A Book Report On A Wonderfull Life: An Look At The Burgess Shale, By Stephan Jay Gould Essay, Research Paper

Name: Wonderful Life

Date: 1989

Publisher: W. W. Norton and Company, Inc.

Pages: 322 (Not including Bibliography and Index)

This book written by Stephen Jay Gould is about the concepts of evolution based on the findings in the Burgess Shale that was found in Yoho National Park in British Columbia, Canada. The organisms that were found here at first by C.D. Walcott in the early 1908-09. At first Walcott placed these organisms into phyla that were present at the time. Years later though two expeditions were released one by the Canadians and one by the Americans the purpose of both was to follow up Walcott s research. In these expeditions the scientists started to discover that these species didn t belong in the phylum s they had been placed but in fact made up their own phylum s. This is where we are today and this is the setting for this book.

First the book talks about what evolution is and the major misconceptions in the evolutionary process in the beginning. It shows at first how evolution is not a ladder but a tree. It brings up how the media always shows the evolution of man in a ladder form one after another after another. This seams to make you think that evolution occurred in a straight line. The problem is it didn t, evolution occurred in a tree shape. Sending branches off in different directions and all the time braking. Not always a straight brake but sometimes one moving a way. All the time though reaching forward towards the sun. Never retracing its track. Always evolving. This is shown by Stephen Jay Gould by bringing forward some of the media s ways of using the ladder approach. Then explaining why the are wrong.

Gould then goes on to how the Burgess Shale was found. It was found by Charles Walcott in 1909. There is some dispute about how and when he found it. Walcott s story says that his donkey tripped on some rocks and kicked them loose. Then after close examination Walcott returned in the last few days of the season and found and extracted most of the known Burgess Shale that we know today. Then he came back the next season and extracted the remaining fossils and examined them all. But after closing looking at Walcott s journal, Gould discovered that this was not the way the Burgess Shale was found at all. It was found in the way most fossils are found. With no glitter and special circumstances. Just pure science at it s best. Walcott was digging in Yoho National Park, British Columbia, Canada, on a rock that jutted out from the side of a mountain. He cut a chunk away and saw the cross section of a fossil. He realized that it was to late in the season to extract the remaining fossils so he waited patiently till the 1910 season to extract the majority of the Burgess Shale.

Walcott returned with his wife and son and excavated the fossils. Then a few friends joined him for the 1911 season. Then when he finished excavating he started to examine thoroughly the items he found. Walcott had found some very interesting fossils that were very odd in nature. Walcott studied them for many years before writing his first paper on these objects.

Walcott placed all these creatures into the same phylum as the current day crab and other crustaceans. Walcott soon published papers on this subject but they weren t that celebrated or look at by many people. To most of these people it was just the discovery of some ancestor of present day horseshoe-crabs.

So Walcott went on in life still writing about the Burgess Shale placing them in their proper taxonomy (at least what he thought was proper).These fossils turned out to be something entirely different though as we would see some fifty years later.

In 1966 and 1967 two expeditions were sent to reexamine the Burgess Shale. The two expeditions where first one by American scientist Harry Whittington and a few of his British students whom he was the advisor. Later more expeditions were sent. A few of the scientist that worked and reexamined the Burgess Shale were Briggs, Conway Morris and Buton. Although they did not work as a team and looked at things completely separate they still read each others papers. This might be why a general conclusion was found.

This conclusion was the Walcott was wrong in his original assumption s. These creatures were two complex to be related to present day horseshoe-crabs and so therefore did not belong in the same phylum as they were put. In fact they were placed in an entirely new phylum. Some creatures have a phylum entirely to themselves. So that had not were called unique anthropoids and a few were called soft bodied trilobite. This is how radically different these organisms are.

One of the major problems with Walcott s assumptions was that he had treated these fossils wrong. Usually a fossil is a two dimensional object the is an imprint of carbon on rock. The organisms are compressed because mud smashed them. This is how Walcott saw these fossils. So therefore he saw none of their external organs or soft parts.

Well, in the sixties they came up with the idea that even though these fossils had been crushed their organs were probably still inside the rocks. Just like Christopher Loyd in “Who Framed Roger Rabbit” a fossil can, after being crushed, be blown back up.

This process has two approaches. There is a tool, much like that in a dentist office, that takes tiny layers of rocks off a big chunk. If this is done correctly you can take of the top layer and see the insides of these organisms. Then keep on doing this process and you will be able to examine the entire specimen from head to toe. If this drill takes of two much you might have to pull away the rock grain by grain with a pair of tweezers.

This three dimensional discovery lead to the realization that the Burgess Shale organisms where very complex and extremely different from previous beliefs. The main fact to remember is that not all fossils are three dimensional. A few leave just external imprints. This is how Walcott saw all of the organisms. In fact most of them are three dimensional but there is still a few that are not.

The organism found in the Burgess shale were not only diverse in the sense of what we have seen in fossils before but also for their time. This chunk of rock included organism that ranged in purpose and habitat by a great deal. A few of the organism including the oddity Anomalocaris, whose mouth was mistaken for an entirely different organism that Walcott called a jelly fish, swam in the open seas that covered Canada at that time. Other like Wiwaxia walked on the sea floor. Still plant life was found in the Burgess shale this odd plant lived at the ocean floor and resembles present day flowers. This organism is called Dinomischus. Still others didn t live as plants on the floor or walk like Wiwaxia. An animal called Opabinia crawled like a snake on the sea floor leaving an impressive track in its wake.

Although there were 12,000 species found by Walcott, 800 by Whittington, and 200 by a man named Raymond. Most of these species are known by under ten specimens. Still there are a few that can only be found in one fossil in the entire world. Those fossils are found in the Burgess Shale. That goes to make the Burgess one of the largest sites of rare organisms in the world. Also to have some of the rarest makes the Burgess shale all the more interesting.

Although there were quite a number of specimens most of the reexamining of the fossils did not come from going out and digging by the actual scientists. Most of the revision occurred when scientists sat down in the Smithsonian (which Walcott was head of towards the end of his career) and looking at the fossils Walcott had found. An astonishing number of revisions were formed just by looking at Walcott s notes and dairy.

Just because Walcott miss named these fossils do not in any case mean that he is a failure as a scientist. Walcott just looked at these fossils from the only viewpoint he could, his own. How was he to know that there actually could be three dimensional fossils and not all of them are two dimensional. Walcott was not a failure as many people thought when the reexamination first came out. He wasn t out to find new ways of doing science or new theories. Walcott was really into the field work. This was something he loved and cherished. He loved being out in the great outdoors. I know that many scientific theories were made while doing field work, this was just something that Walcott wasn t interested in.

So knowing this we see that Walcott was abiding by the rules of science during his time. He wasn t trying to change the rule just trying to make a discovery. He surely knew that these species had little to do with horseshoe-crabs but he still but them in that phyla because he had no desire to change our view of science and crustaceans.

This is what the examination did though, so Walcott might as well gone ahead and done what he though was right. When we saw these very complex creatures as entirely new phyla that had no ancestors linking them to this time, we realize something. They realized that there must be hundreds of other phyla s that had dissipated for some unknown reason.

Another question that was answered was what had happened during the Cambrian explosion. There weren t to many Cambrian fossils before burgess. These fossils were well preserved at least well enough to know and distinguish a lot of different species. This showed us that anthropoids took over the world during the Cambrian Era. This is also a big fact in the world today. People say this is the time of the mammal. This is in no way true. The Cenozoic time period is the time of the anthropoid. They are more complex and greater in population. Without anthropoids this world would have a very hard time surviving.

This book was classified as an evolution book. This is exactly the topic that the book covered. This book spoke much about the Cambrian Era, and also about how these specific specimens came about and how they became extinct or why they as a whole was wiped out. This book also explains the art of fossil extraction, from tiny little drill and tweezers to explosive charges and pick axes.

This book at first we a really big interest to me. I read about Iconography and how it was wrong and how evolution would be better described as tree shaped. Then it talked about how the fossils were found and a brief description of Charles Walcott. This is when it started to get boring. I really didn t need to read eight pages on the misery that a dead scientist went through when his son died. Then Stephen Jay Gould gave his opinion on the Burgess Shale and this is when I realized that this guy is a really big NERD. I would like to cite a quotation from the book, “Oh why was I not made of Stone like these.” He quoted this form Quasimoto from the Hunchback Of Notre Dame. This guy is a little to obsessed. I can see that maybe the rocks could mean something to him scientifically but there is no need to get personal. Don t tell anyone but I think the guy is kinda weird.

All right the next part was the boringest (x is that a word?) part in the entire book. Gould starts describing the fossils, one by one. I read this and I had to take notes on it, it was that boring. I kept on falling asleep and had to write down what page I was one whenever I started to nod off. Anyway, the only good part in these chapters was the cool little pictures of all the specimen. They all looked like little aliens. It was also neat to find out what exactly made the Burgess Shale form (it turns out it was an ocean mud slide that instantly preserved all of these creatures). The rest of the book was neat because it describes what the Burgess Shale proved and disproved.

I learned a lot from this book. From the fact that some scientists have to pick at rocks with tweezers to the fact that Pikaia had what is though to be the earliest form of a spinal cord and column. I also learned that all those advertisements that show humans walking along and becoming something else aren t right. What actually happened is more of a tree or cone effect. Another meaningful concept that I learned is that Diversity is thought to be bottom heavy when it comes to time. That means that the later on in time the less diverse life is. This is shown in a Christmas tree type of effect. With the Christmas tree look it shows that life started of very much the same with only single celled organism. Then exploded and became very diverse. Burt slowly as these creatures adapt to their environment they become more alike all the time.

Personally I think this book was worth the boring parts. It had a lot of interesting fact and was fun to read at times. I would recommend it to anyone who would like to know more about evolution.