Material Transfer Agreements that can require company approval before publication.[26] While researchers are not without free will when they enter these arrangements, the contemporary context of research in many fields makes it impossible to do without such funding and materials.

If a hostile scientist is not contractually connected to a company, then he can be threatened with a libel lawsuit for criticizing a product.[27] It is not necessary to win a lawsuit to silence the scientist because merely the threat of a lawsuit silences many. Defending oneself against libel or breach of contract can be bankrupting, and universities frequently will not support the defense. Even if one perseveres in the suit, years of research will be lost, and one's reputation will be damaged.

If legal means are unavailable, then companies can use extralegal means to attack a hostile scientist to prevent her from providing future expert testimony. Given their sponsorship of academic departments and buildings, corporations can apply pressure on university officials. Corporate funders can contact a university and complain about a researcher, leading to informal discipline. Challenging the research supporting a senior colleague's biotech company can lead to poor performance reviews. Political opponents can threaten to withdraw government grants. Chairmen of congressional committees can demand data. There are many channels for informal, institutional discipline.

Finally, the scientist can find her reputation attacked. Deconstructive attacks on papers can hinder a scientist's chance for journal publications and grant approvals. Her reputation can easily be attacked on the Internet or in sympathetic media outlets eager for a scandal. More troublingly, industry-backed scientists can accuse hostile scientists of scientific misconduct, leading to investigations and ethics hearings. For example, Herbert Needleman's research demonstrated the negative effects on child development of low amounts of lead.[28] Because of this research, he was attacked by the lead industry throughout his career, culminating in an ethics investigation opened by two industry-connected experts who looked at his laboratory notebooks as a result of an Environmental Protection Agency (EPA) lawsuit in which he served as a witness.[29] Although the industry-connected scientists were unable to point to any specific research

[26] Philip Mirowski, *Science-Mart: Privatizing American Science* (Cambridge, MA: Harvard University Press, 2011), 139–93.

[27] McGarity and Wagner, *Bending Science*, 168–77.

[28] Krimsky, *Science in the Private Interest*, 187–91.

[29] Herbert Needleman, "Salem Comes to the National Institutes of Health: Notes from Inside the Crucible of Scientific Integrity," *Pediatrics* 90, no. 6 (1992): 977–81.

violations, they said that they had suspicions of misconduct. These accusations led to two ethics hearings. Needleman had to rely on the University of Pittsburgh's Faculty Senate to receive an open hearing that was initially denied to him, but eventually he was completely exonerated in the second hearing. Even though he was exonerated of misconduct, he suffered reputational damage, research delays, and much anxiety.

Finally, industry actors may engage in a pattern of harassment against antagonistic scientists, as with Hayes. These attacks discredit specific researchers and their work, thus preparing the way for the exclusion of evidence by courts and regulators. Individual scientists rarely have the resources or strength to withstand such assaults. Thus, doubt is produced. To speak the scientific truth on issues central to the common good involves great personal risk. It therefore requires courage tied to the devotion to truth.

Philosophical *Parrhesia*

All of these problems should be addressed structurally by, for example, stricter conflict of interest policies or stronger defenses of scientific speech.[30] In no way do I want to downplay the importance of systematic changes for the defense of scientific integrity. Yet all such changes can have negative effects when influenced by institutional pressures. As discussed in Chapter 2, audit mechanisms are not sufficient to fix the problems of science, and the problems of agnotology show another reason why this is so. Greater attention to research integrity that focuses only on mechanisms of accountability, rather than looking to the virtues of the researcher, can give more weapons to harass scientists whose results are unpopular. Opening research to challenge can undermine the always imperfect science necessary for regulation. No simple deontological code, procedural guideline, or bureaucratic structure can completely solve these problems. The proper deployment of structural changes requires individuals with good character. Moreover, there is little political will to make such changes at the present moment, so both the defense of current science and advocacy for change requires individuals who are morally formed in such a way that they will have the courage to speak in the face of risk. Finally, as discussed in Chapter 5, any institutional system will present threats to a practice of

[30] For structural solutions, see, among others, Krimsky, *Science in the Private Interest*; McGarity and Wagner, *Bending Science*; Ferric C. Fang and Arturo Casadevall, "Reforming Science: Structural Reforms," *Infection and Immunity* 80, no. 3 (March 1, 2012): 897–901.

truth. Many commentators call for an increase in government funding of basic and applied research as a way to protect against corruption by corporate money, but the prior regime of research that relied on government, mainly military, funding also presented threats to true speech, since politics has just as many interested parties as commerce. Defending scientific truth will always depend on properly formed individuals.

One could also argue that the scientific community must be reformed. Some colleagues do come to the defense of attacked scientists,[31] and many scientists speak out in public on disputed issues. However, there are too many members of the community who avoid research in politically conflicted areas or who do not assist those who are attacked out of fear for their own careers and reputations. One of the central problems for science is that the scientific ideal is the entrepreneurial subject rather than the subject of truth. Individual moral formation is at the heart of reforming the community.

One quality, or virtue, that could aid in this project is *parrhesia*. Literally, *parrhesia* means to tell everything, to speak freely, or free speech.[32] Originally, *parrhesia* was a political term that indicated a structural feature of Greek democracy.[33] Any citizen, and only a citizen, could speak freely and critically on issues before the Assembly. In philosophy, the term came to mean telling an unpleasant truth to the people, but telling such unpleasant truths came to be increasingly dangerous. In Plato's work, especially his Letters and the *Apology*, Socrates' death is tied to *parrhesia*, and the political game is seen as extremely risky for the truth-teller in an unjust city.[34]

With the downfall of Greek democracies, *parrhesia* came to be used in the context of personal spiritual guidance, with Socrates serving as the hinge of this development. The parrhesiast was the person with the skill to force one to give an account of one's life and to truthfully guide one on the road to virtue.[35] This more intimate meaning was not without political connotations, since *parrhesia* became necessary to guide the Prince.[36] If a philosopher could educate the ruler properly, this education would presumably have profound effects on the justice with which he governed his kingdom. This focus on the ruler's moral education was not just a feature of Platonic political philosophy, since individuals of many philosophical

[31] E.g., Needleman, "Salem Comes to the National Institutes of Health," 981.
[32] Foucault, *The Hermeneutics of the Subject*, 366.
[33] Foucault, *The Government of Self and Others*, 7.
[34] Foucault, *The Government of Self and Others*, 216–17; Foucault, *The Courage of Truth*, 85–90.
[35] Foucault, *The Hermeneutics of the Subject*, 385.
[36] Foucault, *The Government of Self and Others*, 192–6.

schools undertook the task of forming the Prince with more or, usually, less success: Aristotle with Alexander, Seneca with Nero, and Fronto with Marcus Aurelius.

The second form later political *parrhesia* took was confrontation with a ruler to intercede in the interests of mercy or justice. Peter Brown shows how the philosopher was a privileged person for interceding on behalf of his city or the powerless within it to prevent a harsh punishment or to ask for tax relief, a role that later came to reside with the bishop.[37] This political intervention nearly always included a call to conversion aimed at the ruler's way of being, so the two forms of political *parrhesia* are almost always linked.

Beyond its necessity for spiritual guidance and political intervention, *parrhesia* is central to ethics in another way. This truth is deeply held by the subject who speaks it. "The parrhesiastic enunciation is the affirmation that in fact one genuinely thinks, judges, and considers the truth one is saying to be genuinely true."[38] Rather than disinterested, objective knowledge that could be spoken by anyone, this truth is deeply affirmed by the subject who speaks it. For this to be the case, the subject must have transformed the specific *logos* into his *ethos*. It is here that *parrhesia* depends on the care of the self. The truthfulness of the speech is corroborated by the truthfulness of the life of the speaker.[39] Only the person who lives as a philosopher can speak philosophical truth with *parrhesia*.

[37] Peter Brown, *Power and Persuasion in Late Antiquity: Towards a Christian Empire* (Madison: University of Wisconsin Press, 1992).
[38] Foucault, *The Government of Self and Others*, 64.
[39] Foucault, *The Courage of Truth*, 148. The difference between this emphasis on the subjective stance toward truth and an emphasis on the propositional content of truth can be seen in MacIntyre's and Foucault's different interpretations of the Platonic dialogue *Laches*. It is a dialogue between Socrates and two Athenian generals, Nicias and Laches, about courage. To MacIntyre, the failure of the generals to define courage shows that they lacked true courage because they lacked the knowledge of what courage is (MacIntyre, *Whose Justice? Which Rationality?*, 64). Foucault argued that the dialogue is about the best way to educate children, about moral formation (*The Courage of Truth*, 122–4). Even when it deals with courage, it is about risky speech and the relation between courage and truth: Socrates is the philosophical exemplar and martyr for courageous truth-speaking, but Nicias and Laches also show courage (*The Courage of Truth*, 141–4). Unlike the interlocutors of other dialogues, such as Protagoras, Gorgias, Callicles, or Thrasymachus, who resist Socrates' style of question and answer, these interlocutors accept Socrates' method of proceeding with full knowledge that it may lead to unpleasant truths. From previous observations of Socrates, Nicias accepts that he will have to give an account of his way of life so that it might improve him (Plato, "Laches," in *Complete Works*, ed. John Cooper, trans. Rosamund Sprague (Indianapolis: Hackett, [1997], 188b). Laches accepts this risk of offense and humiliation as well, because he has seen from Socrates' actions that his discourse is authenticated by his life (Plato, "Laches," 188d–189b). The dialogue ends not with a definition of courage but with a call to continue to adopt a form of life that allows for a care of the self that fosters the courage of truth already shown by the interlocutors (Plato, "Laches," 201a–c).

Because science seeks objective knowledge, it seems an unlikely place to find *parrhesia*, with this subjective element. Yet, in figures like Galileo, Needleman, or Hayes, scientists deeply tied to their research, it does seem like these two modes of engaging truth are brought together, and these two modes of speaking the truth need to be brought together if the specific intellectual is truly to play an effective political role. Parrhesiastic discourse is necessary for the bare functioning of biomedical science under its current institutional regime. Scientists need to have the courage of truth to speak publicly about climate change, toxins, and drug trials today because they face actual threats. The expert needs to be committed to truth in her life and speak for it in the public sphere.

The quality of courageous truth-telling clearly addresses many of the problems of contemporary science indicated earlier. In the face of skewed incentives toward fabricating research or engaging in managed publishing, *parrhesia* is shown in one's life and actions as much as in one's words. Through proper care of the self and a different style of life, one binds oneself to the truth, embodying it as much as possible. Thus, the parrhesiastic scientist researches with integrity, not merely in order to follow procedural guidelines, but because it is a way of being. Because of this tie to truth, the scientist will speak it openly and fully, not allowing it to be constrained by contractual nondisclosure obligations. Of course, this truth-telling will occur only if it is timely. There is no need to think that there can be no secrets, merely no secrets that harm public safety and scientific progress. The parrhesiast speaks that truth boldly in the face of public opinion, demagogues, and doubt. The parrhesiast confronts untruth and tries to overcome it, whether it be related to tobacco and cancer, climate change, vaccines, or the latest blockbuster drug. Finally, *parrhesia* demands that one confront the risks to self, reputation, and career that such truth-telling incurs.

Given the current problems of science, it is obvious that mere training in the practices of the scientific community is not enough to develop the virtue of truth-speaking. As Chapter 5 argued, self-conscious work is necessary. The possession of *parrhesia* is the result of the care of the self and engagement in the techniques of the self. Care of the self attaches one to the truth, allowing the *logos* to be expressed in one's *ethos*, and allowing that *logos* to be spoken even in the face of risk.

The techniques discussed in Chapter 5 allow one to develop the capacity for risky truth-telling. First, meditative exercises give one the proper regard for the relative merits and value of truth and the common good versus the things risked by speaking that truth. By meditating on the brief duration of

reputation in science, on the uncertain success of a career that always depends on the next grant application or the reception of the next paper, on the vanity of wealth that only gains short-term consumables, the scientist can set these goods in the proper subordinate relation to her vocation to truth and to the broader common good. A technique more directly related to this issue is the ancient *praemeditatio malorum*. One visualizes oneself with one's reputation ruined by Internet gossip and Office of Research Integrity investigations, one sees one's grants unfunded and one's laboratory closed, one imagines oneself buried in a lawsuit with no defenders. Then one exorcizes these fears by carefully showing oneself that these outcomes are not the worst that can happen, that even these will be tolerable if one adheres to virtue and truth. Through such techniques, one develops the mental constancy that would allow one to face danger.

This care of self also includes the *askesis* of one's form of life. Many of the ancient philosophical schools followed the example of Socrates and thought that the rigor of the philosophical life vouchsafed the truths of the things said by the philosopher. Christian practices of fasting, poverty, and alms-giving similarly disengage one's affections from the seeming absolute goods of this world to put them in proper perspective, while also demonstrating a commitment to the evangelical message. From such practices arises a correspondence between actions and words.

Similarly, but in a much less straightforwardly ascetic vein, the modest salary, nomadic nature, and long hours of the scientific life can prepare one to face difficulties for the sake of the truth to which one devotes oneself. Even the fictional depiction in *Arrowsmith* indicated forgoing some comforts as necessary for the scientific vocation. Steven Shapin describes how the lack of a bourgeois salary for a long time was regarded as vouchsafing the scientist's virtue and commitment to truth.[40] For the biochemist Erwin Chargaff, the poverty of a previous generation of scientists meant that only the truly motivated entered the field.[41] Adopting the style of life advocated by Sertillanges or Weber trains one through hardship to accept risk, which provides added support for the truths that the scientist advocates. The care of the self through the scientific life can be extremely valuable for helping individuals confront threats to the integrity of the practice of science.

[40] Shapin, *The Scientific Life*, 45.
[41] Chargaff, *Heraclitean Fire*, 160.

Christian Truth-Telling

Parrhesia is not merely a secular or philosophical virtue but is deeply embedded in Scripture and the practice of the early Church.[42] Yet *parrhesia* does not always have the same connotations in Christian writings as it does in Greco-Roman philosophical texts. A first aspect of bold speaking largely overlaps with non-Christian philosophical forms of speaking the truth: Thus, in the Septuagint, the personification of Wisdom boldly calls out in the streets, much as the Cynic.[43] Here, it is a matter of speaking the truths of the Wisdom literature, which largely corresponds with the Wisdom traditions of other ancient societies. Christians took up this role through preaching, and Christian bishops and ascetics assumed the social role of philosophers by interceding with the powerful for mercy and justice on behalf of the weak and their communities. According to Peter Brown, St. Ambrose's intervention with Emperor Theodosius after a massacre at Thessalonica takes the form not of pastoral power but of bold philosophical speech.[44] The Christian bishop carried out the role of an ancient spiritual guide pointing to the dangers of anger and its cure in penance.

Christianity adds to this wider definition by seeing *parrhesia* in the proclamation of the gospel. *Parrhesia* and its forms appear throughout the Acts of the Apostles in relation to apostolic preaching, and Paul uses such terms when describing his activity and when others describe his ministry.[45] In the books of Maccabees and in later Christian writings, it is the martyrs who primarily display the courage of truth both in their defense of the faith during interrogations and by their death whereby they witness to the truth of the faith with their blood.[46]

[42] This discussion of *parrhesia* in Christianity draws on Foucault, *The Courage of Truth*, 326–38; Heinrich Schlier, "Παρρησία, Παρρησιάζομαι," ed. Gerhard Kittel and Gerhard Friedrich, *Theological Dictionary of the New Testament* (Ann Arbor, MI: Eerdmans, 1967); G. J. M. Bartelink, "Quelques observations sur parrēsia dans la littérature paléo-chrétienne," in *Graecitas et Latinitas Christianorum Primaeva. Supplementa; Fasciculus 3* (Nijmegen: Dekker & Van de Vegt, 1970), 7–57; Brown, *Power and Persuasion in Late Antiquity*; W. C. van Unnik, "The Christian's Freedom of Speech in the New Testament," *Bulletin of the John Rylands Library* 44 (1962): 466–88; Stanley Marrow, "Parrhesia and the New Testament," *The Catholic Biblical Quarterly* 44 (1982): 431–46. Craig Hovey addresses *parrhesia* from the perspective of contemporary Christian ethics, but he primarily embeds Christian witness in a juridical framework, rather than one of politics and care of the self. He also refuses to engage ancient nontheological sources. See Craig Hovey, *Bearing True Witness: Truthfulness in Christian Practice* (Grand Rapids, MI: Eerdmans, 2011).

[43] Prv 1:20–1.

[44] Brown, *Power and Persuasion in Late Antiquity*, 111–12.

[45] Schlier, "παρρησία, παρρησιάζομαι," 882–3. For a discussion of *parrhesia* in Paul in relation to Jewish sources, see Michael Cover, *Lifting the Veil*, (Berlin: De Gruyter, 2015), 271–80.

[46] Schlier, "παρρησία, παρρησιάζομαι," 885.

This truth-speaking of the apostles and martyrs images God's speaking of truth about Himself. In the Septuagint, God shows Himself in Psalm 94:1–3, where *parrhesia* translates a Hebrew term that means "shines forth" and is used for God's appearances in other places.[47] In John's gospel, the bold preaching of the good news begins with Jesus himself. While full revelation of his identity and gospel will await the sending of the Paraclete,[48] Jesus speaks of himself in open public proclamation: "I have spoken openly to the world; I have always taught in synagogues and in the temple, where all the Jews come together. I have said nothing in secret."[49] Thus, human truth-speaking is the reflection of divine self-revelation and the communication of the *Logos*.

The courageous speaking of the truth to other people is supported by the Christian's friendship with God. In Hellenistic thought, truly virtuous friends are able to speak boldly and openly to one another.[50] Similarly, through the divine filiation in which Christians become children of God in baptism, Christians become friends of God and can thus speak to God confidently.[51] Christian *parrhesia* is a distinct mode of being that is characterized by a trust and confidence in God that is primarily experienced in prayer. Foucault calls this mode vertical *parrhesia* toward God in contrast to the horizontal *parrhesia* toward other people.[52]

This understanding of the tie between speaking the truth and friendship with God was already developed in the Septuagint, Philo, and Josephus. In these sources, to speak openly to God is a privilege of the righteous,[53] so there is a tie between moral character and this boldness of friendship. This boldness is expressed through one's confident prayer to the Lord.[54] In the New Testament, especially in Hebrews, this confidence and trust in God flows from the Christian's relationship to Jesus.[55] It is because of Christ's

[47] Dt 33:2, Ps 49:1–3.

[48] Jn 16:23.

[49] Jn 18:20. Scriptural citations from Harold Attridge, ed., *HarperCollins Study Bible: New Revised Standard Version* (San Francisco, CA: HarperOne, 1989).

[50] For the relation between friendship and frank speech in Greek and Christian writings, see John T. Fitzgerald, ed., *Friendship, Flattery, and Frankness of Speech: Studies on Friendship in the New Testament World* (New York: Brill, 1996).

[51] Bartelink, "Quelques observations sur parrēsia dans la littérature paléo-chrétienne," 13. These ties between *parrhesia*, filiation, and baptism may be visible in the Antiochean baptismal rite. See R. G. Coquin, "La theme de la parrhesia et ses expressions symboliques dans les rites d'initiation a Antioche," *Proche Orient Chretien* 20 (1970): 3–19.

[52] Foucault, *The Courage of Truth*, 326–7.

[53] Schlier, "παρρησία, παρρησιάζομαι," 876–8; Bartelink, "Quelques observations sur parrēsia dans la littérature paléo-chrétienne," 10–11.

[54] 1 Jn 5:14.

[55] Hb 3:6.

sacrifice on the Cross, in which Christ becomes an intercessor for the Christian, that the Christian can approach the throne of God with confidence.[56] This trust in God allows a freedom and boldness in prayer. The righteous can complain and plead to God, and the saints can intercede with God for the Church on earth through their ties of friendship.[57]

This confidence in God undergirds the Christian's boldness toward other people in proclaiming truth and the gospel:

> *Parrhesia* is not just the courage one demonstrates in the face of persecution in order to convince others, [but also a] courage [which] is confidence in God, and this confidence cannot be separated from one's courageous stance towards others. What distinguishes the courage of someone like Socrates, or Diogenes; for example, from the martyr's courage . . . is precisely that the former is only the courage of man addressing other men, whereas the courage of the Christian martyrs rests on this other aspect, this other dimension of the same *parrhesia*, which is trust in God; confidence in salvation, in God's goodness, and also in his listening.[58]

Trust in God's Providence allows the Christian to serve as an instrument of that Providence, by witnessing to one's faith and by speaking on behalf of justice and the common good.

How does the Christian gain *parrhesia*? Linked as it is to charitable friendship with God and the proclamation of faith, it can only be a gift of God through grace. It is given by the Holy Spirit.[59] The early Christians prayed,

> "And now, Lord, look at their threats, and grant to your servants to *speak your word with all boldness* . . ." When they had prayed, the place in which they were gathered together was shaken; and they were all filled with the Holy Spirit and *spoke the word of God with boldness.*[60]

Parrhesia is thus a gift to be asked for through prayer. John Chrysostom and Theodore of Mopsuestia also claim that *parrhesia* is given in baptism.[61] The Christian is adopted by God through God's free action by which he is taken up into the body of Christ, and thus receives the ability to boldly speak truth to God and man.

Yet this gift from God requires a free human response in the Christian life. The perseverance of martyrdom in Old Testament and Christian texts

[56] Hb 4:14f, 10:19.
[57] Bartelink, "Quelques observations sur parrēsia dans la littérature paléo-chrétienne," 25.
[58] Foucault, *The Courage of Truth*, 332.
[59] Marrow, "Parrhesia and the New Testament," 443–4.
[60] Acts 4:29–31. Emphasis added.
[61] Coquin, "La theme de la parrhesia et ses expressions symboliques dans les rites d'initiation a Antioche," 5.

both expressed *parrhesia* and gained the martyr a special friendship with God.[62] Already in the Old Testament and Philo, it was the righteous and those who lived according to wisdom who possessed *parrhesia*.[63] This tie to ethics continues in the New Testament:

> Let us love, not in word or speech, but in truth and action. And by this we will know that we are from the truth and will reassure our hearts before him whenever our hearts condemn us; for God is greater than our hearts, and he knows everything. Beloved, if our hearts do not condemn us, we have *boldness* before God; and we receive from him whatever we ask, because we obey his commandments and do what pleases him.[64]

Patristic texts, in different ways, showed *parrhesia* resulting in part from self-work. In the monastic tradition, the tests of temptations and *askesis* were viewed as a kind of everyday martyrdom through which perseverance in virtue deepened one's *parrhesia*.[65] Basil shows the importance of asceticism for *parrhesia* in his confrontation with an anti-Nicene praetorian prefect, where he argues that confiscation, exile, torture, and death are nothing to him because he owns little, considers himself a guest of God in the world, and would see death as a gain in seeing God sooner.[66] This attitude allows him to freely defend the faith in the face of imperial power. In the mystical tradition, contemplative exercises that assisted the mystical ascent to union with God were viewed as deepening the Christian's friendship with and confidence in God and thus leading to greater *parrhesia*.[67] Though *parrhesia* is God's gift, Christian action, devotion, and spiritual exercises can deepen and strengthen it. Speaking the truth requires living and embodying the truth, which can be accomplished only through the care of the self with the help of grace.

Risky Speech for the Christian in Science

What does Christian truth-telling add to the scientific devotion to truth discussed earlier? In one sense, bold Christian speech will reinforce the fight against the degradation of scientific practice through commercial or personal interests because it shares many aims with it. The Christian

[62] Bartelink, "Quelques observations sur parrēsia dans la littérature paléo-chrétienne," 25.
[63] Schlier, "παρρησία, παρρησιάζομαι," 876–8; Bartelink, "Quelques observations sur parrēsia dans la littérature paléo-chrétienne," 10–11.
[64] 1 Jn 3:18–22. Emphasis added.
[65] Bartelink, "Quelques observations sur parrēsia dans la littérature paléo-chrétienne," 26.
[66] Gregory Nazianen, "On St. Basil the Great, Bishop of Caesarea," in *Funeral Orations*, trans. Leo McCauley, The Fathers of the Church, v. 22 (New York: Fathers of the Church, 1953), 49.
[67] Bartelink, "Quelques observations sur parrēsia dans la littérature paléo-chrétienne," 28–9.

embraces all searches for truth, even in the natural realm, since Jesus is the *Logos* through whom the natural order was created. Realizing that Creation reveals in some way its Creator gives the integrity of scientific practice an added importance for Christians. Christianity also adds resources for bolstering courage. The Crucifixion and the history of martyrs reveal the risks of speaking any truth in a fallen world. Meditating on and using such exemplars as models bolsters courage. The Christian can also have ultimate confidence in God's victory and thus has no need for fear. Moreover, Christian devotional practices involve the techniques of the self invoked by secular philosophers. In these ways, Christianity can strengthen one's will to protect the practice of science.

In another way, the broader truth in which Christian practices form one can oppose the dangerous tendencies of a reductionist rationality through broader normative commitments. Such a curtailed reductionist worldview threatens to encourage the treatment of others as material for use and thus to subordinate the weak to powerful. In contrast, the Christian remains committed to the common good. The embodying of Christian truth through the imitation of Christ counteracts negative aspects of scientific formation because it allows one to see the Providence active in nature and to see the image of God in other people. Thus, people and objects cannot merely be dissolved into a network of relations to be manipulated.

In the last century, the most obvious manifestation of this subordination of humans to social need was eugenics under its various guises, from state-enforced negative eugenics to the subtler eugenics of the entrepreneurial family. Catholics were at the forefront of a broad social opposition to the earlier coercive regime of sterilization.[68] Yet the most important resistance to this negative eugenics program was that of scientists such as J. B. S. Haldane, Julian Huxley, Lancelot Hogben, and Herbert Jennings.[69] They fought eugenics by changing the scientific paradigm to make negative eugenics seem nonscientific. Their opposition was driven not only by scientific considerations but also by their leftist political views, which drove them "to recognize that mainline eugenics expressed race and class prejudice."[70] Similarly, other Marxists, Stephen J. Gould and Richard Lewontin, opposed the genetic determinism of sociobiology on scientific grounds.[71] In a memorial to Gould, Lewontin and Richard Levins compare Gould's life as a public intellectual to Haldane's, and saw his

[68] Sharon Leon, *An Image of God: The Catholic Struggle with Eugenics* (Chicago: University of Chicago Press, 2013); Kevles, *In the Name of Eugenics*, 118–19.
[69] Kevles, *In the Name of Eugenics*, 122–8.
[70] Kevles, *In the Name of Eugenics*, 127.
[71] Kevles, *In the Name of Eugenics*, 84–5.

public advocacy and popular scientific work as driven by radicalism.[72] Beyond moral considerations, the specific intellectual can oppose injustice through science itself.

It is unfortunate that it is largely atheist socialists rather than Christians who have undertaken the fight against dangerous deployments of power in genetics through the means of science. But Marxists, like Christians, are formed in a certain way of life, with a devotion to a truth and an eschatological horizon, even if only an immanent one. These aspects form them in a manner beyond the mere reductionist rationality of science, allowing them to see when science is allowing the normative presuppositions of contemporary power structures to direct its research.[73] These examples show that Christians could also deploy risky speech in a distinctive way in science.

The Christian who is a scientist has another need for bold speech. Because of portrayals of the incompatibility of science and faith since the Enlightenment, religious scientists have frequently faced hostility for their beliefs. For this reason, courage is necessary for the scientist to proclaim the compatibility of faith and reason. For example, Pierre Duhem, a physicist, philosopher, and historian who died in 1916, was never called to take an academic position in Paris partly because of hostility to his Catholic faith in the secular Third Republic, so he spent his life in provincial academic centers.[74] He also saw himself forced to defend his philosophy of science against charges that it was based in faith.[75] More recently, Francis Collins, a respected geneticist who managed the Human Genome Project, faced opposition to his appointment as director of the National Institutes of Health because he had written a best-selling book on the compatibility of science and Christianity and started a foundation that researched the relations between science and religion.[76]

[72] Richard Lewontin and Richard Levins, "Stephen Jay Gould – What Does It Mean to Be a Radical?," in *Stephen Jay Gould: Reflections on His View of Life*, ed. Patricia Kelley and Robert Ross (New York: Oxford University Press, 2009), 199.
[73] Of course, Marxism might not be a critical resource in a Communist society.
[74] R. N. D. Martin, *Pierre Duhem: Philosophy and History in the Work of a Believing Physicist* (La Salle, IL: Open Court, 1991).
[75] Robert J. Deltete, "Man of Science, Man of Faith: Pierre Duhem's 'Physique de Croyant,'" *Zygon* 43, no. 3 (2008): 627–37.
[76] Francis S. Collins, *The Language of God: A Scientist Presents Evidence for Belief* (New York: Free Press, 2007); Jerry Coyne, "Francis Collins as NIH Director," *Why Evolution Is True*, https://whyevolutionistrue.wordpress.com/2009/07/10/francis-collins-as-nih-director/; "Steven Pinker on Francis Collins," *Why Evolution Is True*, http://whyevolutionistrue.wordpress.com/2009/07/11/steven-pinker-on-francis-collins/; Chris Wilson, "Jesus Goes to Bethesda," *Slate*, July 9, 2009, www.slate.com/articles/health_and_science/science/2009/07/jesus_goes_to_bethesda.html.

Proclaiming the rationality of the gospel can have serious repercussions, but this task is sorely needed.

In the other direction, scientists need courage to confront their faith communities with the need to accept scientific findings. The Catholic Magisterium has shown reluctance in the past to engage in the parrhesiastic game with those advocating a reconciliation with contemporary forms of scientific research. The classic example, of course, is Galileo.[77] Galileo advocated what he saw as the true structure of the world against those like Cardinal Bellarmine who followed their interpretation of Aquinas and Aristotle by taking an instrumentalist approach toward astronomical knowledge, an advocacy for which Galileo suffered.[78]

The Catholic Church has admitted that its handling of the Galileo affair was mistaken, and later approaches to controversial scientific advances have been more cautious. For example, the theory of evolution was never condemned, but specific works and authors such as John Zahm and Dalmace Leroy arguing for different ways of integrating evolution and doctrine were investigated by the Congregation of the Index.[79] In the case of Zahm, the Congregation was suspicious of his argument that the human body, but not the soul, could be the result of evolution.[80] Yet the Church did not want to take a firm position condemning evolution, so, with the help of his superiors, Zahm worked out a resolution in which his book was never officially condemned, even though publication of it was withdrawn.[81] In the end, his work would approximate the Church's later way of integrating Genesis and evolutionary theory. Here the parrhesiastic game was not totally successful, but over time, the Catholic Magisterium did accept these conclusions, even though the scientist suffered for his stand.

Yet caution can be warranted on the part of the Church. Science is not always clear, and it can be wrong. Its claims must be balanced against the understandings of Christian anthropology when they are related to the basic structure of the human person. As Foucault teaches us, the

[77] Although one could also accuse Galileo himself of lacking the skill necessary for successful *parrhesia* in that he needlessly alienated his benefactor, Pope Urban VIII, through his mode of writing.

[78] For alternative interpretations of instrumentalism and truth in this debate, see Duhem, *To Save the Phenomena*; MacIntyre, "Epistemological Crises and Dramatic Narrative."

[79] Mariano Artigas, Thomas F. Glick, and Rafael Martínez, *Negotiating Darwin: The Vatican Confronts Evolution, 1877–1902* (Baltimore, MD: Johns Hopkins University Press, 2006).

[80] John Zahm, *Evolution and Dogma* (Chicago: D. H. McBride, 1896), 340–68.

[81] Zahm's case, like many others, was involved in other ecclesial debates, which were often more important for the investigation than the issue of evolution. In his case, his book was read through the lens of the turn-of-the-century conflict over Americanism.

knowledge of the human sciences is always related to contemporary power structures, if not reducible to them, so the Church must ensure that it does not equate transitory contemporary social life with the essence of the human person. Thus, the Church has opposed genetic determinism, negative eugenics, dominance hierarchies, reduction of human action to social structures, and neural reductionism. In these cases, it seems to be on the right side of ethics and the history of science. Care is thus warranted, but it does not relieve Church authorities of the duty to listen to the unfamiliar truths for which faithful scientists argue or for the Christian theologian and scientist to engage in risky truth-telling toward the Church.

Conclusion

The current structure of science makes the researcher vulnerable to many external pressures. These threats require the scientist to undertake a political role at great personal and professional risk in order to defend her practice and society. This calling would be greatly aided if she gains the virtue of *parrhesia* by crafting herself into a subject of truth through techniques of the self. Christian truth and practice, by giving a larger context of truth and devotion to the common good, can support this political form of scientific truth-telling. It also gives the scientist other duties. She must evaluate scientific theories and policies by moral commitments that frequently challenge the normative commitments of the contemporary form of biopower to which the human sciences are linked. Faith can force the scientist to confront her scientific community with her religious beliefs and her religious community with her scientific knowledge. Both confrontations are risky. However, faith provides more resources than secular care of the self to face these risks, since bold speech is the gift of the Holy Spirit expressing the relationship of divine filiation. Truth-speaking and the truth spoken are both gifts.

This analysis raises a number of questions about the ties between truth, subjectivity, and Christian anthropology, questions alluded to throughout this book, but inadequately addressed up to this point. What is this truth that transforms the subject? In one reading of postmodern thought, it could be mere relativism and nihilism, which, if accurate, would destroy this model of ethics. What is this subject who is transformed? The malleability of subjectivity found in some forms of social theory threatens the possibility of finding any stable mode of existence. In Chapter 7, I will explore these questions by comparing the models of the subject and truth discussed so far with Augustinian conceptions of the *imago dei*.