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twentieth-century liturgical movement whose basic tenet is that the early movement's intent to understand the liturgy of the church as it had been celebrated for several hundred years and thus help Catholics to participate in it consciously and intelligently was hijacked by a Vatican official, Annibale Bugnini (as well as others) in the wake of the council. For R. and a number of the contributors who agree with him, the reform was a radical departure from the organic development and reform of the liturgy that had been called for by the Vatican II Liturgy Constitution (no. 31). Even a pope has no right to change the liturgy radically, as Paul VI did. Indeed R. traces this error to Pope Pius X's reform of the breviary at the beginning of the twentieth century. A second crucial chapter is R.'s vigorous defense of the use of the so-called *Usus Antiquior* or pre-conciliar liturgy. In it he accuses the opponents of Pope Benedict XVI's liberalization of the use of this liturgy of being "positivistic" and assessing the post-Vatican II liturgy as "almost a dogma of the faith."

This collection is argumentative and sometimes downright polemical. At practically every turn the liturgy produced by the post-conciliar *Consilium* for the implementation of the liturgy constitution under the leadership of Archbishop Annibale Bugnini is sharply criticized as at odds with the constitution itself. For the majority of the contributors twentieth-century "modernism" is to blame for many of the wrong turns the post-conciliar liturgy took, both in the creation of the liturgies themselves and in their pastoral implementation. Some authors (Robert Hayward and Daniel van Slyke) are very critical of the historical-critical method that has been adopted by many liturgical scholars with regards to the early liturgy. Other contributions, for example, Yitzhak Hen on medieval liturgy and Anthony Chadwick on the Roman Missal of the Council of Trent are extremely erudite. For the most part the bibliographies appended to the chapters are helpful and up-to-date.

To say the least, this collection will not find a welcome among the majority of liturgical scholars who hold academic positions today, some of whom are criticized quite harshly in various essays. This is not a book, however, that should be ignored or lightly dismissed by liturgical scholars and other theologians who consider themselves more progressive, since it contains many arguments that are well worth pondering and invite a reasoned and measured response. On the other hand, those looking for a more balanced and even-handed companion to Catholic liturgy need to look elsewhere.

John F. Baldovin, SJ
Boston College School of Theology and Ministry

Quantum Shift: Theological and Pastoral Implications of Contemporary Developments in Science. By Heidi Ann Russell. Collegeville, MN: Liturgical, 2015. Pp. xxvi + 207. $24.95.

Since the middle of the twentieth century, it has become common to speak of the various "turns" in theology. We can speak of the "anthropocentric turn" of Karl Rahner; the "political turn" of Johannes Metz; the "liberation turn"; and the "linguistic turn."

Today we are experiencing another turn, that is, a turn to science at the quantum and cosmological levels for insights into theology and pastoral care.

Scientific theory at the smallest level (quantum level) and at the largest level (cosmological level) has become so complex that it is generally incomprehensible to the non-scientist, but in the past twenty-five years there has been a significant effort to make these complex scientific ideas accessible to the average person. Scientists like Carl Sagan, Brian Greene and Neil DeGrasse Tyson have had enormous success in bringing contemporary science to the public. Systematic theologians such as John Haught, Denis Edwards, and Elizabeth Johnson, among others, have begun to turn their hands to the task of exploring the implications of science to the various topics in theology. Pastoral theologians and ministers have made much less progress in bringing these developments in science and theology into the lives of their communities. Too often, either topics in science are not raised or not pursued for their insights into practice and devotion.

Russell has provided a valuable text in bridging the gap. She herself is not a scientist, but she has taken the efforts of those scientists who have popularized complex scientific concepts and made them available to those inclined to read theological texts. Topics such as relativity, particle–wave complementarity and entanglement theory from the world of quantum mechanics, chaos theory, and creation, multiple universes and the end of the universe from cosmology, and finally, string theory and loop quantum gravity are all introduced.

Rather than a dialogue, R.'s efforts are a one-way attempt "to bring the insights we can gain from science as theologians, ministers, and believers" (xxiii). It is important to note that R. uses these scientific theories and images as analogies and metaphors for theological and pastoral implications. From Einstein's relativity theory, she takes the images of relativity and relationality to explore notions of God that are dynamic and relational. Likewise, applying these images to the understanding of the human person moves us from seeing the human subject as a static object to a dynamic process. Particle–wave complementarity suggests that something can be both one thing and another without a sense of hierarchy. As an analogy of the human person as body/spirit, this approach gets us beyond the dualism of body/spirit that denigrates the material dimension of our person. Entanglement theory helps us realize that at the most fundamental level, all things are interconnected and interrelated. Theologically this brings us to the notion that we are in relationship with one another, that we impact one another, and that who we are depends on our relationship to one another and God. Chaos theory suggests that systems unfold due to extreme sensitivity to initial conditions and feedback. In nonlinear systems, the slightest change in initial conditions result in complete unpredictability. Complexity suggests that in open systems "one finds nonequilibrium and the dissipation of energy." Theologically and pastorally this suggests that this upholds the idea of novelty in creation. Both order and some chaos must be part of creation. "God as creator does not compel but rather entices creation into new and complex states." R. follows a similar pattern with issues in cosmology—the Big Bang, the possibility of a multiverse and string theory. In each case, she takes the images from these theories and unfolds their theological and pastoral implications.

Much work remains to be done at the theological level and that of pastoral ministry in taking the vast fields of contemporary science and relating them to the Christian tradition. R.'s work, however, is a significant contribution to the field, even if pastoral ministers working with her text still would have to exert considerable effort at applying these insights to preaching and catechesis. Her work is creative and evocative, and well worth serious consideration.

Catherine Vincie, RSHM
Aquinas Institute of Theology (Emerita), St. Louis, MO