7 February 2017

A Doorway of Amethyst
Beginning Geology

A Doorway of Amethyst: Beginning Geology by Mary Daly is a 200 page full-color, Catholic Christian introduction to geology. It is designed to be used for one semester to learn the basics of geology, that is, the common rock types and land forms: their formation, their changes during mountain-building and plate movements, their erosion, and so forth. The text is organized as follows:

- The first two chapters introduce the large picture of the earth and plate tectonics.
- The next three chapters introduce igneous, sedimentary and metamorphic rocks.
- The next four chapters explain some of the basic processes of erosion and also introduce the geologic eras.
- The closing chapters explain the geologic eras, apply that explanation to the Williston Basin of North Dakota, and describe a series of (mostly Catholic) geologists.

A bibliography is included along with two appendices, the first one listing other basins in which the entire geologic record is found, and the second discussing some unexpected information about the theory of evolution, relevant to the study of geology because it always comes up, but not integral to the basic presentation.

The text includes teacher support in the form of questions (answers in the back), crossword puzzles (solutions given), and some research suggestions.

Why the Williston Basin?

Some years ago, Glenn Morton, who had for several years been a leading creationist author, began to see that the things he had been taught in his Christian college geology courses were not to be found "in the field" All those revolutionary ideas, without exception, were useless, and when he checked his finding with other creationist geologists in the field, they agreed that they had found the same. At the next creationist conference, he brought his findings, hoping for a challenging and helpful discussion of the right direction to take with this information.

So far from receiving help, he was met with various levels of rejection from stony silence to outright accusations of betrayal. It was extremely painful and caused him to withdraw from writing -- on either side of the issue -- for

several years re-evaluation.
After that time, in the hope of protecting other Christians from finding themselves in a foolish and false position, particularly in the claim that all the deposits of sedimentary rock, worldwide, are due to Noah's Flood, he returned to writing. His essay on the Williston Basin explains in detail exactly why a professional geologist cannot view the geologic record as belonging to a short time frame, nor view the sedimentary rocks as deposits of a catastrophic flood, no matter of what proportions. This entire essay is available on the web. I have taken and simplified it, illustrated it, edited out some of the references that don't concern the average reader and provided more detail for some of the technical references. This whole effort is chapter 11 of A Doorway of Amethyst.
I agree with Glenn Morton -- and with Saint Augustine -- that Christians should not expose the gospel to ridicule by claiming that it teaches things about the physical world which unbelievers will certainly regard as false, even obviously false. It does not take an Einstein or a PhD in geology to recognize the problems with a young-earth view, though the first ten chapters of A Doorway of Amethyst might help before tackling chapter 11.

Why the Amethyst?

The Amethyst is the traditional stone of the Bishop's ring, which one kissed as a sign of fidelity to the Church and to the Lord Jesus who gave us this gift as he had promised, so that as his words returned to our minds, we would be able to understand them in an orderly and revelatory manner. Although the kissing of the amethyst ring is no longer customary in most places, I wished to express my intent of being faithful to the teachings of the Catholic Church. The book is presently in the hands of the diocesan censor. My books Creator and Creation, and Genesis 1 House of the Covenant, which deal with the same basic issues of creation, evolution, and the flood of Noah, do each have a Nihil Obstat, and so far as I am aware, there is nothing in this volume that goes (theologically) beyond the ideas already published in those books.

Web support

A web support page offers, a chapter-by-chapter list of valuable web sites to extend your study of geology.

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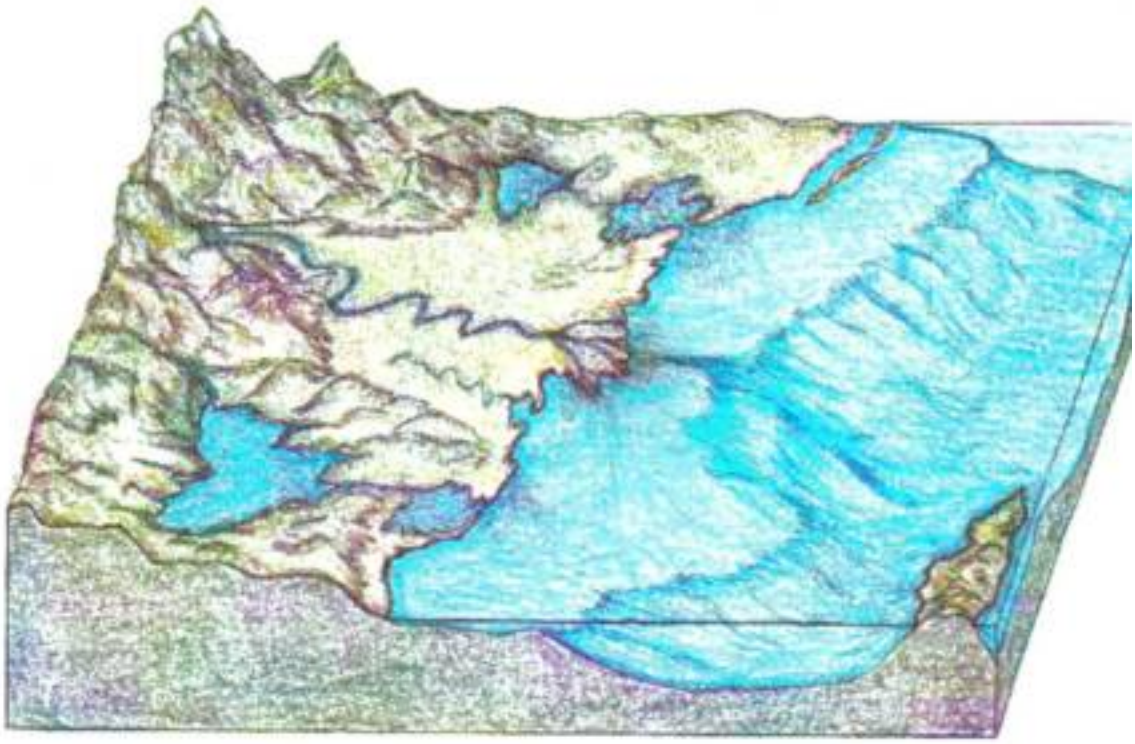
which means you can copy this work for your friends or your study group, and you can add improvements as you see fit. You must acknowledge the original text and author and make sure that readers know how to order or access the primary text if they wish. If you make improvements, either in the drawings and illustrations or in the text, these also go into the Creative Commons, and anyone else can use them as freely as the original text.

Sample Pages:



Instead of calcium from the water, the "glue" might be a deposit of silica or of volcanic ash; it might be other things. Whatever the glue, when it sets up as strong as the rock, there is a new rock, solid all the way through, called conglomerate.

Sediments: where and why

Sediments are not the most common rock of the Earth's crust, but they begin their lives "right on top" so you are sure to see them; they are never formed underground, like granites beneath the continental surface, or gabbros deep below the ocean.

Where do sediments accumulate? Wherever gravity drops them after the winds, the waves, the ice, and the rivers have carried them as far as they can.

Look at the image above and find the places where sediments have accumulated.

Alluvian fan

An alluvial fan is the deposit of sediment at the mouth of a river. The delta of the Missis sippi is an alluvial fan. The letter "d", called *delta* in the Greek alphabet, is a triangle, as is fan; these are the sources of the names alluvi fan and delta. It may also be called a "crowfe delta". Can you see why?

Glacial deposits

A glacier is a massive deposit of ice that grows over hundreds, even thousands of yea When glaciers move, stones caught up in the ice may be taken far from the lands of their formation. When the glacier melts, the stone drop. If you drive west out of Sioux Falls, South Dakota, there are several hills that are obviously littered with white stones. Where d they come from? The dirt around them does not match. The bedrock is pink sandstone; it does not match.

These stones were brought here by glacie from far to the north. Over the world, glacie are found both at the poles and in high mou

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chicken-wire structure which only forms above 33° C (93° F) and near the water table. This type of anhydrite is being deposited in the Persian Gulf area today. Thirdly, the Minnelusa holds wine-red sands with the type of cross-bedding typical of modern desert dunes!

Fossils include brachiopods, cephalopods, gastropods, fish teeth, crinoids, and pelecypods, all sea creatures. There are no fossils of land animals.

Big Snowy group

Below the Minnelusa is the Big Snowy group. Another dolomite lies here, its layers apparently glued with algae, and subjected to intense drying. Intertidal channels have been cut into this surface and then filled with sand.

Mississippian Madison

Below the Big Snowy lies the Madison group, beginning with ancient karst landscapes. Karst is limestone with occasional caverns due to subaerial erosion, meaning erosion under the free air. There are salt deposits confirming in their own way the dryness of the climate. The limestone also heavily burrowed, meaning that there were animals living in it at every level, meaning (in turn!) that every level was once the top, close to fresh air and sunshine.

Fossils here include half-millimeter-long scolecodonts, spores, corals, ostracods, gastropods and plants, but above all, in the Mission Canyon formation, the most extraordinary deposit of crinoids, small sea creatures that look like delicate flowering plants but are sea animals with a calcified outer covering. They once populated the shallow seas of the world, living from the middle Cambrian for 250 million years, all through the Paleozoic. Most died out in the Permian, but a few are left, and thousands of their gently curving fossils are to be found in the marble of churches and public buildings all over the world.

This particular deposit of crinoids is different however, for the shells are almost entirely broken, indicating that the sea had a strong wave action. The deposit of crumbled shells is sometimes as much as 2200 feet thick, nearly half a mile. Half a mile ***thick,*** not half a mile wide! Take a moment to calculate the number of crinoids needed to make such a depth. Over the area we know, there must be 10,000 cubic miles of crinoid plates, enough to cover the earth three inches deep. Even if the whole earth had been covered with the shallow waters they required, it would take quite a while to accumulate so many shells. Nor are these the only crinoidal limestones in the world, though they go elsewhere by

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