

Correspondence

Bode's Law

SIR,—Further to J. G. Hills's letter (*Nature*, 225, 840; 1970) and that of John A. Antal (227, 642; 1970), your correspondents' comments on the following would be interesting.

Bode's law is geocentrically motivated because it uses as its basis the Earth's solar distance. It is increasingly inaccurate for planetary distances as the progression proceeds to the outer planets until by the time Pluto is reached the discrepancy is nearly 100 per cent.

However, as the table here shows, if the Jovian perihelion distance is used as a reference, it is possible to have an almost perfect prediction for planet solar distances by the simple expedient of using the arithmetical progressions of 2, 4 and 6 for the outer planets and $\frac{1}{3}$, $\frac{1}{5}$, and $\frac{1}{7}$ for the inner ones. Mercury and Pluto end the progressions with their highly elliptical orbits given by the factors 6 and 10 for Pluto's perihelion and aphelion and $\frac{1}{10}$ and $\frac{1}{16}$ for Mercury's.

| Planet | Factor of Jupiter's perihelion | Perihelion/Aphelion Solar distance (million miles) | |
|---------|--------------------------------|--|-----------|
| | | Actual | Predicted |
| Mercury | $\frac{1}{16}$ | 28.5 | 28.7 |
| | $\frac{1}{10}$ | 45.7 | 45.9 |
| Venus | $\frac{1}{7}$ | 66.7 | 65.7 |
| | | 67.7 | |
| Earth | $\frac{1}{5}$ | 91.45 | 91.9 |
| | | 94.5 | |
| Mars | $\frac{1}{3}$ | 128.5 | 153.2 |
| | | 154.5 | |
| Jupiter | 1 | 459.8 (perihelion) | — |
| Saturn | 2 | 834.6 | 919.6 |
| | | 937.6 | |
| Uranus | 4 | 1,699 | 1,839.2 |
| | | 1,867 | |
| Neptune | 6 | 2,769 | 2,758.8 |
| | | 2,817 | |
| Pluto | 6 | 2,766 | 2,758.8 |
| | 10 | 4,566 | 4,598 |

The significance of this simple arrangement is one that cannot be gone into here but the full explanation is contained in the publications *Genesis One, Two and Three*.

Yours faithfully,

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Library Pollution

SIR,—It has been established that the deterioration being caused by pollution can be arrested and even reversed if one is prepared to pay the cost. Cost however, needs to be related to benefit.

Deterioration may be less apparent in the case of books than in some other fields, but it is in fact insidious and the need for preservation treatment is most urgent. Moreover the wear and tear of frequent use increases the damage caused by atmospheric pollution. It is now generally conceded that excess acidity is the chief destruc-

tive agent apart from wear and tear and this acidity can arise either from present day methods of paper manufacture, when rosin alum sizes are used, or may be acquired from the sulphur dioxide content of a polluted atmosphere. So that apart from the repair of mechanical damage the deacidification of books and the prevention of further "pick up" of acid from the atmosphere are the most pressing needs.

Many effective processes for achieving these desiderata have been devised, but almost all of them are too slow and expensive to be used for the very large scale operations now necessary. As an illustration of the magnitude of the scale in question it is only necessary to cite the size of six well known and much used libraries.

According to the *World of Learning* for 1965/66 the following six libraries are believed to house about 44 million volumes distributed as follows:

| | Million volumes |
|--------------------------|-----------------|
| USA | |
| Library of Congress | 14 |
| University of California | 6 |
| Harvard | 7 |
| Yale | 5 |
| Great Britain | |
| British Museum | 6 |
| France | |
| Bibliothèque Nationale | 6 |
| Total | 44 million |

Out of this total of 44 million volumes, assuming that half of these will be too acid to last more than 50 years, there is an obvious and urgent need to deacidify 22 million books before they deteriorate beyond repair and are lost to posterity.

The magnitude of this undertaking is enough to frighten the average librarian into *laissez faire* and this tendency will be accentuated by the apparent slowness of the deterioration which conceals the insidious nature of the damage.

If it is assumed that the 32 million volumes in the US deteriorate three times as rapidly as the 12 million of Great Britain and France (on account of the higher ambient temperature) and if a rate of deterioration in cash value equivalent to 3 pence per volume, equivalent to a useful life of 240 years for a book worth £3, is assumed, this small loss amounts in the aggregate to no less than £275,000 a year for the US alone.

Surely a small fraction of this cost spent on well directed research would lead at least to some effective first aid measures—or is the magnitude of the task too intimidating to stimulate the librarian and will it lead instead to a perpetuation of the present *laissez faire*?

There are signs that the librarians of the US are becoming alarmed at the implications of this wastage, but so far there seems little evidence that the British librarians are making any efforts to deal with this menace to our large libraries.

Yours faithfully,

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