the "type," but drastically different in the composition of their essential oils. This was an extremely important piece of research, for it showed clearly that differentiation of plants into taxonomic categories should not be judged by morphological characters alone but that they should also be judged by the chemical composition of their constituents. Occurrence of physiological forms was found to be widespread not only among eucalypts; it was also repeatedly detected by others in different plant families.

For those who are interested in eucalypts as providers of sugar and proteins for honey bees, there is a short chapter on this subject, which includes a list of "Eucalypts for honey and pollen."

Chapter 14 deals with miscellaneous uses and includes an important discussion of its uses for pulp and paper, "improved wood," veneer, and plywood and for extracting tanning materials and rutin. This last product has an interesting history. In 1887 it was found that leaves of *Eucalyptus macrorincha*, when boiled in water, yielded a yellow pigment. A couple of years later H. G. Smith analyzed the pigment, named it myrticolorine, and noted that "the presence of this dye material at once distinguishes *Eucalyptus laevopinea* from *E. macrorincha*. Later it was found that myrticolorine is identical with glucoside of quercitin, called rutin. In 1946, when rutin was elevated to the status of vitamin P (a regulator of permeability of small blood vessels), *Eucalyptus macrorincha* proved to be the best source of the product. Large quantities of rutin are exported now to the United States.

The last and longest chapter (142 pages) deals with descriptions of about 150 selected species of eucalypts. (The total number of species in the genus *Eucalyptus* is about 600.) This chapter will be consulted by all who work with eucalypts.

At the end of the book there are five distribution maps and 38 plates showing morphology of the eucalypts.

The other day one of my colleagues remarked that now is the time for monographs, cutting across accepted lines of botanical research. Penfold and Willis' book is precisely this kind of monograph.

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Man Discovers the Universe

Man's Conquest of the Stars. Pierre Rousseau. Translated from the French by Michael Bullock. Norton, New York, 1961. 356 pp. Illus. $5.

Splendor in the Sky. Gerald S. Hawkins. Harper, New York, 1961. xii + 292 pp. Illus. + plates. $5.95.

Among the sciences, astronomy has always had a special emotional and esthetic appeal to the educated public, and to this has now been added its "practical" interest as the background to space technology. These two books, written for laymen who can read thoughtfully, by professionals who can write clearly and vividly, should find a wide circle of readers. Neither book requires any mathematical preparation, but both presuppose an appreciation of simple logic and an interest in that form of ordered structure that is the essence of science. Though both are for the general reader, their aims differ.

Pierre Rousseau writes a closely integrated history of astronomy, from the Magdalenean cave man to Hoyle and Hubble. The aim is inspiration, as well as information. It is a celebration of the triumph of mind over space, and the style is appropriately flowing and lively, but always clear. A great amount of detail is presented, a canvas crowded with vividly characterized active figures; yet details nowhere obscure the general development of the principles under discussion. Minor advances are subordinated to major, great figures tower above small, and all is combined into a narrative of commanding sweep. It is a brilliant achievement. In fact, I feel that it is a little too brilliant. The true picture is not as clear-cut, as black and white, as this. Some of the dramatic simplifications are overdone, some of the thumbnail sketches misleading, and there are a number of minor misstatements of fact. But these are almost inevitable in a work of this range, written by one man; they are unimportant to the general reader, and the serious student will notice and discount them. The translation seems to convey well the spirit of the French original. One grotesque slip in this English edition is the statement, repeated on a number of pages, that the galactic system has the form of a *girdle*-cake! But I found no other. A full index is provided, but a bibliography of more critical and technical historical studies might well have been added.

Gerald Hawkins states that observatory "public nights" provided the basis for his book. Its content and form are well expressed by this statement. Each chapter is essentially self-contained, and they are grouped into six parts. Two parts are historical, the first carrying the chronicle of astronomy from the shepherds to Ptolemy, the second from Copernicus to Newton, and thence, more episodically, into the 19th century. The other four parts are topical, respectively setting forth our present knowledge of the planets, the stars (including the sun) and stellar systems within the galaxy, the meteors and comets and other nonplanetary material of the solar system, and the realm of the galaxies. The style is pleasing, clear, and direct. The book is excellently illustrated with 45 plates and 38 figures; it has an index and a good bibliography to guide the reader who wishes to extend his knowledge. I note one defect in the otherwise admirable presentation—inadequate emphasis on the imcompleteness of our data and the tentative, even controversial, nature of much that is given here as fact.

Both authors are to be congratulated, and both books are recommended.

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Clay Technology

Ceramics, Physical and Chemical Fundamentals. Hermann Salmang. Translated by Marcus Francis. Butterworth, Washington, D.C., 1961. 380 pp. Illus. $12.50.

There are few textbooks on ceramics available, and during the course of four German editions, Salmang's book (first published in 1933) has become a standard work, well known to ceramists. This English-language translation is essentially the same as the German fourth edition published in 1958.

The word ceramics has different definitions in different parts of the world, and its American meaning has changed over the last several years. As used by Salmang, *ceramics* is nearly equivalent to *clay technology*. In 380 pages all clay minerals and clay products are