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(So this is the stable period.) This is the stable period. One of the things that had to happen during that stable period, of which we don't really have any record, is the formation of the Atlantic Ocean. Cape Breton is washed by the shores of the Atlantic today. But 350 million years ago, you could walk from Cape Breton to Britain, or from mainland Nova Scotia to Morocco. So somehow the Atlantic had to be formed. And that happened in the Jurassic Period, perhaps some 200 million years ago. A great fracture must have opened up, quite far to the east of Cape Breton, off the edge of the continental shelf - out beyond Sable Island. And new ocean floor lavas rose up. And gradually Cape Breton moved westwards at about 10 centimeters a year, relative to Britain and Africa, which was moving eastwards at the same time. You can think of it as a conveyor-belt system, whereby lava is being produced in the centre, and the two blocks are gradually separating themselves apart. Still moving apart. There is a continual ocean-floor spreading process. Throughout the time period - this period which we refer to as the "missing pages" of the geological history of Cape Breton - the climate was fairly warm. At first we were in the latitudes of the Sahara Desert. There are some sandstones down in the Annapolis Valley which record that time period. Then things got a little bit cooler. We moved into a climate perhaps more akin to that of the southern United States. And as Nova Scotia and North America in general moved northwards, we moved into a more northerly climate. / But the culmination of that came when the climate became 'very unstable about 2 million years ago. No one really knows "why the climate started to become unstable. This is a bit of a puzzle. But we start to see big swings in average world temperature. ' It started to get very cold. And then it would warm up again quickly. When I say "And when we go and we look at the rocks in the..." quickly, I'm referring to over a period of per- Atlantic Ocean today, surely 50 or 100 thousand years, enough, the rocks against Cape Early Devonian time: the continent of Pangea in the southern When it got cold, the rain would Breton are the same age as the portion of the globe, showing the shape of future continents fall as snow, ice would build up rocks against Britain. And as you go towards the centre of the Atlantic Ocean they get younger and younger, until you reach the Azores in the middle, where they're less than a million years old. So we've got the whole record out there in the ocean floor lavas, but we don't see any remains of that on land, because this was all above the waves. However, we do see offshore some sediment that was being washed off the new continent of North America, and was being deposited. And the oil exploration has really shown us lots of detail about the buildup sedimentary rock, which records the separation of Africa and Europe from North America. But there's nothing on land that would ever lead you to suggest that there was going to be a great ocean basin opening up at that time. Everything is very quiet and very gentle - no great mountain-building event at all. And that's still going on. Britain is still receding from North America at the rate of about 10 centimeters a year. They're up on any high land and moved



southwards, crawling at very slow rates as far as about New York City. Then it would melt back for awhile, and the climate would warm. And in this period Cape Breton experienced alternating ice ages and warm periods. The climate would fluctuate from that of Greenland today to that of the Carolinas or Georgia. And at the moment we're probably in between two of these ice advances. We don't know when the next one will come, or if it ever will. But the chances are that if things go on the way they've been going on for the last 2 million years, in another 50 thousand years time, ice will again cover Cape Breton. We've been able to record this (movement) of the glaciers moving back and forward because of the very deep waters of the Bras d'Or Lake, particularly the St. Andrews Channel, which goes down some 700 feet below sea level. In that area the ice never quite reached bottom. So sediment continued to be deposited. Cape Breton is washed by the Atlantic today, but 350 million years ago, you could walk from Cape Breton to Britain or from mainland Nova Scotia to Morocco.

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