

chapter; a short index is included.

Whilst the various topics are not studied in much depth the main physical ideas are very clearly explained, and sufficient references are provided for further reading. The book should be very useful to fill in the background understanding needed to be able to appreciate the recent developments in Regge-pole theory (which is very briefly mentioned in the book) and in the analytic properties of S-matrix elements.

The one disadvantage of such a book is that it contains no discussion of the recent advances in strong interactions obtained with current algebras. This wouldn't be bad if the book had been less against field theory and its methods. However the field theory described is that almost of the stone age. It is a pity that such an uncompromising attitude has been taken. Provided the student realizes he is being brain-washed and takes suitable action against it (by reading summer-school lectures on other aspects of strong interaction physics) this book should be of value to him.

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Scholarly dream book

KEPLER'S SOMNIUM: THE DREAM OR POSTHUMOUS WORK ON LUNAR ASTRONOMY. 255 pp. Trans. by Edward Rosen. U. of Wisconsin Press, Madison, Wisc., 1967. \$8.75

by L. Marton

In July 1965, I had the opportunity to review in these columns a translation of Kepler's *Somnium* by Patricia Frueh Kirkwood, with commentaries by John Lear. The announcement of another translation, coming so soon after the first one, surprised me very much and constituted an invitation for a closer look.

Two years ago I lavished quite a bit of praise on the earlier book. Thus the question arises: Was it necessary or useful to have one more translation and how do the two translations compare. Let me start with a bit of statistics: The earlier translation (de-

noted hereafter as the Lear-Kirkwood book) comprises a total of 182 pages; the new (Rosen) book has 255 pages + xxiii. These subdivide the following way:

	Lear-Kirkwood	Rosen
Introduction	79	7
Dream		28
Notes	84	118
Appendix (Kepler's)	18	26
Appendixes and bibliography	—	68
Index	—	10

A little explanation is needed for these statistics. The "Dream" and Kepler's "Notes" are printed together on the same pages in Lear and Kirkwood's book, with Kepler's "Notes" appearing as footnotes. Rosen separates them and adds his own footnotes to the "Notes." Thus the interpretive "Introduction" of Lear is reduced from 79 to 7 pages by Rosen. On the other hand, Rosen adds to Kepler's "Geographical Appendix" his own appendixes, which contain a large amount of biographical material. There is no bibliography or index in the Lear-Kirkwood book. That the number of pages in my statistics do not add up correctly is due to a certain number of illustrations, blank pages, etc., in both books.

Further examination shows that the two translations used different Latin texts. Whereas the new Rosen "translation" was made from the copy of the 1634 *Somnium* at Columbia University, for the Lear-Kirkwood translation,

"Frisch's *Opera Omnia*, volume VIII, was the source document."

There exist certain characteristic differences between the two translations that go beyond what may be expected from poetic license. A few examples, taken at random illustrate the point.

Lear-Kirkwood. "The calculation of the second motions is no less diverse in the case of motions which they see than it is in the case of motions that we see, and it is much more complicated. For all six planets—Saturn, Jupiter, Mars, Sun, Venus, Mercury—experience, in addition to all the irregularities that are familiar to us, three others, two in longitude—one daily, the other in a cycle of eight and a half years—and the third in latitude, in a cycle of nineteen years. For in the midregions of Privolva the sun is larger when it is their midday than when it is their sunrise, other things being equal, and in Subvolva it is smaller, the dwellers in both areas think that the sun deviates several minutes from the ecliptic in each direction, now toward these and now toward those fixed stars. And these deviations have a pattern that is repeated, as I have said, in nineteen years."

Rosen. "The theory of the second motions is for them no less different from what appears to us, and is much more complicated for them than for us. The reason is that all six planets (Saturn, Jupiter, Mars, Sun, Venus, Mercury) exhibit, besides the many inequalities which they have in common with us, three others for them. Two of these irregularities are in longitude; one is daily, the other has a period of eight and a half years. The third is in latitude, with a period of nineteen years. For the mid-Privolvans have the sun at their noon, other things being equal, bigger than when it rises, and the Subvolvans smaller. Both agree in believing that the sun diverges by some minutes from the ecliptic back and forth now among these fixed stars, now among those. These oscillations return to the original position, as I said, in a period of nineteen years."

Whereas, in the second sentence Lear-Kirkwood uses "experience," a statement of fact, Rosen says "exhibit," a careful statement of observation.

Other differences are due to the way the material is handled. In Note 126



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Kepler speaks of "logistic logarithms." Lear-Kirkwood adds in brackets: "Sixtieth part of *Chilias* Volume VII, pp. 391 ff." For those of us who can not look up Volume VII of the *Opera Omnia*, the information is insufficient. Rosen adds four lengthy footnotes, explaining, that, "As contrasted with an absolute number a logistic number represented a measurement."

I am unable to judge whether other differences are due to the translator's choice or to the original documents. So, for instance, Note XXXIV on the "Geographical Appendix" takes up a

page and a half in the Lear-Kirkwood version, whereas Rosen's translation of the same note, together with his footnotes, occupies more than five pages.

As I said before, in my earlier review, I praised the Lear-Kirkwood book, with very minor reservations. I do not wish to modify that stand; I would like to add to it. Obviously the Rosen translation is the more scholarly work. It uses better source material and it appears to be more complete. Its commentaries are more useful for students of the history of science than Lear's. And here is the essential dis-

inction: The two translations are aimed at different sections of the reading public. Whereas the earlier translation is lighter reading and is thus suited for the average reader, the scholar should consult the excellent translation by Edward Rosen. For this reason I can answer my initial query in the affirmative: It was necessary and useful to publish, so soon after the earlier one, a new translation of Kepler's work.

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Physical properties of electronic devices

SOLID STATE ELECTRONICS. By S. Wang. 778 pp. McGraw-Hill, New York, 1966. \$15.50

by H. J. Hagger

When judging the title of a book it is difficult to predict its contents. Especially in the field of solid-state physics the terms "physics" and "electronics" are no longer used very definitely. The book under review deals with conductive, dielectric, magnetic and optical properties of materials used in solid-state electronic devices. The presentation is systematic, even if the reviewer has some criticism of the selection of the topics. Each chapter is more or less divided into an introductory part and a detailed quantitative analysis. In the preface the author gives some lists telling how the contents of the book may be used as text for advanced undergraduate or graduate courses in the field as well as a selection for special courses.

The first two chapters deal with atomic structure, interatomic forces and crystal structures in the classical way widely used in quantum mechanics and spectroscopy courses. These sections give a good basic knowledge of the physics of matter. Chapter 3 on conduction mechanisms in semiconductors follows the well established lines of solid-state physics courses. Transport phenomena in semiconductors and metals, electron-phonon interaction and ultrasonic amplification are treated in the next section, whereas recombination effects are dealt with in chapter 5. This basic knowledge is then applied to semiconductor junc-

tions in chapter 6. This section, however, is in the reviewer's opinion far too short to discuss the facts and phenomena in solid-state electron devices. Unfortunately it does not deal with

field effects, breakdown and Zener mechanisms that are so important for an understanding and application of semiconductors.

Chapter 7 switches to a completely

LABORATORY NOTEBOOK of Nobel laureate Walter H. Brattain records the events of 23 Dec. 1947, when the transistor was discovered at Bell Telephone Laboratories. The notebook continues: "This circuit was actually spoken over and by switching the device in and out a distinct gain in speech level could be heard and seen on the scope presentation with no noticeable change in quality."

