them to Christianity and to a Western way of life). These measures strengthened the authority of the colonial state and established a mercantilist economy in a moment of economic and political crisis in the Andes. In this chapter we analyze the ideological background of the Toledan reforms. First, we examine the *Anónimo de Yucay* (1571), a radical defense of the Toledan policies structured around an attack on Las Casas, in which the authors argue that mining is central to the Spanish Empire within the context of the same teleological frame employed by Acosta. While in Vitoria the absolute necessity of the ends were still prospective, in the *Anónimo* the employment of ends is completely retrospective. Contingent historical facts, such as the coincidence between the formation of a Holy Alliance against the enemies of Catholicism in Europe and the discovery of the mines of Potosí, are interpreted within a providential and teleological frame whose ultimate aim is to justify the continued centrality of mining.

Next is an analysis of Juan de Matienzo's *Gobierno del Perú* (1567), which inspired the Toledan introduction of a rotational system of tributary labor. Matienzo followed Sepúlveda in appealing to the Indians' "servile nature." He claimed that, instead of freely joining the market economy, selling commodities, and offering their services for wage labor, they simply retreated into a regime of mere subsistence. Matienzo argues that this lack of economic interest was due to both the absence of individual property within the Indian community and their collective subjection to the despotic authority of the Incas. As a result, the peasantry had little incentive to seek any improvement in their condition, since the wages they earned were often appropriated for communal purposes. Matienzo provided another reason for compelling the Indians to work in the mines: the natives were inclined to vice, capable of learning only mechanical rather than liberal arts, and yet disinclined to work. Like Vitoria and Sepúlveda, Matienzo drew heavily upon Aristotle's dualism between material body and substantial form, claiming that the indigenous peoples were fit only to obey and not to command because they have strong bodies but weak understanding. Finally, we examine José Luis Capoche's *Relación general de la villa imperial de Potosí* (1585), a text often overlooked in colonial literary studies, which provides a retroactive justification of these Toledan policies. Capoche, an owner of several *ingenios* (amalgamating mills) and mines, narrates the transition from the system of the refinement of precious metals by *huayras* to the method of amalgamation in such a way that the mita appears as a necessary consequence of this technological advance. His arguments are a mixture of some technical pragmatism with a rhetoric of catastrophe that gives mining an air of necessity, thus implying that the entire colonial enterprise depends on it. Capoche argues that there is no evangelization without mining, no mining without amalgamation, and therefore no amalgamation without the mita or compulsory labor. Capoche's verdict was unequivocal: the situation gives the Spanish the choice of either forcing the Indians to work in the mines and amalgamating mills or facing a catastrophic and total breakdown of the interconnected networks of economic relations.

Since these texts continue to use a philosophical and theological vocabulary, imperial discourse regarding the possession of mineral wealth in the New World begins to crack under the pressure of the earlier contradictions in metaphysical instrumentalism. The conflation between the artificial and the natural parallels the contradictions between attempts to

ground the business of empire on a transcendent final cause (the "common good" of the natives) and the material dependence on precious metals and indigenous labor that proves to be incompatible with the ends invoked. Reinscribing mining into a broader ideological picture introduces a slight displacement of perspectives: whereas the classic debates on Spanish sovereignty during the period of conquest grounded "transcendent ends" on a preexisting onto-theology, at this later stage "practical ends" are deprived of any external ground, becoming necessary only under the threat of an undesirable catastrophe. The principle of natural subordination, which once served to justify the "just war" and the dispossession of the natives, suffers a slow productionist metamorphosis when adopting the task of "administering" and "conserving" the Indies. The means cease to be subordinated to the end. The means becomes an end in itself. The chapter ends with a reflection on how these texts can be read as an expression of a logic of domination and subjection and an expression of the logic of the disruptive power of surplus value, as they are the two contradictory sides of the same metaphysical instrumentalism.

Finally, in Chapter 5, "The Exhaustion of Natural Subordination: Solórzano Pereira and the Demise of Metaphysical Instrumentalism," we analyze the work of the jurist Juan de Solórzano Pereira (1575–1655), author of the most influential treatise on Spanish imperial law, which is also the last great defense of the Spanish government, *Política indiana* (1647). This work exemplifies the exhaustion of the principle of natural subordination, in which the irreducible gap between the instrumental means and the political ends parallels the political and economic crises of the empire at the beginning of the seventeenth century. When revisiting the juridical foundations of the Spanish possession of the mineral riches and the disposition of Amerindian labor, Solórzano employs the same philosophical vocabulary used by his predecessors, with the predominant influence of Acosta, while opposing Vitoria's natural law arguments with a more Roman and retroactive justification of the Spanish Empire. In the *Política indiana*, the impasses of instrumentalism and the social deadlock they represent appear under the form of an examination of the arguments in favor of and against the mita introduced by Toledo. The arguments in favor of the mita invoke the principle of subordination of matter to form and means to an end, as well as the classical corporatist image of society as a harmonious social body so dear to Aquinas. The arguments against the mita invoke the failure of the mita to achieve its ends, since the means

themselves are destructive of indigenous lives and incompatible with the goals of civilizing and evangelizing them.

Solórzano faces an irresolvable impasse: the Spanish Empire is impossible both *with* and *without* mining. Mining, understood as the articulation of mita and the process of amalgamation, is an ambivalent material support that maintains the life of the empire while undermining its legitimacy. Potosí becomes the symptom of the contradictions of imperial instrumentalism: the Spanish Empire became dependent on a surplus of silver extracted from Potosí that disrupted the very lives of the Andeans and undermined the moral basis of the kingdom. Solórzano's solution to this impasse is to argue that, although it is impossible to defend the mita without unleashing a backlash, nevertheless, the mita should be practiced until the arrival of a better "judgment" or solution. As a matter of fact, the arguments against the mita are transformed into arguments in favor of continuing to mine while also keeping in mind the true ends of a Catholic monarchy. Therefore, mining cannot become an end in itself, because it has to remain a by-product of the true transcendent ends of the Catholic empire. Solórzano represents the exhaustion of natural subordination because, despite using a metaphysical vocabulary to frame the problem, he fails to see how the problems associated with mining were introduced by imperial instrumentalism itself.

I argue that this irresolvable contradiction at the heart of the Spanish Empire was present from the very inception of imperial reason in the work of Vitoria. The principle of the subordination of material means to the final product presupposed a disavowed productionist gaze: on the one hand, it results from the transposition of technique to physics, and on the other hand, it subordinates technique to higher ends. While in natural law, the dependence on disavowed instrumentalism remains virtual and abstract, after Potosí and the Toledan reforms, the dependence on such a disavowed instrumentalism becomes actual and material. The virtual contradictions in Vitoria become actual irresolvable contradictions materialized in the mines of Potosí. While at the beginning of the present book, with the analysis of Vitoria, we can see how natural right presupposes some disavowed will to mastery and transformation of reality, by the end, with the examination of Solórzano, we can see how mastery and the production and appropriation of surplus have to remain by-products subordinated to the transcendent ends of the Spanish Empire.

The most paradoxical outcome of metaphysical instrumentalism is the

idea of metals as living entities capable of reproducing themselves in the mines. This belief was shared by both Andeans and Spaniards. Solórzano, for instance, writes that, since metals are fruits that grow under the ground, they belong to the Crown, which has right of possession over them and can let particulars enjoy them by means of *mercedes*, or royal grants. José de Acosta also considered metals as possessing a certain kind of self-generating power that allowed them to serve superior entities in a natural order in which the imperfect is subordinated to the perfect. Metallurgists such as Álvaro Alonso Barba, inventor of a method of amalgamation in copper cauldrons and author of the *Arte de los metales* (1640), defended the idea of metals as having a certain power of mutation of their own due to their capacity to instrumentalize their four elements. In other words, the belief in the self-reproducing capacity of metals is not only compatible with but also necessary for instrumentalism since it produces the fantasy of a never-ending source of riches.

In the final section of Chapter 5 we analyze Andean beliefs about the self-reproductive capacity of metals as they have been considered by contemporary scholars. According to these Andean beliefs, the world is a living whole that requires care and respect. The earth, *Pachamama*, is a divine source of universal life. Everything, including metals, is a living fruit of the earth. The idea of this living whole implies a certain harmonic balance between humans and the earth as an immanent source of life.[21] Since everything is alive and a continuous source of nourishment, humans have to repay the earth for its services. For the representatives of decolonial theory such as Walter Mignolo, the view of the earth as a living whole and all things as fruits of the earth is a system of understanding that is completely different from modern and Eurocentric systems of development. Andean beliefs and practices are expressions of an indigenous episteme associated with a political autonomy and an ideal of communality that are irreducible to Western values. Understanding the earth as a living entity implies an ideal of harmony and plenitude with the goal of the regeneration of life.[22]

The first aim of this analysis is to demonstrate how certain attempts to romanticize Andean vitalism, such as some expressions of decolonial theory, remain blind to the problematic convergence between Andean and imperial beliefs on the self-reproductive capacity of metals. Second, it demonstrates how the most serious academic attempts to determine the specificity of these Andean beliefs have to rely on an implicit or explicit

philosophical vocabulary that is intrinsically hylomorphic. This means that Andean vitalism becomes readable only retroactively, through the fissures and paradoxes of metaphysical instrumentalism. Some scholars explain this belief by using a philosophical vocabulary, such as the division between essence and appearance and between matter and form. Moreover, contemporary conceptualizations of Andean uses of money oscillate between considering money either as a neutral instrument useful for satisfying human needs or as a gift irreducible to the logic of exchange, a means of contributing to the circulation of and reproduction of money as cycles and reproduction of life. The idea of the capacity of metals to generate more metals inside the mines ends up being uncannily similar to the valorization process of capital, M-C-M´, in which money becomes a fetish that generates more money out of itself. As Carmen Salazar-Soler demonstrates in "Encuentro de dos mundos," these Andean beliefs, far from being simple obstacles to modernity, were conditions of possibility of the integration of indigenous workers into the modern world of the mines. Andean vitalism cannot be relegated to the status of a pure and untouched alterity that resists Eurocentrism, because *it is the other side of instrumentalism*, which becomes readable once metaphysical instrumentalism exhausts its possibilities by being deprived of a higher end. Andean vitalism—the self-reproductive power of something that does not have any higher purpose than to be life that generates more life—is the name of an excess that is internal to metaphysical instrumentalism and can only become readable through the impasses of metaphysical instrumentalism.

Decolonial thinking reduces the difference between life and what exploits and subordinates life to other ends to a distinction between local ways of knowing and Eurocentric (or global) power structures. Although it is necessary to refuse to romanticize life by identifying it as a local knowledge irreducible to the Eurocentric matrix of power, this does not mean that metaphysical instrumentalism exhausts Andean vitalism. Moreover, Andean vitalism is simply instrumentalism turned against itself once this excess is elevated to the status of an end in itself. When instrumentalism is turned against itself, we witness a movement that is contrary to the one going from the useless to the useful, as in the retroactive readings of metaphysical instrumentalism. We witness a movement that goes from something that was initially useful for the emergence of modernity to something that is useless and even harmful for utilitarian

instrumentalism. From one perspective, vitalism was not an obstacle to technological capitalism but the condition of possibility of the integration of indigenous beliefs into modernity. For another perspective, vitalism was also associated with an organic view of nature that was inseparable from the return of the Inca and anti-colonialist emancipation. With the colonial structure emerges a dysfunctional kernel inherent in instrumentalist metaphysics itself, since the condition of possibility of technological modernity, an excess of life inseparable from the imperfection of matter, is also a threat. When associated with the persistence of Andean beliefs, the dysfunctional kernel of metaphysical instrumentalism can override the interests dictated by technocapitalism, on the condition that they persist even beyond their goal-oriented, survivalist utility. Such nonfunctional attachment that clings to these beliefs, even when they outlived their purpose or usefulness, gives body to a maladaptive colonial antagonism that is inseparable from the failure of metaphysical instrumentalism itself. The ultimate product of the impasses of metaphysical instrumentalism is Andean vitalism as a remainder that escapes modernity's double logic of technological domination and capitalist deterritorialization. This ambivalent and archaic remainder, which becomes readable only retroactively through the colonial situation, is the result of the inner contradictions of the imperial principle of the natural subordination of the material means to the transcendent end.

By examining the interpenetration between early political writings and texts on mining, the argument here is that the impasses of instrumentalism triggered by the confluence of colonial practices and the material force of ideas in the Americas frame technological and capitalist modernity as both an imperial and a metaphysical project. Modern concepts such as *human* and *natural resources* emerge as a result of the violence of abstraction inherent in the metaphysical instrumentalism that shaped the perception of the New World in terms of prime matter. This ambivalent product of metaphysical instrumentalism—both its condition of possibility and its inherent obstacle—contains the potential for thinking and historicizing a non-instrumentalist thinking, but that would be the object of another book. The wager of this book is that we cannot narrate the history of Andean mining without first going through the defiles of metaphysical instrumentalism.