interest in making a suitable home for his finest creation, and this view continued to influence the debate even long after Copernicus and his successors. On this point, it would be fascinating to explore the issue in other cultures, particularly those that have different metaphysics and epistemologies, and where humans have not traditionally occupied so central a place in the universe.

With this volume, Dick has completed the reconnaissance of this topic, together with Karl S. Guthke's *The Last Frontier: Imagining Other Worlds from the Copernican Revolution to Modern Science Fiction* (Cornell University Press, 1990) and Michael J. Crowe's *The Extraterrestrial Life Debate, 1750–1900: The Idea of a Plurality of Worlds from Kant to Lowell* (Cambridge University Press, 1986). Few other areas of science have such fine, reliable, convenient, and literate accounts of their history.

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Vignettes: Biodynamics

At first I liked [the] nineteenth-century image of gears, pinions, levers, and rods clanging away inside the cell. But as I obsessed longer about cancer cells, I found a more modern metaphor even more appropriate: The machinery seemed to function like a mini-computer that operated inside cells and programmed their growth. Those who would one day cure cancer would think more like electronics technicians and less like grease monkeys.

—*Robert A. Weinberg,* in *Racing to the Beginning of the Road: The Search for the Origin of Cancer* (Harmony)

Biotechnology in general and the Human Genome Project in particular aim high. No wonder the Human Genome Project's apologists have called it biology's equivalent to putting a man on the moon. Where else could he go with all that thrust?

—*Donna J. Haraway,* in *Modest_Witness@Second_Millennium. FemaleMan ©_Meets_OncoMouse™* (Routledge)

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Interacting Electrons

Electron Correlation in Molecules and Condensed Phases. N. H. MARCH. Plenum, New York, 1996. xvi, 395 pp., illus. $115. ISBN 0-306-44844-0. Physics of Solids and Liquids.

A typical condensed system, an ordinary piece of household copper wiring for example, contains an enormous number (~Avogadro's number) of electrons interacting strongly with each other through the Coulomb interaction. Coulomb interaction is singular at short distances and, more important, falls off slowly at long distances. It therefore seems to be a daunting task to try to calculate the quantum mechanical consequences of such strong electron-electron interactions in condensed systems. The same is true for molecules where the number of electrons involved may be of the order of a hundred. Quantum aspects of electron-electron interaction effects in condensed systems are often referred to as "electron correlation" effects because the strong interaction among the electrons tends to correlate their dynamics and the simple independent electron approximation, where all the electrons are assumed to be moving independent of each other, no longer applies. The study of electron correlations is one of the most important subjects in condensed matter physics and chemistry, and, not surprisingly, a large number of books exist dealing with this topic at various levels of sophistication. The present book by March takes a courageous broad approach to the topic, with the explicit aim of introducing the modern theoretical concepts to "experimental physicists, materials scientists and physical and inorganic chemists."

The book is vast in scope, as it deals with many different aspects of electron correlations, including several different theoretical techniques such as the density functional technique, the numerical quantum Monte Carlo method, many-body perturbative diagrammatic theory, and nonperturbative model calculations. Each of these theoretical topics can (and does) have books dedicated just to itself. A prospective reader who wants to develop specialized expertise in a topic must therefore look elsewhere. But this book serves the purpose of introducing the reader to the variety of advanced techniques available to study electron correlations in condensed systems.

Electron correlation is the cause of many phenomena in condensed systems—magnetism and certain types of metal-insulator transitions (called Mott transitions) are, for example, direct consequences of electron-electron interaction. The phenomenon of the fractional quantum Hall effect, which occurs in two-dimensional semiconductor systems at very high magnetic fields and low temperatures, is caused by electron correlations that drive the system into an exotic incompressible quantum fluid. The superfluidity in helium-3, associated with the most recent Nobel Prize in physics, is a spectacular and subtle consequence of interaction effects. The high-temperature superconductivity is thought by most practitioners to be caused by electron correlations. Of these topics March treats magnetism and Mott transitions in some detail. Several advanced topics, including the fractional quantum Hall effect and Luttinger liquids, are mentioned in the appendixes. Each chapter is usefully divided into many sections, and these sections often have informative titles including this wonderful title for section 7.7 (p. 165): "Can molecules exist in metallic phases?" (The answer is "maybe.") The book is not always easy to read because of its vast scope and because of the complexity of the subject matter. It could, however, be quite useful to a diligent reader who is interested in some perspectives on modern concepts and techniques in electron correlations.

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Browsings

Encyclopedia of Pinball. Vol. 1, Whiffle to Rocket, 1930-1933. Richard M. Bueschel. Silverball Amusements, New York, 1996 (distributor, Pinball Resource, LaGrangeville, NY). viii, 253 pp., illus. $49.95. ISBN 1-889933-01-5.

A detailed, illustrated history of the Depression-era beginnings of the "Golden Age" of pinball, America's contribution to the world of coin-operated public amusements, with an overview of its development from the 18th-century French court game bagatelle, as well as profiles of 100 collectible vintage pinball games from the modern era.