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| **This next image from the Waikato website shows the structure and process of Accelerator Mass Spectrometry involving the counting of the radioactive atoms in a sample.**  **Very important, however, are the pre-treatments which the samples must undergo to remove contaminants before testing can take place. The relevance of these tests are what I decided to base my research around. It is important to take into account the fact that many of the samples you work with will have been exposed to the elements which can alter the amount of 14C they contain. In the Pedological Perspectives in Archaeological Research it is said one must take into account the biological influences when trying to date a sample. Some of these biological influences are O2, moisture, temperature, C concentration and soil reactivity. Some of these variables can be measured by soil texture and depth below the soil surface at which the sample was found. Also the specific mean annual temperature and rainfall at the site and soil pH should be taken into account when determining what kind of contaminates to look for. For example: "rainfall and temperature affect soil development. Soil pH decreases with increased rainfall. Low pH directly affects extent of leaching and the rate of organic decomposition."**  **There are several different treatments that can be used to remove different contaminants or can be used depending on different types of samples. For example some samples are more sensitive than others and require a much more gentle treatment. Wood is a sample that is fairly durable and can stand up to harsher pre-treatments. Treatments range from chemical washes to careful work with tweezers and a microscope.**  **At the Beta Analytic, INC website, a Professional radiocarbon dating service, they offer numerous pre-treatments and explain what kind of samples the treatment is used on.**  **An "acid/ alkali/ acid" wash is used to remove carbonates and secondary organic acids. This is a method typically applied to charcoal, wood, some peats, some sediments and textiles. An "acid wash" is used to again get rid of carbonates. The alkali wash is not used due to the fact that the primary carbon is soluble in the alkali. This is applied to organic sediments, some peats, small wood or charcoal, and special cases. In "collagen extraction", used primarily for bone, acid washes are used to eliminate the mineral. A alkali wash is used to again get rid of organic acids in the sample. An "acid etch" is applied to shell, calcite and calcareous nodules. This involves the removal of secondary carbonate components. Some samples can be "neutralized" using de-ionized water. Usually this is applied to carbonate that have precipitated from ground water ( strontium carbonate and barium carbonate) and have had hardly any exposure to the atmosphere. An "acid/ alkali/ acid/ cellulose extraction" is used in treating wood that is highly contaminated or very old. All is extracted save the wood cellulose.**  **All of these pre-treatments are Chemical pre-treatments. There are also physical pre-treatments. These involve anything that does not include a chemical treatment. This is mainly work done by hand in removing obvious contamination of rootlets etc. Samples can be scraped clean with a scalpel, dentist drill or carborundum paper.**  **Now comes the part of the introduction that you have patiently waited for. I will explain how I have used all of the above information to formulate a question for research. I mentioned earlier that I would be using the pretreatment methods in my research. My aim in this Research project is to find out how much of a difference the pretreatment methods made in the final estimation of a sample's age.**  **" Is there a significant difference between the results of a pretreated sample and the results of the same sample with no pretreatment?"**  **In carrying out this idea I first had to find a way to test or collect data. I looked up a number of labs to see which ones did radiocarbon dating. Lawrence Livermore Lab was close by and it was a thought to find someone who could advise me. But I later found out that testing is a rather long and fairly expensive operation. The equipment used in testing cost around $2-3 billion a year in upkeep. So I thought of another way to attack my question. I would send out letters to different scientists around the globe and ask for results of tests that had already taken place. I inquired for possible results from a sample of wood and also asked for the method of pretreatment it was subjected to. I also asked if it was tested as a control without the pretreatment and also with the pretreatment.**  **These letters I sent to professors at Waikato University in New Zealand, to Professors at the University of Zurich, Switzerland, and to Professors at Purdue University where the PRIME Lab operates. I got wonderful replies back from all three areas giving information and web addresses at which there is a great deal of information.**  **The following report will thank all three professors and give the results of the information I collected.**  ([Back](http://docs.google.com/intro2.html))  [[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)] |