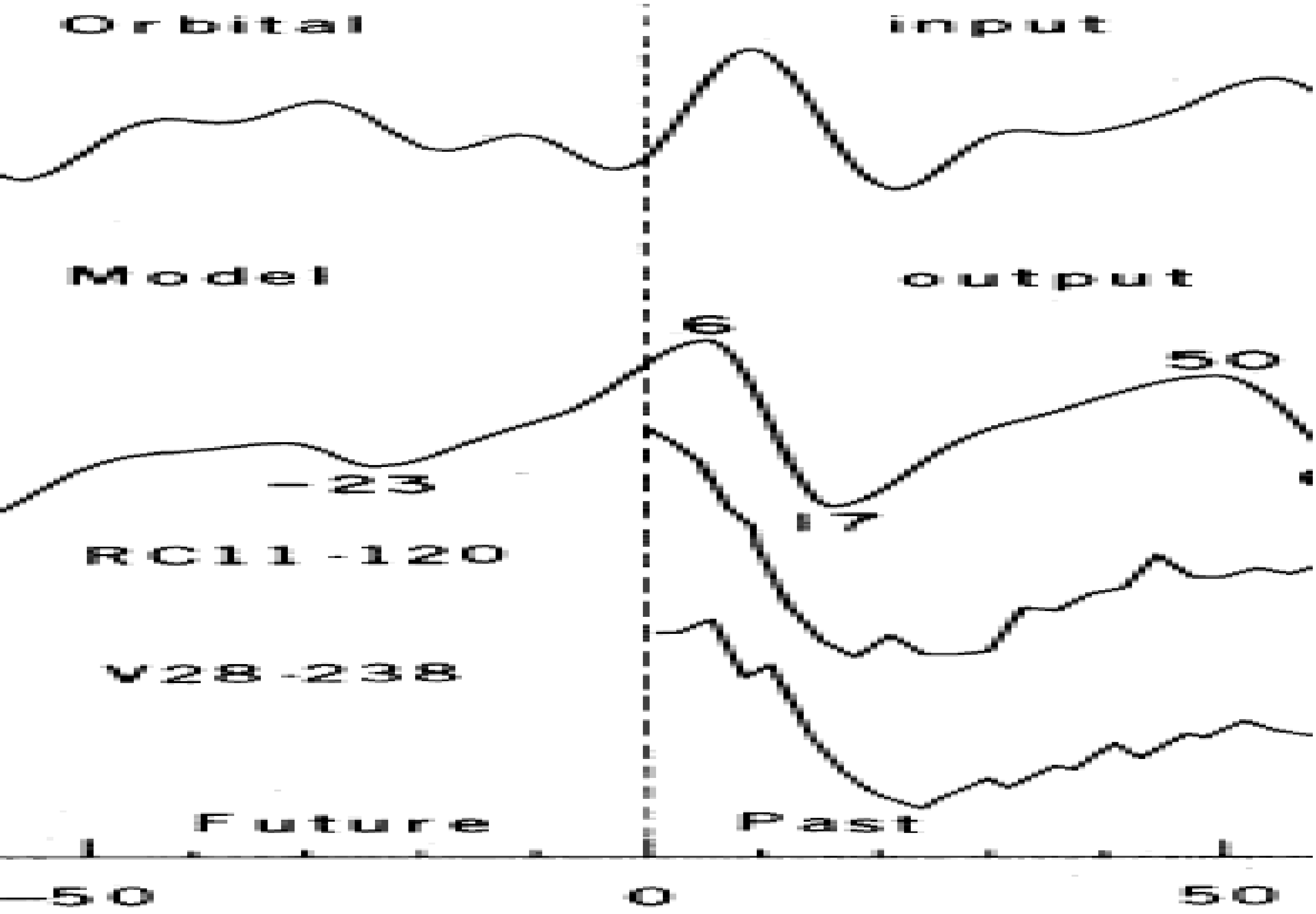

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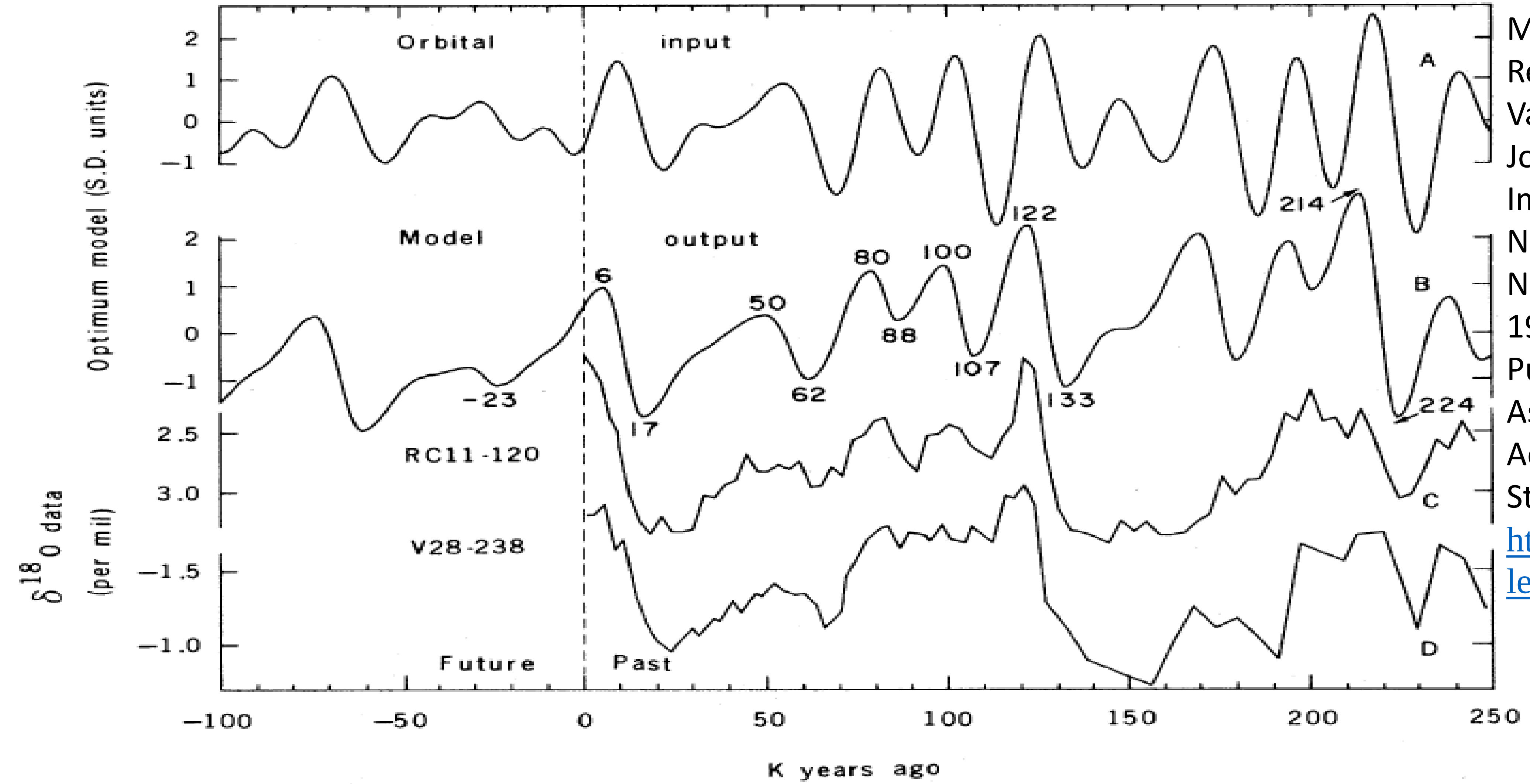

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Fig. 7. Input and output of our response model compared with isotopic data on climate of the past 250,000 years. (A) Orbital input (defined by $\alpha = -2$ and $\phi = 2000$ years) corresponding to an irradiation curve for July at 65°N (*37*). (B) Output of a system function with a mean time constant of 17,000 years and a ratio of 4 : 1 between the time constants of glacial growth and melting. Ages of selected maxima and minima are given in thousands of years. According to this model, the influence of orbital variations over the next 23,000 years will be to enlarge continental ice sheets. (C) Oxygen isotope curve for deep-sea core RC11-120 from the southern Indian Ocean (*5*). (*D*) Oxygen isotope curve for deep-sea core V28-238 (*7*) from the Pacific Ocean [Pee Dee belemnite (PDB) standard]. Curves C and D are plotted against the TUNE-UP time scale of

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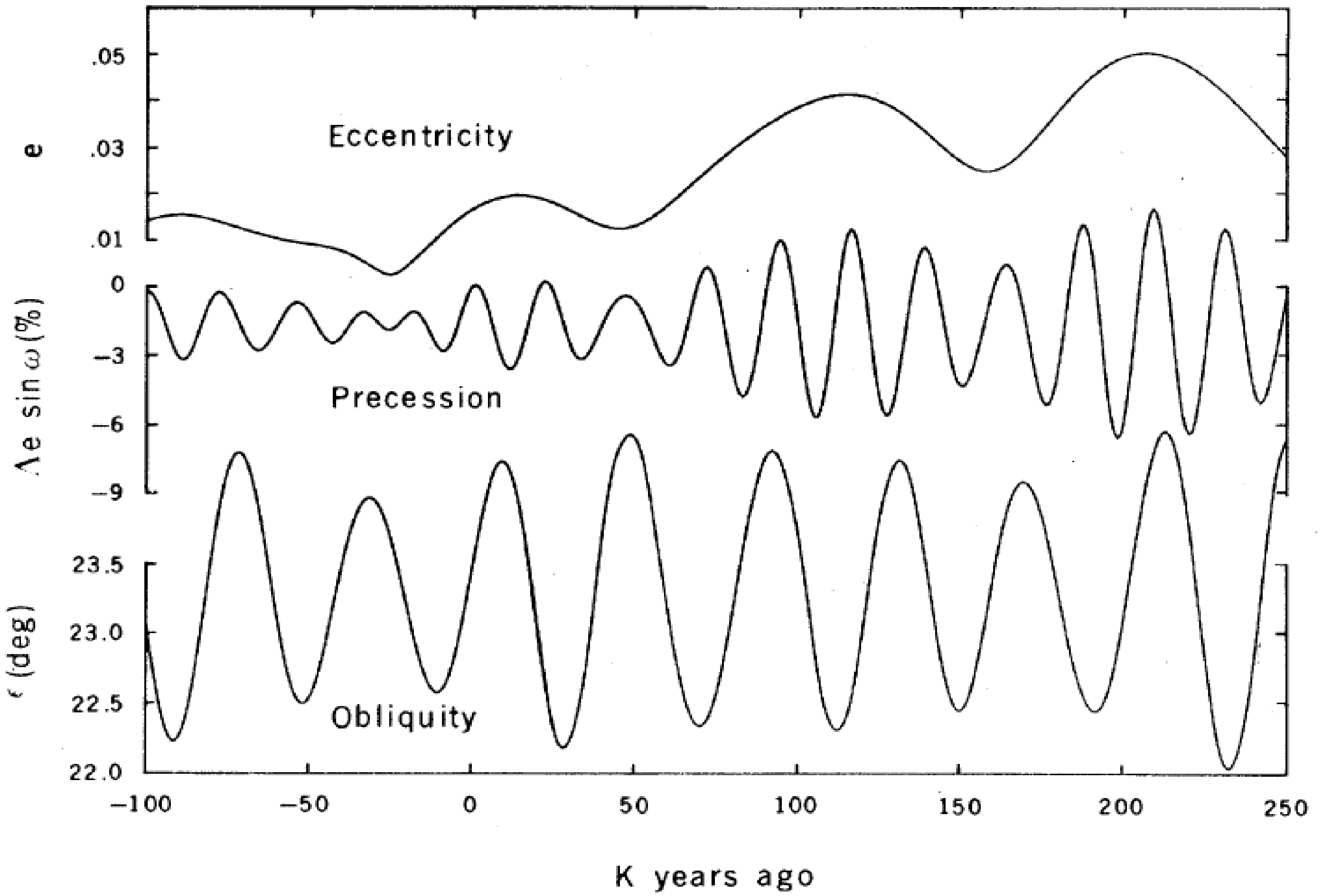

Fig. 1. Variations in orbital geometry as a function of time (K = 1000), according to calculations by Berger (*19*). The climatic effect of precession is recorded as an index ($\Delta e \sin \omega$) that is approximately equal to the deviation from its 1950 value of the earth-sun distance in June, expressed as a fraction of the semimajor axis of the earth's orbit.

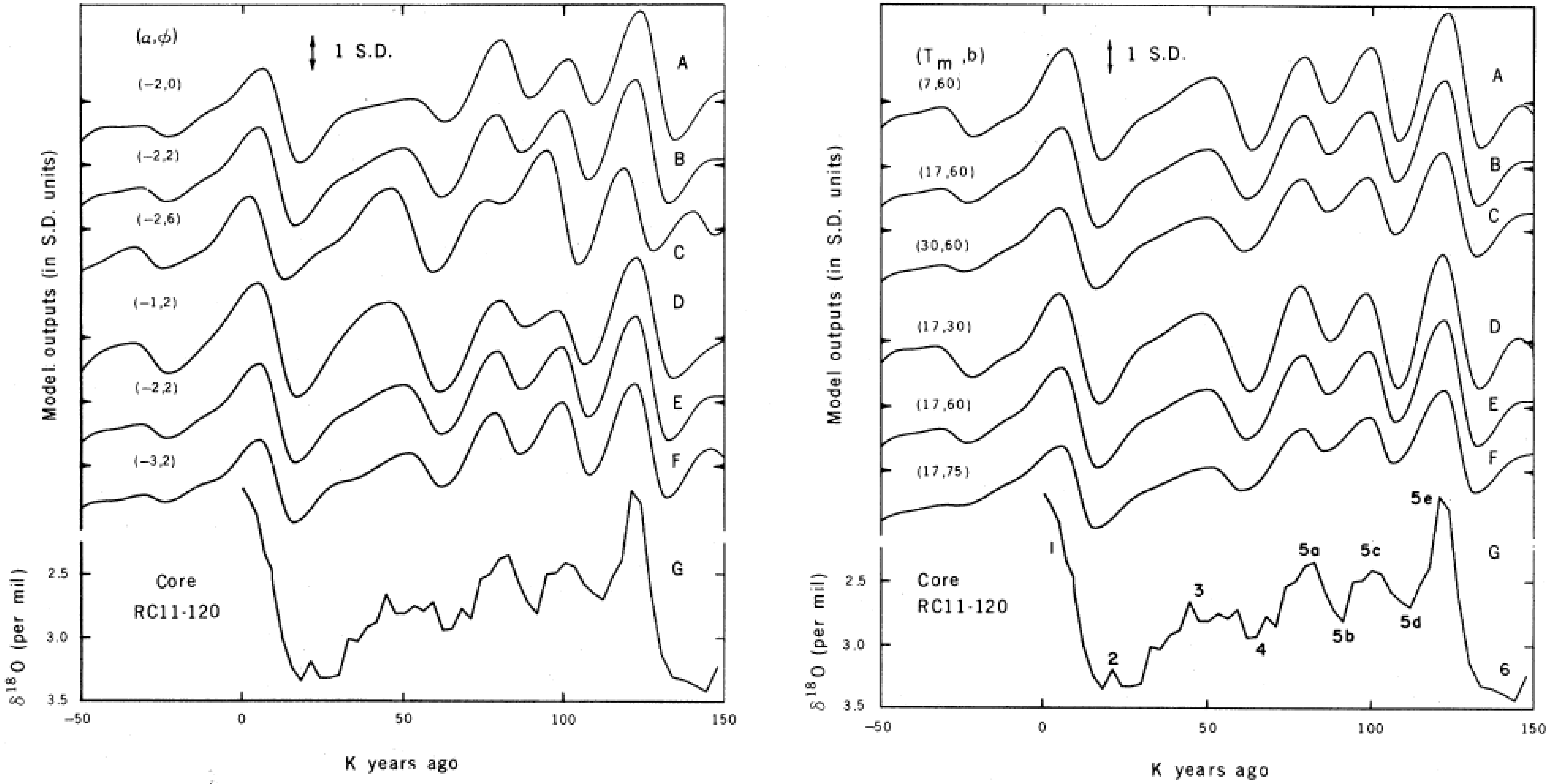

Fig. 5 (left). Family of model output curves illustrating how variations in orbital input affect the output of a given system function. Each of the input curves (Fig. 3) has been processed through the system function of the optimum model (T_m = 17,000 years, b = 0.6). Model outputs (curves A to F) may be compared with isotopic data (*5*) on climate (curve G). The scale for curves A to F is as in Fig. 3; $\delta^{18}O$ is the per mil enrichment of oxygen-18. Fig. 6 (right). Family of model output curves illustrating how variations in the system function affect the output when the orbital input curve is fixed. The input (curves B and E in Figs. 3 and 5) is defined by $\alpha = -2$ and ϕ = 2000 years. Each system function is defined by a mean time constant T_m (in thousands of years) and a nonlinearity coefficient b (expressed in percent). Model outputs (curves A to F) may be compared with oxygen isotope curve G for core RC11-120 (*5*), on which the numbered stages of the standard stratigraphy (*79*) are indicated. The scale for curves A to G is as in Fig. 3.

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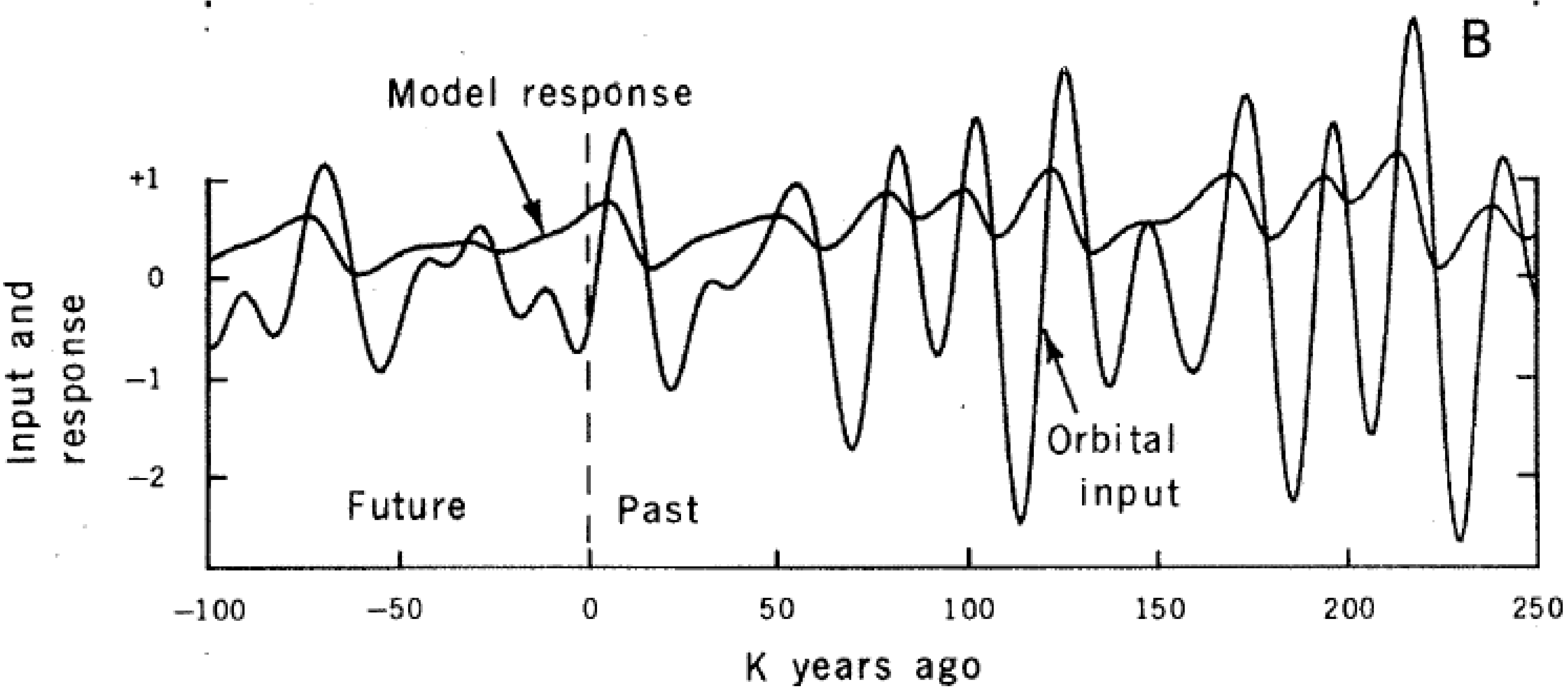

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