SPARCenter 200 computer with 512 MB RAM. Statistical studies suggest that such a procedure is likely to result in a low level of gaps in the final sequence. These gaps were then filled by other techniques to complete the final sequence. The authors estimated their final error rate as between 1 base in 5,000 and 1 base in 10,000.

The resulting genome has 1,830,137 base pairs coding for an estimated 1,743 coding regions ('genes'). The sequence was compared with the sequences in a published database of gene sequences called GeneBank 87. From this, 1,007, or 58 per cent, of the coding regions were tentatively assigned a role, but 736, or 42 per cent, could not be assigned a role. In other words, there is an enormous amount of work yet to be done to confirm and elucidate the functions of each of the coding regions identified.

The putatively identified coding regions were categorised as to their functions into 102 biological roles, and further into 14 broader role categories. It is interesting to see that some 87 genes code for proteins/enzymes involved in DNA replication alone. There are many more involved in transcription and translation, not to mention biosynthesis, energy metabolism, transport, etc. How many of the 1,743 genes are essential for life?

It is clearly becoming more and more untenable to believe that any sort of self-reproducing cell could ever have been 'simple' so as to allow for its naturalistic origin. Anyone who believes in 'simple' bacteria should look at the genome map for *Haemophilus influenzae* — it should cure them for good. Furthermore, if a prokaryote such as a typical bacterium were to be transformed into a human over some billions of years, one has to add the information for about a further 100,000 genes — an impossible task for mutations to achieve.

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D.B.

What do Ocean Bottom Pits Tell Us?

Soon after the development of side-scan sonar in oceanographic research, V-shaped pits on the bottom of the ocean were discovered on the continental shelf off Nova Scotia.[1] These pits, called pockmarks, were soon found to be relatively common on the ocean bottom where detailed surveys have been made.[2] A density as high as 240 per km^2 has been reported,[3] making the ocean bottom appear heavily cratered like the moon. Pockmarks average 50 to 100 m in diameter and 2 to 3 m in depth.[4] However, they range in size from quite small to as large as 700 m long in one oval-shaped pockmark.[5] In Belfast Bay, Maine, pockmarks as deep as 35 m have been noted (see Figure 1).[6]

Pockmarks occur at shallow to moderate ocean depths and are more frequently found in muddy sediments. One of the latest discoveries was made from 2,167 metres depth on the continental rise off the Carolinas, USA.[7] The origin of pockmarks appears to be fluid and gas escape from the sediments.

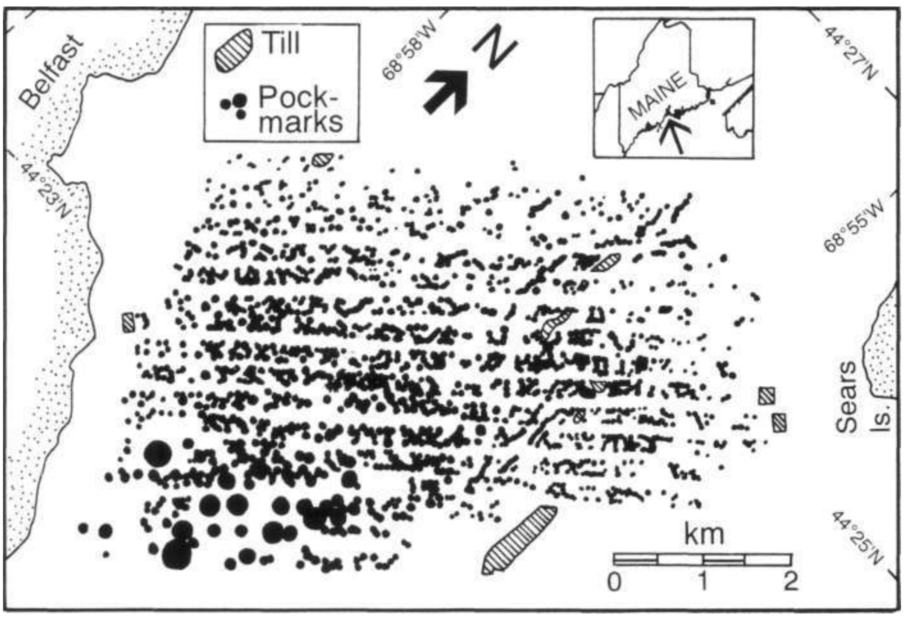

Figure 1. *Map of the sea-floor pockmarks in Belfast Bay, Maine.*

There are many marine, sedimentary rocks on the continents that are supposed to have formed slowly over long periods of time, often at shallow depths. If this were true, pockmarks should be common in these sedimentary rocks, and due to their size and abundance in some areas today, they could hardly be missed. However, pockmarks **are not found in any pre-Pleistocene marine sedimentary rock.** Eyles states:

> *'The style of sediment deformation below surface pockmarks is not known and such structures await identification in pre-Pleistocene glaciogenic marine sediments.'*[8]

Hovland and Judd corroborate and suggest that pockmarks should be common in the geological column back to the Precambrian:

> *'It is unfortunate that pockmarks have not as yet been discovered*

in the geological column; nevertheless, if our present thoughts and models of their origin are basically correct, then it seems reasonable to suggest that pockmarks may have been common as early as Precambrian time."

Within the uniformitarian paradigm, there could be several reasons that may explain the missing pre-Pleistocene pockmarks. Pockmarks could have been eroded before final burial, or they could have been filled in with the same material as the surrounding sediment. These do not seem likely to explain the total absence, so far, of pre-Pleistocene pockmarks. Some smoothing of the V-shaped pits would be expected after the seepage stopped, but since the bedding has already been disrupted, the pockmarks should still show up in the sedimentary record. Pockmarks are actively being buried and protected from erosion on the ocean bottom, since they can sometimes be seen in the subsurface by seismic reflection profiling.[10] Disrupted sediment can also be seen to extend tens of metres downward from the pockmark,[11] making it more likely that the feature would be preserved. Pockmarks likely form rapidly, so we would expect pre-Pleistocene sedimentary rocks to be filled with them:

'Pockmarks occurring at horizons representing relatively short periods of non-deposition are just as large as those at the seabed. Consequently, it must be concluded that pockmarks attain their full size within a relatively short time.'[12]

Thus, pockmarks should be a common feature of marine sedimentary rocks.

Pockmarks on the modern ocean bottom are another one of the many features not found in pre-Pleistocene sedimentary rocks, thus violating the uniformitarian principle. This tells us that pre-Pleistocene marine sedimentary rocks were deposited rapidly, the Genesis Flood being the only viable candidate for such world-wide rapid sedimentation. The lack of pockmarks in pre-Pleistocene sedimentary rocks may also be of interest to those creationists who are concerned about where the pre-Flood/Flood and the Flood/post-Flood boundaries are located in the sedimentary rocks.

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M.J.O.

The Origin of Life (again)

Newspapers hailed the latest work of Stanley Miller and his colleagues[1] as a big step towards discovering how life came to be by natural processes, if not as the very discovery itself.

In this work, pantetheine, a precursor to coenzyme A, was synthesised under laboratory conditions. The procedure involved evaporating a solution of equal parts of beta-alanine, cysteamine, and pantoic acid in a vial under vacuum (reason: a vacuum excludes oxygen which would prevent pantetheine forming). The result was a thin film on the wall of the sealed vial. The amount of pantetheine produced under these conditions was 0.018% after 1 month at 40°C. What was the other 99.82%?

The obvious problem is that in the assumed prebiotic soup there would be a multitude of other compounds that would enter into reactions and greatly reduce the yield, if not prevent pantetheine's formation entirely. Another problem is with the 'atmosphere' in the sealed vial. A vacuum has no gases to react with the compounds, whereas the assumed early earth's atmosphere contained such reactive gases as hydrogen and ammonia. These would also react with the starting materials to further reduce the minuscule yield.

In spite of the insurmountable hurdles, let's assume that the naturalistic origin of the building blocks of life had been demonstrated. This would still not address the question of the origin of life. It's like trying to explain the origin of the information on this page by explaining the origin of the ink and the paper. The real issue in the origin of life is the origin of the coded genetic information which prescribes the form and instincts of a myriad of plants and animals in a mutually beneficial relationship. Until we begin to address the origin of the colossal amount of information required for even the simplest conceivable living thing, along with the mechanisms for reading and expressing that information, we have not even begun to address the issue.

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