the presence of patriarchy but Christianity subtly undermines it with its revolutionary message of equality in Christ. 4. Equal-regard marriage is not a soft androgyny but an affirmation of gender differences and complementarity. 5. Families need parental authority, not just male authority.

This book is a gem for Evangelicals weary of the egalitarian-complementarian discussion that seems to grind on endlessly without any evident or substantial progress. Classes debating this topic will find challenging ideas here that could open up the discussion so that Evangelicals do not proof-text themselves into irrelevance.

BEYOND SCIENTISM: PERSONAL EXPERIENCE IN SCIENTIFIC RESEARCH

James H. Austin, in his work Chase, Chance, and Creativity: The Lucky Art of Novelty (2003), examines the ways in which persistence, chance, and creativity interact in research. Austin's proposal is that the discovery of novelty in scientific research results from the plurality and dynamic interaction among numerous factors: personal lifestyle, persons, luck, intuition, and method. Of the significance of plurality to discovery, Austin concisely elucidates this thesis:

Discovery is plasticistic. It springs from a dynamic interplay between one's own life style and that of other persons, between intuition and reason, between the conventional scientific method and chance in all its forms. The more diversity there is among these elements the more unique is the resulting creative product (p. 189).

Matters raised here are essential and engaging. After identifying and examining the central theses of Austin's book, we intend to estimate the accomplishment of Austin's overall position.

The plan of the book is as follows: First, in "The Meandering Chase," Austin describes the ways in which the researcher's understanding evolves throughout the investigative process. Second, in "The Varieties of Chance," he suggests a new classification of the varieties of chance, drawing on his own research and examples from the history of science. According to Austin, serendipitous and unpredictable events shape the outcome of research and bring about novel results. Third, in "The Roots of Creativity," he explores the nature of the creative process, considering not only the environmental and neurophysiological correlates of creativity but also the role of intuition in both scientific discoveries and spiritual quests.

The Meandering Chase

Austin describes the ways in which the researcher's understanding evolves throughout the investigative process. According to Austin, the researcher is an "adverbial man," who defines "what happens, then figures out where, when, how, and why it happens. His adverbial search for cause and effect, for the basic order in things, is primal, compelling, and satisfying, quite apart from practical considerations" (p. 49). Throughout this section, Austin explores the ways in which an inborn metabolic disease develops through clinical and pathological description using histochemical clues for chemical identification of a substrate and corresponding enzyme.
The Varieties of Chance

According to Austin, serendipitous and unpredictable events shape the outcome of research and bring about novel results. Austin describes the historical background of serendipity, noting Horace Walpole's classification of serendipity as discovery "by accidents of sagacity of things not being looked for" (p. 94). Austin also suggests a new classification of the varieties of chance (i.e., "Chance I through IV"), drawing on his own research and examples from the history of science. Austin defines "chance" as something that can aid the researcher, if the researcher "stirs it up" with his or her own energies, and stays receptive to its every random opportunity. According to Austin, the researcher must continually provoke chance by being open to it in his or her individuality, hobbies, attitudes, and approach to life.

The Roots of Creativity

Austin explores the nature of the creative process, considering not only the environmental and neurophysiological correlates of creativity, but also the role of intuition in both scientific discoveries and spiritual quests. In this section, Austin proffers a series of essays on those psychological and physiological aspects of the creative process, the significance of which transcends creativity in science. Austin develops and emphasizes the formal steps in the creative sequence, including the following: interest, preparation, incubation, illumination, verification, and exploitation. For Austin, these formal steps result in a discovery, which is pluralistic in nature. According to Austin, discovery "springs from a dynamic interplay between one's own life cycle and that of other persons, between intuition and reason, between the conventional scientific method and chance in all its forms" (p. 189). Further, Austin believes that the greater the level of diversity among these elements, the more unique is the resulting creative process.

In Chase, Chance, and Creativity: The Lucky Art of Novelty the reader is offered an opportunity to learn about an eminent medical researcher's mystical and personal journey through a successful research career. Through his captivating description of work that spanned decades, the author attests well to the peculiar interplay that exists between the scientist's knowledge and 'chance,' an interaction that numerous historical scientists have encountered before him. Less than a momentous contribution to the progress of science, this book is a montage of reflections, memories, and anecdotes that harmonize a "hard," cold science, with things personal and idiographic. Of primary importance to Austin is the impact of Buddhist philosophy upon his research endeavors. Austin emphasizes that meditation and prajna, which is wisdom outside human experience and incapable of being conveyed in this-world categories, have provided insight into the creative process of his medical research interests. If the reader allows him or herself to look beyond the minutiae of Austin's particular scientific research interests (e.g., metachromatic leukodystrophy or mucopolysaccharidosis VI), he or she will appreciate the author's resolve and apparent belief that personal identity, as much as scientific rigor, is what makes for creative and successful scientific research.

At the same time, this book has its limitations. First, Austin's understanding of "chance" in its various forms (i.e., "Chance I through IV") is not satisfactorily clarified for the reader, and these forms of chance seem redundant. For example, he describes "Chance II" as that form of chance that "favors those in motion." Those who possess "curiosity about many things" and have a "willingness to experiment and to explore" are most apt to benefit from the "happy accidents" subsumed under Chance II. Chance III is what "favors the prepared mind." Persons who have acquired "a background of knowledge" are those who are likely to benefit from chance III. Then, in Chance IV we read that it "favors the individualized action." Those with "distinctive hobbies" will most likely benefit from Chance IV. Now, we ask, how exactly are these forms of chance different? In each, there is an agent who must act in some capacity in order to achieve the success that chance affords. Each of them, not only Chance II, seems to have the potential to allow the benefits that chance might bring through serendipity.

Unfortunately, Austin's discussions of chance do not appear to proffer a consistent understanding of epistemology in science. How and why the scientist comes to know what he or she knows is not satisfactorily developed or clarified for the reader. The reader is left wondering what Austin's understanding is of the principle of causality. According to the principle of causality, no effect can occur devoid of a sufficient cause to explain it. When placed within a discussion of research progress, the issue is one of predictability and of equal causes having equivalent effects: if a researcher knows the effect e₁ of e₁, and said researcher knows that another cause e₂ is equal
to \( c_2 \), then the researcher can predict that \( c_2 \) will have an effect \( e_2 \) equal to \( e_1 \) (Bunge, 1982; Casati & Varzi, 1996). Given this principle, one wonders whether Austin’s understanding of “chance” occurrences are fallaciously to be understood in the sense that effects occur without a cause. Austin seems to be asserting that “chance” is viewed as “accident,” in which effects are not intended freely or naturally. Austin’s discussion would have been aided by a discussion of Aristotle’s definition of chance. For Aristotle, chance was the incidental production of some significant result by a cause that took its place in the causal chain incidentally, and without the result in question being contemplated (Physics, Bk. II, Ch.V.; see Ross, 1936). Further, Aristotle contended that chance itself is to be regarded as a cause, which incidentally inheres in purposeful action taken with respect to some other end but leading to the event (Physics, Bk. II, Ch.V.). While Aristotle’s formulation reveals the purposeful action and causal efficacy of “chance,” Austin appears to be discussing accidental occurrences, in which effects are not purposely intended.

Second, we would like to have learned more about the author’s personal spirituality and the role that it plays in his approach to the scientific method. While he makes brief reference to his experience with Zen in the preface to this latest edition, and later describes in Chapter 33 his experience with meditation, we wonder specifically: is the author a Theist? Does God in any regard contribute to the scientist’s success in research, and if not, why not? Austin states that “There is no mystery about Chance IV, nothing supernatural about the way it generates an uncommon discovery” (p. 74). We assume that what Austin is suggesting here is that the scientist need not posit the existence of a “God of the gaps” in order to more adequately understand why things come to pass in the very specific manner in which they do. Still, we would like to understand more about why there is nothing “supernatural” about this type of chance. What are Austin’s reasons for not positing the existence of a God or a First Cause or an Unmoved Mover who might complement the scientist’s efforts? Again, there appears to be a lack of discussion of Austin’s understanding of causality. He appears to believe that there are “chance moments” within which “something” selects the objective of its action as an end or purpose for which to strive. However, Austin’s assertion that there is nothing supernatural about the way chance generates an uncommon discovery seems frustrated, for intellect seems to be required in order that nature may be a goal-directing cause (Planck, 1936). In short, if the reader is interested in an explicit discussion of an integration between the topics of science and spirituality qua spirituality, this may not be the book of choice.

In conclusion, *Chase, Chance, and Creativity: The Lucky Art of Novelty* is a pleasant read for anyone who participates in scientific research and is also interested in how personal experience and “chance” contribute, commensurately, to such research. We feel this work fits nicely with other recent works that emphasize the importance of personal experience in scientific discovery. Austin’s emphasis on personal experience in scientific discovery is not unlike, for instance, Randal Keynes’ (2001) recent exploration of how the death of Charles Darwin’s daughter may have influenced his thinking. In current scientific research praxes, where “objective” modernist assumptions in science continue to predominate, it is refreshing to learn that there are scientists who feel that identity and experience are invaluable to good scientific practice. Still, we did not feel that the author adequately clarified his understanding of chance (e.g., can more than one form of chance occur simultaneously?), and were further disappointed that Austin did not more explicitly address the importance of spirituality in science. Overall, however, Austin has much to offer any scientist who wishes to retain a sense of personal identity in the face of hard, cold, chaotic science.

**REFERENCES**


REVIEWERS FOR THIS ISSUE

JAMES R. BECK, Ph.D., is a Professor of Counseling at Denver Seminary. He is the author of The Psychology of Paul (2002) and co-author of The Human Person in Theology and Psychology (2006).

THOMAS D. PARSONS, Ph.D., is a Clinical and Experimental Neuropsychology fellow in the UNC Chapel Hill School of Medicine's Department of Neurology.

NATHANIEL W. NELSON, Ph.D., is a Clinical Neuropsychology fellow in Evanston Northwestern Healthcare's Department of Psychiatry and Behavioral Sciences.