"Student Life" brings readers the best of student-produced journalism at Utah State University. Featured items are written by students for The Utah Statesman, the official student newspaper of Utah State University, or The Hard News Cafe, the online publication from the Department of Journalism and Communication. Both publications are award-winning and present the talents of Utah State's journalists-in-training.

This week's piece is by writer Shauna Leavitt from The Hard News Cafe.

**What's the gripe between 'hard' and 'soft' sciences? The debate rages on**

*From the The Hard News Cafe 6-06-04*

For the environment to endure through time, the "hard" and "soft" science advocates must become more reconciled. A powerful instrument in this reconciliation are the nation's universities.

Hard sciences use math explicitly, they have more control over the variables and conclusions. They include physics, chemistry and astronomy. Soft sciences use the process of collecting empirical data then use the best methods possible to analyze the information. The results are more difficult to predict. They include economics, political science and sociology.

A few months ago, a Utah State University student in the department of environment and society met with department head Terry Sharik. She wanted to transfer to another department where more hard sciences were being taught because she felt they were more important. Sharik was frustrated with the student's perception.

Mark Brunson, an associate professor in the department of environment and society said, "It's culturally ingrained in a society that emphasizes technological innovation over human and environmental stewardship."

Dale Blahna, an associate professor in the department of environment and society said, "If this young student feels more comfortable with the hard sciences where she'll have more concrete evidence in suggesting causal relationships then she should transfer. But if she is wanting to transfer because she believes hard sciences are more important, then she...
needs to gain a better understanding of the soft sciences.

The best hard science set up to protect an element of the environment is useless if you don't understand the political and social side of the issue.

Blahna explained, "One of the misinterpretations of social science is caused because some of it is not scientific. We must distinguish between public involvement (policy process, collaborative process and conflict management) and social science (objectively collecting factual data).

"When we try to persuade the hunter to compromise with the environmentalists, that is not science. But when you are collecting empirical data (what will be the consequences of permitting a set number of snowmobiles to go through Yellowstone Park every day), then that is science."

Many scientists believe their specialty is the only pure science. Blahna said, "They get caught in a paradigm and can't see past the blinders they have built over the years." They don't believe other scientists' fields are as important or as rigorous as their own.

Many years ago, Blahna was playing basketball with two of his scientist friends. One was a biologist and the other a chemist. Both were involved in research using very controlled experiments and math to reach conclusions. When the biologist left the gym, the chemist said, "I don't understand how he [the biologist] can call his work science."

On another occasion, Blahna was visiting with a physicist who declared, "the only true science is physics."

The truth is there is no pure science. Blahna said, "If you are going to use absolute proof as the criterion for science then there is no real science. Physics changes dramatically every hundred years. Using proof as the main criterion, the only real science is math, but it really isn't a science. It doesn't tell you anything about nature or the real world."

The difficult part of this reconciliation is breaking down scientists blinders which have been built and strengthened over many years.

When the USU College of Natural Resources (CNR) was reorganized in 2002, the majors were also reorganized. There were opposing opinions as to how many CNR soft science courses the CNR hard science majors should be required to take. Some professors believed the hard science students should focus primarily on their major and only be required to take one or two soft science courses. Other professors believed it was important that students be immersed in a wide variety of courses to gain a diverse education and understanding. The result is that some CNR majors require five or six courses outside of their major while others require one or two.

Wayne Wurtsbaugh, a professor in the department of aquatic, watershed, and earth resources said, "When you train a generalist you don't have a specialist. We need specialists. It is important that the soft and hard scientists communicate with each other, but they do not have to have an in-depth understanding of each other's specialty. If they can communicate, then they will be effective in mediating changes to protect the environment."

Roger Kjelgren, an associate professor in the department of plants, soils,
and biometeorology said there are environmental benefits when the soft and hard scientists work together to solve an environmental problem. To teach this to students, Kjelgren suggested approaching the lesson as a practical problem-solving experience. The class would identify a multi-disciplinary environmental problem which society is currently facing. They would then decide which type of scientists would be needed to provide the necessary expertise to find the best possible solutions. USU’s Water Initiative is an example of soft and hard scientists coming together to help solve a current environmental concern.

In his article, Washington Watch: Developing the Federal Natural Resource Workforce, Robert E. Gropp said, "[the] need to replenish a scientific, technical... workforce soon to be decimated by the retirement of the baby-boom generation has grown in recent years."

As the environmental scientist baby-boomers retire, newly graduating scientists will be stepping up to fill the void. Finding solutions to society’s environmental problems will weigh heavily upon their shoulders. If the weight is distributed evenly upon the soft and hard scientists, and if they pull the load together, the results will exceed the sum of their individual effects.

"The labels of soft and hard science are misleading and meaningless," said Joanna Endter-Wada, an associate professor in the department of environment and society. "They erroneously assume that what are called "hard" sciences are difficult and what are called "soft" sciences are easy - nothing could be further from the truth. This assumption has created feelings of disrespect among scientists. Often the social sciences that are labeled "soft" actually have the more difficult challenge of understanding human behaviors and being able to predict and find causal relationships."

The "soft" and "hard" adjectives must be dropped if we are ever going to lose the false stigma associated with this classification. "We should be using adjectives that more accurately describe the objects of study in various sciences," Endter-Wada said. "If we are talking about biology, chemistry, or social science, then use descriptive adjectives that identify which science you are talking about, i.e. ecological science or political science. Within any field of science, either qualitative or quantitative methodical approaches can be used. The strengths of one approach compensate for the weaknesses in the other."

The environment will have a better chance of surviving if scientists reconcile their differences and go forward as a joint force.

Endter-Wada said: "The combination of all the sciences working together, mutually respecting the insights each can provide, is vitally needed in order to adequately address environmental problems."