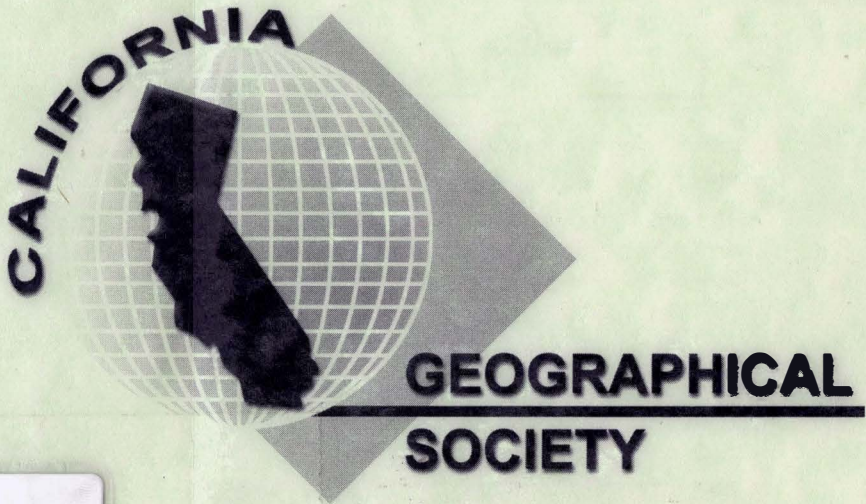


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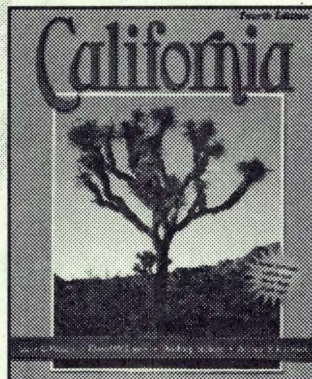
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Industrial Hemp (*Cannabis sativa* L): The Geography of a Controversial Plant

April M. Luginbuhl
University of Toledo

Until the early 1900s industrial hemp was a valuable crop used all over the world for its strong fibers and oil seeds. Today, however, the common perception of the industrial hemp plant is generally negative and associated with the drug marijuana. This perception is the legacy of a century of powerful influences constructing hemp as a dangerous drug, even though it is not a drug and it has the potential to be a profitable alternative crop. In the United States, the public's perception of hemp as marijuana has blocked hemp from becoming a useful crop and product. This paper begins with a history of hemp use and then describes how hemp was constructed as a dangerous crop in the U.S. The paper then discusses the potential of hemp as an alternative crop.

A Brief Hemp History

Industrial hemp has been used for at least twelve thousand years. It is believed that the plant was first utilized in modern day Asia and diffused from there (Rosenthal 1994; 195). By the 1600s hemp was a necessary crop for producing items such as cloth, food, oil, paper, as well as canvas and rope ship riggings. The word canvas is Dutch, derived from the Arabic *kannabis* (Herer 1993; 5). Until the late 1800s Russia and China were the world leaders of hemp production. The Russians could process hemp so well that the cloth was as fine as flax linen (Crosby 1965). Other countries, such as England, used their colonies to increase their stores of hemp. In the Americas, all English colonists were required to grow at least one acre of hemp on their property for the English navy or face a fine (Herer 1993; 1). Because of the early exposure to growing hemp, by the 1800s the United States had a sizable hemp industry. However, the quality was not as good as the Russian hemp, due to inexperienced production techniques (Crosby 1965).

Through the early industrial revolution, hemp was one of the main fibers in textiles along with flax and kenaf (Crosby 1965; 21). Hemp declined however, in the late 1800s with the advent of the cotton gin. Until the invention of the cotton gin, hemp was superior because it was cheaper to harvest and process, while cotton required more labor and expense (Herer 1993; 10). The first denim blue jeans were worn by sail-

ors and made of hemp. A hemp shirt would sell for fifty cents, while a cotton shirt would sell for one hundred dollars (Herer 1993; 10). Also, hemp is much more durable than cotton, as can be seen in the length of time rope, clothes, and paper last. The cotton gin reduced the costs to produce cotton to less than that of hemp, making cotton more popular (Herer 1993; 10).

As an answer to cotton's new technology, George Schlichten invented the decorator in the early 1900s. It made harvesting hemp mechanized like cotton. Schlichten took his machine to investors who initially seemed supportive. Just before all of the details were settled between Schlichten and the investors, they all pulled out, leaving him confused and the hemp industry in trouble (Herer 1993; 13).

THE NEGATIVE CONSTRUCTION OF HEMP

Hemp became a 'bad' plant in the early 1900s and, except for a brief period during World War II, it never regained a neutral or positive status for several reasons. One reason is economic. Hemp was unable to compete with industry rivals that surfaced in the 1920s and 1930s. The other reason is perception. Influential people and companies such as Randolph Hearst and DuPont not only created economic competition, but also used media to construct hemp as a plant to be feared. This media campaign is another reason for the permanent decline of hemp in the United States. To understand this perception it is helpful to deconstruct the causes of the perception. This media campaign can be deconstructed by revealing the contradictions and assumptions within its text (Rosenau 1992; xi). Among the contractions within the United States anti hemp movement are the outlawing of the plant in the 1930s, its decriminalization in the 1940s, and the final re-criminalization in the late 1940s.

According to Herer (1993) Randolph Hearst played a role in the pullout of the investors in the decorator and the beginning of the media campaign. Hearst had taken an economic interest in hemp. He owned several newspapers across the country and he had friends who worked for DuPont. Both groups were threatened by hemp because it dominated markets in which they wanted to profit. World War I had just ended, and DuPont had received the German patents to petrochemical and synthetic technology. Hemp oil was used to make plastics, carpet backing, and construction materials until that time. With the possibilities of using petrochemicals, DuPont wanted the decorator stopped so that they would have a chance at the market with their new products.

Similarly, the tree pulp industry had just reached a firm establishment,

especially in the Pacific Northwest. Hearst held stock in the tree paper companies, and the thought of hemp paper out-producing tree paper scared him and the paper industry (Herer 1993; 24). With all of these groups against the mechanization of hemp, Hearst began a smear campaign in his newspapers. These articles are where our current constructions of industrial hemp are derived from.

To understand the effectiveness of the negative hemp campaign, it is important to understand the distinction between hemp and marijuana. Hemp is known as *Cannabis sativa L*, marijuana as *Cannabis sativa*. While the two plants look incredibly alike, there are major differences between them. Hemp has a fibrous stalk that can be processed into a fine fabric. Marijuana's stalk makes such a coarse fiber no one uses it (Herer 1993; 79). Hemp contains less than 1% THC, or tetrahydrocannabinols, the psychoactive property in marijuana. In other words, smoking hemp cannot create a 'high'.

Despite these differences, in 1916 Hearst began his campaign by erasing the difference between hemp and marijuana. He used stories about marijuana smoking Mexicans and African-Americans who would rape and disrespect whites. He claimed marijuana was the force behind the "voodoo-satanic" music called jazz (Herer 1993; 27). He wrote marijuana will make a person violent and it was a threat to all of America. The marijuana campaign reached its climax in the mid 1930s as other forms of media became involved. The movie *Reefer Madness*, directed by Gassier, was released in 1936. This movie depicts how marijuana destroyed the lives of a group of high school students. The movie begins with a scroll of writing which reads, "There is a new drug menace destroying the youth of America. It is a violent narcotic." After listing the evil consequences of getting high, it ends with, "Something must be done to wipe out this ghastly menace." As the plot advances, the school principal tells parents, "Marijuana is more dangerous than heroin and opium." The principal pleads with a federal agent for help, and the agent replies, "Marijuana grows wild in all states. You must arouse education to get a law against it because marijuana is not interstate commerce. The government can not be involved." The movie proceeds to show the effects of this new drug, marijuana, including, "violent laughter", murder, rape, and ultimately criminal insanity from being addicted to the drug.

The actions of the media created a panic among the American public. Newspaper articles and movies like *Reefer Madness* created this panic with images of drug crazed criminals running wild in the streets. The public, led by the media, demanded that Congress act. In 1937, Congress passed the Marijuana Tax Act, which put all varieties of cannabis under

regulation by the United States Treasury Department who turned monitoring over to the Drug Enforcement Agency (DEA) (USDA 2000; 3). The DEA banned all forms of cannabis through their regulatory actions, as did the rest of the Americas and a few countries in Europe (Table 1) (Roulac 1997; 51). This law removed the obstacle of interstate commerce, and gave the DEA full control over enforcement.

Table 1:

| Country | Year Banned | Year Legalized |
|----------------|--------------------|-----------------------|
| Brazil | No Data | 1960 |
| South Africa | No Data | 1995 |
| Australia | No Data | 1998 |
| United Kingdom | 1928 | 1993 |
| United States | 1937 | NA |
| Canada | 1938 | 1998 |
| Japan | 1948 | NA |
| Germany | 1982 | 1996 |

Information on Canada: Cauchon, Dennis. "Canadian Hemp Isn't Going to Pot." *USA Today*. 7 Oct. 1998. Online. WestHemp Canada. Available: www.westhemp.com. 24 June 1999.
 Japan: Roenthal, Ed. Editor. *Hemp Today*. Oakland: Quick American Archives, 1994
 Brazil, South Africa, Australia, UK, US, Germany: Roulac, John W. *Hemp Horizons*. White River Junction, VT.: Chelsa Green Publishing Company, 1997.

The fear of hemp was constructed through language. The people with power manipulated the word choice to construct a reality where hemp did not exist and marijuana was a new threat. Hearst and the others did a wonderful job constructing their texts. The word hemp was never used in the smear campaign. Hemp farmers read these stories and never realized what was happening because the word marijuana was new (Herer 1993; 28). In the movie, the federal agent states, "in 1930 there were few records on marijuana, and by 1936 there were thousands of them." (Gasnier 1936). While the movie is fiction, it illustrates just how new marijuana was at the time.

The media had the power and scope to construct a uniform reality for enough people to push the federal government to act. Kentucky was the largest hemp-growing state in the union in the 1930s. After the bill passed, making all forms of Cannabis a type one narcotic, there were hundreds of scared and angry farmers who, without realizing how, lost one of their main crops (Herer 1993; 28). Ironically, with the persecution of tobacco, Kentucky farmers are demanding the legalization of hemp once again (Cauchon 1998). Laws in the United States have not regained the difference between marijuana and hemp even though the distinction is recognized in the United Nations 1961 Single Convention on

Narcotic Drugs, the North American Free Trade Agreement, and the General Agreement on Tariffs and Trade (Roth-Li 1996). The United States remains the only major economic power with hemp still illegal (Table 1).

The U.S. government was able to make hemp illegal for the United States citizens because it was constructed as a threat to society. This threat was overlooked as the advent of World War II created a problem for the U.S. industrial fiber supplies. The U.S. knew it would quickly use up the hemp stores it had along with the abaca and jute, other industrial strength fibers imported from the Philippines and Asia (USDA 2000; 3). This shortage was critical because imports from the South Pacific, necessary for maintaining the armed forces, were no longer available. In this context the federal government was forced to contradict the laws against the threat of hemp, and thus began a campaign to make hemp patriotic. They realized the only way to get strong fibers for defense, cloth, rope, and gear was to grow it domestically. Thus began the federal government's Hemp for Victory campaign to help farmers to grow hemp once more. By creating a guaranteed market for the hemp and using educational campaigns farmers were encouraged to grow hemp.

The peak of the Hemp for Victory campaign was in 1943 and 1944. Estimates of the tonnage of hemp grown in those two years are about 75,000 tons in 1943 and 150,000 tons in 1944 (Armagnac 1943; 1). In 1943 there was a wealth of articles written about growing hemp. Some showed a concern about growing marijuana. One expressed this fear by stating, "What can be done to keep these enormous (75,000 tons) new supplies, from which there almost inevitably will be 'leaks', out of their (depraved addicted creatures) twitching hands?" (Armagnac 1943; 1). The government conveniently reconstructed hemp in order to calm these masses, which were afraid because of the 1920s construction of hemp. The United States Department of Agriculture (USDA) said that it created a strain of "drugless hemp" through breeding techniques (Armagnac 1943; 1). At this point the government began a thorough contradiction of its hemp policies.

As part of the new campaign, the USDA issued the movie *Hemp for Victory* in 1942 to tell of the advantages of growing hemp for the war effort. Although this movie, along with other forms of government documentation of the campaign, has been removed from public view, a few pieces can be found. In fact, the transcript of the movie is available on the internet (USDA 1942). In the movie the USDA states that the decline of hemp was due to an increase in imports: "then came cheaper imported fibers for cordage, like jute sisal and Manila hemp, and the culture of hemp in America declined." (USDA 1942). In this movie there is no mention of marijuana. They conveniently separate them and create hemp

into a harmless plant once more. In fact, hemp becomes a symbol of patriotism. The movie concludes with this imagery:

When it [the Manila hemp reserve] is gone, American hemp will go on duty again: hemp for mooring ships; hemp for tow lines; hemp for tackle and gear; hemp for countless naval uses both on ship and shore. Just as in the days when Old Ironsides sailed the seas victorious with her hempen shrouds and hempen sails. Hemp for Victory. (USDA 1942)

Perhaps the most telling aspect of the reversal of the Hemp for Victory campaign is the education given to children of farmers. There were 4-H programs in place encouraging students to grow hemp. "Growing hemp gives 4-H members a real opportunity to serve their country in wartime... Labor requirements do not interfere with school work." (University of Kentucky 1943; 1). The plant was safe enough for America's children to grow as a 4-H project when in a bind. There was no mention of careful handling, and no warning that they would be growing a dangerous plant. There was an outline of a typical growing season and a "hemp seed record" to keep track of the plants and quantities harvested (University of Kentucky 1943; 4).

The government heavily encouraged farmers to grow hemp. They were paid \$30 to \$50 a ton for the hemp fibers. The only rule was that a row of some other crop should surround the hemp field so that no one could access the hemp easily (Mowers 1943; 1). Through all of the favorable publicity for hemp there were some warnings of things to come. There was a mentality created that only poor countries grow hemp, which is why U.S. farmers would no longer need to grow hemp after the war. "Although hemp is a very favorable crop now- in all probability after the war, we will find that it will again lose some of its importance. We cannot compete with the cheap labor of the East, and the hand separated hemp is superior [to mechanically separated hemp]." (Mowers 1943; 2).

After World War II ended, the anti-hemp constructions resurfaced. Hemp cultivation was no longer allowed without permits, special taxes, and DEA initiated intervention once more. Hemp was no longer patriotic, but a threat. People returned to either viewing hemp as the dangerous marijuana or as a crop only developing countries, such as the Philippines, should grow. Wisconsin was the only exception to the rule. Until 1958 they continued to grow hemp, despite strong federal opposition (USDA 2000; 3). So even the federal government had to contradict its own law to use hemp. There was no other substitute for the crop in a time of war. Hemp is a good plant when it saves the country, but a bad plant in peacetime.

The Hemp for Victory campaign left a legacy that can still be seen today. The seeds from the plants that were grown in the 1940s have spread throughout the Midwest, making ditchweed, or wild hemp, a common sight. That ditchweed has been the fuel for current debates over the federal government's insistence that hemp is a dangerous and useless crop, as can be seen in current literature on hemp. A new group of hemp proponents have surfaced during the 1980s and 1990s. These groups are composed of environmentalist, farmers, and even unions and business groups who use or wish to use hemp products in manufacturing. These U.S. groups frequently remind the federal government that the plant was so harmless and vital in U.S. history that the law was ignored for the duration of the Second World War.

The Economics Of Hemp Cultivation

Much as the right factors came together in the 1930s to ban the plant, the right factors came together in the 1990s to re-legalize the plant (Table 1). First was the new interest in the environment and concerns with logging (Roulac 1997; 9). As people cried, "Save the trees!", some people began to explore alternatives to paper products. With environmental and economic concerns growing, the benefits of hemp have resurfaced. People discovered that the first books, bibles, and drafts of the Declaration of Independence were written on hemp paper. One acre of hemp can produce as much paper as three acres of trees and will last up to 150 years before crumbling. If the paper is torn or wet, all one needs to do is set the damp pieces the way they should be and let them dry. The tear disappears with no warping or fading (Herer 1993; 7). Since 1937 the world has lost much of its native forests, which the hemp movement attributes to the loss of hemp as a paper source (Canadian Auto Workers 1997).

The hemp movement quickly spread from environmentalists to farmers because of several environmental and economic benefits. Environmentally, farmers are under scrutiny with the EPA because of the chemicals used as fertilizers, herbicides, and pesticides. Hemp helps reduce some of farming's negative environmental impacts several ways. First, the roots of the hemp plant protrude deeply into the soil, thus allowing for better percolation and nutrient cycling. The dense growth of hemp eliminates other weeds. This coupled with the plant's few insect pests reduces the need for both herbicides and pesticides (Roulac 1997; 146). If hemp is planted the rotation before soybeans it acts as a pesticide by reducing up to 80% the damaging nematode cyst that kills soybeans. This saves on chemical use and money while increasing soybean yields (Rosenthal 1994; 210).

The agricultural economy is another good reason to look at alternative crops, such as hemp. Dan Glickman, Secretary of Agriculture of the USDA projected that United States farm income will decrease by over twelve billion dollars between 1999 and 2001 (The Toledo Blade, Feb. 24, 2000). In light of these declining agriculture incomes, the USDA is looking at European agriculture policy, which includes using alternative crops (The Toledo Blade, Feb 2000). European countries are looking at the viability of alternative crops, including hemp, and most have changed their hemp laws to allow for this alternative crop. Now, most countries, other than the United States, follow the United Nation's guidelines on Cannabis varieties (Roth-Li 1996). As Erwin Sholts from the Wisconsin Department of Agriculture said, "The United States is an island of close-mindedness in a sea of acceptance." (Roulac 1997; 79). Hemp has potential in most countries because it can be used in products including plaster, concrete, insulation, plastics, cloth, paper, animal bedding, beer, food, oil, and fuel (Roulac 1997; 163).

There are a few obstacles, however, that could stop the legalization and use of hemp, one of the largest being the social perception of the plant. While Europe and Asia accept hemp, the U.S. fears hemp because of its resemblance to marijuana. A greater obstacle comes from the DEA, who has successfully continued a negative construction of hemp to the public. Several states have passed hemp bills making hemp legal in their states. Hawaiian State Representative Cynthia Thielen, who was instrumental in passing the Hawaiian hemp bill said, "Opposition (to legalizing hemp) was from law enforcement types. 97% of the DEA's multi-billion dollar budget goes toward eradicating 'ditchweed', according to the DEA's own statistics. It (ditchweed) is not hallucinogenic." (Thielen 1999). This practice has been called "a great fraud being perpetrated on the American people" by Vermont legislator Fred Maslack (Conrad 1999).

In January 2000 the USDA issued a report entitled: Industrial Hemp in the United States: Status and Market Potential. This report detailed the federal government's stance toward industrial hemp. Predictably, the USDA took a primarily negative stance by saying hemp imports are at all time highs, yet if US farms were to grow the same quantity it would only be enough to keep a few United States farms occupied (USDA 2000; iv). Also, in terms of quantity the recent addition of Canadian hemp has oversupplied the market. However, the USDA contradicts itself throughout the report by acknowledging that the growth in the hemp industry will not occur until hemp is legalized (USDA 2000). The report adds that currently hemp can compete price-wise with other fibers such as flax and if legalized has the potential to be a viable non-wood fiber in wood fiber markets. They also point out that hemp is a good option for reducing weeds and improving soil qualities without

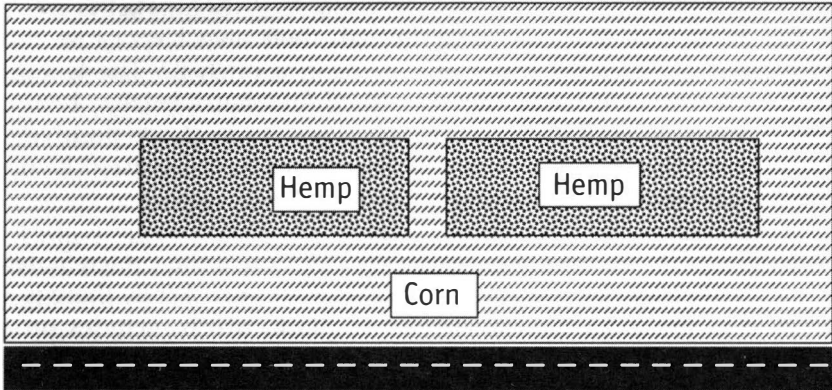
herbicides (USDA 2000; 4). Despite the fact that there were more positive facts cited than negative ones in the report, the paper had a clearly negative bias, with most sections concluding that the market is weak and will likely stay that way, even though their own laws cause the small market. This report leaves the states in a catch-22. The federal government will not legalize hemp until all fifty states legalize hemp, and most states will not try until the federal government acts positively towards hemp (Kahn 1999). Currently four states have legalized hemp and twelve others are considering it.

The USDA report is correct to question the viability of the United States suddenly growing large quantities of hemp all at once. While there is a good deal of production infrastructure in place, which includes production and retail of all possible hemp products, this does not mean that the United States will be successful as a large supplier in the hemp industry. The ban has kept the retail market from growing as large as it could be and large quantities would flood the market.

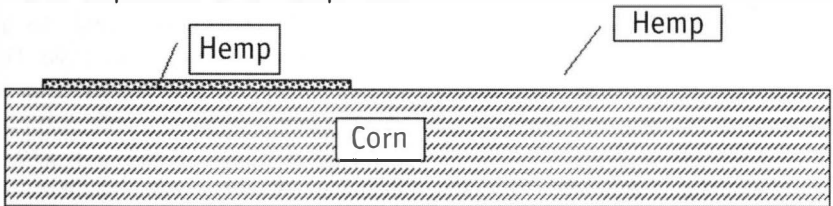
Judging by the Canadian experience the U.S. may have little to fear from legalizing hemp. Canada has had legalized hemp since 1998. They have strict regulations in place, and have had no problems to date. The main government argument against hemp is the difficulty telling it apart from marijuana. The Canadian policies guard against marijuana growth by requiring that hemp farmers purchase a permit from the Provincial Department of Health Canada. Every field is randomly checked for THC levels during the growing season. Farmers are also required to keep their fields from public view (Van Dusen 1998). The best growing technique for hemp, planting 300 to 500 plants per square meter, also helps authorities easily tell the hemp from marijuana, which is a plant that is less densely cultivated (Roulac 1997; 149).

This planting technique effectively hides hemp from public view, thus avoiding public interaction with hemp, which is another governmental fear. This can be seen at farms such as the Kenex Limited farm in Pain Court, Ontario, Canada, one of Canada's first hemp farms. Despite resistance to showing hemp fields to the public, the fields can be seen if one knows what to look for. Near the Kenex headquarters there was a cornfield with uniform, tall, green patches in the middle (Figure 1) (Field Notes 1999). There was no visible access to those patches. The only way to see hemp in Southwestern Ontario is if you know exactly where it is at and how to get there.

Figure 1:
An aerial depiction of how a hemp field is hidden:



A side depiction of a hemp field



Hiding hemp in cornfields protects the farmer from people who think they can slip marijuana into the field or take the hemp thinking it is marijuana. Marijuana would severely harm the quality of the crop by reducing the quality of the fibers. However, simply hiding the crop, and not educating the people as well, contributes to the public fear of the plant. For the industry to be successful there needs to be public awareness of the difference between hemp and marijuana. Hiding the hemp fields behind corn gives the message that there is something different about that crop. Hiding it marks the crop as something forbidden and bad, so without even knowing why, people will continue to think hemp is bad and squirm when they come across hemp products in stores.

Despite a still skeptical populace, there are new hemp stores and industries opening across the U.S. because of the Canadian legalization. While the Canadian outlook is good today, they fear the American entrance into the crop market. (Cauchon 1998). I was told by the Kenex farm, "We do not give tours of our plant at this time because of the confidentiality of some of our machinery and our techniques." (Kenex 1999). The Canadian push to legalize came from their desire to gain a strong market share before America legalized hemp. This way their machinery and

seeds will be superior, much like France and Russia are, from greater experience.

On August 9, 1999, Kenex and Canada received a stumbling block from the United States. The U.S. border impounded over 20 tons of Kenex's hemp seed that American companies were importing for birdseed. The U.S. went on to recall seventeen previous loads of hemp oil and seeds. This recall and stoppage of product has resulted in layoffs in United States companies (The Toledo Blade, Oct. 1999).

In October of 1999, the DEA went on to further hurt American companies by placing a ban on all hemp seeds for use in the United States. This impacted hundreds of businesses, one of which was the Kettle House Brewing Company in Missoula, Montana. They brew hemp beer with hemp seeds in addition to hops. Instead of stopping their work they switched to a hemp paste. The seeds were approved for use once again in March of 2000. The DEA then tried to ban hemp beer through claims that the beer contained THC. Repeated beer and urine tests for THC have been ordered by the DEA, and all tests have come back THC-free at the Kettle House. The DEA has had no reason to stop this particular Montana business, which has been in operation since 1996 (Kettle House, 2000). American companies express frustration over non-narcotic products being treated as such, and thus hindering their own sales.

In order for industrial hemp to be successful in the U.S., there needs to be not only more acceptance, but also technology and techniques like the Canadians are developing. But, we will have to do it on our own. Other countries guard their hemp growing techniques from one another. The way the plant is grown determines the quality of the fibers. If the plant is grown for fiber use, it will take several years for America to learn techniques to grow quality fibers. Canada has begun primarily with harvesting seeds, which is where America will most likely start as well (Cauchon 1998).

Of all the advantages and disadvantages to industrial hemp, the world market, public, and federal government's perception will be the deciding factors of whether the United States enters the hemp market as a crop grower. We have the producing infrastructure in place, which includes production and retail of all possible hemp products (FAO 1999). Unfortunately, it can be a lengthy process locating and purchasing hemp products because they are not mainstream. There are retail stores that provide hemp products including 100% hemp clothing, hats, accessories, body lotions, soaps, candles, and books. However these are specialty shops that are not located throughout the country.

SUMMARY AND CONCLUSION:

Understanding the use of hemp requires a deconstruction of its history. Despite the patriotic view of hemp in the 1940s, hemp's reputation as marijuana is holding fast in the United States. The US is years away from legalizing hemp. There is no question that the crop is useful, even the U.S. government admitted in both the 1940s and in 2000 that hemp has good uses. In favor of legalizing hemp are the facts that the agriculture economy is in the process of changing, and a new diverse crop can only help in the years ahead. Also, there are dozens of environmental benefits from this crop, especially as a substitute for other polluting materials. This crop was originally used for a number of products, and can still be used for those products as well as new ones. Even if the U.S. never legalizes the crop, the truth remains that production and retail are increasing in the U.S. The disadvantages involve the political controversy and effort to educate the population while integrating hemp so that is easily accessible to the conventional population. The education also needs to be given to authorities so that they realize that hemp is grown differently than marijuana as authorities in other countries can attest to. The best way for hemp to be profitable is to change public perception of the crop. There needs to be a social construction that correctly separates hemp from marijuana.

References

- Armagnac, Alden P.** *Can We Have Rope Without Dope? Plant Wizards Fight Wartime Drug Peril.* Online. Hempology. Available: www.hempology.org. 1 March 2000.
- Canadian AutoWorkers Windsor Regional Environment Council.** *Re-establish the Hemp Fibre Industry in Canada.* Online. WestHemp Canada. Available: www.westhemp.com. 24 June 1999.
- Cauchon, Dennis.** *Canadian Hemp Isn't Going to Pot.* USA Today. 7 Oct. 1998.
Online. WestHemp Canada. Available: www.westhemp.com. 24 June 1999.
- Conrad, Chris.** *Legislator Blasts Hemp Eradication Programs.* Online. Hempology. Available: www.hempology.org. 1 March 2000.
- Crosby, Alfred W.** *America, Russia, Hemp, and Napoleon.* Columbus: Ohio University Press, 1965.
- Food and Agriculture Organization, United Nations.** *Agriculture Statistics.* Online. FAO. Available: www.fao.org. 22 July 1999.
- Gasnier, Louis.** Director. *Reefer Madness.* Murry Hill Video. 1956.
"Hemp Seizure Puts Canadian Business in Bind (AP)." *The Toledo Blade*. 5 Oct. 1999:9.
- Herer, Jack.** *The Emperor Wears No Clothes.* Van Nuys CA: HEMP Publishing, 1995.
(Kenex@kent.net.) "Re: a student with hemp questions!" E-mail to April Luginbuhl (aprilu@yahoo.com). 1 July 1999.
- Kahn, Phyllis.** *Minnesota Third State to Pass Hemp Legislation.* Online. Hemp-CyberFarm. Available: www.hemp-cyberfarm.com. 25 June 1999.
- Mowers, Larry.** *A Crop for the Duration is... Hemp in Illinois.* Online. Hempology. Available: www.hempology.org. 1 March 2000.
- Rosenau, Pauline Marie.** *Post Modernism and the Social Sciences.* Princeton: Princeton University Press, 1992.

- Rosenthal, Ed, editor.** *Hemp Today*. Oakland: Quick American Archives, 1994.
- Roth-Li, Gertraude.** *Industrial Hemp [Cannabis Sativa] Economic Viability and Political Concerns*. Online. Hemptrade. Available: www.hemptrade.com. 25 June 1999.
- Roulac, John W.** *Hemp Horizons*. White River Junction, VT.: Chelsea Green Publishing Company, 1997.
- Thielen, Cynthia.** (thielen@aloha.net.) *Re: Industrial hemp questions* E-mail to April Luginbuhl (aprillu@yahoo.com). 9 July 1999.
- "2-Year Drop in Income of Farmers Predicted. (AP)" *The Toledo Blade*. 25 Feb. 2000: 30.
- United States Department of Agriculture.** *Industrial Hemp in the United States: Status and Market Potential*. Online. Economic Research Service. Available: www.econ.ag.gov/epubs/pdf/ages001E/index.htm. 29 Jan. 2000.
- United States Department of Agriculture.** *Hemp for Victory*. 1942. Online NORML. Available: www.pdxnorml.org/hemp_for_victory_1942.html. 5 May 2000.
- University of Kentucky, College of Agriculture and Home Economics.** *Hemp Seed Project for 4-H Clubs*. Online. Hempology. Available: www.hempology.org. 1 March 2000.
- Van Dusen, Tom.** *Hemp Production Goes Into Rehabilitation*. Online. WestHemp Canada. Available: www.westhemp.com. 24 June 1999.



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The Fifth Province: Seamus Heaney and the Reinterpretation of the Cultural Morphology of Border County Ireland

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Introduction:

The prolific Irish literary tradition is well known and Seamus Heaney, the 1995 Nobel Prize winner for poetry, is emblematic of this tradition. Heaney is a native of County Derry, Northern Ireland. This County is located in Ulster, the northern most province of the Irish island, which is bisected by a border dividing Northern Ireland from the Republic of Ireland. There is a disputed heritage located in this region which is characterized by the 'Troubles' – the sectarian strife between Irish Catholic nationalists and British Unionists over the identity and perception of this landscape. However recently a peace process has bloomed in this region and its intellectual foundation lies in a methodology that is post-national and post-modern in character. The seeds of this methodology are found in the artistic and literary community of Northern Ireland, of which Heaney is representative. The methodology contained in this paper consists of a poetical hermeneutic approach to the study of the cultural morphology of this landscape. And through Heaney's texts, the human geographer is afforded a multidimensional, home insider perspective to perceive and reinterpret the cultural phenomenology occurring within the morphology of this landscape.

I: The reinterpretation of landscape

This reinterpretation of the cultural landscape of the border is to employ the insights provided by the cultural mentifacts imbedded in the collective unconscious of the inhabitants of the landscape. The psychiatrist Carl Jung (1936) defined the collective unconscious as an aspect of the human psyche, which unlike the personal unconscious, is not acquired by experience, but by heredity and culture. In essence, the collective unconscious consists of archetypes (from the Greek, *arkhetupon*: literally 'first molded') which are inherited. These archetypes are described variously as 'elementary' or 'primordial' thoughts. Within the realm of mythological research they are described as 'motifs'. Wrote Jung (1936) "This collective unconscious does not develop individually but is inherited. It consists of pre-existent forms, the archetypes, which can only be-

come conscious secondarily and which give definite form to certain psychic contents. Jung held that access to this collective unconscious was found through dreams and what he termed the active imagination.

Within the context of this paper and within Heaney's poetry there is an intersection between Jung's active imagination and Kearney's (1997) imagined community. The anthropologist Levi-Strauss notes that within the archetypes of myth making are constructs which make possible at an imaginary level what is impossible in the 'real' or 'empirical' experience. Notes Strauss (1968) "[Myth-making is concerned with] 'the fantasyproduction of a society seeking passionately to give symbolic expression to the institution it might have had in reality.'" Perhaps imbedded within the cultural landscape contained within the Border region of the Irish Island is a landscape of archetypes accessible through the works of the Fili (poets) inhabiting this landscape. With Irish and British nationalism obscuring this landscape, the use of poetry to 'excavate' these archetypes for objective examination is an avenue of research to explore. Notes Welch (1993) "There is a conflict between Ireland and England; it often seems insoluble to the mind trained in the discourses of politics, negotiation and opposition. It may in fact be insoluble. But a poem...witnesses to a space human creativity can create where history is set aside and the problem is viewed objectively. The 'affect' [of the conflict] to use Jung's term, is there, but viewed from a 'higher level of consciousness', poetry." Exploring archetypes found in the works of poets is perhaps to re-map the morphology of the northern Irish landscape, beyond outdated and anachronistic perceptions of it.

II: The 'Fifth' Province

A post-modern and post-national approach to the Irish landscape would be to construct the Irish landscape in a form that complements its multi-cultural character rather than to mimic and internalize foreign, centralized ethno-political structures. This does not ignore the fissures that compose sectarianism; rather it proposes a different perspective from which to view these fissures. Kearney (1988) has observed a "crisis of culture" which places the modern four provinces of Ireland within a philosophical transition from national constructs to supra-national constructs. Within the context of political geography, this places Ireland as a member of the European Union. The four provinces of Ireland (Leinster, Munster, Connaught and Ulster) however still demarcate the body of the island. Post-modernism does not ignore this 'crisis of culture' as Brandes (1994) notes, "Ireland in its post-modern condition is a state still torn apart-North and South, rural and urban, Catholic and Protestant, employed and unemployed, and man and woman."

However within the context of post-modern thought, Kearney (1997) attaches one more province within the post-modern conceptual model, that of the 'Fifth Province'. He states

"Modern Ireland is made up of four provinces. And yet, the Irish word for a province is coiced which means fifth. This fivefold division is as old as Ireland itself, yet there is disagreement about the identity of the fifth.... The obvious impotence of the various political attempts to unite the four geographical provinces would seem to warrant another kind of solution...one which would incorporate the 'fifth' province. This province, this place, this centre, is not a political or geographical position, it is more of a disposition." He further adds, "The fifth province is to be found, if anywhere, at the swinging doors which connects the parish to the cosmos...the fifth province can be imagined and reimagined; but it cannot be occupied. In the fifth province it is always a question of thinking otherwise."

The excavation and re-examination of cultural archetypes is a fundamental aspect of this 'Fifth' province. The 'cultural crisis' which Kearney (1997) observes perhaps is best understood by the exposition of constituent cultural archetypes buried within the chorological and chronological layers of the Irish landscape. What undergirds this 'cultural crisis' particularly in the communities of the north of Ireland is a tribalism that has its roots in the ancient Celtic/Gaelic culture, which existed before the modern transpositions of political, religious and social structure upon the landscape.

One needs only to compare archeology, art and religious relics strewn across the Irish and Scottish landscapes to appreciate the fact that a collective unconscious was definitely shared, if not traded between the Irish and the Scots. Notes Jackson (1971) "Until at least the end of the sixteenth century Ireland and the [Scottish] Highlands formed a single culture province. The 'sea-divided Gael' as they were called, were closely linked not only by their language but also by their civilization, their customs and traditions..."

Therefore it is important to understand that a shared collective unconscious exists between the communities within this cultural crisis, despite being buried by decades and centuries of sectarian conflict. To utilize the phenomenology of collective unconscious thought and its attendant archetypes, a methodology 'mapping' the oral and written tradition of the culture of these communities can be employed to explore the multi-dimensional landscapes occurring upon the Irish Island. Notes Kearney (1997) "In Celtic culture, unity was an imaginary concept to be safe guarded by Fili (poets) rather than political leaders." The use of the texts of poets and writers to explore the perceptual phenomenology creating the cultural morphologies of the landscape is an avenue to explore the constituent components of this morphology.

III: The landscape as text

Within the discipline of geography the morphology of landscapes can be explored through the use of texts and conversely in this approach one can perceive the landscape as a text as well. Samuels (1978) argues that environments can be read as biographies. Johnson (1979) asserts that the landscape, the creation of those who live/have lived in it, is an important text. White (1985) maintains that in the context of such a landscape text, the *home-insider* provides material on a sense of place...in a placeless world.

I juxtapose these ideas of landscape along ideas of sacred space. Water (1988) comments that "The quality of a place depends on a human context shaped by memories and expectations, by stories of real and imagined events—that is by historical experience located there." Relph (1976) notes "Any exploration of place as a phenomena of direct experience cannot be undertaken in the terms of formal geography nor can it sole constitute part of such geography. It must, instead, be concerned with the entire range of experience through which we all know and make places."

Through the use of this textual methodology a 'feel' for the cultural hues of landscape can be accessed. For instance, the geographer Carl Ortwin Sauer (1925) approached landscapes as morphological entities, subject to change, rather than as static bodies of land. Sauer noted the relationship between culture and landscapes, "The works of man express themselves in the cultural landscape...They are derived in each case from the natural landscape..." The human geographer; Yi-Fu Tuan (1971) concurs, "The quality of human experience in an environment, both physical and human, is given by people's capacity-mediated through culture- to feel, think and act...I have explored the nature of human attachment to place, the component of fear in attitudes to nature and landscape, and the development of subjective world views..."

Through the use the subjective texts of Heaney's poetry, An essence of inner and outer morphologies contained within the symbolism and archetypes of the Irish landscape can be assessed. Seamon (1976) notes, "(The symbolic meaning of landscape) is still an essential part of a literary perspective on people's experiential dialogue with environment because literary symbols and images manifest aspects of this interplay that are perhaps invisible and impregnable to conventional techniques of social science." In particular, the non-linear nature of Irish artistic and intellectual traditions become more prominent when the Irish literary tradition is utilized as a methodology, rather than centralized, positivistic Greco-Roman logo-centric models. Comments Kearney (1985)

"The Irish Intellectual tradition is characterized by the ability to hold traditional oppositions of classical reason, either/or together in a creative confluence of both/and.

The use of this methodology, though qualitative in appearance, actually derives from a non-linear logic construct that is seen as anti-utilitarian if viewed solely from the scientific rational tradition. The application of this methodology is congruous with the Irish intellectual tradition and presents an appropriate research approach to appreciate the mythical artifacts present in this field of study. Levi-Strauss (1968) comments that "the kind of logic in mythical thought is quite rigorous as that of modern science." Given the fact that political processes have offered perhaps solutions that will tentatively allow the absence of war, it is the creation of peace may be in the hands of the 'Fili' (Poets).

IV: The Fili

Before the Anglicization of Ireland, the inhabitants of the Island spoke Irish and Scots-Gaelic dialects. With the advent of Christianity in Ireland, writing was introduced to the culture. Writing subsequently preserved language within text. The folklore of these inhabitants had a strong connection with Celtic cosmology, and though the majority of these tribal people were farmers and stockmen, the shifting alliances of the tribal kingdoms produced a warrior culture, which created imaginative recollections of semi-divine ancestors. The connection between the tribal fields and the heavens was explained and told through the institution of the seanchas -the traditional lore of storytelling according to Purdon (1999). This form of traditional lore was an oral means of preserving epic tales. The individual who collected and preserved these tales was called the shanachie (storyteller). With the arrival of Christianity many of these epic tales, Lebor na hUidre (The Book of the Dun Cow), Lebor Gabala (The Book of Invasions) and Tain Bo Cuailgne (Cattle Raid of Cooley) were inscribed by various monks. The inscription of these epic tales took place between 6 AD and 8 AD. Preceding and concurrent with this the 'technological' innovation of inscription, was the tradition of the Fili (poet), who unlike the shanachie, did not simply recall and recite the oral tradition, but composed pieces of poetry and epic tale themselves. The Fili was an aristocrat within the tribal systems of the Irish and Scots culture both by nature and outlook. The Fili, whose role combined the craft of the poet with the duties of the arbitrator of tribal law, served an apprenticeship of up to 12 years before being allowed to officially compose and arbitrate. Within the tribal hierarchy, the Fili was second only to the king in power. During the Christian conversion of Ireland, the confluence of written language introduced by the monks and the aristocratic role of the Fili created a powerful

social crucible for the completion of written text. Many of the early-inscriptions of Irish poetry were similar to the Japanese haiku- simply spare reflections upon the seasons, the essence of nature and the fickleness of landscapes. The subsequent development and practice of Irish poetry provided a means to access the morphology of both the landscape and culture of the Irish Island.

Notes the geographer J.K. Wright (1924) " Some men of letters are endowed with a highly developed geographical instinct. As writers, they have trained themselves to visualize even more clearly than the professional geographer those regional elements of the earth's surface most significant to the general run of humanity." Another geographer, Watson (1983) claims that literature is a "Primary source for the whole world of images [that] illustrates the 'soul' of a place."

V: Seamus Heaney

Seamus Heaney, through his poetry provides the vantage of the contemporary home-insider for the differing dimensions of the northern Irish landscape. Many of these poems are inspired by landscape. They also incorporate the landscape as a metaphor to describe cultural and socio-political issues occurring upon the landscape itself. Through the vantage provided by these poems, the reader is allowed a contemporary, multi-dimensional geographical exploration of space within Northern Ireland and the Republic of Ireland.

Seamus Heaney was born on April 13, 1939 in Mossbawn, County Derry, Northern Ireland. He was the first child of nine, raised in a farm family. This rural landscape provided Heaney an environment with which to develop his spatial perceptions as the home-insider.

This first selection of Heaney's poetry will explore the linguistic and semantical complexity that occupies landscape space in the geographical north of the Irish Island.

FROM: WHATEVER YOU SAY, SAY NOTHING III

Religion's never mentioned here, of course.
You know them by their eyes, and hold your tongue.
One side's as bad as the other, never worse.
Christ, it's near time that some small leak was sprung

In the great dykes the Dutchman made
To dam the dangerous tide that followed Seamus.
Yet for all this art and sedentary trade
I am incapable. The famous

Northern reticence, the tight gag of place
And times: yes, yes. Of the 'wee six' I sing
Where to be saved you only must save face
And whatever you say, you say nothing.

THE PENINSULA

When you have nothing more to say, just drive
For a day all round the peninsula.
The sky is tall as over a runway,
The land without marks so you will not arrive

But pass through, though always skirting landfall.
At dusk, horizons drink down sea and hill,
The ploughed field swallows the whitewashed gable
And you're in the dark again. Now recall

The glazed foreshore and sillouhetted log,
That rock where breakers shredded into rags,
The leggy birds stilted on their own legs,
Islands riding themselves out into the fog

And drive back home, still with nothing to say
Except that now you will uncode all landscapes
By this: things founded clean on their own shapes,
Water and ground in their extremity.

THE STATIONS OF THE WEST

On my first night in the Gaeltacht the old woman spoke to
me in English: You will be all right. I sat on a twilight bedside
listening through the wall to fluent Irish, homesick for a
speech I was to extirpate.
I had come west to inhale the absolute weather. The visionaries
breathed on my face a smell of soup-kitchens, they
mixed the dust of croppies graves with the fasting spittle of
our creed and anointed my lips. Ephete, they urged. I blushed
but only managed a few words.
Neither did any gifts of tongues descend in my days in that
upper room when all around me seemed to prophesy. But still
I would recall the stations of the west, white sand, hard rock,
light ascending like its definition over Rannafast and Errigal,
Annaghry and Kincasslagh: names portable as altar stones,
unleavened elements.

These three selected works have a common thread weaving through them. That is the ability to speak knowingly from the perspective of the home insider, viewing the different dimensions of the surrounding environment. One is reminded of the Biblical aphorism of "If the stones could speak." In the excerpt from *Whatever You Say Say Nothing*, the speaker explores the semantical terrain of the northern Irish landscape.

The patchwork of sectarianism does not correspond to any rational geography. Lines and boundaries twist and turn. Words are used as both masks and passwords. This exemplifies the linguistic complexity that occupies the social aspect of this landscape. Silence is the best cloak in such an environment. The statement "Whatever you say say nothing" is a familiar refrain. Living in Glencolumbkille, County Donegal, I was constantly reminded by a man nicknamed "King" of that line. He would drink at the sleeve end of the bar, a tailor by trade but a drinker for life. The lack of the ability to truly express oneself is what the speaker is struggling with in this first poem.

The Peninsula hints towards a form of transcendence, which actually brings the speaker into touch with the physical geography of the northern Irish landscape. This is also a journey through a tirtha. (In the Hindu tradition, tirthas are sacred places. The term tirtha literally means crossing; i.e. they are places where one crosses over to far shores or crosses up to the realm of heaven). Singh (1993) notes that a sacred space is a central place of hierophany, where a divine or transcendent dimension breaks through into everyday life. Traveling to the northern Irish coast brings the speaker this tirthic form of solace. Within this solace is the end of the sectarian linguistic labyrinth that the speaker has traveled from. In the face of the powerful physical geography of the terrain, words—and what they represent, convey and express—simply have no ability or power in this space to shape a sense of place. The sense of place here is found in, and formed by the natural terrain. The speaker is reminded of the vastness of nature and the sectarianism that has him in the first poem struggling for expression is diminished in the face of it. However this solace does not bring the speaker to a form of expression. But it does prove to be a balm for the soul. It is interesting to note that the extremity that characterizes this landscape, also characterizes the various sectarian divides in the northern Irish social landscape.

Stations of the West takes place within a Gaeltachta, or an Irish speaking region of Ireland. This poem is probably set in the Republic of Ireland, as the Gaeltachtas are located along the geographical West coast of Ireland, hence the title of the poem. The speaker seems to be a pilgrim of sorts. The symbolism in the poem invokes the Catholic ritual of communion and the image of the Last Supper and the Pentecost, where the tongues of flame descended upon Christ's Apostles anointing them with the gift of tongues. The speaker is struggling to learn Gaelic. In this struggle he feels both at home and alienated. He listens "Through the wall to fluent Irish, homesick for a speech [he] was to extirpate." As in the second poem the speaker invokes the landscape of the stations of the west, "White sand, hard rock, light ascending like its definition over Rannafast and Errigal..." It seems as if the landscape in both poems gives the speaker

a sense of balance. It provides ballast for his semantical and linguistic journey towards expressing a balanced perception of his environment.

This following text selection provides a description of the bog landscape and utilizes it as a metaphor. This metaphor provides a link between the past and the future of this landscape, as well providing a sense of the universal, which Kearney (1997) has noted unites the "parish and the cosmos" and in doing so permeates all diasporatic Irish landscapes.

BOGLAND

We have no praries
To slice a big sun at evening-
Everywhere the eye concedes to
Encroaching horizon,

Is wooed into cyclop's eye
Of a tarn. Our unfenced country
is bog that keeps crusting
Between the sights of the sun.

They've taken the skeleton
Of the Great Irish Elk
Out of the peat, set it up,
An astounding crate full of air.

Butter sunk under
More than a hundred years
Was recovered salty and white.
The ground itself is kind, black butter

Melting and opening underfoot,
Missing its last definition
by millions of years.
They'll never dig coal here,

Only the waterlogged trunks
Of great firs, soft as pulp.
Our pioneers keep striking
Inwards and downwards,

Every layer they strip
Seems camped on before.
The bogholes might be Atlantic seepage.
The wet centre is bottomless.

Bogland, is a geo-poem describing a landscape that covers much of the geographical north and west of the Irish island. The bog is a common term and at times it is used pejoratively to describe a wasteland. However, the poem does not refer to it in this light. The bog has an organic presence and has been a major resource of fuel for heat. It is also a

striking and defining feature of the Irish landscape, much like the moors are in Scotland. It seems to be alluded here by Heaney as both a sepulchre and historical treasure vault, holding the remnants of both pre-colonized and pre-Christian Irish civilization. Heaney in this poem also invokes a metaphorical allusion to the coherence of space as, Wet...bottomless. Kearney (1997) writes that the allusion of a bottomless center bespoke to a more global circumference, once again a reference to the unity of the parish and the cosmos. In *Bogland*, Heaney is utilizing the distinctiveness of an aspect of Irish landscape and connecting it to a greater whole. Ireland whether politically united or not, is still a geographical feature that is surrounded by ocean and therefore is united in its geographical insularity. The allusion to 'Atlantic seepage' creates a passage through the bog to a greater supranational and diasporatic whole. The bog therefore provides the metaphorical transcendent passage to a greater global identity. In this respect the metaphor of the bog acts somewhat like a tirtha, which provides the passage or a crossing to a transcendent perception. While it seems inhospitable on face value, the value of the bog is immense. It has supported life for centuries in the face of invasion, colonialism and sectarian nationalism. It now serves as a metaphor that Heaney uses to both deepen and globalize the Irish identity. Notes Welch (1993) "Bogland'...announces a theme...that of lost and neglected areas of memory and understanding, tribal and psychological...the writing conveys the atmosphere of strenuous effort applied to a hidden secrecy, now opening at last. Those engaged in this activity are pioneers; they are not reciters of the litanies handed out by schools, courts or churches."

With the next selection of poetic text, Heaney approaches the cultural landscape of Northern Ireland as a sort of poetic archaeologist. As in the previous poem, *Bogland*, Heaney is a pioneer, "Striking inwards and downwards...". The poet, influenced by the Danish Archaeologist P.V. Glob's text, *The Bog People* (1969) (which described the bodies of Iron-Age Celtic ritual killing victims found remarkably preserved in a peat bog in Denmark), visited the bog-site. Both the book and the visit to the peat bog, where he gazed upon the preserved body of the Tollund Man, had a profound and insightful effect upon him. Recalls Heaney (1994) "The unforgettable photographs of these victims blended in my mind with photographs of atrocities, past and present, in the long rites of Irish political and religious struggles."

THE TOLLUND MAN

I

Some day I will go to Aarhus
To see his peat-brown head,
The mild pods of his eye-lids,
His pointed skin cap.

In the flat country nearby
Where they dug him out,
His last gruel of winter seeds
Caked in his stomach,

Naked except for
The cap, noose and girdle,
I will stand a long time,
Bridegroom to the goddess,

She tightened her torc on him
And opened her fen,
Those dark juices working
Him to a saint's kept body,

Trove of the turfcutters'
Honeycombed workings.
Now his stained face
Reposes at Aarhus.

II

I could risk blasphemy,
Consecrate the cauldron bog
Our holy ground and pray
Him to make germinate

The scattered, ambushed
Flesh of labourers,
Stocking corpses
Laid out 'in the farmyards,

Tell-tale skin and teeth
Flecking the sleepers
Of four young brothers, trailed
For miles along the lines.

III

Something of his sad freedom
As he rode the tumbril
Should come to me, driving,
Saying the names

Tollund, Grauballe, Nebelgard,
Watching the pointing hands

Of country people,
Not knowing their tongue.

Out there in Jutland
In the old man-killing parishes
I will feel lost,
Unhappy and at home.

Heaney's 'excavation' of the Tollund Man and the subsequent resurrection of him upon the page weaves in a 'sectarian' murder committed by Northern Ireland's auxiliary police force, the B Specials. The murder takes place in the 1920s and in the Tollund Man, Heaney is explicit in his comparison of the body of the Tollund Man, a victim of ritual sacrifice and the bodies of 'four young brothers'. The brothers were dragged by a train, their 'Tall-tale skin and teeth/Flecking the sleepers'. Heaney's theme in this poem is ritual murder, perpetrated both in Iron-Age Denmark and in 20th century Ireland. He admits at the end of the poem that "In the old man-killing parishes/I will feel lost, /Unhappy and at home."

The ritual of murder has expressed itself through out Celtic history, especially among tribal groups indigenous to the northern Irish landscape. In visiting the gravesite of the Tollund man, Heaney connected figuratively the ritual murder stemming from the Celtic Iron-Age cultures to his own contemporary Northern Irish culture. Notes Vendler (1998) "The bog bodies [such as the Tollund man]...persuaded [Heaney] that ritual killing had been a feature of Northern tribal culture in a wide geographical swath: that immediate history alone did not begin to explain the recrudescence of violence in Northern Ireland."

Heaney himself comments on this connection in a 1979 interview in *Ploughshares* magazine by J. Randall,

"The Tollund Man seemed to me like an ancestor almost, one of my old uncles, one of those moustached archaic faces you used to meet all over the Irish country side. I felt very close to this. And the sacrificial element, the whole mythological field surrounding these images was very potent. So I tried, not explicitly, to make a connection between the sacrificial, ritual, religious element in the violence of contemporary Ireland and this terrible sacrificial religious thing in *The Bog People*. This wasn't thought out. It began with a genuinely magnetic, almost entranced relationships with those heads..."

One can surmise that Heaney's collective unconscious was presenting itself into his active imagination. Jung's 'primordial' thoughts were asserting themselves...an archetype was being extracted and recognized. Continues Heaney in the 1979 interview,

"And when I wrote that poem, I had a sense of crossing a line really, that my whole being was involved in the sense of -the root sense-of religion, being bonded to something, being bound to do something. I felt it a vow; I felt my whole being caught in this..."

Heaney had crossed the border from the collective unconscious to the consciousness of his poetic 'active imagination'. This is not say that the insight was imagined. Far from it. What Heaney recognized and inscribed into text was the hereditary strand that culture produces regardless of political or social boundary. The Iron Age ritual killings and the sectarian landscape of murder were embodied within different transpositions of history, yet the out come was the same...murder, whether under the guise of a Celtic goddess, a Christian religious creed, or a sectarian political assumption. The landscape did not provide abstract justifications for these killings; it merely provided the repository archetype, which defined the cultural and historical borders transposed upon it.

The next three selections of Heaney's poetry form a triad that express an awareness of the fatal complexity of these inner and outer borders upon the northern Irish landscape. They also describe the supranational tendency inhabiting the human character to cross the artificial and politically imposed borders both at the cost and creation of life itself.

I TERMINUS

(5th Stanza)

Two buckets were easier carried than one.
I grew up in between.
My left hand placed the standard iron weight.
My right tilted a last grain in the balance.
Baronies, parishes met where I was born.
When I stood on the central stepping stone.
I was the last earl on horseback in midstream
Still parleying, in earshot of his peers.

II CASUALTY

I.
He would drink by himself
And raise a weathered thumb
Towards the high shelf,
Calling another rum
And blackcurrant, without
Having to raise his voice,
Or order a quick stout
By a lifting of the eyes
And a discreet dumb-show
Of pulling off the top;
At closing time would go

In waders and peaked cap
Into the showery dark,
A dole-kept breadwinner
But a natural for work.
I loved his whole manner,
Sure-footed but too sly,
His deadpan sidling tact,
His fisherman's quick eye
And turned observant back.

Incomprehensible
To him, my other life.
Sometimes, on his high stool,
Too busy with his knife
At a tobacco plug
And not meeting my eye,
In the pause after a slug
He mentioned poetry.
We would be on our own
And, always politic
And shy of condescension,
I would manage by some trick
To switch the talk to eels
Or lore of the horse and cart
Or the Provisionals.

But my tentative art
His turned back watches too:
He was blown to bits
Out drinking in a curfew
Others obeyed, three nights
After they shot dead
The thirteen men in Derry.
PARAS THIRTEEN, the walls said,
BOGSIDE NIL. That Wednesday
Everybody held
His breath and trembled.

2.

It was a day of cold
Raw silence, wind-blown
Surplice and soutane:
Rained-on, flower-laden
Coffin after coffin
Seemed to float from the door
Of the packed cathedral
Like blossoms on slow water.
The common funeral
Unrolled its swaddling band,
Lapping, tightening
Till we were braced and bound
Like brothers in a ring.
But he would not be held
At home by his own crowd
Whatever threats were phoned,
Whatever black flags waved.

I see him as he turned
In that bombed offending place,
Remorse fused with terror
In his still knowable face,
His cornered outfaced stare
Blinding in the flash.

He had gone miles away
For he drank like a fish
Nightly, naturally
Swimming towards the lure
Of warm lit-up places,
The blurred mesh and murmur
Drifting among glasses
In the gregarious smoke.
How culpable was he
That night when he broke
Our tribe's complicity?
'Now, you're supposed to be
An educated man,'
I hear him say. 'Puzzle me
The right answer to that one!'

3.

I missed his funeral,
Those quiet walkers
And sideways talkers
Shoaling out of his lane
To the respectable Purring of the hearse...
They move in equal pace
With the habitual
Slow consolation
Of a dawdling engine,
The line lifted, hand
Over fist, cold sunshine
On the water, the land
Banked under fog: that morning
When he took me in his boat,
The screw purling, turning
Indolent fathoms white,
I tasted freedom with him.
To get out early, haul
Steadily off the bottom,
Dispraise the catch, and smile
As you find a rhythm
Working you, slow mile by mile,
Into your proper haunt
Somewhere, well, out beyond...

Dawn-sniffing revenant,
Plodder through midnight rain,
Question me again.

III A PEACOCK'S FEATHER

Six days ago the water fell
To name and bless your fontanel
That seasons towards womanhood,
But now your life is sleep and food
Which, with the touch of love, suffice
You, Daisy, Daisy, English niece.

Gloucestershire: its prospects lie
Wooded and misty to my eye
Whose landscape, like your mother's was,
Is other than this mellowness
Of topiary, lawn and brick,
Possessed, untraversed, walled, nostalgic.

I come from scraggy farm and moss,
Old patchworks that the pitch and toss
Of history has left dishevelled.
But here, for your sake, I have levelled
My cart-rut voice to garden tones,
Cobbled the bog with Cotswold stones.

Ravelling strands of families mesh
In love-knots of two minds, one flesh.
The future's not our own, we'll weave
An in-law maze, we'll nod and live
In trust but little intimacy-
So this is a billet-doux to say

That in a warm July you lay
Christened and smiling in Bradley.
While I, a guest in your green court,
At a west window sat and wrote
Self-consciously in gathering dark,
I might as well be in Coole Park!
So before I leave your ordered home
Let us pray: may tilth and loam
Darkened with Celts' and Saxons' blood
Breastfeed your love of house and wood.
And I drop this for you, as I pass,
Like the peacock's feather in the grass.

These three poems hint at the recognition and crossing of both internal and external borders placed upon and within the northern Irish landscape. In *Terminus*, Heaney speaks of the awareness of a sense of balance that he arrives at while caught in midstream between two banks of a shore. 'Baronies, parishes met where I was born.' Speaks of the class, religious and cultural divides that permeate the northern Irish landscape. The choice of *Terminus*, The Greek god of borders as the title of the poem cements the essence of the poem from the beginning. It is a meditation on the nature of borders.

Casualty is an elegy for a fisherman, a modern Tollund Man, who at home on the sea, where the only boundaries are physical, will not be limited by social boundaries when he places his feet upon the land. The poem speaks of a time frame surrounding 'Bloody Sunday'. On January 30th 1972, Paratroopers from the British army killed thirteen unarmed civil rights marchers in Derry. The IRA reprisals consisted of a series of bombings, which included Loyalist patronized public houses. The fisherman in Heaney's poem, despite warnings to stay within the social boundaries of his own tribe, 'But he would not be held at home by his own crowd..' travels for his nightly drinking session to a pub where a sectarian bomb has been planted. The cost of admission is fatal, as he has crossed the social/sectarian boundaries and his fate becomes a casualty of the 'troubles'. Heaney muses upon this strictly social ordering that has come about due to the political situation imposed upon the landscape. He questions the ethos of this ordering, 'How culpable was he, That night when he broke, Our tribe's complicity?'

Tribal geographies are characterized by the non-linear. Cartesian ordinances do not effectively map out the ebb and flows of tribal existence or thought. To recognize that tribalism was an effective social ordering during the time of the Celts (Kearney, 1997) is to recognize its de-centralized character, which is completely incongruous with the political superstructure imposed upon the landscape of northern Ireland. The mentifacts and social structures of tribalism remain despite this political imposition and in the case of the poem, *Casualty*, delineates invisible yet deeply ingrained cultural boundaries which are not in synchrony with the super imposed political sectarian geography of Northern Ireland.

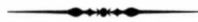
Heaney it seems yearns for a freedom from both the claustrophobic tribalism and the nihilistic superimposed sectarian political geography. Towards the end of the poem he reflects, 'I tasted freedom with him. To get out early, haul steadily off the bottom, Dispraise the catch, and smile as you find a rhythm working you, slow mile by mile, Into your proper haunt somewhere, well out, beyond..' Heaney yearns for a freer existence as exemplified by the life of the fisherman. It is no coincidence I believe that a fisherman was sacrificed in *Casualty*, much like the 'Fisher of Men', Christ was sacrificed at Golgotha. Heaney despite his yearning for the freedom of the supra-national, still unconsciously allows his tribal, Catholic roots to appear within his poetry.

The third poem *A Peacock's Feather* describes the crossing of cultural borders. The serenity of a christening is framed in a poem as a gift to his 'English' niece. He describes 'tilth and loam' as 'Darkened with Celt and Saxon blood'. This intermingling of his Celtic family with a Saxon family describes the crossing of cultural borders. This supranational metaphor

hints at the crossing of deeply ingrained internal borders as an avenue to create a peace process on the outer landscape. And is emblematic of the visionary landscape of the 'fifth' province.

References

- Brandes, Rand.** (1994) *The Dismembering Muse: Seamus Heaney, Ciaran Carson and Kenneth Burke's "Four Master Tropes"* in Rickard, John (ed) *Irishness and (Post) Modernism* Bucknell University Press.
- Carpenter, Andrew. Fallon, Peter.** (1980) *The Writers: A Sense of Ireland.* George Braziller, N.Y.
- Glob, P.V.** (1969) *The Bog People.* Faber
- Heaney, Seamus.** (1995) *Nobel Laureate Acceptance Speech, Oslo Norway.*
- Heaney, Seamus.** (1990) *Selected Poems 1966-1987.* The Noonday Press.
- Heslinga, M.W.** (1971) *The Irish Border As A Cultural Divide.* Assen.
- Jackson, Kenneth.** (1971) *Common Gaelic: The Evolution of the Goedic Languages.* In *Proceedings of the British Academy* XXXVIII, 71-97.
- Johnston, R.J.** (1997) *Geography & Geographers: Anglo-American Human Geography since 1945* 5th Ed. Arnold.
- Jung, Carl, G.** (1971) *The Portable Jung.* Penguin Books.
- Kearney, R.** (1997) *Postnationalist Ireland: Politics, culture, philosophy.* Routledge.
- Kearney, R.** (1988) *Transitions: Narratives in Modern Irish Culture.* Manchester University Press.
- Kearney, R.** (1985) *The Irish Mind: Exploring Intellectual Traditions.* Wolfhound Press.
- Levi-Strauss, Claude.** (1968) *Structural Anthropology.* Penguin
- Purdon, Edward.** (1999) *The Story of the Irish Language.* Mercier Press.
- Rasndall, J.** (1979) *Interview with Seamus Heaney* Ploughshares 5.
- Relph, E.** (1976) *Place and Placelessness.* London: Pion.
- Samuels, M.S.** (1978) *Existentialism and Human Geography.* In D. Ley and M.S. Samuels (eds) *Humanistic Geography: Problems and Prospects.* Chicago: Maaroufa Press, 22-40.
- Sauer, C. O.** (1925) *The Morphology of Landscape.* University of California Publications in Geography.
- Seamon, D.** (1976) *Phenomenological Investigation of Imaginative Literature* in G.T. Moore and R.G. Golledge (Eds) *Environmental Knowing: Theories, Research and Methods.* Stroulsburg Pa.: Dowden, Hutchinson and Ross.
- Singh, Rana P.B.** (1993) *The Spirit & Power of Place. Human Environment & Sacrality.* National Geographical Journal of India, Vol 40, 1994: 5-10.
- Tuan, Yi-Fu.** (1971) *Geography, Phenomenology and the Study of Human Nature.* The Canadian Geographer Vol 15.
- Vendler, Helen.** (1998) *Seamus Heaney.* Harvard University Press.
- Welch, Robert.** (1993) *Changing States: Transformations in Modern Irish Writing.* Routledge.
- White, P. E.** (1985) *On the Use of Creative Writing in Migration Study.* Area 17.



Watershed Management and Enhancement for the Morro Bay National Estuary: A Geographic Appraisal

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Introduction

Watershed management and water quality are central concerns in the area of natural resource management. Geographers' concern with regions and complex human and environmental interactions means that the profession has much to contribute to the study of watershed function, management, and change. This paper discusses the geographic implications of watershed management for water quality within the context of the Morro Bay National Estuary on the central coast of California. A discussion of the geographic and organizational issues related to watersheds leads to a regional overview of Morro Bay and its watershed, followed by a description of the locally led effort to organize a watershed management initiative and identify the problems affecting water quality. Enhancement projects implemented so far are outlined before an examination of the challenges that must be overcome in the watershed management process, based on experience in the Morro Bay area.

Regions and Watersheds

We have all heard the popular expression—*think globally, act locally*. Forman (1995, p.488) suggests that the optimum scale for planning is the region. A region is a geographic unit of the earth's surface that contains distinctive patterns of physical geography (e.g., climate, geology, vegetation) or human development (e.g., land use, policy, culture). A region encompasses a common sphere of human activity that links the physical environment with the human dimensions of resource utilization and landscape change.

A watershed is a geographic region. A watershed is all of the land area that drains to a common end point, such as a river, lake, or estuary. Sommarstrom (1994) accurately predicted that watershed management would be the hot topic in natural resource management for the decade of the 1990s. National policies often impose blanket rules that fail to consider the uniqueness of local resources and problems. Meanwhile, local policy and planning efforts can be piecemeal and unable to

transcend and link the complexity of larger issues and institutions. Watershed management provides an integrated regional approach to managing natural resources, at a scale that makes sense for planning.

Richard Wilson (1994), former director of California Department of Forestry and Fire Protection, stated that the watershed is a fundamental building block of landscape. Whereas political and administrative boundaries are artificial and typically drawn to exclude, watershed boundaries are inherently inclusive of many natural and social processes. People can relate to watersheds as both natural resource and community units. Wilson adds that watersheds are an important part of their sense of place, especially for rural dwellers. Individuals often identify strongly with a region or regional culture. This regionalism can act as a cohesive force and a catalyst for action. Furthermore, watersheds often transcend county and even state boundaries, thus emphasizing the need for coordinated management with a spatial component.

The analytical framework of geography has much to contribute to the understanding of watersheds and their management. Geography is a field of study that focuses on the interrelationships between the physical environment and human activities on the earth. It is a holistic discipline that links people and the land. As geographers, we must cultivate this human connection to the land, especially among urban dwellers, and provide a means through which people can learn how watersheds function, understand the human impacts on watershed health, and participate in the management of a watershed's resources. Geographers also study regions. A comprehensive regional approach that links natural resources and land use planning issues can aid in understanding and solving problems.

The 1990s saw the proliferation of over 1,500 locally led watershed management initiatives in the United States (Lant 1999). Griffen (1999) uses the term *watershed council* to describe an emerging form of public participation in natural resource management that includes local stakeholders in the resource management process. These efforts represent a trend toward private-public partnerships that bring together governmental institutions, non-governmental organizations, and individuals to manage local resources and land uses within a complex political and legal environment. The watershed council is a pragmatic action-oriented vehicle for resource managers and stakeholders to address common concerns at a scale the makes sense socially, ecologically, and spatially.

The policy impetus behind the watershed management movement is the enhancement of water quality. Water is an essential resource and serves vital functions for municipal water supply, agriculture,

recreation, and wildlife. Land management practices and other human impacts have the potential to affect the quality of water, and either enhance or degrade the activities that rely on it. Kenney (1999) notes that water links a host of otherwise distinct interests and activities, demanding coordinated planning and action at physically relevant regional scales.

Current water pollution law traces its roots to The Federal Clean Water Act, passed in 1972 (Gallagher and Miller 1996). The Clean Water Act addressed "point source" pollution, such as discharges from a factory or wastewater pipe. The Act was amended in 1987 to address "nonpoint" source pollution, which is the result of run-off over large or diffuse areas. Common non-point sources of pollution are fertilizer and pesticide runoff from agricultural lands, fecal contamination from rangelands, soil erosion, and a multitude of pollutants in urban storm runoff. Nonpoint source pollution often has no single identifiable source, meaning it is more difficult to locate, address, or regulate than point source pollution. Therefore, the organizational and geographic characteristics of watershed management provide an appropriate and effective mechanism for addressing problems related to water quality and nonpoint source pollution.

Morro Bay and Its Watershed

Morro Bay is the most important wetland system in central California between Monterey and Point Conception. The bay's 2,300 acres serve as habitat for migratory birds, as a nursery for numerous fish species, and as home to a diverse collection of wildlife, many of which are endemic to the region (MBNEP 2000b). The Bay and surrounding area are one of the last relatively undeveloped and unspoiled places along California's coast. Morro Rock, a 587-foot volcanic plug at the entrance of the bay, is symbolic of the scenic beauty of the region that attracts visitors from all over the globe.

The Morro Bay watershed is all of the land area that drains into the bay (Figure 1). The watershed covers approximately 48,450 acres or 75 square miles. The highest elevation within it is 2,763 feet above sea level, and the furthest point extends 10 miles from the bay. The watershed is comprised of two major sub-watersheds. Chorro Creek drains approximately 60% of the watershed and Los Osos Creek drains 40% of the watershed. The climate and vegetation of the area are quintessentially Mediterranean. Winter storms deliver up to 22 inches of annual rainfall, while summer is characterized by a near absence of rainfall that accounts for the region's golden brown hills. The primary vegetation types are annual grasslands, oak woodland, and chaparral.

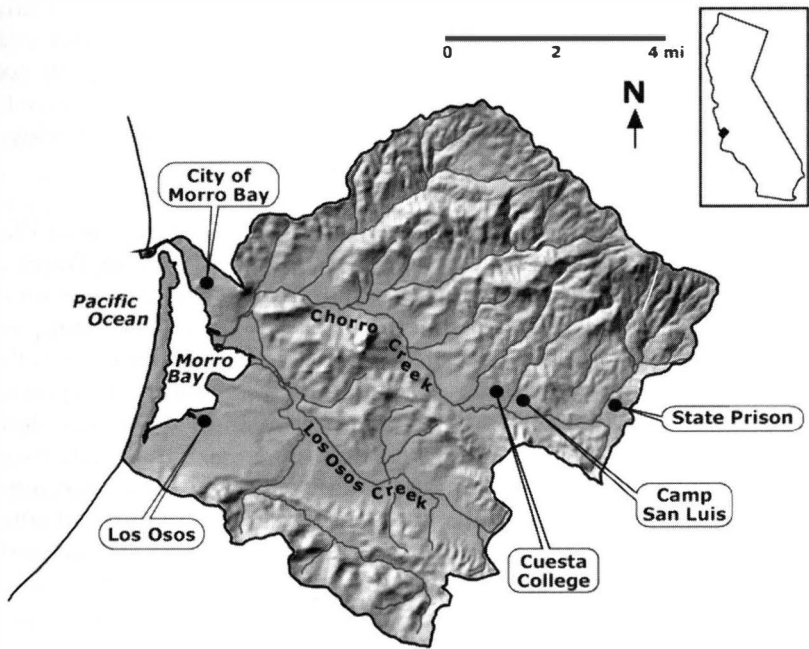


Figure 1: Morro Bay Watershed

The population of the Morro Bay watershed has doubled to approximately 40,000 over the last thirty years, with proportional impacts on the natural resources. The two principal urban centers are the city of Morro Bay, with a population of 9,845, and the unincorporated area of Los Osos/Baywood Park, encompassing a population of 18,000. In 1970, the Los Osos area had only 3,450 residents. Despite this rapid growth, Los Osos residents still rely on septic tanks. The other major population center is the state prison (California Men's Colony) that contains an inmate population of 9,000. The prison relies on a wastewater treatment plant that was installed in 1943, and suffers frequently from technical problems. Cuesta Community College, with an enrollment of nearly 8,000 students, also affects the watershed, as does the National Guard Camp San Luis Obispo, with 1,000 members.

The resources of Morro Bay and its watershed support numerous economic uses. The Bay is home to 75 commercial fishing boats, earning \$4.6 million annually (CDFG 1999). Recreation and tourism draw an average of 4,000 tourists per day to the bay and surrounding area. The Morro Bay watershed has three state parks, a county park, three camp-

grounds, two 18-hole golf courses, two bird sanctuaries, and numerous designated nature trails. Other recreation activities include swimming, boating, kayaking, whale-watching excursions, and sightseeing. Tourism and visitor services dominate the economy of the City of Morro Bay, accounting for 37 percent of all jobs in the city and one-third of the city's general fund revenues (MBNEP 2000b). Morro Bay has 42 motels, and the scenic beauty of the area is a primary draw for the people who stay in them. A strong local economy is clearly linked to good environmental management.

The State Water Resources Control Board (referred to as the Regional Board) is the state agency that regulates water quality. The United States EPA and the Regional Board have identified 18 *beneficial uses* of the waters of the bay and watershed (Table 1). A beneficial use can be anything that relies on the water supply in a given watershed area. Table 1 reveals a complex pattern of land and water use in the Morro Bay watershed. The uses can be summarized into three general categories—economic, social, and environmental (or biological). It is also evident that some of these multiple uses are competing or mutually incompatible. Protecting for one use may degrade another. By law, however, all of the uses are protected, which means that a balance must be found that protects them all. Stakeholder groups must consider the needs of others in an effort to find a balance that protects and optimizes the most uses. Furthermore, Morro Bay and Chorro and Los Osos Creeks are listed as impaired by the state (SWRCB 1999), meaning that the activities in the watershed are subject to regulation in order to enhance water quality.

Table 1: Beneficial Uses of the Waters of the Morro Bay Watershed

| |
|--|
| Agricultural water supply |
| Commercial and sport fishing |
| Navigation |
| Aquaculture |
| Shellfish harvesting |
| Water contact and non-contact recreation |
| Industrial service supply: cooling water for electric power generation |
| Wildlife habitat |
| Rare and endangered species habitat |
| Municipal and domestic waters supply |
| Groundwater recharge |
| Cold freshwater habitat |
| Warm freshwater habitat |
| Migration of aquatic organisms |
| Spawning, reproduction, and/or early development of fish |
| Biological habitat of special significance |
| Estuarine habitat |
| Freshwater replenishment |

(Source: MBNEP 2000b)

The Organizational Effort

In 1966, the California State Senate declared, “the preservation of Morro Bay’s fish, wildlife, recreational, and aesthetic resources was of great importance to the people of California” (MBNEP 2000a). The resolution also recognized the need for a comprehensive approach to managing the resources of the estuary and watershed. In the early 1970s, the Morro Bay Task Force was formed and developed the first management plan. Lack of community involvement meant that this effort faded and resulted in no lasting action.

In 1986, the Task Force was reestablished. This time, the effort was supported by the creation of two non-governmental organizations. The Bay Foundation manages restoration funds, while The Friends of the Estuary promotes education and advocacy. Over time, the Task Force grew to more than 250 participants. In 1990, the California State Assembly affirmed the importance of the bay and supported the nomination of Morro Bay as a National Estuary. In that year, a “State of the Bay” conference was held. In 1994, the Governor established Morro Bay as California’s first State Estuary, stating the bay was “one of the state’s rare natural treasures” (MBNEP 2000a). In 1995, after nearly two decades of grassroots efforts, U.S. EPA named Morro Bay a National Estuary, one of only twenty-eight in the nation. The Morro Bay National Estuary Program (MBNEP) was formed, which receives \$300,000 annually from EPA. However, MBNEP is a public-private partnership. The organization also receives financial and material support from the Regional Board (a state agency), and the Bay Foundation (a non-governmental organization) holds and disperses program funds.

The purpose of the Morro Bay National Estuary Program is the development and implementation of a Comprehensive Conservation Management Plan, or CCMP (MBNEP 2000a). The generation of the CCMP involved a coordinated local effort to bring together all of the stakeholder groups. The goals of the CCMP are to restore and maintain the health of the Bay and watershed, to address point and non-point sources of pollution, and to protect the beneficial uses of the waters and resources of the bay and watershed. In July of 2000, after four years of research and community meetings, the MBNEP staff completed the CCMP for Morro Bay and its watershed. To bolster the watershed management process, in 1997 the MBNEP was awarded \$3.7 million from water quality mitigation funds levied on PG&E’s Diablo Canyon nuclear power plant.

The guiding principles for implementing the CCMP include federal, state, and local coordination, private/public partnership, public involvement

in decision-making, and scientific credibility. A high level of governmental participation is essential because of the legal, regulatory, financial, and policy actions that are required to change the way natural resources are managed. Public involvement, especially among business and agricultural interests, is important in order to gain support for the policy changes and for the acceptance of new land management practices. Good scientific data add credibility to the call for change.

The organizational structure for CCMP implementation is composed of the executive committee, the implementing committee, the task force, and the MBNEP staff. The eleven-member executive committee is the policy and decision-making body. The membership on the committee represents a balance of sectoral and regional interests. Government at all levels is represented and includes U.S. EPA, the Regional Board, San Luis Obispo County, City of Morro Bay, and Los Osos Community Services District. Non-governmental interests are represented by the Bay Foundation and stakeholder groups such as agriculture, commercial fishing, and environmental organizations.

The function of the implementing committee is to provide professional review of CCMP actions, including research, evaluation, and monitoring. Committee members are organized into technical, finance, and outreach education work groups. The task force is open to all interested participants and acts as a public forum for information sharing. The role of the MBNEP staff is the coordination and management of all activities that are carried out under the MBNEP umbrella. Staff are the day-to-day managers who administrate the program. The MBNEP staff includes a program director, a scientific coordinator, a public outreach coordinator, interns, and an office manager.

Priority Problems

Morro Bay National Estuary Program staff, through research and public outreach efforts, identified six *priority problems* affecting water quality in Morro Bay and the watershed (MBNEP 2000a). The most important problem is accelerated sedimentation of the bay. Tetra Tech's (1998a) bathymetric survey and Haltner's (1988) historic data (from 1884, 1919, 1935, and 1987) indicate that Morro Bay is filling in with sediment at ten times the rate that would be expected without human disturbances in the watershed. Between 1884 and 1998, the mean high water area of the bay decreased by about 15 percent, and the area at the lowest tides decreased by about 60 percent. Without mitigation, the bay will fill completely in 300 years and threaten many of the beneficial uses in the process. Sediment is a direct threat to estuarine and freshwater habitat and is detrimental to navigation and the fishing industry. The Army

Corps of Engineers dredges the main navigation channel in the bay every five years, at a cost of \$4.56 per yard of sediment removed (MBNEP 2000b).

The Tetra Tech sediment loading study (1998b) surprisingly indicated that the most significant source of sediment in Morro Bay was erosion from chaparral-covered National Forest lands in the higher elevations of the watershed. These lands are periodically scorched by wildfires, and when followed by a high precipitation El Niño year, several feet of sediment can be deposited in the bay in a single year. This indicates that not all sources of erosion are human caused, and also emphasizes the need for cooperation among all levels of government in local watershed management efforts. Eroding streambanks are another important cause of erosion, especially when riparian vegetation has been deliberately removed or when the banks are trampled by cattle. Other sources of erosion include bare ground in farm fields, improperly installed or maintained unimproved roads and culverts, and urban run-off from construction sites and other non-vegetated areas.

The second priority problem is high bacteria levels. One of the main contributors is failing septic systems. This is especially true for Los Osos/Baywood Park, an urbanized area of 18,000 people without a public sewage treatment facility. In 1998, after years of disagreement, the state mandated the installation of a sewer, but problems related to cost, location, design, and permitting have delayed construction. Discharged effluent from the state prison (inmate population 9,000) is often contaminated because of treatment plant failures. Illegally moored boats and improper marine sewage disposal present additional problems. Other sources of bacteria include domestic animal waste and runoff from rangeland cattle operations. High bacteria levels threaten recreation, a commercial shellfish operation in the bay, and the drinking water supply in Los Osos/Baywood Park.

The third priority problem is nutrients, primarily in the form of nitrogen. Excess nutrients promote the growth of algae that reduces the level of dissolved oxygen in the water, resulting in degraded habitats and fish kills. The primary causes of nutrient pollution are leaking and failing septic systems, urban and agricultural fertilizer runoff, wastewater discharges, and animal waste.

The fourth priority problem is low levels of freshwater flow in the dry season. This problem affects habitat such as stream environments that support the endangered steelhead trout. Agricultural water supply and groundwater recharge are also threatened. Chorro and Los Osos Creeks are "fully appropriated" for much of the year, and extraction sometimes

exceeds flow when water is poorly managed. In addition, urban users continue to waste water as many people treat water as ubiquitous and basically a free good. They often do not understand where their fresh water originates and the impacts they have on the watershed.

The fifth priority problem is toxic pollutants. Urban runoff contains oil, gasoline, tire and brake-pad dust, household chemicals, and industrial contaminants. Pesticides are the primary agricultural pollutant. Other sources include runoff from inactive mine tailings, solid waste disposal areas, illegal chemical disposal, and boat paints and boat repair activities. Toxic pollutants affect fish spawning and other habitats, shellfish harvesting, and water recreation.

The final priority problem is habitat loss. This problem is integrally linked to the other problems mentioned above because development, agriculture, and recreation all can damage habitat. Some of the most threatened habitats are eelgrass beds, wetlands, coastal dune scrub, and riparian area vegetation.

The discussion of the priority problems indicates that there are a large number of causes of impaired water quality in Morro Bay and its watershed. However, identifying the problems is only the first step toward enhancement of the region's resources. The challenge lies in finding solutions that can effectively address multiple problems that have multiple contributors. An integrative regional approach that links human impacts and land processes is required for sustained progress. The comprehensive conservation management plan (CCMP) represents an effort at such an approach.

Enhancement Projects

Although the CCMP was only recently completed and the MBNEP is just entering the implementation phase, affiliated agencies have been working to address the problems identified above and to enhance resource management practices in the Morro Bay watershed. The Morro Bay Watershed Enhancement Project (MBWEP) funded projects from 1991 to 1999 (Robbins 1999)¹. Approximately \$1.2 million dollars were spent on more than 235 water quality enhancements (Figure 2).

The MBWEP installed a sediment trap at Chorro Flats near the mouth of Chorro Creek. In the late 1940s, Chorro Creek was channeled into a 15-foot high levee, the riparian vegetation on Chorro Flats was cleared, and the area was put into irrigated agriculture. The levying of Chorro Creek increased the depth and velocity of its flow, thereby increasing the sediment load carried directly into the bay. In 1993, 85 acres were

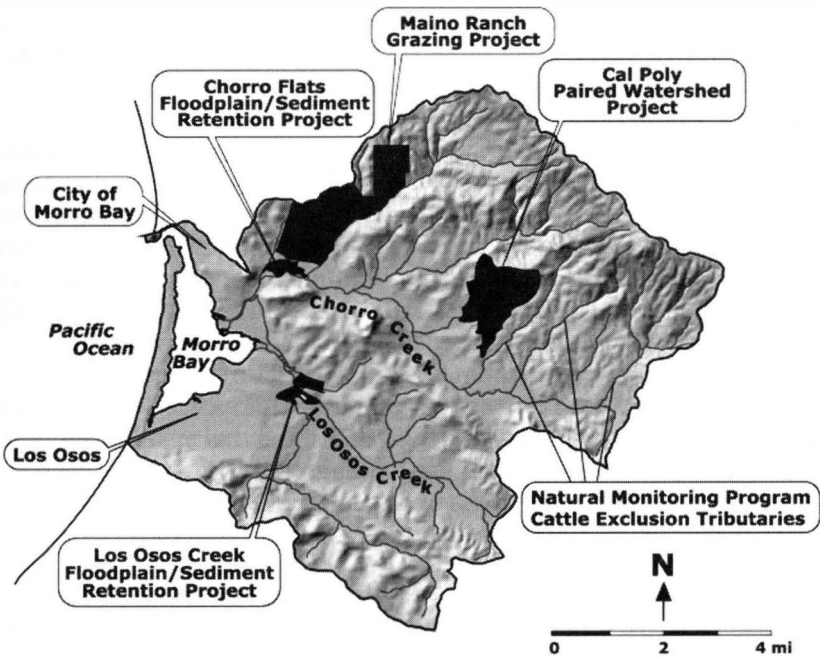


Figure 2: Enhancement Projects in the Morro Bay Watershed

purchased to create the Chorro Flats Sediment Trap and Habitat Restoration Project. A new levee was built to recreate a wetland area, and the floodplain was revegetated. The total project cost was \$700,000. High flows during storms spread over Chorro Flats, allowing the water to slow and sediment to drop onto the floodplain before reaching the bay (Figure 3). A 1999 USDA Natural Resources Conservation Service (NRCS) topographic and sediment field survey concluded that 213,000 tons of sediment had been captured, and that 85% of the bed load and 17% of the fine material carried by Chorro Creek is being deposited in Chorro Flats. Approximately one-quarter of the sediment from the entire watershed is captured by this one enhancement project. The history of Chorro Flats also demonstrates how perceptions and use of natural resources change over time.

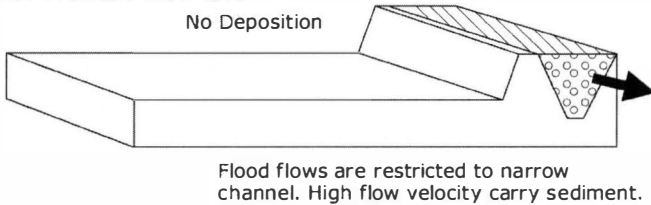
In 1995, the MBWEP created a wetland reserve on Los Osos Creek, meaning that both major creek systems in the Morro Bay watershed now have sediment deposition areas. The project obtained a conservation easement on 144 acres of private land just upstream from the estuary. One hundred and eleven acres were allowed to flood and return to riparian habitat. Thirty-three acres were placed in an agricultural easement and permanently protected. Despite remaining in private hands,

the land cannot be cleared or developed. By 1999, the site had already trapped an estimated 135,000 tons of sediment.

The Watershed Enhancement Project also assisted landowners in stabilizing severely eroded streambanks. A stabilization project typically involves grading, bank stabilization (often with large boulders), and vegetation plantings. NRCS engineered the projects, obtained the permits, and provided cost share assistance. This experience illustrates that private landowners may not have the technical or financial means to implement many watershed enhancement activities, and emphasizes the need for a cooperative approach to watershed management.

Another important component of the MBWEP was to work with cattle ranchers to stop sediment at the source, especially given that rangeland accounts for approximately 60% of the land area in the watershed. NRCS and UC Cooperative Extension provided education, technical assistance, and cost share funds to help ranchers implement so-called best management practices to reduce non-point source pollution. The Maino Ranch demonstration project is the centerpiece of this effort. The ranch owner runs 210 commercial beef cows on 2,250 acres of annual rangeland. Between 1992 and 1994, the rancher implemented a time-controlled grazing management program. The ranch was divided into 30 pastures where cattle typically spend one to five days in any given pasture, thus allowing the land to rest 95% of the time. The project installed 40,800

Before Construction



After Construction

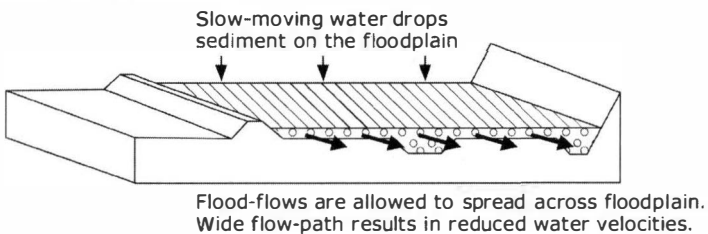


Figure 3: Chorro Flats Floodplain and Sediment Retention Project

feet of electric fence, 26,750 feet of plastic pipe, and two 18,000-gallon water tanks at a total cost was \$110,000, 90 percent of which was provided in cost share assistance. Riparian pastures allow the rancher to control cattle access to creeks in order to protect riparian vegetation and streambanks, as well as minimize manure loading in streams.

The new grazing management system has led to better forage cover, more even forage utilization, more plant biodiversity, improved stream habitat for the endangered steelhead trout, and more observed wildlife. Cattle production and the quality of the natural resources are both improved. However, a properly functioning grazing program requires more than just the installation of new pipe, tanks, and fencing. What makes the system work is good management by the landowner, which requires experience and local knowledge. The Maino Ranch hosts field trips for ranchers, conference attendees, and other stakeholder groups in an effort to promote diffusion of the new practices.

UC Cooperative Extension organized three rangeland water quality short courses. Ranchers from the central coast area attended five-day courses with field trips where they learned about water quality issues, best management practices, and land use planning. Short courses are part of Cooperative Extension's statewide effort to promote voluntary compliance with State water quality standards. Future educational outreach efforts in the Morro Bay watershed need to focus on irrigated agriculture, which involves practices that can affect all of the priority problems. Cooperative Extension in San Luis Obispo County is currently developing short course material targeted for farmers.

UC Cooperative Extension's educational activities also included the 4-H watershed model, which is a topographically correct concrete scale model (10 X 15 feet) of the Morro Bay watershed. 4-H kids apply props and spray water on the model to simulate watershed concepts, erosion, buffer strips, fertilizer run-off, bacterial contamination, and urban run-off of detergent and oil. It is a simple but very powerful demonstration of watershed functions and spatial relationships between human activities upstream and their impact on the bay. The 4-H program also used the video series "From Ridges to Rivers: Watershed Explorations" and other curriculum materials in local schools.

The Morro Bay Watershed was selected by U.S. EPA to participate in the National Monitoring Program, a federal program that is administered by the state. Since 1993, 11 different water quality tests have been taken weekly and biweekly at 17 sites within the watershed. The monitoring program includes cattle exclusion fencing on three of the tributaries of Chorro Creek. An upstream-downstream model is combined with

varying cattle access and water testing. Volunteer monitors have also been used to take samples around the bay, especially during storm events to monitor urban runoff. The volunteer monitoring program has the added benefit of increasing community participation and awareness. National Monitoring Program data provide information about sources of pollution, environmental management strategies, and the evaluation of best management practices. Spatial analysis of water testing data can help to identify, link, and locate human impacts on water quality with specific land uses. The program also adds scientific credibility to the watershed management initiative.

The other major component of the National Monitoring Program is the paired watershed monitoring project. The project is a cooperative effort between Cal Poly State University in San Luis Obispo, the Regional Board, and NRCS. Two similar sub-watersheds were identified on Cal Poly's rangeland in the Chorro Valley. Four hundred acres on Chumash Creek were designated as the treatment area, and 480 acres on Walters Creek were designated as the control. Baseline data were collected starting in 1993, and in 1995 management practices (similar to those on the Maino Ranch) were installed on Chumash Creek. Data will be collected for ten years from both creeks on climate, streamflow, water quality, cross-sectional stream profiling, and vegetation. The data for the first five years of the study indicate a 50 percent reduction in sediment yield in the treatment area (Robbins 1999). The data are so convincing, that the Cal Poly faculty managers wish to end the study early, in order to implement similar management practices in the control area.

With the completion of the CCMP in July of 2000 and the organizational structure in place, the Morro Bay National Estuary Program moves into the implementation phase. MBNEP has assumed leadership in coordinating and initiating actions to enhance the water quality of Morro Bay and its watershed. Most of the enhancement work so far has taken place in rural areas. The MBNEP needs to build on that work, but also focus future actions in the urban areas, which is where most of the people live. The cumulative impact of urban runoff on water quality is substantial, yet landscape change is often least understood by urban residents. They interface less directly with the physical environment than agriculturalists, for example.

Conclusion

The case of the Morro Bay watershed illustrates several problems that must be confronted when managing the resources of a watershed. First, there is a problem of multiple and sometimes competing uses of an area's resources. It is paradoxical that some of the beneficial uses of the

water in the Morro Bay watershed are mutually incompatible (e.g., agricultural water supply and freshwater habitat), yet they are all protected by law. This necessitates compromise. A successful organizational effort must bring people together from diverse stakeholder groups who often have opposing views on natural resource management issues. However, with broad representation, there is a possibility of reaching consensus on action and facilitating long-term change.

Second, when managing the resources of a watershed, there are conflicting and overlapping jurisdictional and administrative authorities involving numerous federal, state, and local agencies. In order for a comprehensive management effort can proceed, government at all levels must be represented and involved. This problem is compounded by the fact that some stakeholder groups, notably farmers and ranchers, may not like the idea of government involvement in their affairs.

The Morro Bay National Estuary Program is a quasi-governmental agency. It is accountable to the U.S. EPA and the Regional Board for funding and policy oversight. However, partnership with local non-governmental organizations (i.e., The Bay Foundation and The Friends of the Estuary) and industry representation in the MBNEP organizational framework adds credibility to the management process, broadens public participation, and gives distance from government. This framework provides a vehicle for decision-making that is local and not subject to constant governmental approval. In order to gain widespread support of landholders in the watershed, they must perceive MBNEP actions as non-regulatory, as well as collaborative, inclusive, and transparent.

Finally, there is a general lack of understanding by the public of spatial relationships. Many people simply do not understand how watersheds function and how humans impact them. The MBNEP and participating interests identified what they consider to be the most important problems affecting the health of the bay and watershed, specifically sedimentation, chemicals, bacteria, habitat loss, etc. However, the priority problems as listed are physical in nature, representing immediate symptoms and not the causes of the problems affecting water quality in the Morro Bay watershed.

The challenge of addressing the priority problems and maintaining and restoring the bay lies in understanding the human dimensions of watershed and landscape change. It is not difficult for stakeholders to acknowledge the physical problems in the watershed, but few believe that they are contributing to these problems. Most rural landowners feel that they are the true stewards of the land. However, this is not always true. Furthermore, most urban dwellers are often disconnected

from the land. They are unaware of the waste they generate and where it goes. Very few people even know where their water comes from.

If watershed managers expect to achieve widespread participation among landowners and the public in the enhancement process, they must begin by focusing their efforts on two critical actions. First, outreach efforts need to educate people about watersheds and how they function. Second, various stakeholder groups have to learn how their actions impact the watershed and understand their role in contributing to the larger problems. Once they understand the processes that shape watersheds and the human-induced problems associated with them, then they become more open and willing to take action and participate in enhancement initiatives. Therefore, watershed education outreach efforts such as water quality short courses, the 4-H watershed curriculum, and volunteer monitors are essential steps in creating the understanding that is necessary for people to change. These endeavors provide the basis for the public participation that is required for sustained enhancement of a watershed.

Watersheds are geographic regions, and the management of the resources of these regions lends itself to the analytical framework of geography. Geographers are especially good at integrating the study of human activities and the natural environment. A regional approach provides a comprehensive framework for understanding the processes that link human land uses with environmental concerns in a specific place. The organizational dynamics of a watershed scale management initiative provide the appropriate local mechanism for managing resources and solving problems that require integrated regional solutions.

References

- CDFG (California Department of Fish and Game).** 1999. *California Commercial Landings*. Long Beach: CDFG.
- Forman, Richard T. T.** 1995. *Land Mosaics: The Ecology of Landscapes and Regions*. Cambridge: University Press.
- Gallagher, Lynn M., and Leonard A. Miller.** 1996. *Clean Water Handbook*, 2nd ed. Rockville, Maryland: Government Institutes Inc.
- Griffin, C. B.** 1999. Watershed Councils: An Emerging Form of Public Participation in Natural Resource Management. *Journal of the American Water Resources Association* 35(3): 505-518.
- Haltiner, Jeff.** 1988. *Sedimentation Processes in Morro Bay, California*. San Francisco: Philip Williams and Associates.
- Kenney, Douglas S.** 1999. Historical and Sociopolitical Context of the Western Watersheds Movement. *Journal of the American Water Resources Association* 35(3): 495-503.
- Lant, Christopher L.** 1999. Human Dimensions of Watershed Management. *Journal of the American Water Resources Association* 35(3): 483-486.
- MBNEP (Morro Bay National Estuary Program).** 2000a. *Comprehensive Conservation Management Plan for Morro Bay*.

_____. 2000b. *Understanding the Morro Bay Estuary and Watershed: A Characterization*.

Robbins, Scott. 1999. *USDA Water Quality Hydrologic Unit Area Final Report: Morro Bay Watershed*. Morro Bay: USDA Natural Resources Conservation Service.

Sommarstrom, Sari. 1994. *A Practical Guide to Some Practical Watershed Management Guides*. Watershed Management Council Newsletter 6(Spring).

SWRCB (State Water Resources Control Board). 1999. *California Water Quality Assessment Report*. Sacramento: SWRCB, Division of Water Quality.

Tetra Tech. 1998a. *Morro Bay Bathymetric Survey*. Prepared for the Morro Bay National Estuary Program, Los Osos, CA.

_____. 1998b. *Sediment Loading Study*. Prepared for the Morro Bay National Estuary Program, Los Osos, CA.

Wilson, Richard A. 1994. *California Watersheds: Natural Resource and Community Integrators*. Watershed Management Council Newsletter 6(Spring).

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Vendor display at Stockton Meeting

California Women at Work

Jenny Zorn
CSU San Bernardino

Since 1950 the women of California have followed the national trend of entering the paid labor force at increasing rates. Despite this greater presence in the paid labor force for fifty years, they still earn less than their male counterparts. A close examination of the factors associated with gender income gaps reveals how the experiences of women in California are similar to the nation as a whole and how they differ.

This research examines the patterns of paid labor force participation, educational attainment, and income differentials in California in 1990. The historical trends since 1950 give the background for the study. The regional patterns of these factors are investigated and the resulting spatial impacts are revealed.

Previous research on women in the paid labor force has focused on paid labor force participation (Kessler-Harris, 1981; Spain, 1992), occupational sex segregation (Beller, 1984; Blau, 1984; Reskin, 1984a; Reskin, 1984b) and gender wage gaps (Barnett & Rivers, 2000; Becker, 1964; National Committee on Pay Equity, 1998; Reskin & Ross, 1995; & Zorn, 1990). A great deal of research has examined these trends and the complex factors affecting them nationally (Bergmann, 1986; Rothenberg, 1998). This study will also examine those trends, but focus on the state of California.

Trends in Paid Labor Force Participation in California

In California women moved into the paid labor force somewhat faster than the country as a whole. In 1990 57.7% of Californian women worked in the paid labor force while the U.S. participation rate was lower at 56.8% (1990 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics, United States). Gender Income Gaps are narrower for California women than for women across the country. The gender income gap in the United States was \$0.62, meaning women earned 62 cents on the male dollar. In California women fared better with a 64 cent gender income gap. Therefore, women in California were earning 64 percent of the income levels of their male counterparts (1990 Census of Population, Social and Economic Characteristics, California).

Since the 1950s increasingly more women with children have been entering the paid labor force. Initially the large influx of women into the

paid labor force was dominated by older women entering or returning to the paid labor force. However, in the past three decades younger women have dominated the influx nationwide. Even women who had children of school age or preschool age were entering the paid labor force. In the U.S. 62% of all women with children younger than 6 years of age were employed outside the home. In California that trend was much smaller. Less than half of all women (46.3%) with preschool aged children were working in the paid labor force.

Recent data from the Bureau of Labor Statistics reveal that women in the U.S. earned 76.5 cents on the male dollar in 1999. While that gap has diminished over the past 50 years, parity has not been attained. A glass ceiling is still prevalent. Indeed, Lopez (1998) describes a glass wall too, where women have difficulty moving laterally. The occupational sex segregation, she argues, emerges at earlier levels than the higher rungs of the ladder.

More women are entering the higher paying managerial and professional jobs. In 1983 40.9% of these jobs were held by women and by 1999 they reached near parity with 49.4%. However, they are not receiving comparable pay in these jobs. The gender wage gap for financial managers is 60.9% and 62.4% for doctors (San Bernardino Sun, May 26, 2000).

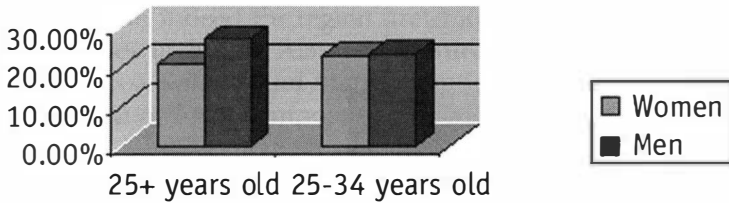
Other high paying occupations such as doctors have seen an increase in the number of women graduating from medical school. Reports from the American Medical Women's Association and the American Medical Association reveal in 1960 only 5.7% of all medical school graduates were women. However, by 1998 that had increased to 41.5%. With more and more women graduating from medical school, expectations are that incomes for women should begin to approach their male counterparts. However, a comparison of the occupational category of doctors reveals occupational sex segregation is helping suppress female doctors' incomes as compared to male doctors' incomes. Women are not reaching the top academic ranks, and they are under-represented in certain lucrative specialties. Three out of ten dermatologists are female, nearly one third of all obstetricians are female (32%), and almost half of all pediatricians are female (46%). However, these are lower paying specialties. The higher paying specialties are dominated by men. Only one fifth of Anesthesiologists are women and a mere 9% of general surgeons are women (Marquis, 2000).

Gender Differences in Educational Attainment

The differing educational attainment levels of men and women have

accounted for gender variations in income in the U.S. as well as in California. Men have a longer history of earning college degrees than women do. In California however 76.9% of men and 75.5% of women earn high school degrees, revealing no gender education gap at the high school graduation level. The gender education gap widens when examining college degrees. In California, 26.8% of males have earned college degrees, while only 20.1% of females have college diplomas. This results in a gender education gap of 75%. The amount of degrees women earn is 75% of the amount of degrees men earn. However, the gender education gap is shrinking because today colleges have more women than men on their campuses. An examination of the proportion of college-educated rates by age reveals age variations in these rates. The gap for 25–34 year olds is nearly gone as demonstrated in Graph 1. The gender education gap is near equity at 98% for this youngest age cohort (1990 Census of Population, Social and Economic Characteristics, California).

Graph 1
1990 California
College Education



Spatial Patterns

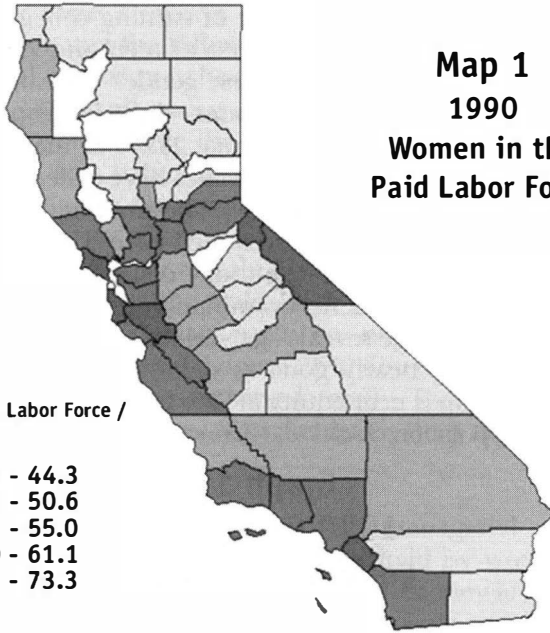
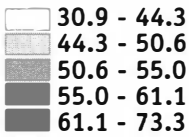
In California, most women are working for pay outside the home and nearly half of all paid workers are female. The trends for paid labor force participation, educational attainment levels, and resulting incomes are spatially variant in California. The spatial patterns of labor force participation, education, and income in California reveal some significant trends for women in the workforce.

Spatial Patterns in Labor Force Participation Rates

In California 57.7% of women work outside the home. However, the paid labor force participation rates vary widely from county to county. The range of the participation rates is quite wide: 73.3% in Mono county and 30.9% in San Francisco county. Map 1 shows the paid labor force participation rates of women in the 58 counties in California. The highest rates are in Mono county with 73.3 % of women working in the paid

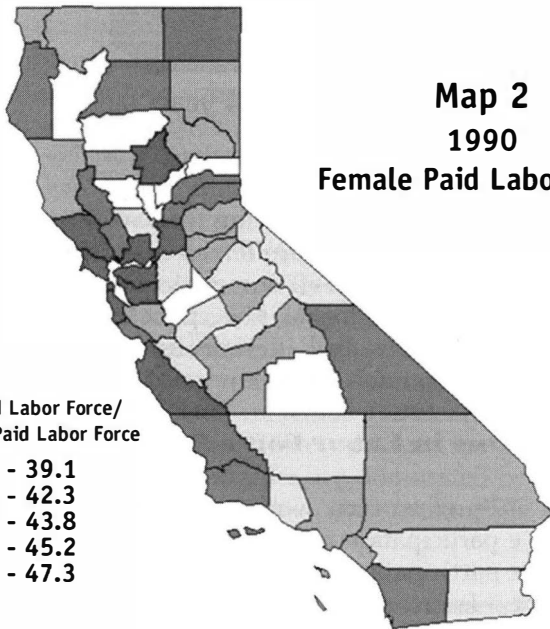
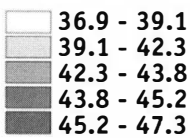
Map 1
1990
Women in the
Paid Labor Force

Female in Paid Labor Force /
 All Females



Map 2
1990
Female Paid Labor Force

Females in Paid Labor Force/
 All Persons in Paid Labor Force



labor force. The rates are also high in Alpine county; the Los Angeles suburban counties of Ventura and Orange; and the San Francisco suburban counties of Alameda, Contra Costa, Santa Clara, Santa Cruz, and Solano.

However, in San Francisco county only 30.9% of women work and the participation rates are also low in the rural counties of Calaveras, Lake, Tehama, and Trinity.

Therefore, women in California are working at higher rates (57.7%) than the nation as a whole (56.8%), but the diverse nature of California is revealed by the variation in participation rates at the county level.

The gender composition of the paid labor force in California varies slightly from the trend in the U.S. In California 44% of paid workers are women, while the U.S. is higher at 45.3. The range of these rates in California counties is a high of 47.3% in Marin county to a low of 36.9% in Tulare county. Map 2 displays these rates by county. The northern counties of Tulare, Colusa, Sierra, Stanislaus, Sutter, Tehama, Trinity, Tulare, and Yuba have a smaller female paid labor force. However, in Marin county the paid labor force is almost equally balanced where 47.3% of its workers are female. Indeed, the region stretching from San Luis Obispo to Sonoma counties including Alameda, Contra Costa, Monterey, San Francisco, San Mateo, Solano, and Marin counties have higher proportions of the paid labor force composed of women.

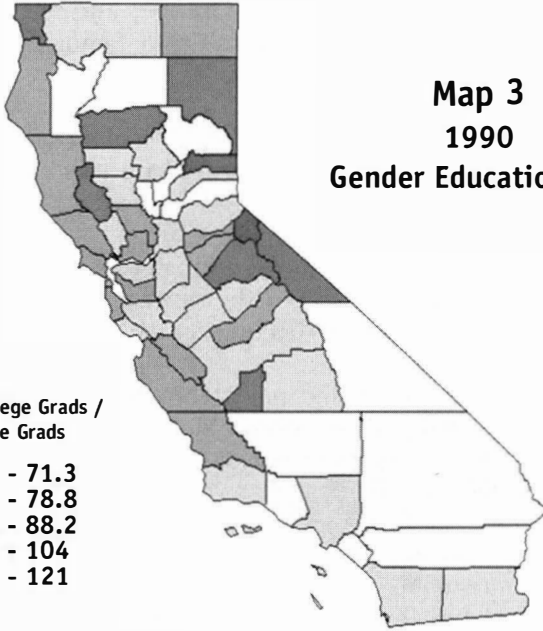
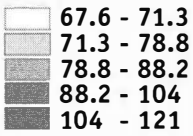
San Francisco county reveals an interesting pattern. While its gender composition of the paid labor force is nearly balanced at 45.7%, the percentage of women who work is the lowest in the state (30.9%). If more of the women who are not in the paid labor force were to move into it, it could easily have a paid labor force, which had more women than men. San Francisco county does have a higher proportion of older women over 70, and a larger proportion of working age women who have chosen not to work in the paid labor force, perhaps because they live with men who earn the high incomes found in San Francisco.

Spatial Patterns in Income Distribution

California is wealthier than the nation as a whole. The per capita income for the state is \$16,409 as compared to the national per capita income of \$14,420. It is also a remarkably diverse state with some counties much poorer than others. The lowest per capita incomes are found in the north and the central valley, but Imperial county on the Mexican border is the lowest with \$9,208.

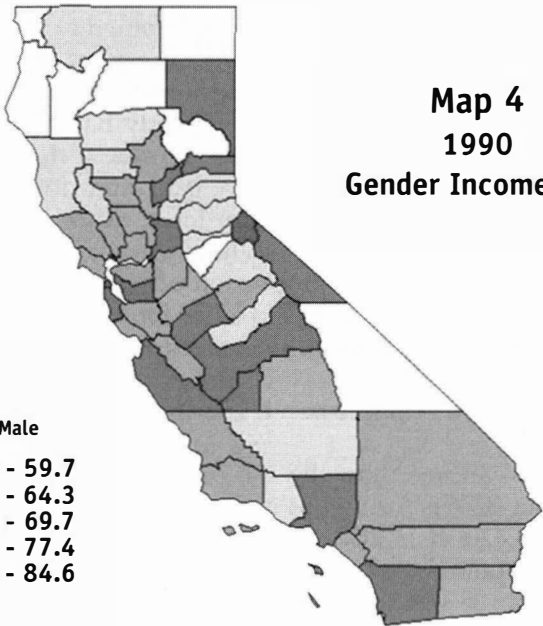
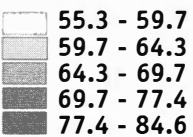
Map 3
1990
Gender Education Gap

% Female College Grads /
 % Male College Grads



Map 4
1990
Gender Income Gap

Female/Male



The highest per capita incomes are found in San Francisco and its surrounding counties as well as Los Angeles and its surrounding counties. Marin county has the highest per capita income with \$28,381. Quite a difference from the \$9,208 in Imperial county.

The richer counties also have higher rates of women working than other counties in the state. The pattern is a higher percentage of women are working in those higher income counties.

Spatial Patterns in Gender Education Gaps

Historically men have earned higher degrees than their female counterparts. Men stayed in school longer and earned more degrees than women ever did. However, those patterns are changing as universities across the country are reporting more women than men enrolled on their campuses. Female high school graduation rates have climbed to parity with males' rates. Overall women are increasingly becoming just as educated as men. However, gender education gaps still persist in some regions. This parity hasn't occurred uniformly across the landscape.

In California the gender education gap for college graduates is 75%. Overall the educational attainment levels of women is 75% of their male counterparts. A significant spatial variation in gender education gaps is revealed in Map 3. In fact, in three counties the gender education gap favors women and not men. In Sierra county women enjoy a 122% gender education gap, in Alpine 120%, and in Mono 104%. In Kings county there is no gap. The gap is widest in Ventura (67.6%), Shasta (67.9%), Orange (68.1%), and Placer (68.3%).

Sierra county has a gender education gap that favors women (122%). A closer examination of Sierra county reveals only 39% of their paid labor force is composed of women. Therefore, the few women who are working in Sierra county are highly educated. Sierra county also is predominantly white (95.7%). This affects its gender education gap because those gaps are wider for whites than for nonwhites. Historically white males have higher college graduation rates than white females. However, the gender gap for nonwhites is not as large because nonwhite males college graduation rates are low. Therefore, it is easier for nonwhite females to approach the graduation rates of nonwhite males.

Spatial Variations in Gender Income Gaps

The gender income gap (median income) for full-time workers in California is 72.3%. It also is spatially variant with a range of 55.3% to 84.6%. Map 4 shows some counties where women are making little more than half of the income their male counterparts earn. While in other counties

they are comparatively better off than the national average.

The gender income gap is best for women in the larger metropolitan areas of Sacramento, Oakland, San Francisco, San Jose, Fresno, Los Angeles, and San Diego. In San Francisco women earn 84.6 on the male dollar. The diverse opportunities in the larger metropolitan areas enable women to command higher incomes.

Alpine county has the second narrowest gender income gap of 84.3. They also have the second highest gender education gap (1.20). The higher educational attainment levels of the women in Alpine county are rewarded with higher incomes. Even so, they are more educated than their male counterparts, yet they still can't out-earn them.

Gender income gaps are worst for women in the far north (Del Norte, 56.7 and Trinity, 56.8) and in the Sierra Nevada (Inyo, 55.3). Inyo county has the widest gender income disparity and the fifth worst gender education gap (68.3). The wide gender education gap in Trinity county also impacts its wide gender income gap. Therefore, the lack of education of women in Inyo and Trinity counties is paralleling their lack of income.

Findings

This study revealed several spatial patterns of the paid labor force participation of women in California. The higher income counties tend to have higher percentages of women working for pay outside the home. In some areas with lower percentages of women working, the few women who are working are highly educated. Younger women today are just as educated as younger men. In counties with high percentages of whites, the women are more educated than in other counties. The gender income gap is narrower in counties with highly educated women and, conversely, it is wider where women are less educated. The gender income gap is narrow in larger metro areas.

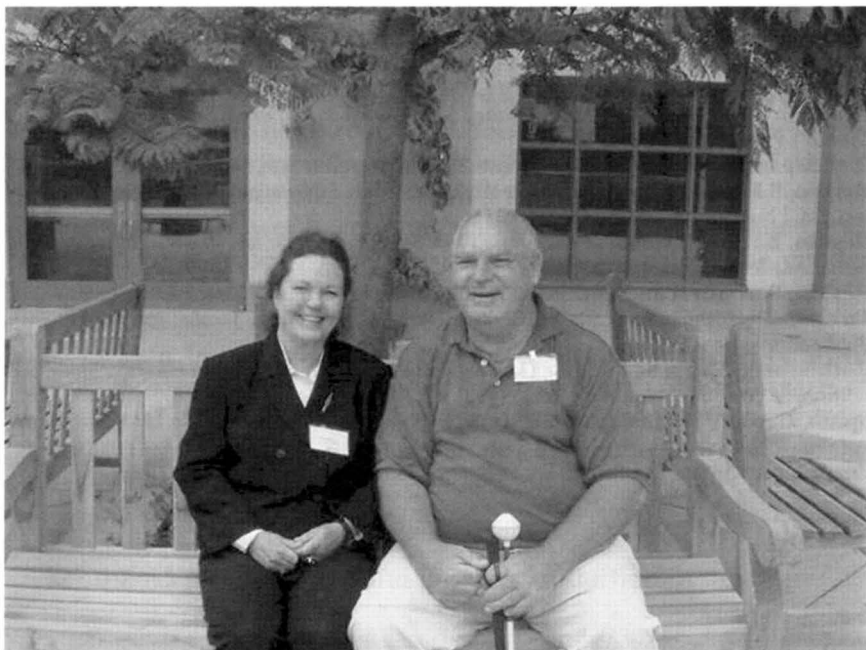
This research investigated the patterns associated with labor force participation, education and income. Further research on the impacts of occupational opportunities in the counties is necessary to more fully understand the dynamics of these patterns and to begin to explore the various reasons for the resulting spatial patterns.

My thanks to Andy Copeland for map production in this paper.

References

- 1990 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics**, California. U.S. Department of Commerce, 1990.
- 1990 Census of Population, Social and Economic Characteristics, California**. U.S. Department of Commerce, 1990.
- Barnett, Rosalind Iltait and Caryl Rivers**. *She Works, He Works*, Harvard University Press, 2000.
- Becker, G.S.** *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education*. New York: Praeger Publishers, 1964.
- Beller, A.H.** *Trends in occupational segregation by sex and race: 1960-1981.* Pp. 11-26 in B.F. Reskin (ed.), *Sex Segregation in the Workplace: Trends, Explanations and Remedies*. Washington, D.C.: National Academy Press, 1984.
- Bergmann, Barbara**. *The Economic Emergence of Women*. Basic Books, Inc., New York, 1986.
- Blau, F.D.** *Occupational segregation and labor market discrimination*. Pp.117-145 in B.F. Reskin (ed.), *Sex Segregation in the Workplace: Trends, Explanations and Remedies*. Washington, D.C.: National Academy Press, 1984.
- Goldin, Claudia**. *Understanding the Gender Gap: An Economic History of American Women*. Oxford University Press, 1990.
- Jacobs, Jerry, Ed.**, *Gender Inequality at Work*. SAGE Publications, 1995.
- Kessler-Harris, Alice**. *Women Have Always Worked: A Historical Overview*. The Feminist Press, New York, 1981.
- Kobayashi, Audrey**. *Women, Work, and Place*. McGill-Queen's University Press, Montreal & Kingston, 1994.
- Lopez, Julie Amparano**. *Women Face Glass Walls as Well as Ceilings*, in *Race, Class, and Gender in the United States: an Integrated Study*, 4th Edition, Paula S. Rothenberg, Ed., St. Martin's Press, New York, 1998.
- Marquis, Julie**. *A Huge Dose of Change*, Los Angeles Times, March 10, 2000.
- Massey, Doreen**. *Space, Place, and Gender*. University of Minnesota Press, Minneapolis, 1994.
- McDowell, Linda and Joanne P. Sharp, Ed.**, *Space, Gender, Knowledge*, Arnold, London, 1997.
- National Committee on Pay Equity**, *The Wage Gap: Myths and Facts*, in *Race, Class, and Gender in the United States: an Integrated Study*, 4th Edition, Paula S. Rothenberg, Ed., St. Martin's Press, New York, 1998.
- "Pay disparity between the sexes persists." San Bernardino Sun, May 26, 2000.
- Reskin, B.F. (ed.)**. *Sex Segregation in the Workplace: Trends, Explanations and Remedies*. Washington, D.C.: National Academy Press, 1984a.
- Reskin, B.F., (ed.)**. *Women's Work, Men's Work: Segregation on the Job*. Washington, C.D.: National Academy Press, 1984b.
- Reskin, Barbara F. and Catherine E. Ross**. *Jobs, Authority, and Earnings Among Managers: The Continuing Significance of Sex*, in *Gender Inequality at Work*. Jacobs, Jerry, Ed., SAGE Publications, 1995.
- Rothenberg, Paula S., Ed.**, *Race, Class, and Gender in the United States: an Integrated Study*, 4th Edition, St. Martin's Press, New York, 1998.
- Spain, Daphne**. *Gendered Spaces*. The University of North Carolina Press, Chapel Hill and London, 1992.
- Zorn, Jenny**. *Spatial Variations in Gender Income Differentials*. The Ohio State University, 1990.

Geographic Chronicles



Ray Sumner interview with Reg Gollidge

Professor Reg Golledge and the Millennium Project Interview

In Volume XXXVIII, 1998, we published an account of the Millennium Project on Australian Geography and Geographers. This project was developed and led by Elaine Stratford, University of Tasmania.

As part of the Project, prominent geographers were interviewed on audiotape, following a standard set of questions, which are printed in italics in the Golledge interview. Australian English spelling has also been retained.

Ray Sumner volunteered to do the interview with Reg Golledge, who generously agreed that an abridged version of his interview could be published in the *California Geographer*. Although the interview took place in 1999, publication was held over because of the nature of the *California Geographer 2000*.

Australian Millennium Project participants were:

Respondent

Joe Gentili
Mike Isbell
Janice Monk
Ruth Fincher
Angus Witherby
John Holmes
Jack Davis
Jack Mabbutt
Trevor Langford-Smith
Denis Jeans
Jim Fox
Bill Cooper
Reg Golledge
David Lea
Harold Brookfield
John Connell
Diana Howlett
Gordon Linge
Peter Rimmer
Gerry Ward
Margaret Fielman
Murray Wilson
Bob Young
Les Heathcote
Murray McCaskill
Ian Alexander
Jim Walmsley

Interviewer

Eleanor Bruce

Ruth Liepins
Kate Myers
Mike Isbell
Roger Epps
Bruce Thom
Bruce Thom
Bruce Thom
Gwenda Sheridan
Jim Walmsley
Roy Jones
Ray Sumner
Barbara Rugendyke
Barbara Rugendyke
Barbara Rugendyke
Peter van Diermen
Peter van Diermen
Peter van Diermen
Peter van Diermen
Jean Hillier
Leslie Head
Leslie Head
Cecile Cutler
Cecile Cutler
Margo Huxley
Neil Argent

Interview with Professor Reginald Golledge

October 26, 1999 – Santa Barbara

RS: ***What in general influenced your interest in geography?***

RG: I think I've probably always been a geographer right from my earliest years. My father worked on the NSW Government railways and we moved around quite a lot. I was born in the small town of Dungog in the Hunter Valley. We moved from there to Katoomba and then Lithgow, then out to the Murray River to a little place called Tocumwal, then down to the Riverina to Cootamundra, then to a small farm and a little hamlet called Yarra outside of Norwood, before moving to Newcastle and my movement to the University of New England.

So, we moved around a fair bit, primarily in small towns and in the countryside and you got to appreciate from an early time on the substantial differences between one part of the country and the other. I enjoyed learning about those differences because when you live in the country you have to not only learn about them but you have to learn how to use them and to recognise them as part of your survival.

RS: So you went to school in a lot of these little country towns in NSW?

RG: Right, yes, and in every one of them, probably my best subject was geography.

RS: Good. Any teachers that stand out in any place?

RG: In my high school I had a teacher by the name of Quinlan who was a bit flamboyant at times in terms of how he presented material, but he presented the curriculum material in such a way that I enjoyed it and went well beyond it. And that helped to, interest me in geography. Actually, my two Honours subjects at high school were history and geography and I actually did much better at history. I did a first class Honours in history and only a second class in geography on the leaving certificate.

RS: So, was it in Newcastle that you did your leaving?

RG: No, it was in Goulburn.

RS: ***Now, the second part of question one says, what shaped the trajectory of your career and interests? Perhaps, the moving around, or when you got to university?***

RG: I think probably in high school and at university. At university probably the most influential thing were the faculty that were at the University of New England at that time and the tremendous, not just support, but the stimulation that I obtained in many of the geography courses as opposed to the other courses that I did at that university.

I think also personalities, I really enjoyed the leadership of Ellis Thorpe at New England at that particular time and became a good friend of his even as an undergraduate and continued through into my graduate work. He did convince me that I should be a geography major and not a history major for example, and concentrated my efforts more in the geography area than elsewhere. He was instrumental in talking me into enrolling in the Honours courses, and staying on for a BA Honours degree and was also very influential in suggesting that I stay for the Masters, the new Masters program that they were just building at New England instead of going off and being a high school teacher somewhere.

RS: Compared with the American experience, I'm assuming you enjoyed really small classes?

RG: Yes, very much so. In my freshman year, in my first year at the University of New England, there were 81 people. There were only 240 students in the entire university and there were about 180 faculty members. So it was very intensive, small tutorial work. The largest classes were about 50–60 people and they were the introductory, stage one classes. But the closeness, the close relationship that you developed with your professors, with your teachers and lecturers at that stage, was very important.

RS: And on a practical note, did you have a Commonwealth scholarship or whatever was the equivalent, that enabled you to go to university?

RG: I was awarded both a Commonwealth scholarship and a teacher scholarship and at that time I had no career expectations apart from being a teacher so I turned down the Commonwealth scholarship and accepted the teacher scholarship, and that's what paid my way through university.

I learned much later on that I should not have done that, particularly when I eventually got to New Zealand for my first job and the Department of Education called in my bond.

RS: ***Which geographers or other figures outside the discipline have most influenced your work and why?***

RG: Yes. There are several phases that I'd have to identify where different people have influenced my work at different stages of my life. I mentioned Ellis Thorpe. Other people like Eric Wilmington, John Holmes, Ted Chapman at the University of New England, all had a very important influence on my undergraduate and my first couple of graduate experiences.

In New Zealand I was really fortunate in being offered a job at the University of Canterbury which I took up in 1961, and other people who were appointed at that time included Les King, John Rainer and William Clarke – Bill Clarke – who was just finishing his Masters at Canterbury, so we developed a cadre of four “young Turks” who stimulated the Canterbury department quite a lot, particularly with Les King leading us and bringing back the quantitative methods and theoretical revolution-type things that he had experienced for his Ph.D. program at the University of Iowa.

RS: Did you have your Ph.D. then or you'd just finished your Masters?

RG: No, I went to New Zealand just after I'd finished my Masters. In fact, while I was over there a Fulbright visitor to the department was Harold McCarty who was then Chair of the University of Iowa, where Les King previously got his Ph.D. McCarty and I taught a couple of courses and he started suggesting that I should go to the States for a Ph.D. because with the faculty Ph.D. I was doing at Canterbury at that time, the normal time for a faculty member to finish a Ph.D. was about eight years at that stage. So he was the next most significant influence. He obtained a University Fellowship and attracted me to Iowa where I did my Ph.D. At Iowa he had a significant influence but at that time there was a very interesting group of new graduate students, Jerry (Gerard) Rushton was there and he and I got to start working together right from an early stage. Doug Amadeo and I wrote a number of papers as graduate students together and John Hudson, among others, these were three names that have gone on to significant prominence in the discipline. We all interacted a lot and really that's the place where most of the initial work on behavioural geography came out of those interactions.

RS: So once you came to America you more or less stayed?

RG: Yes. When I finished my Ph.D. I went to British Columbia, the University of British Columbia but I had every intention, when I finished my Ph.D., of going back to Australia or New Zealand; but I wrote to every department in Australia and New Zealand looking for a job and only one department Chair responded to me and that was George

Dury in Sydney who said he had a part time job marking final exam papers if I wanted to pay my own way back. But no-one else even bothered to respond to me which meant that, career-wise, I had to look towards North America for employment possibilities.

But I enjoyed the year at the British Columbia and met some very important people there, also young Assistant Professors who, like me, were just starting out, developing new areas like David Ward and Julian Minghi and Mark Melton in the physical area and so on.

And then the next step was to go to Ohio State University. Les King had finished up there after going back to North America to McGill University and he managed to get the department Chair, then [Edward] Taafe, to appoint both John Rayner and myself so the three of us got back together again, after first starting off in New Zealand. And King has had a significant impact on my whole life as a geographer. It was he who really formalised my interest in quantitative methods and geographic theory at Canterbury. He and John and I learned how to program and use computers when the first computers came on board at Canterbury.

RS: Back in Fortran days?

RG: Oh it was pre-Fortran. Learning machine languages. At the Ohio State University also, there was another very exciting young group there, Emilio Casetti and Rayner and King or course and Larry Brown and Kevin Cox, George Demko and (Howard) Gauthier and other people. It was just an extraordinarily stimulating environment.

RS: There must have been a lot of interaction within the department too then?

RG: Yes, there was quite a lot. Students we met up with and befriended and taught were excellent people like Yorgo Pappageorgiou and John Oldand, David Cowen, amongst many many others. In 1970 I took leave without pay and came back to the University of Sydney for a year, sort of the equivalent of a sabbatical except that the Ohio State didn't have sabbaticals so I had to take the leave without pay. [David] Simonett was the Chair at Sydney at that time and I had met him a number of times before but this was an opportunity to learn a lot about him. We became very good friends. I think we worked very hard, he worked me very hard, both in terms of teaching but also in getting the first computers into the geography department at the University of Sydney. I remember one day he came in and said take the University vehicle and go over to Crow's Nest and pick up these boxes. I picked them up and brought them back and I said what do you want me to do

with them, and he said they're Hewlett Packard computers, put them together and get them working.

RS: And you did it?

RG: Well, we got them together and he said, "Okay now for the next couple of weeks I want you to teach the geography faculty here how to use them and while you're at it, give them some courses in mathematics and statistics." So a whole stack of the department there, including myself, were all ready to take off for the December break and he hauled us all back in and we all had to sit around learning about computer and some fundamental math and statistic stuff.

RS: And start teaching as soon as the year started in February or March.

RG: Anyway, then he was appointed as Chair here in Santa Barbara and he and I were the actual final two candidates for the Chair position. They selected him, which I'm very thankful for. He started this department off and invited me to come out here with him in 1977. From then up until the time of his death from cancer in 1990, we were close friends, worked very closely to help build this department into one of the better ranking departments in the world. So at this end there's been Simonett and Terry Smith and Waldo Tobler in particular that have had significant impacts on my life and interests and research areas in the profession.

RS: ***There is a second part to that question, about other figures outside the discipline, some non-geographers who might have had an influence on your work and why?***

RG: I've been a very inward looking person as far as that's concerned. There are a limited number of people outside the discipline who have had significant influence on my work. One was Gustav Bergman the philosopher, a logical positivist; from him I took courses at the University of Iowa and he really introduced me to the positivist way of thinking. I'd say, particularly during the 60s and the period in which I was heavily involved with the mathematical modelling and quantitative analysis group, his influence was fairly important. Apart from that it would be hard for me to implicate any particular person, academic or non-academic, outside of geography who had a significant impact on my thinking and activities.

RS: ***What things in general, or in relation to geography, would you like to be remembered for? How about geography first?***

RG: I think probably the single most important thing has been my contribution to the development of behavioural geography. I think that's fairly well recognised and I hope it continues to be recognised. Apart from that, there are a number of other areas which I feel I'd be quite happy if people recognised my efforts, particularly two areas; one is building bridges with the discipline of psychology and more lately cognitive science, spatial cognition and artificial intelligence in those areas; and secondly I'd be very happy if people recognised my work in focusing the attention of the discipline on disability.

RS: Do you want to talk then about your GPS work, I think this might be an appropriate place to mention that?

RG: Yeah. I lost most of my vision in 1984 and that was a very significant turning point in my life.

I had actually been working for seven or eight years prior to that with borderline retarded individuals so I was already working in a disability context. But then to become disabled myself was a really serious blow and I really did not know how to handle it.

I had some friends here on campus, a couple of psychologists, Jack Loomis and Roberta Klatzky, who came to my office one day and offered to help. I didn't know how they could help, but they offered to help by going away and reading articles in my research area and then meeting with me once a week to abstract them and talk about them.

Well, that started back in 1985 and we've been meeting ever since – for 15 years – until recently, we met every Friday. Even when Roberta Klatzky went to the Chair of Psychology at Carnegie Mellon, we would have weekly telephone conferences about our ongoing research. Now we're down to about once every three weeks, but the conversation is still there. We continued working, we have continued working in this area and I'll come back to talk a little bit about what we're doing in a minute.

But historically I went to Australia again on a sabbatical in 1986 and stayed in the Newcastle area. I didn't officially attach myself, or want to be attached to any university, I was still sort of recovering and trying to figure out how to work in an academic environment, but Don Parks who was in Newcastle at that time, was a good friend. We visited a few times and then around about Christmas he came up with the idea of building a talking geographical Christmas card. And he went out and he bought talking Christmas cards and he cut out their little speakers and the little chips and arranged them behind a map of the University

of Newcastle campus so that I could explore it tactually. As I explored it there would be little chimes played and it would show me how to walk around the campus and what paths to follow and things. We parlayed that into an idea for an auditory tactual combined map and Don took off work with this and invented the device called Nomad which was an auditory tactile information system and it showed me that using today's technology we could make maps and graphics available to blind people in ways that they had never been able to access this type of information before.

So, in effect it meant that now blind people could do geography whereas it was extremely difficult for them in the past. We worked together on that for a number of years and have continued interacting on other products that he's developed, but I was really turned on by the idea of using geographic knowledge and geographic technology to sort of crack the print barrier, to crack the graphics barrier so that blind and vision impaired people could, including myself obviously, could get access to relevant geographic material.

At the same time and parallel with this the two psychologists at Santa Barbara and I were working on an idea that Jack Loomis wrote in a white paper for us to talk about, about developing a guidance system for blind people, a navigation system in which he described the possible creation of the virtual reality in auditory space rather than visual perceptual space. We thought this was a great idea, got some funding from the National Institute of Health and began looking at the difference between blind and sighted people, their spatial abilities and their ability to perform certain navigational tasks and when we found out that we could not find statistical differences, statistically significant differences between the performance on a range of navigation tasks between blind people and fully sighted people, then the idea of building a guidance system that used modern technology and could be used by both sighted and blind people became a reality.

So in 1990 we started working on actually building the physical system, again with funding from the National Institute of Health, particularly the National Eye Institute. And we worked on, we decided that we'd use GPS, the global positioning system, to locate and track an individual, we'd build a GIS, a geographic information system, of the local environment which included all the information a person would need in order to comprehend where they were and what was surrounding them, layout-type information. Again information that's completely out of the reach of blind people unless someone stands there and describes in details what's surrounding them. And then the third modular component of this was the virtual auditory display which meant that as

you walked around, as a blind person walked around an environment it appeared as if the environment talked to them. So in the virtual world and coming from the base map in the computer we'd get identification of surrounding features, environmental features. So, say the library would call to you off in the direction, the exact direction that it was from you and the volume would give you an idea of how distant it was.

RS: So you need a headset?

RG: Oh yes, you have a stereo headset and on top of that was a compass so that constantly allowed the computer to adjust for your head turning so that the environment always remained constant in the virtual system and no matter which way you turned your head the voice would always come from the real, from the virtual location of the real object and you could stand there and I could point to all the different buildings on campus and be 100 percent correct in terms of identifying where they were and approximately how far away they were.

RS: So that's the photograph of you on your web page trying this out?

RG: Right. But that also meant that blind people could build a survey type, cognitive maps because for the most part the information they could access previously was just linear, and learned specific routes or they and/or their dogs would learn routes but often they didn't know what was more than 10 feet off to one side on those routes and it was incredibly difficult integrating individual routes into a layout. Humans are not very good at that, that's one of the reasons why we developed geographic information systems, it does it very well.

Following that, I went to a meeting at the Braille Institute, down on 75th Anniversary, and there was a young guy down there demonstrating a product that he called Talking Signs. This was an infrared device that he'd locate transmitters say over the doorway to an elevator or at the top of the stairs, or a water fountain or a telephone or a toilet, and you'd carry an infrared receiver along with you, a hand-held, just about the size of a channel changer for your TV, and you'd move it around and you could pick up these signals from each of the objects such that I'd know where the stairs were and I'd know where the elevator was and I'd know where the bathroom was, or any other feature to which a transmitter was attached. This means that I can learn the interior of buildings for example. Well one of my graduate students, Jim Master, and I have been working for about the last five or six years in adapting that technology into more widespread use. We have incorporated Talking Signs on the local bus system for example.

RS: In Santa Barbara?

RG: In Santa Barbara, and in the bus terminal. A blind person can stand there with their receiver and examine each bus as it approaches to see whether it's the bus that they want rather than having to flag down every bus that passes and ask the driver where you're going and what's your number and all this type of thing. And we've also put them in the terminals so that blind people can walk into the terminals and find where the bathrooms are or the change machine or they can go to a ticket window, an information window and ask for information and so on. It's proving very successful. We have just finished some workings in the San Francisco area where we've put some of these transmitters on the Caltrans Station on the light rail station and the bus stations and taxi stands so that blind people now can travel independently and when they get off in the San Francisco area they can do a mode transfer. They can find by following these signs how to catch the light rail downtown or where to pick up the bus or a suburban destination or so on.

And the fourth thing in this area that I'm working on right now with another researcher who came over for a year from Belfast, from Queen's University of Belfast to work with me his name's Dan Jacobson, he had developed a more modern version of the Nomad called Haptic Soundscapes. Now with Nomad you actually had a touch sensitive pad and you had to put a tactual map on it and explore it with your map, but Dan is using what's called a Haptic mouse and this is a force feedback mechanism so that, and it's completely computer operated, so that now you can use this mouse to explore what's on a tv screen. There's no way you can touch a TV screen to find out what's on it, but you can explore the screen and explore maps or diagrams or windows that are on the screen. I've got a group here out at Florida State where he's moved to, working on this project right now.

So this is an area as I mentioned in disability in which I'm very proud of the different contributions I have been able to make since starting on it. In doing so I think I've been able to show geography and geographers that they can use their accumulated geographic knowledge and expertise and traditional technical strengths, cartography and so on, to reach significant populations or benefit tremendously from these inventions which otherwise are paid no attention to throughout the entire history of geography, so I'm very pleased with the effect of opening up to a very disadvantaged population the chance of bringing an understanding of the real world into their lives.

RS: Quite a jump from the seeing-eye dogs to this high technology solution. Now, we want to move on to question number five. It's about

Australia. How do you think the discipline has changed in Australia since you began your career? Philosophy? Politically? Teaching methods? the philosophical underpinnings?

RG: I'll make some general comments on this.

Philosophical underpinnings. I think there's been some very significant changes since I did my undergraduate and early graduate degrees in Australia. I guess that's paralleled the change in thinking that's gone on in the discipline at large in the whole international arena. I think I was lucky enough at New England that there were a number of empirically and analytically minded geographers so that I wasn't brought up to be a traditional descriptive geographer. I was not influenced to be a traditional regional geographer. I was influenced in being a problem solver and to be a problem solver you have to understand scientific method and think about experiments as well as original data collection and the analysis of data in a variety of ways, cartographically, as an expert in the area of your training or analytically. But that was not common in Australia at that time. There was a much more traditional thinking influence largely by regional thinking and a little bit along the lines of humanist thinking. Very different from what I see today.

I know that in the early 1960s Bob Smith had come back from North America and was doing his Ph.D. at ANU and he was sort of beginning to push the quantitative methods and the scientific method and the positivist philosophy at that time and for the most part for the physical geographers in Australia there was no problem, this is how they worked anyway they were physical scientists then and they're physical scientists now. The human geographers weren't, they weren't human scientists in the real sense of the word, in the really scientific sense of the word and they were not too keen on being pushed in that particular direction. So I think that in many ways during the 60s and 70s human geography in Australia maintained a fairly traditional outlook and really did not keep pace with what was going on in the United Kingdom and in America, Canada and the United States. Then in the 1980s there were significant changes as people like, at the end of the 80s or 90s I guess I can't remember exactly when, when Mike Webber and Ruth Fincher came back to Australia and sort of brought new philosophical ideas with them, political economy and social theory and feminism, and I find those particular areas very strong in Australia now. Probably stronger in Australia than they are in North America. I think in both the United Kingdom and North America there has been a rationalisation and maybe a decline in the importance particularly in the social theory and political economy but I don't think that's happened in Australia yet and I don't see it happening. So, I think philosophically speaking, there

have been, as one might expect, lags in Australia and there is a possibility for in the near future some additional changes to take place as we move into the 21st century and as information and technology become probably equally if not as important as intellectual theory.

RS: Teaching methods?

RG: Yes, I'll make some comments about that. One of my interests for a long time has been geographic education interfacing with anywhere from K through 12, probably even more so than undergraduate and graduate. Australia I think has always had a very active group of geographers interested in education particularly in the early years through the teachers colleges and now spread more widely throughout the whole university system. Some of the early work on curriculum for example I found very innovative and the methods of teaching including the continued use of field trips and field work, still puts them apart from much of say North America where field trips and field work have disappeared from the elementary and high schools almost completely and have also disappeared from most undergraduate and graduate geography departments. So I'd say that in terms of teaching methods Australia has been more or less a leader in this area at least comparable if not more so than what's been going on in Europe and only recently in the last decade and a half has North America's emphasis on education begun to be as extensive as it has been in Australia for a long time. I think also the actual pioneering of geographic information systems has refocused a lot of attention on the K through 12 curriculum and from what I can gather that similar type of impact has already been noted and acted on in the Australian teaching environment. So I'd say as far as teaching methods are concerned, there is a very substantial group of geographic educators in Australia who are well up and maybe beyond the rest of the world in a number of different areas.

RS: Research modes? Perhaps the institutional opportunities?

RG: I think that in research modes again there are differences. I think there's been a far more significant proportion, particularly of human geography in Australia that has adopted post-modernism to research paradigms and to that extent, again in human geography, there is less emphasis on positivist, scientific experimental research.

RS: Do you have an opinion on this?

RG: Yes, I do. I don't see that the emphasis on this paradigm has made any significant contribution to the discipline, in fact it might well be introducing such substantial red herrings that it would not surprise

me to see a resurgence of administrative efforts to close down departments because they cannot see what the benefits of this type of activity is preparing for the future, that it's becoming information oriented and more technical.

RS: One of the things I have found in Australian geography from talking to a few people, is they feel they're losing their identity, as geography becomes swallowed up into other departments – town planning or whatever number of different areas.

RG: Well that's happened in England, in Canada and in Australia and it's because the geographers have failed to show that they have something different to offer that's distinct and they will never have that as long as they just copy the activities of other disciplines.

RS: So as President of the AAG you see, you're in the right position to make a statement about this it seems to me.

RG: Oh well, yes, I mean I'm making a statement like this in every regional meeting I go to. My message is that we're entering the new century and this new century is not going necessarily to be as tolerant as our current century was of academic activities that are primarily intellectual rather than an accommodation of intellectual and applied. And if you don't know what your discipline can do in the applied arena anymore you're going to be put in with some other organisation that really can show the people at large and the administrators and the governing officials that they have something to offer.

RS: *That's right. Well, question number six follows on. **In what ways do you think that these changes in the discipline have been driven by forces internal or external to Australian geography?***

RG: I would say that most of the changes that have taken place in Australian geography have been driven by external forces. Many Australian geographers are very active in terms of travelling to national and particularly international conferences and they bring back in a very prompt manner reports on what's going on in Europe, in Asia and in North America in particular where geography is strong and in that way they introduce change into geography. I think perhaps the one area where there's not as much need to be importing and implementing other ideas from outside the country as I mentioned before is the area of teaching methods where I think there is a lot of innovation and to a certain extent Australian educators are up right up there with the best in the world in this manner. But I don't see anything uniquely Australian in terms of research modes or philosophical underpinnings

or anything like that, they appear to reflect changes that have gone on or are going on in the world at large.

I think the same thing is true with respect to the institutional context. There is still a reasonable tie between what happens in Australia and what happens in say the United Kingdom in terms of the structure of tertiary education although they're not strict imitations of each other and never really have been. The Australians are also noticing what's going on in Canada and the United States and they have produced a good melange of events related to the institutional context of their disciplines. But it's still primarily external influence.

Perhaps one thing that has influenced Australian geography and Australian universities more than anything else that one can pinpoint is the implementation of Bob Smith's recommendations about changing the structure of tertiary education in Australia, making more four year colleges, making the professional egalitarian in terms of their responsibilities and salaries and benefits and all that type of thing, and to a certain extent that for a while at least that tended to reduce the perceived and actual difference between the institutions that were granting advanced degrees and the institutions that weren't. And perhaps that is somewhat similar to what happened outside the country but the way that it's been applied massively throughout the whole continent I think is probably different to anywhere else, so that is one activity that, while it's planning was influenced by a geographer Bob Smith who had had extensive experience, particularly in the North American context, the way that it was implemented in Australia is I think quite different from most other places. But apart from that ...

RS: *Number seven. Could you detail the ways in which you have contributed to these changes in Australian geography?*

RG: Well I would have to say that I think my influence on Australian geography has been fairly minimal. It hasn't been significant in promoting any of the changes, in fact I have been surprised on a number of occasions when visiting Australia that many young Australian geographers including people employed in colleges and universities are not even aware that I am Australian born.

RS: That's what happens when you stay away for so long.

RG: Well, that's true, you know I have been back constantly and I always think of myself, until recently anyway when I took out American citizenship after 30-odd years in the country, I've always thought of myself as being an Australian geographer and as I said I get back quite

a lot, I travel amongst Australian universities quite a lot and I get surprised when I am introduced and when people are not aware that I am Australian and that my background is in Australian geography and it had a fairly significant influence on the direction that I took in sort of fulfilling my professional training and degree and interests. But other than that I'd say minimal.

RS: Is there something else you want to say while the tape's running?

RG: One thing I missed out a little bit earlier on actually that I would like to recognise, after I lost my vision and was sort of completely at a loss Mike Webber was at that time Chair of the Department at McMaster University, he heard about this and we've been friends since I first met him in 1970 in Australia, and he organised the McMaster department once a month to put together a cassette tape in which they summarised what they were teaching or what they were researching and it gave me at least an idea from that department, which was a very significantly ranked department, what geographers were doing. The only other geographer to do that with any regularity was Peter Gould so I had these two sets of tapes, one being produced by Mike and his group and one by being produced by Peter Gould that sort of kept me in touch with the profession at a very critical time in my rehabilitation process and I've always greatly appreciated that particular fact and you know, whenever I get the chance in coming to Australia I go down and visit with Mike and Ruth in Melbourne and I'm, you know, I don't know how I can express that appreciation and debt that I owe them except in a situation like this to recognise that they participate very much in my returning me to active work in the field.

RS: Travelling around for the AAG, do you want to comment on that at all?

RG: My December newsletter column as President of the AAG, I'll comment on that. It starts off with the title "Let's Bring Back the Peanuts", but in essence I start by saying I'm getting heartily sick of pretzels and that's because I'm doing so much travel.

RS: I had peanuts when I flew to Reno where I met you.

RG: Well some time ago, there was a move amongst, by a small group of people who were allergic to peanuts to have peanuts taken off the snack menus in all airlines and pretzels substituted and I figure that last year and this year I've been doing over 110 trips for the AAG and I'll bet on 108 of them I'll get pretzels. Every one I've been on this year I've got pretzels.

Anyway, the whole purpose of this December newsletter column is to point out, that by going to the regional meetings you learn an awful lot more about the profession and I take to task the larger institutions who think they're above all this, you know they only have to go to the national meetings type of thing, and they don't participate as fully as they should in the regional meetings. One of my themes in this is to get the major institutions back into their local neighbourhoods. I guess with just the IAG and the Australian Geographical Society they're not at odds with each other (are they?) and there isn't the similar type of thing in Australia I don't think. I did notice when I was in New Zealand the first time and every time I've been back that they have a wonderfully integrated geographic community over there.

RS: Size probably helps.

RG: Well, it's not just that, it's attitude. I mean the most significant people in geography in the country are extremely willing to integrate at their meetings with the newest elementary or high school teacher. Everyone from teaching to university level feels they're part of a geography community and there are not these artificial levels, you know 'I'm a four year university Ph.D. granting institution person, I don't really talk to four year colleges and I don't want anything to do with teachers'. There's still a little bit of that in Australia I think, a little bit of class consciousness.

RS: There certainly is in California.

RG: Oh yes, very much over here. There's arrogance, intellectual arrogance.

RS: Well there certainly is separation. So, a closing word? Advice for young geographers?

RG: Yes, I think geography is about to enter a new phase where it's image is going to become positive and it's going to be recognised once again as a contributing academic, social and applied discipline. But, this will only happen in any particular country if the geographers in that country are themselves aware of what their country needs from them, and they don't go off in naval gaze in their critical thinking towers. They have to be aware that in order to survive in the next century they can afford to have a reasonable amount of pure intellectual curiosity, but they also have to have a reasonable amount of application, and if they run short on the application they'll find more departments are being merged with other departments who are more application oriented, and if they want to retain their independence and to improve

their image, they've got to look at the new century from a completely different point of view from what they've looked at this, particularly for the last 50 years of this century.

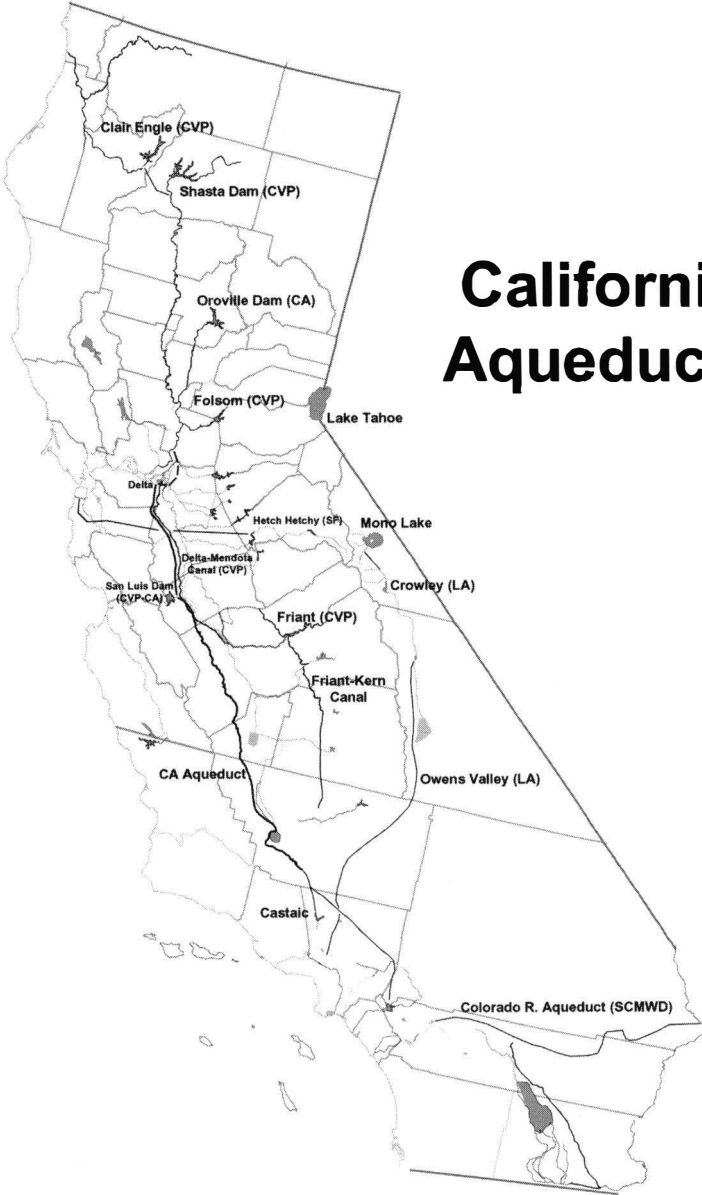
RS: Thank you very much.

References

- E. Stratford: The Millenium project on Australian Geography and Geographers: an introduction and agenda, *Australian Geographical Studies*, vol. 39, no. 1, 2001, (pp 91-95).
Stratford, E, "The Millennium Project on Australian Geography and Geographers", *The California Geographer*, XXXVIII, 97-104 (1998)



California Aqueducts



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The Stockton Meeting

*The 55th Annual Meeting of the California Geographical Society was held at
San Joaquin Delta College in Stockton, May 5-7, 2001*

Award Winners 2001

CGS Outstanding Educator

Bill Preston , Cal Poly San Luis Obispo

Friend of Geography Award

Joan Clemons, UCLA

Outstanding Service to the CGS

Ray Sumner, Long Beach City College.

Dave Lantis Scholarship Award Winners

Undergraduate Award

Yvette Sennewald, California State University, San Bernardino

Graduate Award

Brenda Kayzar, San Diego State/ UC Santa Barbara

Distinguished Teaching Awards

Jerrell Croskrey and John Anderson.

Tom McKnight Graduate Student Paper Awards

Jamie Conley, CSU-San Bernardino

"The Anaheim Resort Area: Renovation and its Affect on Crime."

Pey-Yi Lee, UC-Riverside

"Hierarchical Dispersion Pattern of Loggerhead Shrike in Three
Geographical Scales."

Christopherson Geosystems Award

Tom Carlson, UC–Davis

“Spatial and Temporal Landscape Change on the Point Reyes Peninsula.”

Tom McKnight Undergraduate Student Paper Award Winners

Dawn Aiu, Eric Fraim, Scott Gilleland, Kyle Garcia, David Gunter, Hector Larius, Mohammed Masry, Janet Moreland, Rebecca Paniagua, Sandy Perry, Andrew Recko,, Byran Tanner, Sean Tully, Mario Villegas
“Tracing the Decline of Apple Production in the Watsonville, CA Area.”

John Fisher, Humboldt State

“John Wesley Powell and his Implications for Wilderness and the West
.”

Stacey Clarke, Sonoma State

“Origin and Diffusion of the Glassy-winged Sharpshooter”
sharing the award with
Lisa Rasmussen and Catharine Wallace, Humboldt State
“A Guide to the Humboldt Bay Area.”

Joe Beaton Poster Awards

DeShawn Leiatua & Kelley McMurry,
California State Polytechnic University, Pomona,
“Characterizing the S. California Coastal Urban Ocean Using
Remotely Sensed Imagery”

James Chuang, Jessica Castaneda, James Sullivan & Thomas Scott,
University of California, Riverside,
“Western Riverside County Multiple Species Habitat Conservation”

Debra Catanesi, Cosumnes River College,
“Monterey Bay National Marine Sanctuary–Why Protect It?”

Mapping Contest Winners

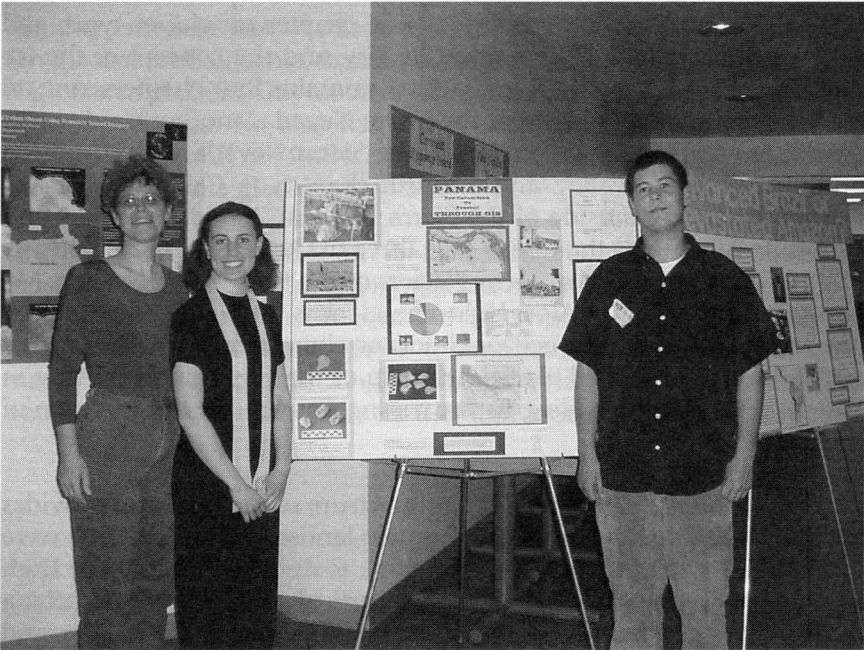
Verena Kellner

“10,000 Mile Journey from Germany to San Diego”

Ariann Bulger

“South America Physical Map.”

Geographic Education



Students from LBCC with their poster at the Stockton meeting, May 2000

Book Reviews

Glaciers of California: Modern Glaciers, Ice Age Glaciers, the Origin of Yosemite Valley, and a Glacier Tour in the Sierra Nevada.

Bill Guyton. Berkeley: University of California Press, 1998, xvi and 196 pp., maps, figures, tables, photos, color plates, reference lists, glossary, additional reading list, and index. \$34.95 hardcover (ISBN 0-520-21295-9), \$16.95 paper (ISBN 0-520-22683-6).

Guyton's book is a wonderful treatise on how glaciers have sculptured the high mountain landscapes of California. Unlike many contemporary physical geology books, it is not just about geological processes, but also describes the people who have studied California glaciers and glacial landforms during the past two centuries. These include John Muir, Francois Matthes, Josiah Whitney, Clarence King, William H. Brewer, and Israel Clark Russell. Indeed much of Guyton's book consists of quotations from these and other natural scientists.

This book contains nine chapters divided into four parts. The first part, "California and Glaciers," consists of one chapter on glacier types and processes, glaciations in geological history, and the concept of the Ice Age. The second part, "Ice Age Glaciers," contains four chapters, one on glacial evidence and history of the Sierra Nevada, another on description of Ice Age glacial landforms in the Sierra Nevada, a third on the origin of Yosemite Valley, and a fourth chapter on California Ice Age glaciers that were outside of the Sierra Nevada. "Modern Glaciers and Holocene Climate" is the title of part three of Guyton's book. It consists of three chapters about modern glaciers of the High Sierra Nevada, Mt. Shasta, and the Trinity Alps; Holocene glaciers and climate of California; and nonglacial evidence for Holocene climate change. The last part of this book is a guided glacial field trip of the High Sierra starting in Yosemite Valley and ending in Lee Vining Canyon on the east side of the Sierra.

Glaciers of California covers a broad spectrum of material and provides much insight into how the high mountain landscapes of California were formed. The strongest aspect of this book is its description of the High Sierra and Yosemite Valley. Guyton pays particular attention to describing in detail the key field sites that provide evidence for the history and evolution of glaciers of the High Sierra. The book's abundant good photographs (many taken by the author), diagrams, figures, and tables

beautifully complement the text description. The guided field trip across the Sierra Nevada from Yosemite to Lee Vining Canyon is a joy to read even if the reader does not plan on driving and hiking the many diverse locales described along the route.

The best part of this book is its description of the evolution of ideas about the history and formation of California's glacial landscape. If you want to understand the methodology of geological science in determining the formation of landforms, read Guyton's detailed explanation about the controversies surrounding the origin of the High Sierra glacial landscapes. For example, he spends an entire chapter describing the evolution of geological ideas on how Yosemite Valley originated. Guyton writes of the personal conflict between John Muir, who believed that Yosemite was formed from glacial processes, and Josiah Whitney, who thought the valley was produced by faulting. He also writes about how Francois Matthes latter determined that Yosemite Valley was formed by both glacial and river processes. Guyton concludes the history of thought about the origin of Yosemite Valley with a modern interpretation. As with most scientific endeavors, the controversies about the glacial history of the Sierra Nevada rage on today as evidenced by the reviews of Guyton's book that are posted on the Amazon Books website (www.amazon.com).

Another excellent part of this book is the detailed explanation of modern glaciers in California. Besides a detailed explanation of the existing High Sierra glaciers, Guyton also has a good description of the glaciers of Mount Shasta. He also has a nice section on the rock glaciers of California. You will not find a better book for providing information on modern California glaciers.

One could criticize Bill Guyton for not going into more detail about the modern evidence for Quaternary glaciations and climate change (about which more has been written in the last two decades than in the last two centuries). Instead, he chose to emphasize the works from great masters such as Matthes, King, Muir, and Whitney. I recommend this book to anyone who appreciates the high mountains of California.

Key Words: Glaciers, California, Yosemite Valley, Quaternary, Geology

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Exploring the Highest Sierra

James G. Moore. Stanford: Stanford University Press, 2000, xv and 427 pp., maps, figures, tables, photos, reference lists, glossary, and index. \$49.50 hardcover (ISBN 0-8047-3647-2), \$17.95 paper ISBN 0-8047-3703-7.

"Such a landscape!" scribed William H. Brewer 137 years ago from the southern Sierra peak that now bears his name. Brewer and Richard Cotter, field members of the 1864 California Geological Survey, were stunned to find that their 13,570 foot aerie left them eight miles shy and to the west of the Sierra crest. Readers who are similarly enamoured with this mountain landscape may well state "such a manuscript" after reading this groundbreaking volume. While Sierra Nevada erudition is long and colorful, books that plumb the geographic and geologic exploration of the southern Sierra are rare. Moore's invigorating text fills this gap. The opening chapter defines the highest sierra as "lying around and within Sequoia and Kings Canyon National Parks, near the southern end of the range" (Page 3). The next 10 chapters are really three books in one. Chapters Two and Three discuss the early exploration and mapping of this terra incognita. Here we cross paths with luminaries such as John C. Fremont, Josiah Dwight Whitney, Clarence King, and John Muir. While Farquar (1965) and others have furnished this narrative before, the new material on mapping clarifies many riddles. The second section—Chapters Four through Eight—explores the geologic time frame, tectonic forces, and rock types of the highest Sierra. This is where Moore's unique crocheting of geologic thinking and the history of exploration hit full stride.

The final section—Chapters Nine through Eleven—utilize the same approach to explain Sierran geomorphic processes (glaciation, landslides, weathering, etc.) and geologic structure. An Afterword, an Appendix of geologic road and trail guides, and a very useful Glossary conclude the book. Along the way Moore dispels the annoying notion that Sierra Nevada geology is basically granite and glaciation. We learn that although Sierran granite comprises nearly ten percent of California, the "four terranes of metamorphic rocks" (page 295), three phases of Cenozoic volcanic rocks, and scattered mineral deposits of gold, tungsten, copper, and molybdenum (among others) are now caught up in the Sierra Batholith. Moore also explains how geologists divide faults within and adjacent to the range into three main groups: young faults of the east flank, the Kern Canyon Fault, and older enigmatic faults that pre-date granitic emplacement. These and other lucid geologic explanations are frequently presented by the scientists who wrestled with them over peak and pass, lab and lecture hall. Utilizing direct quotes and Moore's interpretations, we see Muir and Whitney debate faulting, Charles

Hoffman struggle with erroneous compass bearings to properly identify Mt. Whitney, and UC Geologist, J. N. LeConte, write off what is today the ever-popular Muir Pass as “very doubtful” for stock travel (page 139). In more recent times, Moore touches on how J. B. Saleeby and W. Hamilton debate the origin and assembly of metamorphic rocks. This enticing historical approach thus investigates science, the scientific method, and the lives of scientists, all of whom obviously succumb to the charm of this magic kingdom. Moore’s very effective approach makes for rapid and enjoyable reading that is hard to put down. Those wishing succinct and highly technical—or elementary geology—should look elsewhere as this tome is somewhere betwixt. The numerous historical photos speak 1000s of words, and the accompanying detailed captions complement the text.

Unfortunately, some diagrams and maps are either indistinct (several in the Mineral Deposits chapter), are poorly reproduced (Figure 4.4, global tectonic map), or appear cluttered and thus difficult to read (Figure A.2, field trip routes). Also, Moore’s concluding Afterword provides a continuum of scientific exploration in the Sierra. That is to say, the age of discovery is not over but rather, is enhanced by new technologies such as GIS, remote sensing, and GPS. Here I expected a strong statement for the continued importance of original fieldwork and field verification. This omission was curious as the entire book centered on this very idea. But these minor flaws are small change in an otherwise rich mother lode of new insights. Although written for the general reader with an interest in both science and history, the well-crafted and comprehensive text will suit a wide audience. It will become a standard reference for academics and mountain enthusiasts alike. No library on western exploration, scientific thought, or Sierra Nevada natural and human history should be without it. Avid students of this region need to find shelf space alongside Francois Matthes’ (1930) classic interpretation of Yosemite geology.

Keywords: Sierra Nevada, geology, exploration, cartography Farquar, F. P. (1965). History of the Sierra Nevada.

Berkeley: University of California Press. Matthes, F. P. (1930). Geologic history of the Yosemite Valley: U.S. Geological Survey Professional Paper 160.

Stephen F. Cuñha
Humboldt State University

**1500 California Place Names:
Their Origin and Meaning
a Revised Version of 1000 California Place Names**

Erwin G. Gudde, Third edition. William Bright. Berkeley: University of California Press, 1998, 170 pp. and 1 map. \$12.95 paper (ISBN 0-520-21271-1).

From Abalone to ZZZX, this impressive pocket guide provides students, teachers, armchair explorers, and trivia buffs with clear and brief place name origins. For teachers of California Geography, this little volume is an inexpensive addition to supplement a traditionally ignored facet of regional geographies; answering the question, "How come it is called___?" Bright's revised version of Erwin G. Gudde's 1000 California Place Names transforms the locational attributes of place to the familiar, through succinctly written notes about 1500 places in every county of the Golden State.

For brevity, consider, "Exeter (Tulare County), named in 1880 for the founder's home city in England" (page 55). Bright's use of phonetics (see the concise Key to Pronunciation, pages 5-7) enables readers to understand sounds derived from Spanish, Native American, Russian, and other European languages. One of the many positive features of this pocket-friendly paperback is the inclusion of many California Native American tribal names that comprise a significant source of our contemporary place names. One learns for example that the "Jurupa (huh ROO puh) Mountains (Riverside and San Bernardino Counties), originates from Gabrielino horuv-nga (sage-brush place) or a similar form in a related language" (page 75). The influence of Spanish as an origin for many place names in California is evident throughout the volume.

The history, politics, religion, and physical landscape attributes have also given rise to abundant place names. From Reliez Creek in Monterey County—in Spanish reliz means "landslide"—to Santa Ynez Mission, referring to Saint Agnes, the explanations provide a deeper appreciation of California's rich and varied cultural history. Native American languages have had considerable impact on local places. Bright does a grand service by including brief glimpses into the language groups represented by place names. Consider Paoha Island in Mono County. A casual reader could logically conclude that it derives from Native American origin, and let it go at that. Bright's description, however, explains that the correct pronunciation pah OH huh or pay OH huh comes from the "Eastern Mono pa-ohaa (water baby) referring to a dangerous supernatural creature supposed to live in bodies of water" (page 112).

Obviously this smaller version is a supplemental reference. Written for the generalist audience, the casual reader can tuck this volume in the auto glove box with a road map to use on vacations, traveling, or attending business meetings in new locales. Teachers can apply this information to stimulate discussion, and to provide rationale for understanding the history and culture underlying areas under study.

Volumes such as these enhance student awareness of their own "place familiarity." As such, Bright's work is an excellent bridge for those concerned with "active" versus "passive" learning. The active process of area studies has an historical component which when explored, produces a richer and more readable analysis. For those whose curiosity is piqued by place-names and geographic history, it is a very handy volume. Bright does not hesitate to state when the origin or meaning of a name is uncertain or unclear. His honesty is appreciated and leads one perhaps, towards further study of the nature of place-name derivation and cultural history. Certainly, the author's personal research and attention to detail needs to be recognized. I think that Mr. Gudde would provide a positive review as well.

Ralph Allen, Jr.

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