at the bottom while only half unfastened. As expected, the rift in the Woodlark Basin is slowly opening up like an unfastening zipper, but it has now been discovered that a 500 km (311 mile) section 750 km (466 miles) from the unzipping region seems to have burst open.

This comes as a big surprise to these scientists, because the accepted wisdom has been that it requires more force to rupture a continental plate than to tear it apart.

> *'It is not obvious how the Earth can produce the large forces necessary to achieve this rupturing',*

says John Mutter of Columbia University in New York.[2] The only other alternative is that the Earth's crust may be weaker than it was thought to be. Either way, scientists may have to rethink their ideas about the strength of the Earth's crust and the forces that break it apart.

This is good news for creationist geologists. These findings are highly relevant to our geological models based on the biblical description of the breaking up and bursting open of the *'fountains of the great deep '* (Genesis 7:11) at the outset of the Flood.[3] Such a catastrophic event requires either forces capable of rupturing continental plates or a weaker crust, or both. Even in the context of today's apparent slow-and-gradual geological processes, in contrast to the global catastrophic geological upheavals of the Flood year, it seems that the required bursting open of the Earth's crust where not expected has now been observed.

REFERENCES

1. Taylor, B., Goodliffe, A., Martinez, F. and Hey, R., 1995. Continental rifting and initial sea-floor spreading in the Woodlark Basin. **Nature, 374**:534-537.
2. Goddard, A., 1995. 'Burst zip' undermines theories of ocean birth. **New Scientist, 146**(1723):14.
3. Austin, S. A., Baumgardner, J. R., Humphreys, D. R., Snelling, A. A., Vardiman, L. and Wise, K. P., 1994. Catastrophic plate tectonics: A global Flood model of earth history. *In:* **Proceedings of the Third International Conference on Creationism**, R.E. Walsh (ed.), Creation Science Fellowship, Pittsburgh, Pennsylvania, pp. 609-621.

A. A. S.

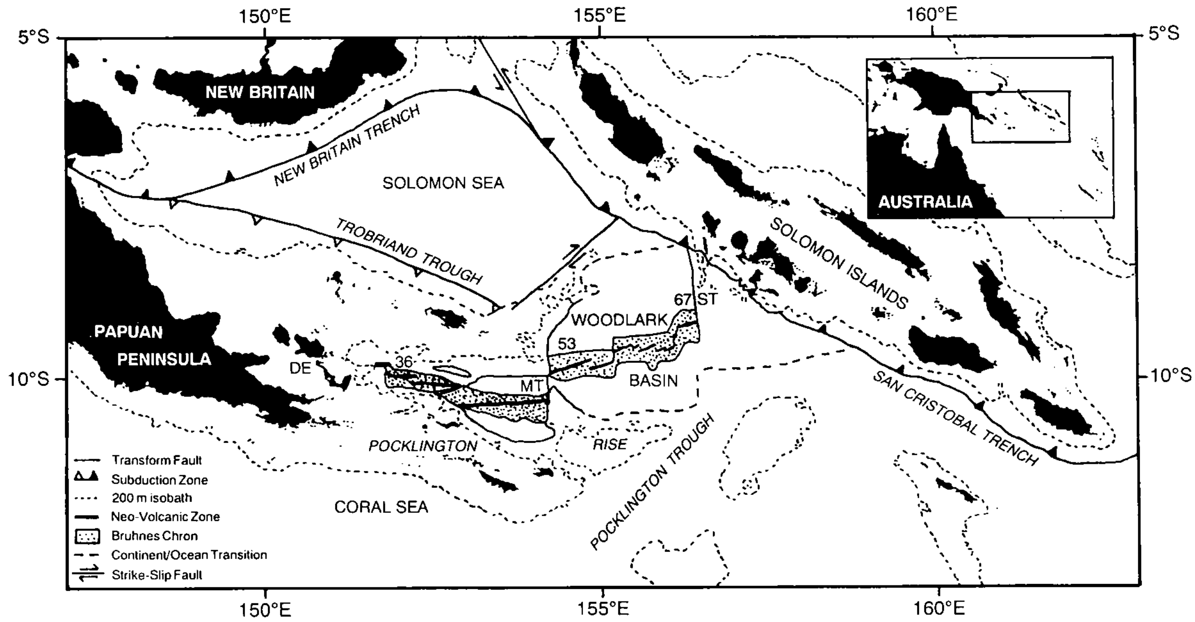

Figure 1. *Location of the Woodlark Basin between Papua New Guinea and the Solomon Islands, north-east of Australia.*

Another Computer Simulation Fails to Develop an Ice Age

Computer simulations of complex earth processes are valuable for providing insight into earth processes and guiding further study. However, because of the many poorly understood interacting variables and the inability of the computer to represent these variables, the models can be poor representations of earth processes:

> *'In the earth sciences — hydrology, geochemistry, meteorology, and oceanography — numerical models always represent complex open systems in which the operative processes are incompletely understood and the required empirical input data are incompletely known. Such models*

can never be verified. '[1]

Scientists have been trying for many years to simulate the ice age on computer. They have been searching for the particular variables that *initiate* an ice sheet. A few early computer models produced some success, but most failed. These models were simple energy balance models. Recently, more sophisticated general circulation models that include a simple ocean and a seasonal cycle have been applied to the problem. The results are showing just how difficult it is to initiate glaciation.

In a recent issue of the **Journal of Climate,** Phillipps and Held report on several computer simulations with different initial conditions that failed to develop ice sheets in the Northern Hemisphere.[2] The computer simulations contained features that would favour glaciation, such as the lack of oceanic heat transport — an important process that warms the higher latitudes. It also has a few features that would tend to disfavour glacial inception, for instance it assumes all melted snow and ice runs off, while meltwater often refreezes in the snowpack at night. The model assumed that the Milankovitch theory of the ice age has been geologically verified. According to this theory, ice sheets grow and melt in regular 100,000 year intervals as a result of reduced solar radiation at mid and high latitudes in summer. This reduced radiation is caused by regular, slight changes in the earth's orbital geometry over time. However, there are many problems with this theory.[3-5]

Using all parameters favourable for glacial inception from the Milankovitch mechanism, Phillipps and Held find that summer snow melts everywhere in the Northern Hemisphere by *early* summer:

> '*Despite cooler summertime temperatures, in CS* [cooler summer simulation] *the winter snow accumulation completely melts during the spring season everywhere except on the imposed glaciers of Greenland and Antarctica . . . The model appears to be far from developing new glaciers.* '[6]

In desperation, Phillipps and Held force inception of an ice sheet by adjusting parameters in the simulation. While keeping the Earth's orbital geometry favourable for glaciation, they first reduce the solar constant by 6 per cent. A permanent summer snow cover does develop, but it is only over Tibet!

They then increase the cloud cover north of 45 °N latitude from 40 per cent to 70 per cent, increase the snow albedo (reflectivity) to 70 per cent all year around, and reduce the solar constant 3 per cent. This time an incipient ice sheet develops only over Tibet and Alaska. The problem with this simulation is that the lowlands of central and northern Alaska, a seemingly favourable location for glaciation, were *never* glaciated during the ice age.

As a final attempt, Phillipps and Held reduce the solar constant 6 per cent while keeping all the above parameters the same. This produced a little better result. Besides Alaska and the Tibetan Plateau, western Canada, a part of northeast Siberia, and a patch of north central Canada developed a permanent snow cover. However, the simulation missed most of the area covered by ice sheets during the ice age! The authors express their frustration:

> '*We now have glaciation, but mainly outside the area where it existed during the last ice age.* '[7]

Why did the model simulations do so poorly in developing ice sheets in the Northern Hemisphere? There are model parameters that are biased against a permanent summer snow cover, but it seems that there are stronger biases favouring glacial inception. I believe it is because the present climate is strongly inimical towards glaciation where ice sheets do not presently exist. The Milankovitch mechanism is also much too small, even given all the time allotted for the ice age in the uniformitarian time scale. The model simulations of Phillipps and Held are in accord with other general circulation model results, for instance those of Rind, Peteet and Kukla:[8]

> '*Rind* et al., *(1989) use various combinations of orbital parameters, sea surface temperatures, imposed land ice, and CO_2 concentrations in a GCM* [general circulation model] *to investigate glacier initiation. They find that land surface snow cover is not maintained through the summer over North America or Scandinavia even when all these model parameters are set at values thought to be favourable for glacial growth.* '[9]

In fact, in one simulation, Rind, Peteet and Kukla start with a 10 metre thick ice sheet everywhere that was covered by ice in the ice age. They were hoping that with the higher albedo of snow and ice, the ice sheet would continue to grow. Instead it completely melted in five years!

The reason why these simulations all fail to initiate glaciation, even under the most favourable simulated conditions, or in extreme conditions develop ice sheets in the wrong places, is because the ice age was not a uniformitarian phenomenon.[10]

REFERENCES

1. Oreskes, N., Shrader-Frechette, K. and Belitz, K., 1994. Verification, validation, and confirmation of numerical models in the earth sciences. **Science, 263**:643.
2. Phillipps, P. J. and Held, I. M., 1994. The response to orbital perturbations in an atmospheric model coupled to a slab ocean. **Journal of Climate, 7**:767-782.
3. Oard, M. J., 1984. Ice ages: the mystery solved? Part I: the inadequacy ofa uniformitarian ice age. **Creation Research Society Quarterly, 21**:66–76.
4. Oard, M. J., 1984. Ice ages: the mystery solved? Part II: the manipulation of deep-sea cores. **Creation Research Society Quarterly, 21**:125-137.
5. Oard, M. J., 1985. Ice ages: the mystery solved? Part III: paleoma**gnetic stratigraphy and data manipulation. Creation Research Society Quarterly, 21**:170-181.
6. Phillipps and Held, Ref. 2, p. 778.
7. Phillipps and Held, Ref. 2, p. 780.
8. Rind, D., Peteet, D. and Kukla, G., 1989. Can Milankovitch orbital variations initiate the growth of ice sheets in a general circulation model? **Journal of Geophysical Research, 94** (D10): 12,851-12,871.
9. Phillipps and Held, Ref. 2, p. 767.
10. Oard, M. J., 1990. **An Ice Age Caused by the Genesis Flood**, Institute for Creation Research, El Cajon, California, USA.

M. J. O.