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*Religious Confessions and the Sciences in the Sixteenth Century*  
edited by Jürgen Helm and Annette Winkelmann

Studies in European Judaism. Leiden: E. J. Brill, 2001. Pp. xvi + 161.  
ISBN 90-04-12045-9. Cloth \$64.00

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*Religious Confessions and the Sciences in the Sixteenth Century*, the proceedings of a conference held in 1998 at the Wittenberg Leucorea Foundation, is a welcome addition to the growing literature on religion and science. It presents eleven diverse case studies, each focusing on a different example of the interaction between religion and science in the 16th century. Section 1, 'Christian Confessions and the Sciences', focuses on Lutheran, Calvinist, and Jesuit developments in Germany and Royal Prussia. Section 2, 'Ways of Transmission', examines the Jewish role in the transmission of science in Italy and the Ottoman Empire after the expulsion of the Jews from Spain in 1492. Section 3, 'Judaism between Tradition and Scientific Discoveries', considers Jewish developments primarily in Italy. It also includes a brief essay on the Maharal of Prague and a more synthetic article on the history of geography in Jewish sources.

According to the editors of the volume, the purpose of the conference was to present a very wide perspective on the impact of the Reformation and Counter-Reformation on scientific developments. This wide perspective has in fact produced an extraordinary range of subjects. In this slim volume of 161 pages, the essays range from Germany and Prussia to Italy and the Ottoman Empire, from Lutherans and Calvinists to Jesuits and Jews. There is also a great variety in subjects broached and methods employed. Thus, the fields covered include physics, psychology, anatomy, mathematics, music, mineralogy, astronomy, and geography; and the individual chapters draw on the methods of the history of philosophy and science, the history of ideas, the sociology of science, the history of scientific institutions, intellectual and cultural history, source criticism and the study of influence.

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ISSN 1549-4497 (online)

ISSN 1549-4470 (print)

ISSN 1549-4489 (CD-ROM)

*Aestimatio* 1 (2004) 91-106

This diverse approach to the problem of religion and science in the 16th century helps introduce the reader to several contemporaneous developments, some of which have rarely been studied together. The sections themselves, however, are generally isolated from each other; there is little overlap between the different parts and very little effort is made at comparative study.

What I want to do in this review is to summarize the eleven essays briefly, and to draw attention to some of their main points and problems.

### Christian Confessions and the Sciences

The first section of *Religion Confessions and the Sciences*, which focuses on science and Christianity, consists of five essays. Four of the five essays relate to science and philosophy in Germany and one examines the various institutional developments in Royal Prussia. All the essays show considerable interest in Lutheran developments, especially the achievements of Philipp Melanchthon (1497–1560), but there is also some effort made to compare developments among Calvinists and Catholics as well. The first essay concentrates more on philosophy than science; the other four address issues in medicine, mainly anatomy, and in the development of curricula and scientific institutions.

#### 1. Günther Frank, 'Melanchthon and the Tradition of Neoplatonism'

In this first essay, Frank attempts to support previous but unsubstantiated suggestions that Melanchthon, generally hailed as the first Aristotelian among the Protestants, was more a Neoplatonist than Aristotelian, at least on some key issues. In order to support this claim, Frank focuses on three philosophical-theological problems: the creation of the world, the nature of God, and the immortality of the soul. In discussing Melanchthon's views on these three issues, however, it is really the Platonic rather than the Neoplatonic influence that is emphasized.

In making his argument, Frank draws attention to the fact that Melanchthon, in his commentary on Aristotle's *Physics* and in his introductions to Luther on *Genesis* and *Psalms*, shows no interest whatsoever in Aristotle's ontological discussion of creation or his teleology.

Instead, as Frank explains, Melanchthon replaces Aristotle's principles of nature with theological doctrines. In so far as Melanchthon is willing to accept a philosophical explanation of the beginning of existence, moreover, it is Plato's God as architect in the *Timaeus* that is to be preferred; but, nevertheless, he emphasizes that Plato ('and Xenophon and Muhammad') did not understand the true nature of God, of divine will, and of the role of Jesus as intercessor and mediator.

Frank also highlights the fact that, with respect to God and divine attributes, Melanchthon is interested in Aristotelian ideas about 'substance' only so far as they help clarify Christian dogmatic usage of the term. Instead, he follows Plato (and Cicero) in developing the idea of God as architect of the world, God as a 'spiritual essence, intelligent, eternal, the cause of the good in nature, i.e., the honest, good, just, and almighty creator of all good things'. Here Frank mentions Neoplatonism in relation to Melanchthon's discussion of the 'natural notions' that God plants in the human mind, but the sources cited from Melanchthon refer only to Plato (and Cicero).

The 'natural notions' may also figure, according to Frank, in Melanchthon's Neoplatonism with respect to immortality of the soul. In his *De anima*, Melanchthon defends immortality through an argument adapted from Aristotle's *De caelo* 1.12, that anything not generated from the elements will not pass away. According to Melanchthon, the soul contains 'natural notions' which are implanted by God into the human mind, and these 'notions' are eternal by nature and survive the body. As before, however, the text cited from Melanchthon's commentary refers not to Neoplatonic sources but to Plato, Xenophon, and Cicero.

What then might the sources of Melanchthon's Neoplatonism be? Frank suggests the edition of Plato produced by Melanchthon's close associate Simon Grynaeus (1493–1541), which seems to have included Proclus' commentary on the *Timaeus*. What I would propose for further investigation is another likely source for Neoplatonic doctrines, namely, the Neoplatonized Aristotelianism of medieval scholasticism, which had borrowed and developed doctrines found in the writings of the Arabic philosophers, especially al-Farabi, Avicenna, and Averroes.

2. Paul Richard Blum, 'The Jesuits and the Janus-Faced History of Natural Sciences'

While Frank's essay is straightforward history of philosophy that searches for sources and influences, Blum tries to stay closer to the sociology of science, which is the field (thanks to Merton) most closely associated with the study of religion and science. Here Blum focuses on the Jesuit response to Melanchthon, as it is represented in works by the mathematician Christophorus Clavius (1537–1612), his students and disciples.

The problem which interests Blum is that, in his commentaries on Euclid and Sacrobosco, Christophorus Clavius argues that the study of mathematics and astronomy is important not because of any religious reason or obligation but because of the nobility of the disciplines themselves. More specifically, Clavius maintains that astronomy is the noblest of subjects because the heavens are not subject to generation and corruption and because they are the causes of sublunar beings. He also argues, citing Plato and Pythagoras, that mathematics is, more than any other science, 'in tune with the soul'. Both arguments are inconsistent with Christian doctrine—the argument in favor of astronomy assumes the eternity of the world and the Platonic view of mathematics assumes reincarnation—and so it would seem that Clavius is making a very important step toward finding an autonomous place for science in the Jesuit schools. But Blum is suspicious. Despite the rhetoric of scientific research among the Jesuits, mathematics and astronomy never did find a solid foundation in the Jesuit schools. References to the importance of the sciences, on the contrary, represent more the Jesuit ideology of the unity of knowledge and their efforts to use the Reformation 'prestige of science' to advance their own image as the masters of all wisdom.

What are the implications of this for understanding the development of early modern science? As an alternative to recent research into Protestant and Catholic sciences, Blum proposes looking at the different school traditions in light of different narratives: empirical *vs* metaphysical approaches to scientific problems, and the autonomy of scientific investigation *vs* the unity of all the sciences within a religious framework.

3. Michael G. Müller, 'Science and Religion in Royal Prussia around 1600'

Michael Müller's essay, the third in the volume, introduces yet a third subject and third approach. He presents a brief social and political history of various Calvinist scientific developments in Royal Prussia. By examining the shifts in political, social, and religious developments he aims to understand the different movements in science and science education. Beginning with reference to a travel report of a French Diplomat in 1635–1636 Gdansk/Danzig, he examines the loose confessional relation between Calvinists, Lutherans, and Catholics and the impact that a period of Protestant tolerance had on the development of scientific institutions.

Müller's first conclusion is that the important humanistic center of Krakow lost its prestige in the 15th century as a result of the anti-academic spirit of Protestantism. With growing sectarianism, moreover, two new, rival academies came into existence, the academy of Zamosc and the Jesuit academy in Vilna. With the strengthening of the Counter-Reformation in Poland-Lithuania, Protestant cities in Royal Prussia attempted to bolster a Protestant element in Poland-Lithuania, even though the Prussian population was mainly Lutheran and the Polish-Lithuanian population was mainly Calvinist. In order to achieve some rapprochement with the Protestants in Poland-Lithuania, the churches of Prussia united with the Polish Protestant churches in 1570.

In Müller's view, this union between the Protestant churches of Poland-Lithuania, which was organized under the control of academic elites and patricians in Prussia who pursued protestant educational reforms and established universities and gymnasia that could rival the Jesuit institutions of the Counter-Reformation, created a unique period of intra-confessional tolerance. The gymnasia and universities attempted to establish an educated population and to train professionals and leaders; but they also developed more academic interests as well and attracted major theologians and mathematicians from elsewhere, often because of the relatively tolerant environment. This came to an abrupt end in the mid-17th century with the general breakthrough of the Counter-Reformation, which made Protestant links between Prussia and Poland-Lithuania irrelevant. As Prussia became more and more aligned with Germany, Lutheranism again

become the predominant religion of cities such as Danzig, Elblag, and Torun.

#### 4. Andrew Cunningham, 'Protestant Anatomy'

The final two essays in the first section focus on anatomy, with contradictory results. The first of these two essays, by Andrew Cunningham, argues that one can speak of a distinctly Protestant anatomy in the 16th century, and attempts to isolate its peculiar characteristics. According to Cunningham, one key feature is the introduction of anatomy as a preliminary subject in the study of the soul by Melanchthon at Wittenberg. This curricular innovation, Cunningham reports, had important influences elsewhere as well. Another important feature is the anti-authoritarian and empiricist tendencies in Vesalius's anatomy: Vesalius, a Protestant in approach if not in creed, rejected authority in favor of sense and experience, the book of Galen in favor of the book of nature. Cunningham also draws attention to the extreme development in the Protestant rejection of authority, a development represented by Paracelsus, who rejected all authority, even the Bible and the body. In Paracelsus' opinion medical knowledge (as other knowledge) was gained through an internal process, that is, through intuition which comes directly from the Holy Spirit. Going one step further than Vesalius, Paracelsus rejected sense and experience in favor of spirit. All of these developments Cunningham contrasts with earlier 'Catholic' anatomies, which, despite their willingness to engage in human dissection, were governed by a theological desire to show God's wisdom and providence. Anatomy, like botany and zoology, was a part of natural theology.

#### 5. Jürgen Helm, 'Religion and Medicine: Anatomical Education at Wittenberg and Ingolstadt'

The second essay on anatomy argues against the existence of a peculiarly Protestant anatomy. It provides some element of contrast in the study of a Protestant medicine by comparing the study of anatomy at Wittenberg, the leading Protestant university in Germany, and the study of anatomy in Ingolstadt, which was a center of Catholic education in Germany, a bastion of anti-Luther sentiment and, later, an important Jesuit institution.

What is the character of these two universities and their courses of study in anatomy? According to Helm, the curriculum in Wittenberg was strongly classical, but science was nevertheless subordinated to Christian doctrine. Science and medicine were considered useful and even necessary, but ultimately Gospel was viewed as the only path to redemption and the only real source of knowledge about God. This attitude to science comes out very clearly already in Melanchthon. In his lectures on physics, for instance, Melanchthon emphasizes the importance of natural science in showing divine wisdom and power and indicates that the study of science is useful for refuting heretics and establishing a rational foundation of revelation. In anatomy in particular, Melanchthon also emphasizes its usefulness for showing the wisdom of God.

As far as the subject of anatomy itself is concerned, moreover, Helm maintains that Melanchthon is much less an opponent of authority than Cunningham would have us believe. Helm adduces several examples to support this contention. In his commentary on the *De anima*, which is distinguished for its peculiar interest in anatomy, Melanchthon still draws heavily on Galen; and the conception of psychic faculties contained therein is itself strangely Platonic. Even in Melanchthon's *Liber de anima*, moreover, in which there is evidence of Vesalius' influence, Vesalius is used more often to correct Galen than to supersede him. In both the commentary and independent work, moreover, 'Law' is subordinated to 'Gospel'. Anatomy helps to explain the nature of man in his unredeemed state after the Fall, but it cannot itself redeem: it is only God that can redeem from this state of imperfection. Thus, in both physics and psychology, science and anatomy serve theological ends—the defense of religious doctrines and the explanation of original sin—and theological ideas such as divine providence and redemption remain the central preoccupation. That anatomy was considered a required course for all students, not only physicians, is a further indication of this theological orientation.

In Ingolstadt, according to Helm, we find equally surprising results. Anatomy was taught in the medical school, dissection was accepted as necessary in medical training, and there was an emphasis on sense and experience as well as medical tradition. Of course, there remained a keen interest in the ancient authorities, especially Hippocrates and Galen; but they were considered the beginning rather than end of the tradition, which was constantly being revised, refined,

and corrected, most recently by Vesalius. In other words, Vesalius was not rejected but absorbed; whereas the attacks on Protestant anatomy and medicine were not directed at Vesalius but against Paracelsus and the radical reformers who threatened the entire scientific enterprise itself. The one main difference between the study of anatomy at Wittenberg and Ingolstadt, Helm argues, is that anatomy was taught at Ingolstadt exclusively in the medical faculty: the *De anima* as studied at Ingolstadt did not include discussion of anatomy as it did for Melanchthon. Finally, although there were occasional medical professors at Ingolstadt who did emphasize the theological significance of anatomy, they were generally much more focused on its practical applications.

Thus, for Helm, there was essentially no difference between education in Protestant Wittenberg and Catholic Ingolstadt, so far as the medical curriculum was concerned. The differences that did exist were more the result of differing ideas about the relation of medicine to theology than any Protestant rejection of authority.

### Ways of Transmission

Section two of *Religious Confessions and the Sciences* consists of only two essays, which approach the subject of transmission in very different ways. Mauro Zonta, who is interested in the history of philosophy and science and the question of influence, considers the ways in which Crescas' *Light of the Lord* could have become known to scholars of the Renaissance. Eleazar Gutwirth presents the beginnings of a cultural history of Jewish medicine in the Ottoman Empire, focusing not on medicine itself but on Jewish habits of reading as they can be elicited from an eclectic mixture of documentary and literary sources. Both articles are focused on the transmission of science, knowledge, and books from the Iberian Peninsula; neither relates to the Reformation and Counter-Reformation of Northern Europe.

#### 6. Mauro Zonta, 'The Influence of Hasdai Crescas' Philosophy on Some Aspects of Sixteenth-Century Philosophy and Science'

Zonta's article is the only essay among the Jewish studies that relates to problems of technical philosophy. It considers some possible Jewish influences on the emergence of Renaissance and early modern anti-Aristotelianism, physics, and cosmology. The contribution of

the 14th-century Paris Physicists to the emergence of modern science, Zonta notes, is well-known, thanks to the work of Clagett, Grant, and Lindberg. There is also a growing appreciation of the influence of Kabbalah on Renaissance Platonism. But the same cannot be said about the important innovations of late medieval Jewish philosophy, in particular the work of Hasdai Crescas (1340–1410/11) and his followers.

Zonta focuses on two examples: Crescas' influence on Giovanni Francesco Pico della Mirandola (*ca* 1469–1533), especially Pico's refutation of the eternity of the world and definitions of time and place, and Crescas' influence on Giordano Bruno (1548–1600), especially Bruno's novel theories about infinity and the plurality of worlds. Although these connections were already recognized by Wolfson [1929] and partially documented by Schmitt [1967], it has never been shown exactly how these Renaissance philosophers and scientists could have gained access to Crescas' *Light of the Lord*, which was never translated into Latin or Romance. Based on the recent research of Harari, who suggests that Judah Abarbanel (Leone Ebreo, the famous author of *Dialoghi d'amore*) was in personal contact with Pico, Zonta goes one step further. Not only might Judah have introduced Crescas' doctrines to Pico and others, through personal contact as well as through his *Dialoghi d'amore* (which contains several doctrines borrowed from Crescas), he seems also to have composed a Latin work for Pico entitled *De harmonia caeli*. Could this lost work, which must certainly have dealt with issues of infinity and the plurality of worlds, have introduced Crescas' proofs and arguments in a more direct manner? Although the question cannot be answered with certainty, Zonta's discussion of it helps to re-focus attention on the importance of late medieval Jewish philosophy.

#### 7. Eleazar Gutwirth, 'Language and Medicine in the Early Modern Ottoman Empire'

Very different is Gutwirth's study of Jewish medicine and medical practitioners in the early modern Ottoman Empire. Like Gutwirth's many studies of late medieval and early modern Iberian-Jewish culture, this paper relates to questions of religion and science in a unique way. It attempts to reconstruct a certain linguistic culture at a specific time and place, and to identify its relation to medicine.

The article itself consists of a series of test cases: it collects together Judaeo-Spanish medical texts and fragments from the Genizah; looks at the various contexts that might have given rise to these texts; and then considers other evidence, direct and circumstantial, that bears upon the subject. The Genizah texts themselves consist of a variety of material: translations and transcriptions of Arabic, Greek, and Latin treatises; recipes and prescriptions; medical-astrological prognostications and directions on how to prepare amulets and talismans; compilations on the properties of herbs and various simples and compounds. The main burden of Gutwirth's paper is to establish the context of these texts.

The first part of the article attempts to reconstruct a Spanish-speaking community in Cairo during the period of the Genizah. Focusing on patterns of migration, Gutwirth identifies the emergence of such a community already in 1391, when riots in Spain initiated a period of persecution and forced conversion that culminated in the expulsion of the Jews from Spain in 1492. The second section of the paper then focuses on the habits of reading in Spain itself in order to give an indication of the background of the Genizah community. In Spain before the expulsion, Gutwirth finds Judaeo-Spanish literary developments which mirrored those of the emerging vernacular literature, a rich literature which included medical and scientific texts that were primarily translations and adaptations from Hebrew and Arabic. The remaining sections of the essay are then devoted to examining some of the descriptions of Hispano-Jewish physicians in the Ottoman world, including Cairo, by European travelers. Gutwirth makes use here of the extensive travel literature produced in the 16th century in attempting to rehabilitate this literature (which has been notoriously affected by bias, stereotyping, and lack of originality) as a legitimate historical source. What he finds is a general image of the Jewish physician that corroborates the many details of the Genizah texts, that is, the existence of Hispano-Jewish physicians throughout the main centers of the Ottoman Empire who served in the courts and applied and disseminated the medical knowledge of the west as a result of their access, direct and indirect, to a Hebrew and Arabic medical library. What emerges is the real portrait of the Hispano-Jewish physician in exile, with Judaeo-Spanish book in hand.

What is the significance Gutwirth's investigations? His conclusion is worth quoting *in extenso*: For reasons which are quite unrelated to the history of medicine but closely bound with the history of religion (the pogroms of 1391, the expulsion from the Iberian peninsula, the rise of the conversos), the history of medicine in the early modern Ottoman Empire is related to that of the culture of the 15th-century Iberian Jews. Its study can therefore benefit from close attention to the language, the culture and the religion of the Iberian Jews.

### Judaism between Tradition and Scientific Discoveries

The third and final section of *Religious Confessions and the Sciences* is focused exclusively on Jewish science, specifically, science in the Jewish communities of Italy and Prague. The essays in this section are generally quite short, giving the reader a brief introduction to subjects that deserve, and have recently been receiving, much greater attention [see Ruderman and Veltri 2004]. Here in this section there is very little contact with the previous sections, although the Maharal of Prague is cast as an interesting Jewish reformer, who may parallel the reformers of Germany and elsewhere.

8. Gianfranco Miletto, 'Tradition and Innovation: Religion, Science and Jewish Culture between the Sixteenth and Seventeenth Centuries'

Miletto begins his study with a problem: such encyclopedic scholars as Abraham Portaleone (1542–1612) and Azariah Figo (1579–1647), both known for their scientific erudition, introduce their encyclopedias and summas with an avowed rejection of the science of their days and with the expression of regret for their youthful forays into the secular disciplines of wisdom. Although this is surely a literary device, Miletto maintains, there seems to be something more here than mere rhetoric and apologetics. What he suggests is that these and other 16th-century Jewish savants represent a more general response to science among Jews as well as Christians. Unlike Galileo among the Christians or Azariah de Rossi among the Jews, who were the real bearers in their time of an uncompromising scientific spirit, Portaleone and Figo were conservatives who wanted to preserve a unity in divine knowledge and to maintain a traditional synthesis between the Jewish and 'external' sciences. While De Rossi, for instance, cited rabbinic precedents for the separation of Torah from

science and historical research, Portaleone and Figo argued that all science worth knowing was contained in the Torah itself. Ironically, however, this defense of Torah really imbibed the emerging values of the scientific culture itself, with its emphasis on empirical science and rejection of metaphysical speculation. Thus, by rejecting science and yet absorbing its values, these scholars could appear both conservative and erudite at the same time.

9. Samuel S. Kottek, 'Jews between Profane and Sacred Science in Renaissance Italy: The Case of Abraham Portaleone'

While Miletto introduces Portaleone as one example of a more general trend in 16th-century Italian-Jewish thought, Kottek singles him out for more detailed investigation. Building upon other recent articles (to which he makes reference), he briefly characterizes Portaleone's encyclopedia of science (entitled *Shilte ha-Gibborim*), indicating the background of Portaleone's scientific views and noting how his scientific ideas are related to relevant biblical texts.

Of the many subjects in Portaleone's encyclopedia, Kottek focuses on musicology, cryptography, military strategy, and mineralogy. These he illustrates with the following examples. Portaleone describes biblical musical instruments in light of contemporary Baroque instruments and musical theory. He describes secret inks used to pass information during periods of war. Military strategy and weapons, ancient and modern, are discussed by Portaleone in relation to biblical stories, such as Abraham's battle with the four and five kings in *Genesis* 14. The longest section of the article is devoted to Portaleone's discussion of precious stones and their properties, in relation to the biblical 'breastplate of judgment' [*Exodus* 28:15ff.] and its four rows of three gems each. Kottek explains Portaleone's discussion of the stones' medicinal and alchemical properties, and identifies possible sources in Latin and Greek *lapidaria*.

More than anything, this article provides an introduction to a fascinating work of Renaissance compilation. It should be read together with the important work of Mauro Zonta [1996] on mineralogy, the introduction to *Shilte ha-Gibborim* by Abraham Melamed [2000], and especially the recent German translation of Portaleone's work by Gianfranco Miletto [2002], which appeared after the publication of this volume. It also indicates the many important areas that still need to be researched. Indeed, the subject of nearly every chapter of

Portaleone's encyclopedia deserves monograph treatment within the history of science.

10. Giuseppe Veltri, 'Science and Religious Hermeneutics: The 'Philosophy' of Rabbi Loew of Prague'

Veltri's chapter is the only essay in the second and third sections to direct its attention to the north: it considers the cultural and religious developments among the Jews in Prague, Poland, and Moravia. It is also the only essay that focuses more on matters of religion than science. This essay examines the life and writings of Rabbi Judah Loew b. Bezalal, the Maharal of Prague (d. 1609); it presents a lengthy biography that refers frequently to the Maharal's 'reform program' (but never indicates what this program entailed), and discusses the Maharal's 'hermeneutics of the awareness of the past'. The latter part consists of unreferenced citations from the Maharal's works; a discussion of his defense of rabbinic legends (*aggadot*) against Azariah de Rossi; and then concludes with the famous legend about the Maharal's creation of a golem, which Veltri explains allegorically as an image of the dangers of science. The account of science in this essay consists of a few unexplained references to the Maharal's ideas about *sibbah qerovah* (*causa proxima*) and *sibbat ha-sibbot* (*causa causarum*), which Veltri associates with the 'literal meaning' and the 'real meaning' of text and tradition.

What seems most important in this chapter is the emphasis on rabbinic *aggadot* as a crux for the study of religion and science. There is a long history of the Jewish attempt to come to grips with these *aggadot* in a variety of contexts, for instance, in polemics and apologetics, philosophy and kabbalah. The Maharal is an important development in this history, but his attitude to rabbinic *aggadot* needs to be assessed in light of the existing research on the subject [see most recently Lawee 2001]. It seems to me that a history of scientific and anti-scientific explanations of rabbinic *aggadot* would contribute a great deal to our understanding of the Jewish attitude to science in the 16th century and in other periods as well.

11. Johann Maier, 'The Relevance of Geography for the Jewish Religion'

Equally suggestive is the final chapter by Johann Maier. The first part of this essay surveys the strictly geographical writings of the

Jews, which makes for a very small list indeed: Abraham Bar Hiyya's *Tsurat ha-Arets* in the 12th century, Isaac ha-Parhi's *Kaftor u-Ferah* in the 14th century, and Abraham Farissol's *Iggeret Orhot Olam* in the 16th. Despite the small number of scientific works on geography, however, what Maier notes is a much more extensive interest in unscientific and particularistic aspects of geography, such as the location of Jewish communities in exile, the legendary qualities of the Land of Israel, and the meaning and often apocalyptic significance of biblical place names and geographical locations. This latter interest he illustrates with a brief history of the interpretation of *Genesis* 10, the so-called 'table of nations' or 'catalogue of nations', focusing on six place names in particular (which appear in *Genesis* 10 or elsewhere): Edom, Canaan, Tarshish, Tsarfat, Sefarad, and Ashkenaz.

Maier finds that Biblical Edom was generally connected in Jewish sources with Rome, and was mainly of concern only for eschatological and apocalyptic reasons—how Rome and general changes in world geography figured in the unfolding of the four kingdoms. This is especially manifest after the conquest of Constantinople in 1453, as illustrated by Joseph ha-Kohen among others. Canaan, Maier reports, was explained mainly in light of racial and ethno-geographical theories deriving from speculations about the three sons of Noah. In later periods, Canaan was associated with Bohemia-Slovakia, and with the slave trade in Russia. Maier discusses Tarshish, Tsarfat, and Sepharad only briefly; he focuses his attention instead on the meaning of Ashkenaz, considering the views of Josephus, the Rabbis, the medieval Yosippon, Saadia, Ibn Shaprut, Ibn Daud, Rashi, David b. Abraham al-Fasi, Benjamin of Tudela, Abarbanel, Ibn Verga, Joseph ha-Kohen. What he finds is a surprisingly varied treatment of the term, with Ashkenaz being located anywhere from Asia Minor to Western Europe, before finally 'coming to rest' in Germany and Eastern Europe.

Maier concludes by adding the legendary to the exegetical: he cites the geographical information found in Hebrew versions of the Alexander Romance, information about the Jewish Kazar kingdom of the East, travel accounts, and speculations about the lost ten tribes and their location as found in the story of Eldad ha-Dani in the ninth century and David ha-Reubeni in the 16th. The best example of Jewish interest in geography is the Jewish response to the discovery of new lands in the 16th century, which inspired less

scientific interest than speculation about a possible connection with the ten lost tribes. What I hope will come from this study is a more thorough and exhaustive treatment of geography in exegetical sources. It seems that a full study of Jewish sources on the Land of Israel should prove to be very useful as well.

## Conclusion

As I wrote at the beginning of this review, *Religious Confessions and the Sciences in the Sixteenth Century* is a welcome addition to the growing literature on the history of science and religion. But it is only one contribution. There is much research still to be done before any integrated understanding of the period and the subject can be achieved. There is also a need for a more comparative approach that considers Jews and Christians in Italy and Northern Europe as well as general developments in both Italy and Germany. Contemporaneous developments in the Ottoman Empire and Islamic East deserve greater attention as well. What I hope this book represents, finally, is a more general interest in the history of the relation between religion and science, not only in the 16th and 17th centuries, but throughout antiquity and the Middle Ages as well. The time has certainly come for a much broader and deeper examination of the relation between religion and science in all periods, not only 17th-century England.

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