SCIENCE FICTION:
A Historical Anthology

Edited and with Commentary by

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Introduction

Welcome to the world of science fiction!

> *The last man on Earth sat alone in a room.*
> *There was a knock on the door. . . .*

What had happened? Had there been a nuclear holocaust? An interplanetary war? A terrible man-made plague? What would happen? Would there enter the first of a race of horrible mutants? A conquering Martian? The last woman? Perhaps a forlorn wind is merely swinging a torn tree limb against the door. This tiny story, usually attributed to Frederic Brown, exemplifies much of what characterizes science fiction. The story concerns alienation, whether through the presence of an alien or the simple isolation of the human: humanity made strange in the world or the world made strange for humanity. The story is fantastic, reversing rules to gain attention: the last man on Earth should, at first thought, be in a situation that prohibits a knock on the door—but the knock comes nonetheless. The story calls up a background of science, quite different from the tone one would hear in a story that concerned simply "the last man . . . in a room" and quite full of inventive possibilities. And the story functions in extremes to indulge what Sam Moskowitz calls "a sense of wonder": this is not the next-to-last man in a life raft but the last representative of our race. Science fiction is a world of exaggerated drama.

On our Earth, overloaded by change and inundated by violence, drama often needs to be exaggerated to be felt at all. On

a spinning globe smoldering with ambiguous conflicts between countries we once ignored, the clear good-and-evil battle for possession of a galaxy has made *Star Wars* the most financially successful film of all times. In cities terrorized by crime we see foreshadowings of *A Clockwork Orange*. At night, troubled by visions of biotechnology and industrialization gone beyond our comprehension, we grow fears that are given shape as *The Andromeda Strain* and long for the good green safety of *Silent Running*. With so many machines let loose around us, even if no real monsters rise from Tokyo Bay, our "brave new world" seems ever more fearful, and the ancient wish for a Garden of Eden innocence becomes a poignant nostalgia for a time before we knew so much. Science fiction is sometimes exuberant about the young strength of new knowledge—the flash of light sabers delights us—but it is also fearful of the way the human mind has apparently set the world out of control. We want a simpler world. Light sabers, after all, are still sabers, the understandable weapons of lusty Vikings and handsome princes; the fairy tale needs to go on.

Science fiction is everywhere in our dangerous world. All forms of art have their science fiction branches: motorized statuary, light show rock-and-roll, the impossible drawings of M. C. Escher. The alienation we all too often feel takes shape as the misunderstood monster (*Frankenstein*) or the outcast genius (*Altered States*) while the hopes we yet cherish continue to promise a transformation of humanity into something better than itself (*Close Encounters*). While once we prayed for miracles to save us from disasters, now we pray for "miracle cures" to save us from industrial cancers. We live at the very edge of a gleaming new future, but the year is 1984.

The literature of all this ferment is vast and diverse, associating in one section of the bookstore gloriously self-indulgent mass gratifications with thoughtful and difficult social commentaries, vigorous tales of adventure with quiet ruminations on the difficulties of defining oneself in the world. The names of the subspecies include Sword-and-Sorcery, alternate time streams, utopian and dystopian literature, speculative fiction, lyric romance, and doomsday fiction. The novels and short stories offer power fantasies, mystic experience, intellectual challenge, and

always excitement. This wealth seems almost beyond definition.

The easy—and perhaps appropriate—way to define science fiction is to approach it through sociology. Science fiction is what sells under the name of science fiction, and the needs it serves are those of its audience, a group for a time composed of almost all broadly literate readers. When Poe and Hawthorne wrote works we would now call science fiction, they spoke to widely sensed fears as do Pynchon and Calvino today. A more narrowly defined market study would force us to attend especially to the enormously successful Verne and Wells and then to mass culture giants such as Edgar Rice Burroughs and "Doc" Smith. The reintegration of the mass culture with the elite culture is a phenomenon of our times, dominated as they are by art produced through expensive technology but made affordable by inexpensive duplication (films, records, comic books). Science fiction is now gathered in one place in the bookstore, but may also be scattered through the sections for general fiction, children's literature, poetry, reference, and even religion and self-help. It turns up on calendars and T-shirts and instructions for programming your home computer to run "Space Invaders."

Perhaps no single definition could do justice to this extraordinary wealth of production. Speaking primarily of its literary branches, different critics have attempted nonetheless to trace some order in this universe. Brian Aldiss has written of science fiction as a variety of Gothic romance; this definition is useful if we wish to emphasize the literary heritage and typical moods of much of science fiction. Darko Suvin calls science fiction the literature of "cognitive estrangement"; this definition is useful if we wish to emphasize the intellectual devices of much of science fiction. My definition of science fiction as the branch of fantastic literature that takes scientific knowledge as its background is useful if we wish to emphasize the literary techniques and reader responses associated with much science fiction. While no single definition seems to have been fully satisfactory for all discussions, all definitions rely on the recognition that the worlds of science fiction are, often aggressively, not our world and yet, often quite subtly, the worlds of our inner doubts and wishes.

A purist definition that once seemed appealing held that the

ideal work of science fiction made one and only one assumption, preferably based on an unlikely but not absolutely impossible scientific notion, and "extrapolated" a narrative world from that, keeping all other rules of our world otherwise unchanged. Although no extended work ever fulfilled that definition, Wells's novels came close. *The Time Machine* (1895) postulates the vehicle of its title, but the projected futures it reveals are based on ideas about human nature and society widely held at the time of writing. Yet even in a classic short story like "The Star," Wells himself not only postulated a radical new astronomical event but, in the last paragraph, adds the postulation of a non-human race. As the progress of science has itself demonstrated, once one decides to start inventing, it is very difficult—if not impossible—to stop. Sometimes the unlikely assumption that characterizes science fiction, then, may be of the "Star Trek" kind: assuming a spaceship that can go absolutely anywhere, you can always decree a new planet that has anything you can think of. So much for careful extrapolation.

The assumptions made by science fiction are usually those that do induce "wonder," or at least supply us with drama so exaggerated that the symbolic power of the tales is assured: Frankenstein's demon walks through our culture and Superman flies above it. Because the symbols of science fiction are so palpable they sometimes seem unsubtle; delicacy of characterization does sometimes fade in this strong light. Science fiction has often been criticized as a literature more concerned about "ideas" than about "characters"—as if that were an obvious fault! Science fiction *is* often about ideas, just as science is about knowing and the quest for knowing. The quest for knowing is the theme of much of our literature, a fundamental aspect of the tale of the Fall, of the myth of Prometheus, of the versions of Faust, and of all narratives of initiation and coming of age. Who would complain that the character of Prometheus is not drawn in the manner of the psychological realist or that we have no hints of Faust's toilet training? In fact, many science fictions do deal with subtly defined characters, but the special hallmark of the field is that the characters live in dramas that speak to our whole culture or to whole aspects of the human condition, rather than to the particularities of a brief cultural moment intersecting a person at a fleeting stage of life. While so-called mainstream fiction is set in its own here-and-now, science fiction is removed into the there-and-then, the distant land or planet or galaxy, the future or past or sidewhen. Because such removal inevitably affords contrast, exaggerated contrast, with our own world, science fiction becomes a literature not only of wonder, but of commentary, not perhaps of character analysis, but of serious inquiry. What does it mean to suppose a government overwhelmingly more powerful than the citizenry? How can the act of invention change a person? Does the world look the same through the eyes of another? Science fictions may help readers explore their world, their society, their life, their vocation—these are among the highest uses of art.

Just as no single definition can satisfactorily confine and describe science fiction in the abstract, no modest anthology could exemplify science fiction in its fullness. Nonetheless, it is possible to present some of the best of science fiction, some of its enormous variety, and suggest some of the ways in which the field has developed. Especially with that last aim in mind, this collection is organized historically.

In Part 1, we see science fiction emerging as a vehicle for satire, a literature constructed to highlight by contrast the foibles of the world of its readers and writers. Science fiction is particularly well suited to such contrasts because it simply postulates the most dramatic alternative worlds one might wish, and beginning in the seventeenth century science itself made such postulation seem worth considering. By the nineteenth century, as we see in Part 2, the workings of science were already becoming problematic, calling human nature into question and suggesting how it might be improved or, more frequently, revealed as beyond redemption. In the beginning of the twentieth century, well into the Industrial Revolution, science was remaking the world in surprising, sometimes hopeful, but often frightening, ways. The stories in Part 3 show fiction concerned with these developments, aiming to help us outgrow our past selves and warning against our insignificance and pride. Despite the technological successes coincident with and growing from the effort of World War II, the wide reading public became more scared by the bomb than delighted by penicillin. Besides, fiction need not

help us learn to live with penicillin; something was clearly needed to help us live with the bomb. In Part 4, we see some visions of science trying, and usually failing, to create a better world. In the expansive post–World War II period, such pessimism was a minority view in mass literature and science fiction was a ghetto literature read by a small group of fans who often shared qualities of hope and timidity and alienation. This readership had grown out of the pulp readership of the earlier part of the century but was more literate and not nearly so massive as had been the audience for Burroughs or as was the audience for detective stories or Westerns, and certainly not so representative of the society at large as had been the audience of Wells or as would be the audience of Vonnegut. But by the modern period, when the world itself had in some sense become the world of science fiction, the literature of science fiction began again to speak to everyone. In Part 5, we see stories that clearly grow out of the traditions of science fiction but that are readable by all.

Science fiction can be connected to fanciful satire and utopian literature going all the way back to the ancients, but as a separately definable sort of literature it truly emerges in the seventeenth century, when science begins to take hold. The first utterly science fictional novel is perhaps *Frankenstein* (1818), a work that haunts our culture to this day. But our culture has come around to science, become defined by science, and what in the nineteenth century had developed as a separate thread in the fabric of literary history has been woven back into the whole cloth. Science fiction—its techniques and concerns and attitudes—is now the common stock of all writers. How science fiction began, grew, and finally joined the society of letters is a historical question. This collection presents some of the materials from which to construct an answer.

PART 1

The Emergence of Modern Science

Science today is typically seen as a tool, as a threat, and as a mysterious source of power, a fascinating constellation of attributes quite sufficient to prompt our hopes and fears and hence motivate our art, including our fiction. This constellation emerged over time; we can see some of that emergence in the works of this section: the excerpt from Cyrano's *Other Worlds* is a satiric tool for philosophical speculation; the excerpt from Swift's *Gulliver's Travels* is a recognition and ridiculing rejection of the power of applying scientific speculation; and the short novel by Voltaire employs science, among other things, to speculate on the nature of the mystery of human life. In delineating these artistic possibilities, such early works of speculative fiction paved the way for the emergence of modern science fiction.

Science fiction emerged, quite properly, when science did. The process took about half of recorded history. In the fourth century before Jesus, Aristotle lived and taught, producing, among other texts, *To Organon* (The Tool), an essay explaining how careful observation, what we now call empiricism, could lead to a much fuller and more powerful understanding of the world than could mere cogitation. Aristotle's writings were a source of philosophic thought for centuries, serving as authority, benchmark, and spur for some of the most gifted minds of the following millennia. While Western civilization elaborated this "natural philosophy" of classification and observation, the so-called "mechanic arts" and what we might call trades and crafts

proceeded on their own, slowly developing the techniques that made possible human agriculture, manufacture, art, and economy. In 1620, Francis Bacon published the *Novum Organum* (The New Tool) in which he urged the joining of these two areas, careful observation and theory, for the advancement of all human activities. Modern science was provided with a manifesto, and the evolution of science and technology became a revolution. The world after the Renaissance was, quite simply, different from the world before the Renaissance.

Differences in worlds, whether created by history or by purposeful artists, automatically provide the occasion for commentary. Bertolt Brecht wanted theaters to produce committed social dramas, works of art that would provoke audiences to judge their societies. Brecht called for an art based on "alienation." When the alien walks among us, his very strangeness makes us reexamine our familiar lives; when we walk among aliens, we suddenly recognize what we usually and unconsciously take for granted. The potency of alienation in highlighting the too familiar is apparent even by the presence of so common an alien as a child. The toddler among the legs of adults makes us aware of our language, our rituals, our aims; an adult suddenly set down in a school yard feels how strange the world may be, even a world he once inhabited. How much greater is the effect of alienation when the visitor is a giant from a planet circling Sirius or when a person such as ourselves walks on the moon. Beginning with the seventeenth century, it became quite clear that science could change the world. It became reasonable then to produce science fictional worlds of art that were alien to our own, contrasting realities that commented upon our own reality.

Nowadays, many people confuse the reality of which science speaks with reality in its entirety, as if the knowledge of quarks and behavioral psychology were enough to define the world. Maybe, just maybe, this will ultimately prove to be accurate; but, judging in terms of what our current science accepts, it is clear that early science was not a mere map of reality. Or, to put it in Renaissance terms, the maps of reality showed sea dragons on the boundaries with as much clarity as they did the capitals of Europe. What we see as fantasy today was often

granted in those days the same authority granted the science of those times.

We all learn in school that Copernicus (1473–1543) revolutionized humanity's view of its place in the universe by asserting that the Earth circled the sun and not the other way around. What we have learned is false. Copernicus revolutionized practically nothing, but some scholars did read *De revolutionibus* and one of them, Galileo Galilei (1564–1642), made observations that confirmed the Copernican position, argued the implications of his observations, and got in trouble with the Roman Church. Only then, seventy years after Copernicus's death, did the "revolution" become news. Before then, the Copernican and Catholic views simply coexisted.

Another figure who was quite impressed by Copernicus was Johannes Kepler (1571–1630). Today he is best known for performing careful observations and making complex calculations that led to a crucial refinement of Copernicus's position: the paths of the planets were not circles but ellipses. In his own day, however, Kepler was not known for this correction so much as he was known for discovering an astonishing "fact" about the solar system that confirmed God's plan. In geometry, a regular solid is one the faces of which are formed by polygons of equal sides and which meet at equal angles. There are only five such: the four-sided tetrahedron, the faces of which are equilateral triangles; the six-sided cube, the faces of which are squares; the eight-sided octahedron, the faces of which are equilateral triangles; the twelve-sided dodecahedron, the faces of which are pentagons; and the twenty-sided icosahedron, the faces of which are equilateral triangles. Kepler assumed that the universe followed a divine plan, and he "knew" that there were only five planets, so he inscribed the regular solids one inside the other, computed the ratios of their radii and—miracle of miracles—the ratios matched exactly the ratios of the radii of the planets in the Copernican system! What hath God wrought? We now "know," of course, that there are at least nine planets, that Kepler's success was an artifact of insufficiently precise observations, and that luck had much to do with it all. Or did it? Astronomers had a hard time making a living in seventeenth

century Poland, but Kepler, whose mother had been tried as a witch, earned his daily bread as a court astrologer. The nice clear line we might like to imagine between reality and fantasy is not always clear at all.

In 1610, Galileo published initial observations made with his own hand-ground telescope, a remarkable device for its day made after a Dutch design. Among his reports was the first mention of the four moons of Jupiter. Now we think Jupiter has perhaps twenty moons and even faint rings besides, but we still call the four largest moons the Galilean moons. When Kepler heard of this discovery, he immediately realized that Mars must have two moons. Why? Well, Venus had none, Earth clearly had one, and now Jupiter was known to have four. In a geometric progression, obviously a favorite of Kepler, the planet between Jupiter and the Earth should have two. Both Swift and Voltaire refer to Mars's two moons. A modern reader might well not realize that these moons, at those times, were fictions: the first actual observations of the moons of Mars did not occur until 1877.

It is often difficult to tell, when dabbling in science, what is to be believed and what is not. With the advent of modern science, we began to learn that the most far-fetched ideas might turn out to be true. The true facts we discover, of course, may be true for reasons utterly different from those we imagine. The emergence of modern science threw human understanding into question, and the fiction that responded to these new uncertainties and certainties, both true and false, addressed a world in which the nature of things required discussion. The extreme contrasts of scale that astronomical distances encourage led to the most dramatic commentaries, philosophical humor, satire. From its birth then, science fiction has responded to science—and to the questions science raises—with speculation, adventure, invention, and satire.

From Other Worlds *(1657)*
Cyrano de Bergerac (1619-1655)

"The States and Empires of the Moon" and "The States and Empires of the Sun," now often known together as Other Worlds, *were published shortly after the death of their author, Cyrano de Bergerac. He was a courtier, soldier, poet, essayist, and accomplished gentleman of parts quite different from the recollection many carry of the tragicomic protagonist of Edmond Rostand's play, loosely based on the life of Cyrano. This excerpt from the voyage to the moon is remarkable for a number of reasons. First, the science in it is prescient, including even an anticipation of Newton's first law of motion in the discussion of the inertia of billiard balls. Second, the spirit of modern science imbues the text, especially in the Baconian assertion that the ultimate explanations of all things could be derived from a knowledge of the infinitesimal atoms of which matter is composed and of their motions and interactions. Third, and of greatest artistic value, this section is notable as satire. The human protagonist is removed to a "topsy-turvy world" which by implication stands our world on its head. Cyrano's society, odd by seventeenth-century standards, is one in which youth has high value and repression low value. The initial effect of this technique of inversion is to shock us into rejection, but this satire, like all good and lasting satire and like all successful speculative fiction, causes us to stop, ponder, and ultimately open our minds to unfamiliar positions toward which, perhaps, the familiar ought to be induced to move. This early science fiction is in part a call for philosophical reform.*

Dinner with Two Philosophers: Youth, Age, and Vegetables

The two professors we were expecting entered almost at once and we went to sit down at the table which was laid, where we found the young man he had mentioned, already eating. They greeted him with great salutations and treated him with a respect as profound as a slave's for his master. I asked my demon the reason for this and he replied that it was on account of his age, since the old in that world showed every kind of respect and deference to the young. Moreover, fathers obeyed their children as soon as they had reached what the Senate of Philosophers considered to be the age of discretion.

"You may be surprised," he went on, "at a custom so contrary to that of your own country, but it is in no way repugnant to common sense. For tell me, in all conscience, is not a hot young man, who still has the power to imagine, judge, and act, more capable of ruling a family than an infirm sixty-year-old—a poor dullard, his imagination chilled by the snows of sixty winters, guided only by what you call his experience of successful achievements (which were in fact the simple effects of chance, contrary to all the rules governing human prudence)?

"As for judgement, he has little enough of it, although the common herd in your world make it an attribute of old age. But if they want the truth, they should realize that what is called 'prudence' in an old man is no more than a panic apprehension, a wild fear which obsesses him of undertaking anything at all. So when he refuses to take a risk, in a situation where a young man comes to grief, it is not that he has foreseen the young man's fate, but merely that he lacked sufficient fire to spark off those noble impulses which make us dare to act. The young man's boldness, on the other hand, was like a pledge for the success of his enterprise, because it was the

ardour which makes for speed and facility in performance that prompted him to undertake it.

"As for the matter of action, I should be insulting your intelligence if I offered proofs to convince you. You know that youth alone is suited to deeds. But even if you are not wholly persuaded of this, tell me, I pray you, when you respect a courageous man, if it is not because he can take revenge on your enemies or your oppressors? And is it from any other consideration than pure habit that you have regard for him, once a battalion of seventy Januaries has chilled his blood and frozen to death all that noble enthusiasm for justice which fires young people? When you defer to a man stronger than yourself, are you not making him indebted to you for a victory which you could not contest? Why then submit to him, when idleness has softened his muscles, enfeebled his arteries, evaporated his spirits and sucked out the marrow from his bones? If you worship a woman, is it not on account of her beauty? Then why continue your genuflections after age has made her a spectre which threatens the living with death? When, lastly, you have loved a clever man, it was surely because his lively genius could fathom and unravel a confused matter; his brilliant talk held the attention of assemblies of the highest alloy; he could digest whole sciences in a single thought. And yet you continue to honour him, when his worn-out organs render his head foolish, ponderous, and importunate in company and when he bears more resemblance to the figure of a household god than to that of a reasonable man.

"You may fairly conclude from all this, my son, that it is better for young people to be entrusted with the government of families than old men. All the more because, according to your maxims, Hercules, Achilles, Epaminondas, Alexander, and Caesar, who almost all died this side of forty, would not have merited any honours, being, by your reckoning, too young. Yet their youth alone was the sole cause of their fine actions, which a more advanced age would have rendered ineffective. They would then have lacked the fire and agility, to which they owed their great successes.

" 'But,' you will say, 'all the laws of our world are careful to resound with the respect due to old men.' True, but then

the lawgivers were old men, who were afraid the young would rightly dispossess them of their extorted authority and so, like the legislators of false religions, they have made a mystery of what they could not prove.

" 'Yes,' you will say to me, 'but this old man is my father, and heaven promises me a long life if I honour him.' If your father, O my son, orders you nothing contrary to the inspirations of the Almighty, I grant you this. Otherwise, walk upon the belly of the father that begot you! Trample upon the breast of the mother that conceived you! For as to your imagining that this cowardly respect which vicious parents have wrung from your weakness is so pleasing to the heavens that they will prolong your lease of life for it, I see little likelihood of this. What! Does doffing your hat to flatter and nourish the arrogance of your father lance the abscess in your side or correct your bodily moisture? Does it cure you of a stoccado through your stomach? Does it break up the stone in your bladder? If these things are so, then your doctors are all wrong. Instead of the infernal potions with which they plague the lives of men, why do they not prescribe for the smallpox three curtsies on an empty stomach, four *thank you very kindly*s after dinner, and twelve *goodnight father and mother*s before going to sleep?

"You will reply to me that but for your father you would not exist. That is true, but neither would he have ever existed without your grandfather, nor your grandfather without your great-grandfather; and without *you* your father could not have a grandson. When nature brought him into the world it was on the condition that he pay back what she lent him. So when he begot you he gave you nothing, he was merely paying off a debt! And besides, I should very much like to know if your parents were thinking of you when they made you. Alas, not at all! And yet you think yourself obliged to them, all the same, for a gift they granted you without thinking about it. How's this! Just because your father was so lustful that he could not resist the charms of some fair creature and signed a contract for her, to gratify his passion, and you were the edifice that arose from them pawing one another, you reverence this voluptuary as one of the seven sages of Greece! What! Because another man, a miser, purchases his wife's riches by means of a child, may this

child only speak to him on bended knees? On yes, your father did well to be a lecher and the other man to be avaricious, for otherwise neither you nor this child would ever have existed. But I should very much like to know whether, even if he had known for sure that his pistol would beget a rat, he would not still have fired his shot. Just God! I wish the people of your world could be made to see it!

"All you have from your mortal architect is your body: your soul comes from the heavens. It is only by chance that your father was not your son, as you are his. How do you know that he did not even prevent you inheriting a coronet? Your soul may have left heaven, destined to animate the King of the Romans in the belly of the Empress and only chanced to meet your embryo on the way and stayed there in order to cut its journey short. No, no, even if your father had died as a little boy, God would not have struck you off his plans for mankind. But who knows if today you might not have been the handiwork of some valiant captain, who would have shared his glory with you as well as his property. So perhaps you are no more in your father's debt for the life he has bestowed on you, than you would be in a pirate's, who put you in chains because he wanted to keep you as his slave.

"And even supposing he had engendered you a prince or a king, a gift nevertheless loses its value when the one who receives it has no choice. Death was given to Caesar: it was also given to Cassius. Cassius was indebted to the slave at whose hand he received it, yet Caesar was not to his murderers, because they forced it upon him. Did your father consider your wishes when he took your mother in his arms? Did he ask you if you would like to see this century or if you would rather wait for another one? Whether you would be content to be the son of a fool or if you would long to spring from a brave man's loins? Alas! you, whom the matter alone concerned, were the only one not to be consulted. Perhaps if you had been, and instead of being in the matrix of nature's ideas, you had actually been shut up somewhere with an option on your birth, you would have said to the Fate: 'My dear lady, take up another man's spindle. I have been in the void for a very long time and I should much prefer to remain non-existent for another hundred years, rather than

come into being today, only to repent of it tomorrow.' Nevertheless you were forced to make the transition. In vain you howled to return to the long, dark house whence they snatched you: they pretended to think you were asking for suck.

"These O my son, are more or less the reasons for the respect which fathers have for their children. I am well aware that I have been more biased on the side of the children than justice required, and that in favouring them I have gone a little against my conscience. But I wanted to correct the arrogance with which some fathers defy the weakness of their little ones, and I was compelled to act like those who, in order to straighten out a lopsided tree, pull at it from the other side, so that between opposing tensions it grows straight and even. In making fathers restore the deference which they had tyrannically usurped, I have robbed them of much that was theirs, so that next time they might be content with their due. I know for certain that I will have shocked all old men with this apology. But let them remember that they were children before they were fathers and a good deal of what I have said must also have been in their favour, since they were not found under heads of cabbages themselves. Whatever happens in the end, even if my adversaries were to make war on my friends, I should be bound to win, for I have served the whole of mankind well and only done disservice to half of them."

With these words he fell silent and our host's soon took up the conversation as follows: "Permit me," he said to my demon, "since, thanks to the trouble you have taken, I am acquainted with the origin, history, customs, and philosophy of the world of this little man, to add something to what you have said and to show that children are in no way indebted to their fathers for their birth, because their fathers were obliged by their consciences to beget them.

"The very narrowest philosophy in their world admits that it is better to die—since in order to die one must have lived—than never to exist at all. Therefore since, if I do not give substance to this nonentity, I put it into a state worse than death; in not bringing it into the world I am committing a worse crime than killing it. Now if you had cut your son's throat, O my little man, you would consider yourself guilty of unforgivable par-

ricide. It would indeed be monstrous, but it is even more execrable not to give any existence at all to someone who could have received it. For this child, whom you thus permanently deprive of the light of day, would at least have had the satisfaction of enjoying it for a space of time. Of course we know that he is only deprived of it for a few centuries, but then if you maliciously prevent these poor little nothings (out of which you might have made your King forty good soldiers) from coming into the world and leave them corrupting in your loins, you run the risk of an apoplexy which will choke you.

"Let no man answer by singing the praises of virginity; this honour is just so much empty vapour. For despite all the veneration with which it is idolized by the mob, it is still no more than a recommendation, even among your own people. But not to kill and not to make one's son (by not making him at all) more wretched than a dead man—these are commandments. For this reason I am greatly astonished, seeing that in the world you come from continence is held to be preferable to carnal intercourse, that God has not arranged for you to be born from the dew in the month of May like mushrooms, or at least, like crocodiles, from the greasy slime of the earth in the heat of the sun. None the less He only sends eunuchs among you by accident. He does not snatch away the genitals from your monks, your priests, nor your cardinals. You will tell me that they were given them by nature. Yes, but He is the Lord of nature, and if He had regarded this part as dangerous to their salvation He would have commanded it to be cut off, just as He commanded the Jews to do with their foreskins in the ancient law.

"But such fancies are too ridiculous! I ask you, is there any place upon your body more sacred or more accursed than any other? Why do I commit a sin when I touch myself on the part in the middle and not when I touch my ear or my heel? Is it because of the titillation I feel? Then I should not relieve myself at the privy either, for that cannot be done without a certain kind of pleasure. Nor should the devout lift themselves up to the contemplation of God, for their imagination enjoys great delight in this. Indeed, when I see how much the religion of your country is against nature and jealous of all the gratifica-

tions of men, I am astonished that your priests have not made it a crime for you to scratch yourselves, on account of the agreeable pain you feel in doing it.

"For all that, I have noticed that far-sighted Nature has given all great men, the valiant and the clever, an inclination towards the delights of love, as witness Samson, David, Hercules, Caesar, Hannibal, Charlemagne. Was it in order that they might reap the organ of this pleasure from themselves with a blow of a bill-hook? Alas, she even found a way under a wash tub and debauched Diogenes, thin, ugly, and lousy as he was, and constrained him to heave sighs, reeking of carrots, for Lais. Doubtless nature treated him in this way because she feared there was a shortage of honest men in the world.

"Let us conclude from all this that your father was compelled by his conscience to allow you to see the light of day, and though he might think he had greatly obliged you by making you, while gratifying himself, he has in essence given you no more than an ordinary bull gives the cows ten times a day for his own pleasure."

"You are wrong," my demon then broke in, "to want to regulate the wisdom of God. It is true that He has forbidden us the excess of this pleasure, but how do you know He did not want it this way, so that the difficulties we encounter in fighting this passion might make us worthy of the glory He has in store for us? Or how do you know His purpose was not to whet our appetities? How do you know He did not foresee that if the young were abandoned to the impulses of the flesh, overfrequent coition would weaken their seed and bring the world to an end with the great-great-nephews of the first man? How do you know He was not seeking to prevent the earth's fertility being exhausted by the needs of so many hungry mouths? How do you know, lastly, if He did not wish to make it appear quite unreasonable in order to reward just those who had faith in His Word contrary to all semblance of reason?"

This reply did not satisfy the young host, so far as I could judge, for he wagged his head at it three or four times. But our common mentor fell silent because the meal was impatient to take flight.

We stretched ourselves out upon very soft mattresses covered

with vast carpets. A young serving man took the elder of our philosophers and led him into a separate little room. My demon called out to him that he must come back and join us as soon as he had eaten.

This whim of eating apart made me curious to ask the reason for it. "He has no taste for the odour of meat," he told me, "or even that of vegetables, unless they have died a natural death, because he believes them capable of feeling pain."

"I am not so surprised," I replied, "at his abstaining from flesh and all things that have once been sentient beings, for in our world the Pythagoreans and even some anchorite saints have adopted this regimen. But not to dare to cut a cabbage, for example, for fear of hurting it, seems to me totally ridiculous."

"And I," replied by demon, "find his opinion very plausible.

"For tell me, is not this cabbage you mentioned just as much one of God's creatures as you? Are not God and necessity equally father and mother to both of you? Has not God throughout all eternity had His mind taken up with the question of its birth just as much as with yours? He would even appear to have provided more surely for that of the vegetable than for that of the reasoner, since he has entrusted the generation of a man to the caprices of his father, who can beget him or not as he likes—a hazard to which He did not, however, wish to subject the cabbage. Far from leaving the fertilization of sons to the discretion of their father, He seems to have feared the extinction of the race of cabbages more than that of the human race. He makes them give birth to one another willy nilly, unlike men, who only beget offspring when the fancy takes them and cannot produce more than a score at the most, while cabbages can produce four hundred thousand per head.

"To say that none the less God loves mankind more than cabbages is simply tickling ourselves to make ourselves laugh. Being incapable of passion, He can neither hate nor love anyone, and if He were capable of love He would have more tenderness for this cabbage you have in your hand, which cannot offend Him, than for this man, whose offences against Him He can already foresee and who would destroy Him if he could. Furthermore, a man cannot be born without crime, for he is a part of the first criminal: but we know very well that

the first cabbage did not offend its Creator in the earthly paradise. It may be said that we are made in the image of the Sovereign Being whereas the cabbage is not. But even if this is true, in tarnishing our souls, which are what we resemble Him by, we have destroyed the likeness, since there is nothing more contrary to God than sin. And if our souls are no longer portraits of Him, we do not resemble Him any more with our feet, our hands, our mouths, our foreheads, and our eyes than the cabbage does with its leaves, its flowers, its stalks, its stem, and its head.

"Truly if this poor plant could speak, do you not think it would say when it is being cut: 'Man, my dear brother, what have I done to you to deserve death? I only grow in your gardens. You will never find me growing wild in places where I could live in safety. I scorn to be the work of other hands than yours. Hardly am I sown in your garden when to show you my goodwill, I flourish, I stretch out my arms to you, I offer you my children in seed and yet as a reward for my courtesy you have my head cut off!'

"That is the speech this cabbage would make if it could express itself. But what happens? Because it cannot complain, does that mean we have the right to do it all the harm it cannot prevent? If I find a wretch in bonds, may I kill him without committing a crime just because he cannot defend himself? On the contrary, his impotence would make my cruelty worse, for, however poor and deprived of all our advantages this wretched creature may be, it does not deserve death. What! Of all the blessings of existence the only one it enjoys is that of vegetating and we deprive it of this! The sin of massacring a man is not so great—for one day he will live again—as that of cutting a cabbage and taking its life, since it cannot hope for any other. You are destroying the soul of a cabbage when you make it die, whereas by killing a man you merely make his soul change its abode.

"I will go further: since God, the common Father of all things, cherishes all His works equally, it would surely be reasonable for Him to have shared His benefits equally between us and the plants, so it is only just to consider them as our equals. It is true that we were born first, but in God's family there is

no right of seniority. Therefore if cabbages were given no share in the fief of immortality along with us, they were doubtless endowed with some other gift which made up for its transience by its greatness. This may be a universal intellect, a perfect understanding of the causes of all things; and it may well be why the wise Mechanic did not fashion them organs like ours—which only produce mere reasoning, feeble and often misleading—but others, more ingeniously formed, more powerful and numerous, which serve them in conducting their speculative conversations. Now you may ask me what they have ever communicated to us of these great thoughts. But then what, pray, have the angels ever taught you, any more than these? Just as there is no correspondence, connexion, nor harmony between the imbecile faculties of man and the ones of those divine beings, so any attempt on the part of these intellectual cabbages to make us grasp the occult causes of all the wonders of the world would also be vain: we lack the senses capable of such lofty perception.

"Moses, the greatest of all philosophers, who drew his understanding of nature from the source of nature itself, pointed out this truth when he spoke of the Tree of Knowledge. He doubtless wanted to teach us, by means of this enigma, that plants are in possession of the perfect philosophy, to the exclusion of ourselves. Remember then, O most arrogant of all animals! that although the cabbage you cut may not utter a word, it is thinking just the same. The unfortunate vegetable has no organs suited to yelling like you; it has none for writhing, nor for weeping. But it has them, none the less, for lamenting the wrong you do to it, and for bringing down the vengeance of heaven upon you.

"And if, in conclusion, you insist on asking me how I know that cabbages have these fine thoughts, I ask you how you know that they do *not*. How do you know that when one of them closes in the evening it does not say, in imitation of yourself: 'I am, Sir Curly Kale, your most humble servant, Garden Cabbage'?"

Dinner with Two Philosophers: Bodies Great and Small

He had come to this point in his speech, when the young lad who had taken our philosopher out brought him back again.

"What's this; finished dinner already?" my demon called to him. He replied that he had, or almost, because the physiognomist had given him permission to have a taste of ours.

Our young host did not wait for me to ask him to explain the mystery. "I can easily see," he said, "that this way of life surprises you. But you should know that although you are more negligent with your health in your world, our regimen here is not to be despised.

"In every house there is a physiognomist, supported at the public expense, who is more or less what would be called a doctor, where you come from, apart from the fact that he only looks after healthy people and only judges the various ways in which we must be treated from the proportion, shape, and symmetry of our limbs, the lineaments of our faces, the colouring of our flesh, the delicacy of our skin, the agility of our bodies, the sound of our voices, and the shade, strength, and hardness of our hair. Did you notice quite a short little man studying you just now? He is our physiognomist here. You may be certain that he varied the odours of your dinner in accordance with his diagnosis of your complexion. Look how far the mattress you were given to lie on is from our beds. Doubtless he judged you to be of a temperament far removed from ours, since he was afraid that the odour which arises from these little taps under our noses might spread across to you, or that yours might waft over to us. This evening you will see him choosing the flowers for your bed with the same circumspection."

Throughout this discourse I was signalling to my young host for him to try and make the philosophers turn to some chapter of the science which they professed. He was too good a friend not to create the opportunity at once. In view of this, I will not recount to you the speeches and prayers which

solicited the following treatise, since the nuance between parody and seriousness was too subtle for it to be possible to imitate it. At all events, reader, the most recently arrived of these learned doctors, after dealing with various matters, continued in this way:

". . . It remains for me to prove that there are infinite worlds within an infinite world. Picture the universe, therefore, as a vast organism. Within this vast organism the stars, which are worlds, are like a further series of vast organisms, each serving inversely as the worlds of lesser populations such as ourselves, our horses, etc. We, in our turn, are also worlds from the point of view of certain organisms incomparably smaller than ourselves, like certain worms, lice, and mites. They are the earths of others, yet more imperceptible. So, just as each single one of us seems to this tiny people to be a great world, perhaps our flesh, our blood, and our minds are nothing but a tissue of little animals, nourishing themselves, lending us their movement, allowing themselves to be driven blindly by our will (which acts as their coachman), carrying us about, and all together producing that activity which we call life.

"For do you find it hard to believe that a louse should take your body for a world, or that, when one of them travels from one of your ears to the other, his friends should say that he has voyaged to the ends of the earth, or that he has journeyed from pole to pole? Why, doubtless this tiny people take your hair for the forests of their country, your pores full of sweat for springs, your pimples for lakes and ponds, your abscesses for seas, your streaming nose for a flood; and when you comb your hair backwards and forwards they think this is the ebb and flow of the ocean tides.

"Does not the itch prove my point? The mite which produces it is surely none other than one of these little animals, which has broken away from civil society and set itself up as a tyrant in its own country. If you ask me how such creatures come to be larger than the rest of their imperceptible fellows, I will ask you why elephants are bigger than us and Irishmen bigger than Spaniards. As for your blister and your scab, whose origins are unknown to you, they must either result from the rotting carcasses of enemies slaughtered by these little giants,

or else a plague (caused by the lack of foodstuffs upon which the rebels have gorged themselves) has left behind heaps of corpses, or else the tyrant has driven away all his neighbours, whose bodies stopped up the pores in our own, thus making a passage for the phlegm, which then escapes from the bloodstream and becomes corrupted.

"It may be asked why one mite produces so many others. But this is not difficult to conceive, for just as one revolt produces another, so these little peoples are roused by the bad example of their seditious companions and each aspires to take command, enflaming war, massacre, and famine all around.

" 'But,' you will tell me, 'some people are much less subject to the itch than others, although all of them are equally filled with these little animals, since it is they—you say—who make up life.' This is true, but let us also observe that phlegmatic people are less a prey to scratching than choleric people, for the reason that, in accordance with the climate they inhabit, the peoples in a cold body are more lethargic than those heated by the temperature of a homeland which crackles, shifts, and cannot remain in one place. Thus the choleric man is much more delicate than the phlegmatic, because he is animated in many more parts of his body, and as his being is made up of the action of these little beasts he is sensitive in all the places where their herds are stirring. On the other hand the phlegmatic man is not hot enough to make this mobile population active, save in a few places, and is therefore only sensitive in a few places.

"As further proof of this universal mite-system, you need only consider how when you are wounded the blood runs to the wound. Your doctors say that it is guided by nature seeking to help the weakened parts, but that is just a pretty fantasy, for in that case there would have to be a third intellectual substance in us, apart from mind and soul, with separate functions and separate organs. That is why I find it much more plausible to say that these little animals, finding themselves attacked, send word to their neighbours to ask for help. When they are gathered together from all sides, the country is unable to support so many and they either die of hunger or are suffocated in the throng. These deaths occur when the abscess is ripe and the fact that the rotten flesh goes numb proves that these creatures are

stifled then. If the bleeding, which is prescribed to divert the flow, does very often take effect, this is because the little animals have already lost many of their number through the opening they were trying to block and now refuse to assist their allies, having barely the strength to defend themselves, each on their own ground."

He had concluded in this way when the second philosopher found all our eyes focused upon his, exhorting him to speak in his turn.

"Men," he said, "seeing that you are interested in teaching this little animal, our fellow creature, something of the science which we profess, I shall be very pleased to supply him with a treatise which I am now dictating, on account of the illuminating light it sheds on our physics: it is an explanation of the eternal origin of the world. But I am in a hurry to start my bellows working, as the town is leaving tomorrow without delay, so I hope you will excuse me for the moment, with the promise, however, that as soon as it arrives at its destination, I will satisfy you."

At these words the host's son called his father to know what time it was, but when the latter replied that eight o'clock had struck, he flew into a rage and asked him why he had not notified them when it was seven, as he had commanded him to do: he knew very well that the houses were leaving next day and the town walls had done so already.

"My son," replied the good man, "an express prohibition has been published while you were at table, forbidding anyone to leave until the day after tomorrow."

"That makes no difference," retorted the young man. "You should obey me blindly, without trying to understand my orders, and only remember what I have commanded. Quickly now, go and fetch your effigy!"

When it was brought he seized it by the arm and whipped it for a good quarter of an hour. "Now, sir, you good-for-nothing," he went on, "as a punishment for your disobedience I will make a laughing-stock of you today, for all to see, and to this end I command you to walk upon two legs only for the rest of the day."

The poor old man went out in floods of tears and his son

continued: "Gentlemen, I must ask you to excuse the knaveries of this hot-headed fellow. I had hopes of making something of him, but he has abused my indulgence. For my part, I believe the rascal will be the death of me. To tell you the truth, I have been on the verge of cutting him off with my curse ten times already."

I found it very difficult, although I bit my lips, to keep myself from laughing at this topsy-turvy world. So, in order to have done with his burlesque of discipline, which would doubtless have ended by making me guffaw, I begged him to tell me what he meant by this journey of the town's he had mentioned just now, and whether the houses and walls actually travelled.

He replied to me: "Among our towns, dear stranger, there are both mobile and sedentary ones. The mobile ones, like the one we are in now, for example, are made in the following manner. The architect constructs each mansion of a very light wood, as you can see; underneath it he installs four wheels; in the thickness of one of the walls he sets ten large pairs of bellows, whose nozzles lie in a horizontal line across the top storey from gable to gable, so that when we want to drive the towns somewhere else (for they have a change of air for each of the seasons) everyone unfurls a quantity of large sails on one of the sides of his house in front of the bellows. Then when a mechanism has been wound up to make them work, in less than a week their houses can be transported over a hundred leagues, if it is desired, by the constant blasts vomited from these wind-monsters.

"As for those which we call 'sedentary,' the dwellings there are very like your towers, except that they are made of wood and have a huge and powerful screw running through the centre of them from cellar to roof, so that they can be raised and lowered at discretion. A hollow is dug out of the earth, as deep as the building is high, and the whole is constructed in this way so that, as soon as the frosts begin to chill the heavens, they can lower their houses into the earth, where they remain in shelter from the inclemencies of the air. But immediately the gentle breezes of spring arrive to soften it, they come up into the light by means of the great screw I have told you of."

I begged him, since he had already shown me so much kindness and the town was only leaving on the following day,

to tell me something of that eternal origin of the world, which he had mentioned to me some time before. "And I promise you," I said to him, "that in recompense, as soon as I return to the moon from whence my tutor (I indicated my demon) will bear witness to you that I have come, I will spread your reputation there, by recounting the fine things which you have told me. It is easy to see that this promise makes you laugh, because you do not believe that the moon I speak of is a world or that I am an inhabitant of it; but I can also assure you that the peoples of that world, who take this one for a mere moon, will make fun of me when I say that your moon is a world with landscapes and inhabitants."

To this he merely replied with a smile and then spoke these words: "Since, when we want to come at the origin of this great Whole, we are bound to run up against three or four absurdities, it is reasonable enough to take the road which makes us stumble the least. I say, then, that the first obstacle standing in our way is the eternity of the universe. Since men's minds were not powerful enough to conceive of this and were not capable, moreover, of imagining how this great cosmos, so beautiful and so well ordered, could have made itself, they have had recourse to the idea of Creation. But like the man who plunges into a river for fear of being soaked by the rain, they escape from the clutches of a dwarf only to find themselves at the mercy of a giant. Besides they do not escape: this eternity of which they rob the universe, because they fail to understand it, they then give to God—as if He needed the gift, and as if it were easier to conceive of in the one than in the other! So this absurdity, or this giant I spoke of, is their Creation. For tell me truly, has anyone even been able to imagine how something could be made from nothing? Alas! there is such an infinite difference between nothing and a single atom that the sharpest brain could not fathom it. In order to escape this inexplicable labyrinth, you have to admit the eternity of matter as well as God, and then it is no longer necessary to admit a God because the universe could have existed without Him.

" 'But,' you will say, 'supposing I grant you the eternity of matter, how did this chaos order itself on its own?' Aha! I will explain to you.

"One must, O my little animal, first mentally divide every tiny visible body into an infinity of tiny invisible bodies and think of the universe as being composed of nothing but these infinite atoms, which are quite solid, quite incorruptible and quite simple and some of which are cubic, some parallelogrammatic, some angular, some round, some pointed, some pyramidal, some hexagonal, some oval—all behaving diversely, each according to its shape. Now if you take a round ivory ball and place it upon a very flat surface, at the slightest touch you give it, it will roll for seven minutes without stopping: and let me add that if it were as perfectly round as some of these atoms I am speaking of, and the surface on which it was placed were completely flat, it would never stop. If art, therefore, is capable of making a body inclined to perpetual motion, why should we not believe that nature can do it? It is the same with the other shapes: ones like the square seek a state of perpetual repose, others a sideways motion, others quiver in a partial movement: and when one of the round ones, whose essence is to move, comes into conjunction with one of the pyramidal ones, it may well be that they produce what we call "fire," because fire not only moves restlessly, it also pierces and penetrates easily. Apart from this, the flame behaves differently, according to the type and size of the angles made between the pyramid and the sphere: so the flame produced by pepper, for example, is quite a different thing from a sugar flame: sugar produces a different one from cinnamon, cinnamon from cloves, and this last differs from the flame of a burning faggot.

"It is fire, the builder and designer of both the parts and the whole of the universe, which has drawn together and assembled in this oak tree the quantity of shapes needed to compose it. 'But,' you will say to me, 'how can all the elements needed to produce this oak tree be gathered together in one place by chance?' My reply to you is that it is no marvel for the matter thus arranged to have formed an oak tree, although it would have been a great marvel if the matter were arranged thus and an oak tree had not been produced. A few less of some shapes and it would have been an elm, a poplar or a willow. A few less of certain others and it would have been a *mimosa pudica,* an oyster in its shell, a worm, a fly, a frog, a sparrow, an ape, a

man. When you throw three dices upon a table and a triple two comes up, or three, four, and five, or two sixes and a one, you will say: 'Oh, what a miracle! The same number has come up on all the dice, although so many numbers could have done!' 'Oh, what a miracle! three consecutive numbers have come up!' 'Oh, what a miracle! Just two sixes have come up and the opposite side of the other six!'

"But no, I am sure that being a man of intelligence, you will never make such exclamations, since the numbers on the dice are limited and it is impossible for one of them not to come up. Yet you are still astonished at the way this matter, mixed up pell-mell at the whim of chance, could have produced a man, seeing how many things were necessary for the construction of his person. Are you not aware that this matter has stopped a million times on its way towards the formation of a man, sometimes to make a stone, sometimes a lump of lead, sometimes coral, sometimes a flower, sometimes a comet? All this happened because there were more or less of certain shapes, which were necessary, or certain shapes, which were superfluous to the design of man. Hence it is no marvel that they should have come together, from among an infinity of substances which are shifting and changing incessantly, to make the few animals, vegetables, and minerals which we see, any more than it is a marvel for a triple number to come up in a hundred throws of the dice, since it is impossible for this movement not to produce something. And a fool will always marvel at this thing, not knowing how near it came to not being made.

"If the great river of  turns a mill and drives the mechanisms of a clock, while the little stream of  does nothing but flow along, sometimes hiding underground, you would not say that the river has great intelligence, because you know that it simply meets in its path the devices put there to produce all these masterpieces of artifice. Were the mill not situated on its course, it would not grind any wheat. Had it never encountered the clock, it would not tell the time. And if the little stream I mentioned had had the same encounters, it would have performed the same miracles. It is just the same

with this fire, which moves by itself. Where it has met organs suited to the kind of vibration necessary for reasoning, it has reasoned. Where it has found those suited only to feeling, it has felt. Where it has found them suited for vegetating, it has vegetated. Moreover, if one puts out this man's eyes, which the fire of his soul causes to see, he will no longer see, just as our great clock will cease to mark the hours if you break the mechanism.

"Lastly, these primary and indivisible atoms offer us a wheel on which the most problematical difficulties of physics will run smoothly. There is nothing, not even the operation of the senses, which I cannot easily explain by means of these little bodies. Let us begin with sight, which, as the most mysterious of them, is worthy of our first attempts.

"To my way of thinking, this occurs when the outer coats of the eye, which have openings in them similar to those in glass, send out the fire dust known as sight-rays and it is stopped by some opaque matter which makes it rebound back to its home. On its way this dust meets the image of the object that repulsed it, which consists of nothing but an infinite number of tiny bodies continually and evenly given off by the subject observed, and it drives them back to our eye. You are sure to object to me that glass is an opaque body and very compact, yet nevertheless, instead of repulsing the first little bodies, it allows itself to be penetrated by them. But my answer to you is that the pores in glass are the same shape as the atoms of fire which pass through it: just as a wheat sieve is no good for sifting oats, nor an oats sieve for sifting wheat. Similarly a deal box, although it is thin and lets sounds through, is not penetrable to sight; whereas a piece of crystal is transparent and penetrable to sight, but one cannot touch things through it."

I could not help interrupting him here. "A great poet and philosopher of our world," I told him, "following Epicurus, who followed Democritus, has spoken of these little bodies almost in the way you have, so your discourse does not surprise me at all. Please tell me, when you continue, how you can explain by these principles the way one's image is reflected in a mirror."

"That is quite easy," he replied. "You must picture these

fires from your eye passing through the glass, encountering behind it a non-diaphanous body, which repulses them, and returning the way they came. Meeting more of these little bodies travelling evenly towards the mirror, they call them back to our eyes, from whence our imagination, being warmer than the other faculties of our soul, draws the most subtle of them and from them makes itself a portrait in miniature.

"The operation of hearing is not more difficult to conceive and for the sake of brevity let us simply consider the case of the notes of a lute touched by the hands of a virtuoso. You will ask me how I can possibly perceive something so far away from me and which I cannot see at all. Does a sponge come out of my ears and soak up this music in order to bring it to me? Or does the musician beget another little musician inside my head with a little lute and instructions to sing the same tunes to me like an echo? No; the miracle is due to the fact that the plucked string strikes the air which is composed of little bodies and drives it into my brain, gently piercing it with these little bodily nothings. If the string is taut the note is high, because it drives the atoms more vigorously and once the organ is thus penetrated it furnishes my imagination with sufficient of them from which to make its picture. If it is not so taut, it happens that when our memory has not yet completed its image, we are obliged to repeat the same sound to it; so that, for example, from the materials furnished by the measures of a saraband, it takes enough to complete the portrait of this saraband.

"But this operation is by no means as wonderful as those by which we are moved now to joy, now to anger with the aid of the same organ. This occurs when in the course of their movement the little bodies meet others inside us which are moving in the same manner, or whose own shape makes them susceptible to the same type of vibration. The new arrivals excite their hosts to imitate their motion and in this way when a violent tune encounters the fire of our blood, it makes it take up the same dance and excites it to thrust itself outwards, and that is what we call 'the ardour of courage.' If the sound is sweeter and has only the strength to raise a lesser, more quavering flame, by causing this to travel along the nerves and membranes and through the apertures in our flesh, it excites

that tickling sensation which we call 'joy.' The other passions are aroused in the same way, according to the greater or lesser violence with which these little bodies are hurled at us, according to the motion resulting from their contact with other impulses and according to the mobility they find in us. So much then for hearing.

"The demonstration of the sense of touch is now no more difficult, if one imagines that there is a perpetual emission of little bodies from all palpable matter and that when we touch it, still more of them evaporate off it because they are squeezed out of the object—just like water from a sponge when we press it. The hard ones come to the organ of touch to make a report of their solidity, the supple ones of their softness, the rough ones, etc. Moreover, when our hands are worn with work they are no longer so sensitive to touch, for the thick callosity, being neither porous nor animated itself, only transmits these vapours of matter with great difficulty.

"Does someone desire to learn where the sense of touch has its seat? For my part I think it is spread over all the surfaces of the body, seeing that this can feel with all its parts. I do believe, however, that the closer the organ we feel with is to our heads, the quicker we can make things out. This can be tested by closing our eyes and feeling something with our hands, for we can guess what it is more easily than if we felt it with our foot instead, when we should have some difficulty in recognizing it. This is due to the fact that, our skin being riddled all over with little holes, our nerves, whose substance is no more compact, lose many of these little atoms on the way, through the tiny gaps in their fabric, before they have reached the brain which is their destination. It remains for me to speak of smell and taste.

"Tell me now, when I taste a fruit, is it not the heat of my mouth that makes it melt? Admit to me that, since there are salts in a pear which split up, when they dissolve, into little bodies of a different shape from those which make up the taste of an apple, they are bound to pierce our palate in a very different fashion. In the same way the wound made by the blade of a pike going through me is not like the blow from a

pistol bullet, just as the pain from a pistol bullet is different from the one imprinted by a lozenge of steel.

"Of smell I have nothing to say, since your philosophers themselves confess it to be produced by a continual emission of little bodies.

"On this principle I am now going to explain to you the Creation, the harmony and influences of the celestial globes, and the immutable variety of the meteors."

From Gulliver's Travels *(1726)*
Jonathan Swift (1667-1745)

This excerpt comes from the third book of the travels of Lemuel Gulliver, erstwhile ship's surgeon. While the first two books reporting Gulliver's sojourn among the tiny Lilliputians and among the giant Brobdingnagians are well known, the other two books also deserve attention, including this passage in which our narrator visits the aerial island inhabited by the rulers of an ocean island realm. From the first image of the Flappers who rouse thinkers to attention to the real world to the parody of the transactions of the Royal Society in which the aerial island's motions are discussed, the whole is a consistent satire against the substitution of abstract thinking for attention to both common sense and ethics. Lest we miss the relevance of Gulliver's journey in a land removed from our own, Swift virtually invites us to think for ourselves: he elaborately asserts his inability to trace the etymology of Laputa, *as if he did not know that* la puta *is* the whore *in Spanish, an apt name for a land of people without ethics and with disdain for their own bodies. This fantasy is intended to speak to our reality; conditions in all places are "much more uniform than can be easily imagined."*