PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY A MATHEMATICAL, PHYSICAL & ENGINEERING SCIENCES

Epilogue

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Phil. Trans. R. Soc. Lond. A 1977 **285**, 600
doi: 10.1098/rsta.1977.0105

Phil. Trans. R. Soc. Lond. A. **285**, 600 (1977) [600]
Printed in Great Britain

EPILOGUE

We end this review of the knowledge gained since the *Luna* spacecraft, *Pioneer*, *Surveyor* and *Apollo* missions brought first scientific instruments and then men to study the lunar surface by looking forward to a new era of lunar, and planetary, exploration. The complete solution of many of the fascinating questions which have been posed in these pages depends on completing the survey of the Moon which has been so well begun. In this task, the concepts developed in the Soviet Union – the automated return of samples as in the *Luna* 16 and 20 missions and the idea of automatic survey vehicles, such as *Lunakhod* – and the concept now being actively studied in the U.S.A. – the lunar polar orbiter – will be of major importance. From such an orbiter it is clear that a variety of physical and chemical properties can be studied: the magnetic and gravitational fields, the Moon's shape and topography, the elemental abundances at the surface, the thermal gradient in the regolith and the internal electrical parameters (see the account by Runcorn & Coleman 1977). It seems appropriate to end by illustrating the possibilities of this new development by reproducing the surveys, covering as yet a small area o the Moon and not nearly so discriminating as they will become, of the distribution of key chemical elements in the lunar surface. Figures 1 and 2 are taken from recent lunar science conference proceedings.† We look forward to the mapping of the entire surface which will result from these new developments.

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Reference

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† *Geochim. cosmochim. Acta* 1973 *Suppl.* 4. *1*. Plates I and II.

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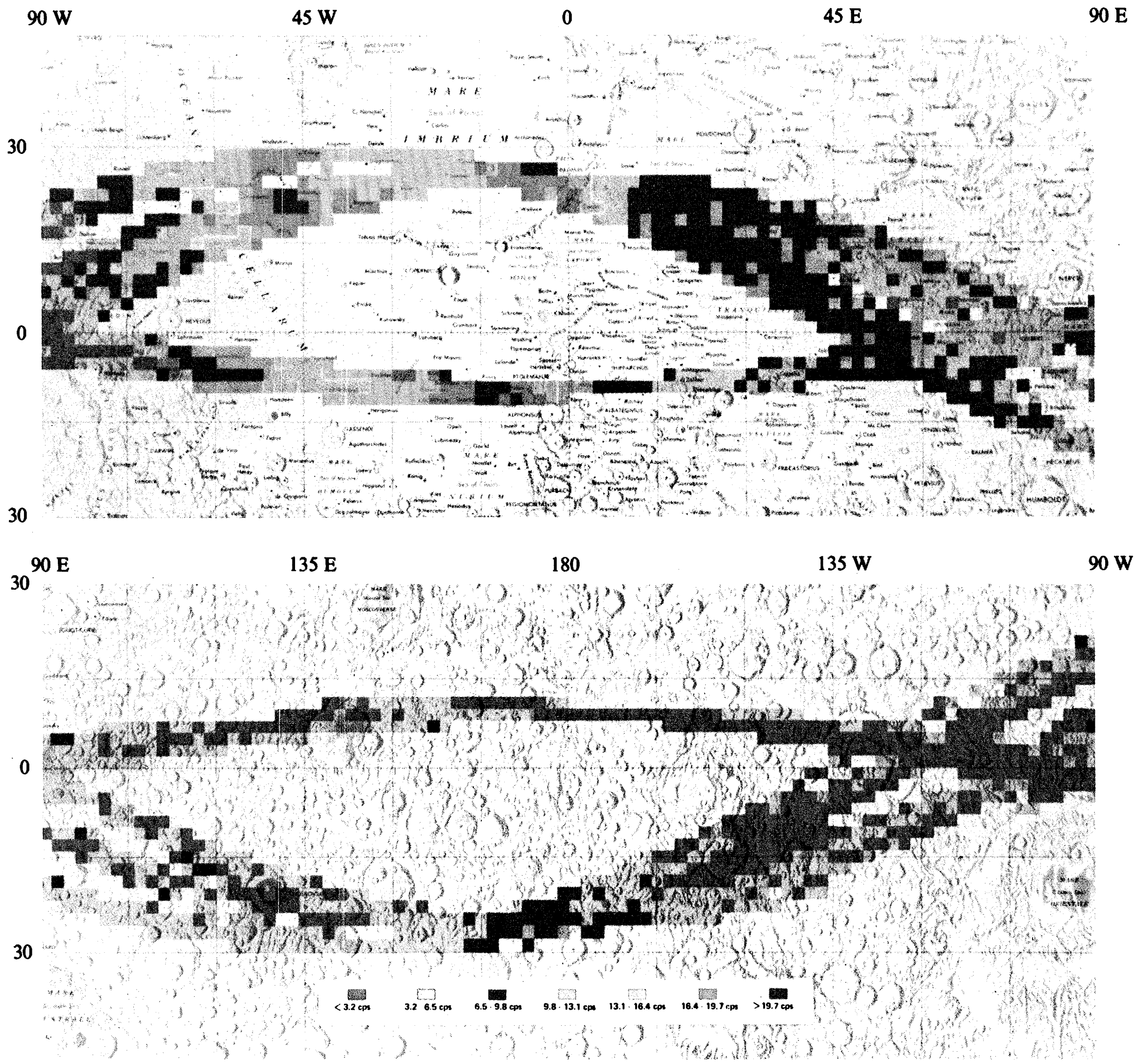

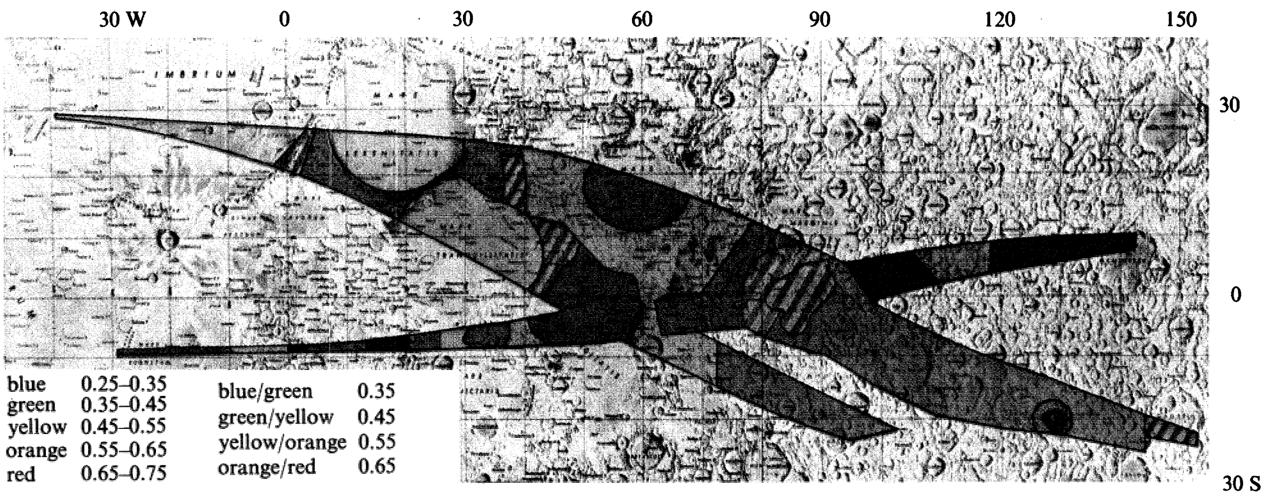

Above: Net lunar radioactivity. A relief map of the radioactivity of regions of the moon overflown by the Apollo 15 and 16 CSMs. Differences in the integrated counting rate in the energy range of 0.55–2.75 MeV are chiefly due to differences in the concentration of the radioactive elements Th and U. The data are averaged over $2° \times 2°$ areas after correcting for altitude and background components.

Below: Apollo X-ray fluorescence experiment.
Al/Si concentration ratios for specific areas along the Apollo 15 and 16 ground track.

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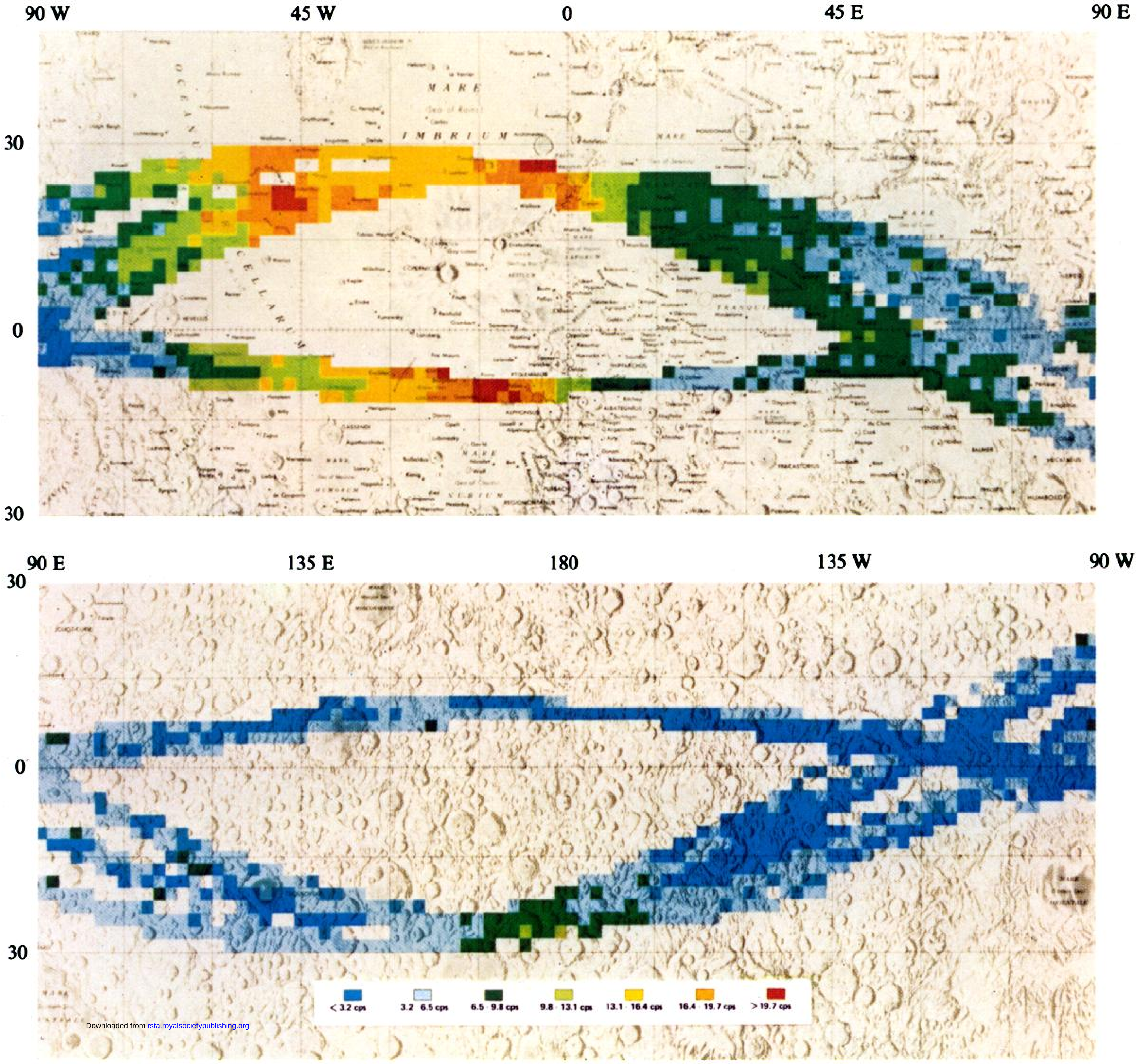

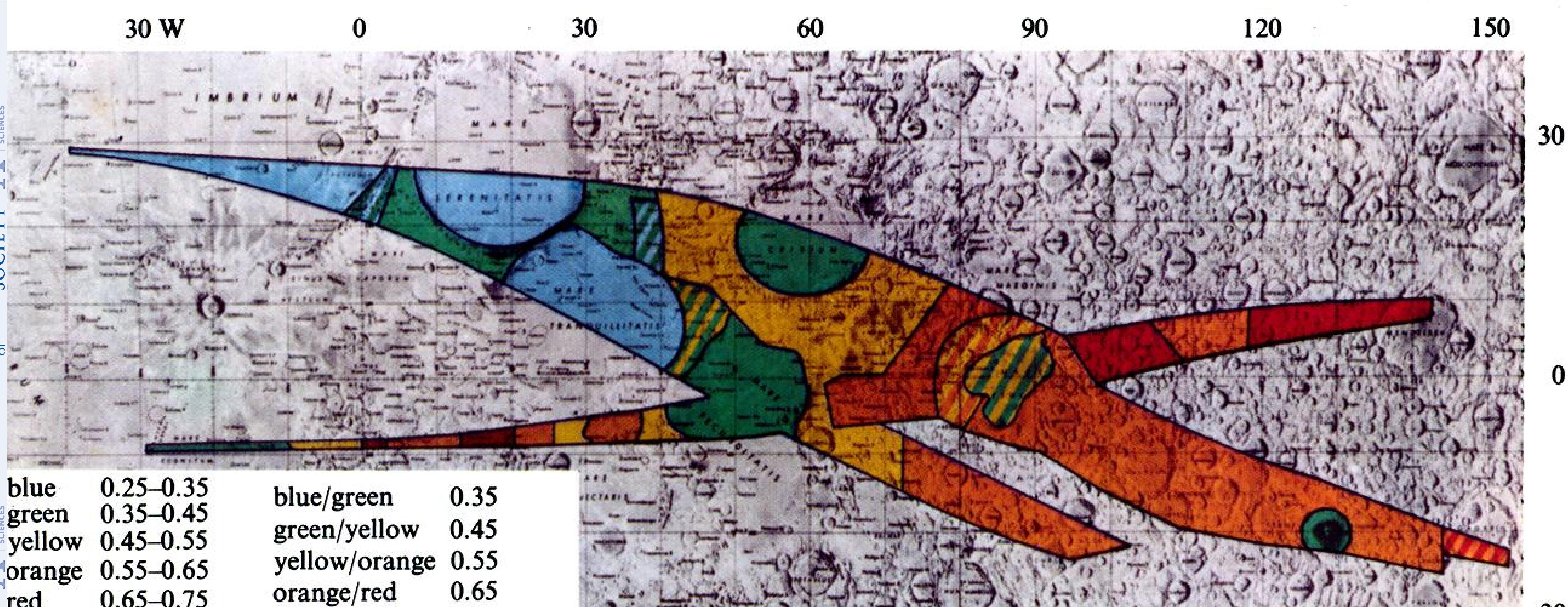

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