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| **Experiment / Survey**  **I wrote letters to several different professors though-out the globe asking them for experiment results on their previous radiocarbon dating tests. The actual carbon dating procedure was so complex, as I found out, that it would have been impossible for me to even attempt to set up an experiment. Here is a basic outline of the letter I distributed to different places.**  **"Hello there,**  **I am a student from Amador Valley High School in Pleasanton, California doing a research project for my advanced placement Biology class. I am looking for help in gathering data for my assignment. It is a fairly exciting Assignment and I hope that I will be able to get enough replies.**  **My assignment is based around the field of Carbon dating as it is a topic that interests me and I will to enter the field of Archaeology in the future.**  **I understand there are several preparation tasks that must be completed before each test, including acid washes and some manual work picking out contamination.**  **The data I need is simply this.......I wish to know the results after testing if the preparation is carried out, and the results after testing when there is no preparation. I am trying to determine how great the margin of error is between the two and how much of an influence the preparation had on testing.**  **I was wondering if the raw sample was included as a control?? I think that wood or bone samples are good sample examples. ........**  **Thank you for you help, Best Regards,**  **Hillary Reid "**  **In response to my letter I received three wonderful replies from professors and scientists from different parts of the globe. I received a letter from Fiona Petchey who is the Deputy Director for the Radiocarbon Dating Laboratory of the University of Waikato in New Zealand. She sent me a letter giving me a web address containing information I could use about contaminants and the pretreatments involved in cleaning samples. She did however inform me that there were no tests she knew of that tested the effectiveness of pretreatments. The web address proved to be full of information and helped me aquaint myself more with the carbon dating process.**  **Another letter I received was from David Elmore who is a Professor of Physics and Director of the Prime Lab at Purdue University. He agreed that it was a good idea to measure both prepared samples and raw ones but the reason it is probably not done is the extra cost of running the tests. His opinion was that in many cases the result would not be too different and that modern contamination is removed through processing and that will make a raw sample look younger.**  **The last letter I received was from Ivan Woodhatch who works at the University of Zurich in the Department of Geography. He also gave me some good replies. He told me no testing that is done does not include the standard cleaning process. At their laboratory they use the Acid/ Alkali/ Acid cleaning method to remove carbonates that generally make the sample appear older and human acids which make the sample appear younger. Other cleaning methods are carried out if the sample requires special treatment e.g. the sample is covered in preservatives, lacquer or paint. He gave me a good website address on which I found information and test results needed for this research.**  **I found tables of data relating to the carbon dating of the Dead Sea Scrolls on the internet source given to me by Ivan Woodhatch.** [**www.radiocarbon.org**](http://docs.google.com/www.radiocarbon.org) **It told the types of pretreatments used on the samples taken depending on types of know contaminants. It also contained the processes of the testing and the final results. There are two different types of pretreatments carried out, and since that all samples were treated I decided to do a comparison between the two.**  **I will explain the method involved in the pretreatment and in the experiment.**  **Also I have chosen two samples to compare. One has been treated due to modern contamination and one has just been treated with the standard procedures due to a reasonably clean appearance.**  **The first was a sample of parchment from the document that was 23.35mg in weight. Seeing as it had been contaminated with Perspex glue due to the fact it had been strengthened with a backing of rice paper. This sample was also difficult to clean as it had been attached to a backing of silk. Sample 2 was a sample of parchment that was 4.90mg was relatively clean and required no special treatment. I will be comparing the difference of the final results and try and determine if there is a great difference possibly due to the difference of pretreatments.**  ***Preparation method for sample 1-modern contamination***  **For 30 minutes wash the sample in an ultrasonic bath of acetone. Then the sample is washed in ~1N HCL for 10 minutes then rinsed in distilled water and washed in 0.1% NaOH for another 10 minutes then again washed in distilled water. The sample is finally dried in a vacuum oven.**  ***Preparation method for sample 2- no apparent contamination***  **The sample is washed in ~1N HCL for 10 minutes then rinsed in distilled water and washed then in 0.1% NaOH for another 10 minutes and again rinsed in distilled water. The sample is dried in a vacuum oven.**  ***Testing -AMS method***  **The accelerator mass spectrometry testing method was used in processing the 14C amounts. The samples were combusted with CuO to make CO2. 0.2 ml of this sample was taken to analyze the ratio of 13C. This analysis will be used to make accurate corrections to the 14C age. The rest of the CO2 is converted to graphite using the equipment. The graphite was loaded into an accelerator target holder. The AMS machinery is then used to analyze the quantity of 14C by measuring the velocity of the radioactive ions. The 14C ages were all corrected to a ratio 13C value of -25%.**    [[Home](http://docs.google.com/home.html)][[Introduction](http://docs.google.com/introduction.html)][[Hypothesis](http://docs.google.com/hypothesis.html)][[Procedure](http://docs.google.com/procedure.html)][[Data](http://docs.google.com/data.html)][[Conclusions](http://docs.google.com/conclusions.html)][[Bilio/Links](http://docs.google.com/biblio.html)]  [[2001 Projects](http://docs.google.com/index.html)][[2000 Projects](http://docs.google.com/AP2000/index.html)][[1999 Projects](http://docs.google.com/AP99/index.html)][[1998 Projects](http://docs.google.com/AP98/index.html)] |