

All of part two is devoted to the performance of aircraft regardless of the mode of propulsion in quasi-steady flight. The final and third part treats of non-steady flight and includes the performance of hypervelocity vehicles and multistage rockets. Except for one short chapter on the equations of motion for flight over a spherical earth, the remainder of the book is concerned only with motion over a flat earth.

Although a knowledge of vectors and matrices is assumed at the beginning of part one in order to set up the equations of motion, a knowledge of these disciplines is not needed in parts two and three. By sticking to fundamental techniques and analytical solutions, the author has emphasized understanding of the phenomena rather than considering numerous specific configurations. There are many exercises, plenty of references, and excellent figures, all combining to make this a good introduction to flight performance.

**The Inspiration of Science.** By Sir George Thomson. 150 pp. Oxford Univ. Press, New York, 1962. \$4.00. Reviewed by L. Marton, National Bureau of Standards.

IT is a truism that great British scientists are past masters in the popular presentations of their subjects, and this truism is once again proven by Sir George's recent book. In it, Sir George attempts to explain to the intelligent layman what science is trying to do, what scientists are doing to accomplish the scientific tasks, how certain discoveries were made, and the tactics of experiment. The necessary physics background is clearly outlined and documented with very good examples. A few biographical sketches, in which the author scrupulously uses only examples of dead scientists, illustrate the presentation. The presentation is both clear and vivid. The book can be highly recommended to all who at some time, must present, in a popular manner, the subject of their researches and, if we define the audience in this manner, then almost every physicist should be obliged to read it. It is, at



Sir George Thomson

the same time, not only an introduction into science but a very thought-provoking book, and I would like to present here at least a couple of the ideas which came to mind while reading it.

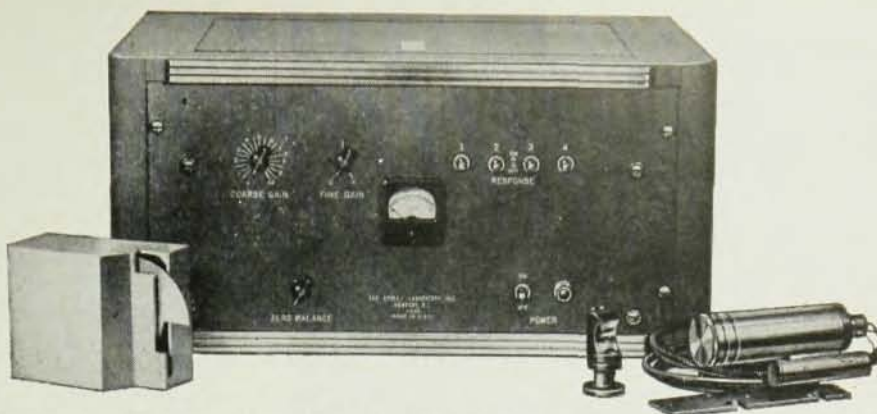
First, there is the question: For whom is the book written? The usual explanation that it is for the intelligent layman is somewhat questionable. Who is this "intelligent layman" for whom so many good books have been written. Does he exist, or is he a figment of the imagination? After discussing this question with several friends, I am quite ready to voice the common opinion that the "intelligent layman" does not exist. Who then is the reader of such volumes? Well, the first category is the one already mentioned, that of scientists who wish to learn how to present their own subject in a more-or-less popular fashion. The second category is the budding scientist who wants an introduction at a relatively simple level. The third group is that of scientists in other fields who wish to augment their limited knowledge of the field by easy reading, which is not encumbered by too much detail or difficult symbolism. Can these three groups, who comprise the major reading public of these books, be considered as "intelligent laymen"?

These remarks are not to be considered a criticism of the book; they merely constitute a request for clarification—an attempt to avoid "kidding" ourselves. It is quite obvious that the exchange of designation of the public does not make the book less necessary. It is still needed, in fact, may be more needed once we know for whom it is written.

My second comment concerns the technique of presentation. Sir George has followed time-honored methods in which the main idea emerges from a mass of insignificant detail. As I said, this is the time-honored practice of presenting the emergence of scientific ideas and if I am using this example for expressing a somewhat discordant view, it is not a criticism of the present book at all. I do recognize that the main scientific ideas form a skeleton which holds the whole body of physics or chemistry together, but that the skeleton is useless without all the little cells which form the body. One day I would like to see an entirely different type of popular presentation which would trace the emergence of the certain scientific facts out of the very minor contributions. In fact, it would be rather nice to have for once a book written about the accomplishments of the very minor scientist who may not have contributed more than a very insignificant element to the total body of science. But in using the example of this minor scientist, one could show the motivations of the scientist, the process by which he obtained his results, and how an unsuccessful man can find inspiration in his very minor accomplishments. If he is a good scientist, he knows what he did is somewhat insignificant, but he still feels satisfied that he could contribute something to this wonderful body of knowledge which he calls science.

I would also like to express the hope that Sir George could be persuaded to write such a book. The present

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\*Fundamental and experimental aspects of this detector are discussed in the following publications: Rev. Sci. Inst. 18, 347 and 357 ('47); *ibid.* 20, 816 ('49); Proc. IRE 40, 1161 ('52).

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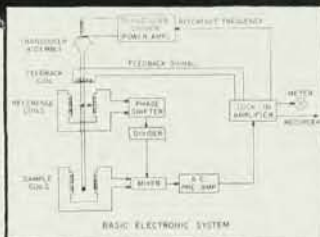
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one and several other of his books amply show how masterfully the subject could be handled by him.

*La Poussière cosmique. Les Milieux interplanétaire, interstellaire et intergalactique.* By A. Dauvillier. 207 pp. Masson et Cie, Paris, 1961. 25 NF. Reviewed by E. J. Öpik, University of Maryland.

THE author of the book has published some essays in cosmogony. Not having seen these works before, this reviewer decided to start with the book on cosmic dust, one of his own subjects. The disappointment was complete. After reading the first 40 pages, and a rapid perusal of another 50, the numberless misstatements convinced the reviewer that further reading was useless.

The most flagrant example is on pp. 47 (Fig. 5) and 48, where Phobos, the inner satellite of Mars, is represented as having retrograde motion, opposite to the sense of rotation of the planet and that of the other satellite, Deimos. This serves some of the author's cosmogonic speculations, but is pure invention.

Some other pearls: on p. 11, in the first introductory paragraph of the book, gas pressure depends on density only; on p. 12, Phobos (the retrograde!) is said to be a cloud of small particles (what about tidal disruption by Mars?); on pp. 12 and 88, comets are said to be strongly influenced by planetary perturbations, by virtue of their small masses ("de par leur faible mass", thus Newton amended); on p. 15, solar wind is rejected as the cause of repulsive forces in comet tails because it would blow away the planetary atmospheres; on p. 72, to avoid tidal breakup of a solid body inside Jupiter's Roche's limit, Sir Harold Jeffereys' theory is quoted as requiring the diameter to *exceed* 400 km, whereas it is just the opposite, only small bodies being able to maintain their integrity by cohesion; on p. 80,  $10^{20}$  molecules per  $\text{cm}^3$  are said to yield a density of  $10^{-13} \text{ gm}^{-3}$ . This may suffice.

*Mathematics for the Physical Sciences.* By Herbert S. Wilf. 284 pp. John Wiley & Sons, Inc., New York, 1962. \$7.95. Reviewed by Peter L. Balise, University of Washington.

A TEACHER of applied mathematics in science or engineering may choose from a rapidly increasing number of texts, all covering about the same topics, emphasizing applications and minimizing rigor, and differing mostly in writing style (which of course can be a vital difference). Although Professor Wilf's book also deals with the subjects common to these texts, it is refreshingly different in a way that will make it attractive for some teachers and unusable for others.

Physical applications are not mentioned, and the approach is rigorous, but the exposition is obviously aimed toward applications, giving the text a clarity for nonmathematicians reminiscent of Ralston and Wilf's *Mathematical Methods for Digital Computers*. There is some discussion of numerical methods, but more prominent is the author's attention to mathematically