

## CHAPTER 8

### DISCUSSION

The results of Dr. Wenger's spectrophotometric analysis is in keeping with the results of other analysis of textiles from the same regions of Peru. None of the ten Peruvian textile samples tested by Dr. Wenger had ever been tested for dye content, but the likelihood of cochineal being the dye used was highly suspected. Since the camel bag was mine, I was disappointed to find that aniline dye had been used on the red fibers taken from the bag. The presence of a natural dye would mean that the camel bag was probably woven before the advent of aniline dyes in 1856, making the bag older, and thus more valuable. Even if the camel bag had been woven after 1856, but had been woven with naturally dyed fibers, the naturally dyed camel bag would be more desirable than one synthetically dyed. This fact has caused many weavers to return to the use of natural dyes, including cochineal.

There is a growing body of information about the use of cochineal in early weavings from Northern Mexico and New Mexico, but very little is known about the use of cochineal in textiles from other areas of the United States. When dye analysis was conducted on a number of historical American flags it was discovered that the red colorants used for all the flags was consistently cochineal. These results raise the question of how extensively cochineal was in use throughout the United States before aniline dyes were discovered.

The use of dye analysis on archaeological material is fifty years old, but this type of testing is only now becoming frequently used. The more frequent use of dye analysis has come about partly because of the greatly reduced sample size needed for analysis.

This reduction of sample size has resulted in the analysis of some textiles which could not afford the loss of a larger specimen. There is still a great deal that could be learned by submitting samples of unanalyzed textile, already present in museum collections, to dye analysis.

I have acquired the cochineal insects from three sources for comparative purposes, from Peru, Oaxaca, and Central Texas. I found that the cochineal purchased in Oaxaca is smaller than Peruvian cochineal purchased from Alliance Import Co. (see Appendix VI). The smallest-sized insects were removed from cactus in Central Texas. The Central Texas cochineal was smaller than the domestic variety from Oaxaca. Since the Oaxaca insects were supplied by a government-supported attempt to re-establish the cochineal industry, one would expect that the insect would be as large as the one coming from Peru. I have been unable to obtain a sample of cochineal from the Canary Islands, where it is reported to be the largest and best in the world.

It is unfortunate that the United States' supply of cochineal does not come from Oaxaca, but is imported from Peru. There is still hope that the Oaxaca region of Mexico will once again become a major supplier of cochineal. New efforts are being made by the Instituto Tecnológico Agropecuario de Oaxaca to re-establish the cochineal industry in the Oaxaca Valley. New methods have been developed to counteract the problems of sun, wind, and rain which hamper production. In Peru the wind and rain present less of a problem. Perhaps this explains why it is so successfully grown there.

Another factor to consider is that the Indians who gather the wild cochineal are very isolated and still willing to perform the labor-intensive task required for gathering and preparing cochineal. Producing cochineal dye is a tedious, labor-intensive job. This fact has kept the production of cochineal in the hands of the peasant populations throughout cochineal's long history. The peasant people seem to be the only ones willing to perform

such a labor-intensive task, and even they are not willing without strong motivation from the local markets.

Re-establishment of the cochineal industry in Oaxaca could be economically beneficial to the Indian populations there. With the use of little backyard-sized greenhouses, additional income could be added to families wishing to grow cochineal and serve as an alternate means of subsistence when crops do poorly.

Today cochineal is grown in, but not exported from, Mexico. Peru is the largest producer of cochineal in the world, as well as the primary supplier to the United States. In 1977, 135 metric tons, valued at four million U.S. dollars was imported from Peru. Eight million dollars worth of cochineal was shipped to the United States in 1988. As the use of synthetic food coloring declines, cochineal and other natural coloring substances are taking their place. Red dye no. 3 has come under increasing fire from the FDA and could be banned in the near future. This factor could significantly increase the amount of cochineal imported into the United States if cochineal is used to replace red dye no 3. Some of the cochineal needed to fill the United States' increasing demand could be supplied by Mexico if the industry has been re-established.

The food industry is the primary user of cochineal, but it is also widely used in medicines and laboratory stains. The area of laboratory testing is expanding rapidly and this too could increase the demand for cochineal. In looking through catalogues from chemical supply houses I did not find one which did not offer a form of cochineal, as cochineal, carminic acid, carminoisin, or carmine, for sale.

Oaxaca is making efforts to rekindle the once-lucrative industry. From observations made in Oaxaca, I believe this effort to be very small and under-funded. Less than one year after I traveled to Oaxaca, I learned that Ernesto Hidalgo had lost his job due to a lack of funding. Still, I believe the cochineal industry will return to Mexico because of the increasing market demands for the product. When there is sufficient economic

incentive to produce the dye, the Indians will once again return to this means of production. If the demand is great enough, the supply will be met, if not from Mexico, the Canary Islands, or Peru, from some of the many places where the climate is suitable and the peasant is willing.