

Outlines of Mercury

The Atlas of Mercury. By Charles A. Cross and Patrick Moore. Pp. 48. (Mitchell Beazley: London; Crown New York, 1977.) £5.95: \$10.

JUDGING by the presence of the word "telescope" in the glossary at the back of this book, Cross and Moore are attempting a relatively popular treatment of their subject. To this end, in addition to the glossary, they provide helpful diagrams to explain anything that might give pause for thought; for example, why Mercury has a day which is two of its years long. This consideration, shown also in the innumerable illustrations and photographs provided, makes the book easy and informative reading for the relatively uninitiated; whereas, on the other hand, its comprehensive nature should mean that it is not without interest for more advanced readers.

The broad scope of the book also provides a neat way of illustrating just how much of our present knowledge of Mercury we owe to that triumph of American technology, Mariner 10, since the whole history of observation (including much duplication) up to the time of Mariner 10, takes up far less of the book than the results gained from that one space-probe. Those who do not have the time to count the relevant number of pages need only compare Chapman's pre-mission map of the planet (p5) with the map drawn by Cross. It ought perhaps to be remarked, however, that Chapman's map is the upper of the two described on p5 and that it is not the latest pre-Mariner map; this distinction belonging to a map drawn by J. B. Murray *et al.* (*Icarus*, 17, 576-584; 1972). Cross's excellent maps, which form the basis of this book, are centred on the useful subsolar point, and the accompanying photographs give an accurate idea of the planet's surface, perhaps the only omission being a high resolution picture of the Hilly and Lineated Terrain. Also, some mention of the processing these pictures have undergone might have been interesting.

The text accompanying the pictures, however, is the weakest part of the book. There was just not enough geological nitty-gritty to maintain my interest in the endless succession of craters; and calling them circular "enclosures", "formations" or "walled plains" did not help. It could be said that this is the criticism of a geologist, and rather unfair, since the book is an elementary one wherein the authors are clearly trying to keep things simple, but the approach of describing things by quadrants and vast numbers of photographs rather than subjects has provided gaps for the astronomy-orient-

ated authors to stray into, and go astray in, the geological field. For example, on p24, it is argued that, because of the lower number of scarps and the "various younger craters and basins", the area covered by the South-West Quadrant is younger on the whole than the South-East Quadrant. In fact, it is the oldest features which indicate the age of the terrain and in terms of age and distribution of craters, the South-West Quadrant could be older, if anything, than the South-East, but whether it is or not, the statement would have been unnecessary in the first place if something more solid had not been cut out by the simplification process.

A key to the age of the surface is the nature of the Intercrater Plains, which on p18 are correctly described as the regions between the main craters (assuming there is nothing else there, such as Smooth Plains). In the next paragraph, however, it is stated that there is an "obvious" resemblance between this intercrater unit and the highlands of the Moon, which for the most part are nothing but craters. The original description (Trask and Guest, *J. Geophys. Res.*, 80, (17), 2461-2477; 1975) is quite clear: "Intercrater Plains (unit) has a closely similar analog on the Moon in the Pre-Imbrian Plains of Wilhelms and McCauley (*Miscellaneous Geological Investigation Map 1-703*, US Geological Survey; 1971)". That is to say, the Intercrater Plains are similar morphologically to terrain situated between the main craters of a relatively sparsely cratered unit within the southern highlands of the Moon. The lunar unit is of much smaller extent and for this reason, among others, is not thought to originate in the same way.

On p30, a prominent ray is said to be "clearly a northward extension of Heemskerck Rupes". If this is so, then it is an exciting discovery linking what has hitherto been considered as a superficial unit, thrown out by the impact of a meteorite, to a feature interpreted as a very large compressional fault scarp in the planet's crust. I am not excited. On p35 Rupes Zeehan is said to be formed from wall remnants of pre-Caloris craters. Certainly, it seems to be influenced by them, but faces the wrong way for the authors' description to be correct.

On p21, it is indicated that the large scarp in the crater Po Ya "seems to be" a lava front rather than a compressional feature. There are good examples of *small* scarps apparently confined to the Smooth Plains (not present in Po Ya) on some crater floors which some think might be the fronts of highly viscous lava flows (c.f. highly fluid mare basalts). The Po Ya scarp is not one of these. This error is an example of the heavy volcanic bias present in the book. Thus, it is thoroughly misleading of the authors to suggest that there is any controversy over

the cause of the craters on the Moon (and therefore Mercury), even if they do plump for a mixture of both impact and volcanic hypotheses. The vast majority of craters on the Moon, Mars and Mercury were caused by the impact of impinging space debris and because they are morphologically different from the volcanic features also present on the Moon and Mars (but not yet pointed out with any confidence on Mercury), there is no argument as to their origin.

If all this is not entirely compatible with the implication in the proud claim on the cover that this is "the most concise and accurate account of the planet available" (Sir Bernard Lovell), it is also true that, although the mistakes tend to mislead or confuse as to certain pictures or features, they do not seriously misrepresent the fundamental processes which have shaped the planet's surface. In addition, apart from the volcanic bias, the authors do strive throughout to maintain an admirable scientific restraint. For example, the attractive theory that Mercury was once a satellite of Venus is quite properly described as "still highly speculative". On the whole then, this book can be commended to the readers for whom it was written. **W. P. O'Donnell**

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