

Letters

look into and for establishing certain overall impressions of times and events gone by, they are seldom, if ever, to be relied upon to establish particular facts or even interpretations of facts. The reconstruction of the history of science must ultimately rely as much on the data of the contemporary documents of history as the conclusions of the research physicist must conform to the "stubborn and brute facts" of nature.

References

1. Max Born, ed., Irene Born, trans., *The Born-Einstein Letters*, Walker, New York (1971).
2. W. Elsasser, "Bermerkungen zur Quantenmechanik Freier Electronen," *Naturwiss.*, 13 (14 Aug. 1975), 711.

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2/16/78

Empty space in the galaxy?

In an admirable article on the 18th-century physicist J. H. Lambert that appeared in September (page 25), Stanley L. Jaki writes that Lambert "pictures the Milky Way as a disk composed of a large number of stellar systems, with an empty space in its central region," and speaks of Lambert's "ring-like model of the Milky Way."

The evidence for this supposed empty space rests, I believe, on the phrase 'inner Diameter' in Letter XIV of Lambert's *Cosmological Letters*. In this letter the author discusses the relationship between our star cluster and the other clusters that make up the Milky Way system, and in my opinion the phrase refers to the extent of the empty space immediately surrounding our cluster, before one comes to neighboring clusters. But even if Jaki is right in his interpretation, still the "inner diameter" of the Milky Way is no more than the space separating our cluster from its nearest neighbors (1500 Sirius-distances), so that the center of the Milky Way—far from being empty—is as packed with clusters as the rest of the Milky Way.

I develop this theme in a review of Jaki's translation of *Cosmological Letters*, to appear in the June issue of *Journal for the History of Astronomy*.

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1/12/78

THE AUTHOR REPLIES: That the center, or central area of the Milky Way, as conceived by Lambert, cannot be as densely packed with star clusters as are its more outlying parts is a consequence of the kind of hierarchical organization that he attributes to the world-edifice. As illus-

trated by a diagram in my article, in such an organization the distribution of no unit (be it a cluster, or local system of stars, which on the hierarchical ladder is four to six times subordinate to the Milky Way according to Lambert's speculations) is homogeneous. The chief reason for this is the increasingly more enormous mass of higher ranking central bodies (re-agents), a circumstance which entails optical and gravitational consequences set forth by Lambert himself. A "ring" may not be the best word for conveying this situation, but is possibly no more inappropriate than the expression, "a disk with a large hole in its center." Only such a hole would justify the use of the term "inner diameter." It may also be of interest that the idea of a homogeneous distribution of stars throughout the Milky Way, including its central part, was advocated by Soldner in 1800 as he advanced arguments relating to gravitation against Lambert's idea of a central body in the Milky Way. Concerning this latter point, see my articles on Soldner's calculation in 1801 of the bending of light around a celestial body forthcoming in *Sky and Telescope* and in *Foundations of Physics*, a calculation to which he was led by considerations relating to Lambert's cosmology.

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3/7/78

RMP reviews

I wish to comment on a revision in the format of *Reviews of Modern Physics*. At present, this publication consists of selected, rather lengthy, comprehensive reviews, which are intended for those wishing to delve deeply into the particular field under examination. Part of the purpose of a physics review journal should be to inform the physics community continually of the relatively new advances and approaches in the many subdisciplines of physics. A single issue of such a journal should entail several short articles, each approximately five pages long, in various physics sub-fields, either instead of or in addition to the present format of fewer, longer reviews. These reviews would be technical, more so than articles published in *PHYSICS TODAY*, but both more convenient and thought-provoking for the general readership than, say, the various sections of *Physical Review*. The nature of the contributions to such a journal would be similar to those in *Accounts of Chemical Research*, published by the American Chemical Society.

The present format of the *Reviews of Modern Physics* does not accomplish its stated purpose. There does appear to be a need to make such shortened reviews available to the physics community. This could probably be best accomplished the

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letters

modifying the present journal (perhaps also with more frequent publishing) instead of introducing a new publication.

IRVING P. HERMAN

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11/7/77

THE EDITORS COMMENT: The editors of *Reviews of Modern Physics* agree wholeheartedly on the value of shorter reviews designed to keep members of the physics community abreast of new advances in the many subdisciplines of physics. Several considerations, however, cause us to question the advisability of abandoning our present format in favor of very short articles.

First, it is exceedingly difficult to get good people to write very short reviews or articles. The shorter and more superficial the article must be, the less attractive an undertaking it becomes for the serious physicist. One of the main advantages of writing for RMP has always been the freedom to write *long* articles and to cover one's topic in depth.

On the other hand, a physicist in the midst of active research often does not have the time to write a lengthy, comprehensive review. Since 1974, therefore, we have encouraged the submission of shorter and more personal "perspectives" in addition to traditional reviews. We have solicited articles on frontier topics in physics for which we relax our requirements that a review be complete, provided the author is a major contributor to the field and makes an effort to be pedagogical. Our hope has been that in such cases the vitality and excitement of work in a new field will be of interest to our readers, and that the balance sacrificed in a single perspective will be regained over a five-to-ten-year period by articles from other leading workers in the field whose approaches are different.

What we term a "shorter," perspective article is, of course, a good deal longer than the five-page review suggested by Herman. For truly short articles, a second difficulty arises. This is that someone needs to identify which topics are important and why. The traditional approach, employing referees, due process, and so on, would be both cumbersome and inappropriate in the selection of many brief, informal articles, more akin to letters than to reviews. One solution to such a problem would be to employ an editorial staff to write all the articles. But this, of course, would be entirely alien to the concept of the review journal as a place in which physicists can communicate with each other about work in their respective fields.

Finally, granting the usefulness of very short, timely reports, the editors feel that the case for publishing them in RMP is severely weakened by the fact that several

journals already exist to fill the need which Herman describes. Among these are *Physical Review's* *Comments* and *Addenda* section and particularly the *Comments* journals of Gordon and Breach (*Comments on Nuclear and Particle Physics*, *Comments on Solid State Physics*, etc.). As long as such sources of timely information exist, it seems to us that RMP can be most valuable to the physics community in its present role, as an archival—though we hope not fusty—journal, in which physicists may speak to each other at some length about their respective fields.

DAVID PINES,

Editor

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Associate Editors

5/2/78

Reviews of Modern Physics

Space colonies

We were glad to see Philip Chapman's review of four books on space colonization (January, pages 59–60). We agree that the movement to colonize space is already underway and that it may grow to "a magnitude comparable to the ecological or anti-war movements of the 1960's." We feel that physicists should join this movement because it is the perfect marriage of idealism and self-interest. Ideally, space colonization offers a definite, plausible way to overcome the present economic malaise of the United States and to alleviate many of the world's problems. (Supportive reasoning can be found in the four books cited in the review.) Pragmatically, space colonization and/or space industrialization will surely provide new opportunities to utilize labor, resources and research facilities. In particular, such efforts should create many jobs for physicists willing to consider challenging problems in developing and applying new, space-related technology.

What should physicists do to encourage the growth of this technology? First, we should make an effort to become well-informed on the issues involved. (Again, read the books!) Then we should engage in a constructive dialogue that will assist in solidifying the fundamental concepts propelling humanity "up and out" into space. Contributions to this dialogue can take two forms: professional scientific work applicable to the many problems involved, or political action.

Immediate political action is needed in the next few months. Specifically, two resolutions were submitted to the US House of Representatives on 15 December 1977. The first, House Concurrent Resolution 451, sponsored by Olin E. Teague (D-Texas), calls for study of a national

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