

## ***Carbon Dreams*** by Susan Gaines

Notes from the FMS Book Club Meeting

12 April 2016, Bremen

Group members present: Heather - Dorothea - Manfred - Susan - Uwe - Alice - Stephan - Betty - Janna

These notes were generated by circulating a list of points discussed, which we all added to, with the following directions: First, a personal statement can be made. Then we can add anything we think is missing from the list of points made: either elaborate on a given point, or add to the list. If there are conflicting opinions that are missing on a given point, be sure to add them. There is no need to specify who exactly said what, but if it seems relevant and you want to add a name or perspective, that's also okay.

### **First round (without Susan present) - did you like the book?**

The FMS book group has never been so unanimous about any book. Nobody said they did not like it. Several people really liked it; others were not quite so enthusiastic while still finding it engaging and readable. Many people commented on how accurate the depiction was of the foggy Californian coast and on the farming details. The science was also very well described. Those who can remember this far back found it very accurate. Others enjoyed it for the interesting insight to these historical times before email and electronic papers and autosamplers and HPLC peak libraries. Life on the drill ship was perfectly depicted. The critical elements were that it could have been shorter, that the plot was perhaps a little dated and predictable and that the science was a bit confusing, some things were not explained.

### **Was the book well written?**

Yes, very readable (HJ). Yes, and the sex scenes were well written, which is no easy task (M). Sometimes the science parts were a bit complex, I tended to skip over them (U). Well written and a good read although very predictable; dream sequences not really interesting for me (AL).

### **Are the characters realistic?**

Yes, there are lots of interesting characters in the book. The characters were well written and many of the minor characters had interesting backstories and details about their lives.

I did not find the character of Tina particularly sympathetic. Probably I have little in common with anyone who chooses to get up at 4am. And then choose to spend the night sleeping in a chair in the office. I think the 'so small, so cute, looks like a 12 year old, yet so clever and has a PhD, who would have thought it' has become a bit of a cliché, perhaps it seemed fresher when the book was published (HJ).

### **Are the personal relationships realistic? Are they important to the plot of the book?**

One of the main plots of the book is the relationship of Tina with Chip. This is quite realistic although perhaps a bit predictable (B).

The relationship of Tina with other scientists was quite well portrayed.

### **Is the protagonist a good scientist?**

Yes, she works, eats and even dreams science, she is devoted to it. She does not seem to suffer either from stress or self-doubt. She gives up a pregnancy and then a relationship because she is more interested in following her science career. She also seems to be a very successful scientist. She asks good questions in conferences, she devises interesting and successful projects. She gets grants funded, although not always the first time.

### **Is science accurately portrayed?**

Was it perhaps a bit early for people to be worried about global warming? In the 1970s people were worried about global cooling. The book mentions 'climate change', but was that term already used in the 1980s?

It is a nice portrayal of how labs were in the 1980s when plotters could run out of ink and all peaks coming out of a chromatograph had to be compared to published peak libraries. The details of how science was back then, were interesting to read as a reminder that for instance in those days, everything submitted to a journal, or sent to the co-authors for comment had to be physically sent, in an envelope.

The description of the cruise and its atmosphere is also very accurate, although American ships are now dry. It was also funny to be reminded of doing presentations without power point!

### **Did you learn something about science from this book?**

Yes, I learned that the carbon cycle is very complicated (U).

### **Was there a clear scientific message the author was trying to get across?**

The book deals with an area of science I am familiar with (HJ) and I still found it a challenge to keep up with all the scientific themes. Tina was working on identifying early life in 3 billion year old rocks; using a temperature proxy to identify the start of glaciation after the Cretaceous; picoplankton productivity as 'missing CO<sub>2</sub>' sink and a way of identifying the maturity of petroleum source rocks. She was a busy woman! It was enjoyable to read about all these things, but a bit confusing. At the end of the book an important topic came up, the 'climate sensitivity', the relationship between CO<sub>2</sub> and global temperature. Tina mentions to Chip that the role of CO<sub>2</sub> as a greenhouse gas was known for 100 years and talks about Arrhenius (who ~1890 empirically estimated that doubling atmospheric CO<sub>2</sub> would increase global temperatures by ~4 C (no, he didn't know much about orbital forcing) but it was an amazingly accurate estimate). The concept is very important for climate models. Tina's suggestion that C uptake by picoplankton will keep atmospheric CO<sub>2</sub> in check is taken up in the book, by a slightly eccentric scientist called Cox and then the press. The scientist Cox talks about a term he has invented 'Global temperature sensitivity' but the opportunity to explain the term in use 'climate sensitivity' was not taken. This part of the book could have offered a clear discussion of this area, but it did not. It was an interesting overview of many of the things oceanographers might be interested in, but I don't think there was any clear message to be easily grasped other than the carbon cycle is very complicated (HJ).

### **Were the title and cover well chosen?**

There was some discussion of the difference between the English word Carbon and the German Kohle. Carbon dreams is a strange title, mixing science and fantasy. The dreams are only a small part of the book (JS), does the title promise something less scientific than the actual book?

### **Questions to the author and discussion**

#### **Why was it set in the 1980s?**

SG - It was not possible to make it completely contemporary. The science was advancing faster than the writing, and so were the politics. The early 80s was a key time for the development of this field [paleoceanography] and discussion of climate change which were still relevant when the book was published.

**Did you think of a different ending (JS)?**

Yes.

**Why does the book offer such a dismal prospect to women in science?**

Because that is how things were in the 1980s.

**Why is the most successful woman scientist in the book, Prof Orloff, such a terrible person?**

SG - She had to be a bitch to get on in those days.

**Are the characters based on real people?**

SG - They are all composites, but Katharine in particular was partly based on a specific person. She was small and blonde and well-dressed and sure of herself and was very successful in her scientific career. There was speculation about who Prof. Orloff was supposed to be based on.

**Why not be more accurate about the science?**

The only real scientist who appeared in the book was Keeling, why not incorporate other scientists of the time?

**How much was based on personal experience?**

SG - none, it was all made up.

**Further discussion**

the themes raised in the book - particularly to do with the unknown parts of the carbon cycle and the sensitivity of the climate to CO<sub>2</sub>- are still very relevant to science today and still subjects of much research. However, science has reached much more of a consensus opinion on trends in the global climate than was the case in the 1980s or even when the book was published in 2001. The question nowadays is not is the climate warming due to anthropogenic disruptions to the carbon cycle, but how much it will warm and how quickly (HJ).

In answer to the question 'Who believes that fossil fuel CO<sub>2</sub> causes global warming?' 7/9 people present believed that adding fossil fuel carbon to the atmosphere causes global warming. We then had a discussion on whether we could trust prediction of climate model about future warming.

Additional comments by the participants of the group:

Comments by Dorothea

I think that the author should receive a lot of credit for the fact that she picked up the topic of climate change so very early in time and that she discussed the topic in the book in a precise science - based manor.

One can also learn a lot about life in academia in California from the book, as the descriptions of life and science of the 1980s are both very well done.