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Who's Been Workin' on the Railroad?: An Examination of the Construction, Distribution, and Ethnic Origins of Domed Rock Ovens on Railroad-Related Sites

ABSTRACT

In recent years small domed rock structures have been recorded throughout western North America; others are located in Australia. Those that occur on railroad-related sites are mainly associated with railroad construction camps; a few are known to have been built by later section gang workers. Still others have been found in mining regions, particularly in California. While folklore has often referred to them as "Chinese ovens," no archaeological or documentary evidence has yet been found that would definitely support a Chinese association with either their manufacture or use in the United States. Instead, there is reason to believe that they were built and used mainly by Italian immigrants who brought with them a familiarity with the construction and use of such ovens for baking bread. In Canada and Australia, however, domed rock structures have occasionally been found on sites apparently coinciding with Chinese occupation. This paper surveys rock oven construction techniques, distribution, ethnic associations, dating, and related literature; it provides a starting point for more intensive, localized studies of such structures.

Introduction

Small domed rock structures are found throughout western North America; some also are known in Australia. Generally measuring some 1–2 m in height and 1–3 m in diameter, they are found frequently on railroad construction camp sites and also occur in mining regions. They are commonly believed to have been used for baking bread. In areas where their origins and purpose are unknown to local residents, folklore often has associated them with the Chinese. To date, however, no Chi-

nese artifacts are known to have been found in definite association with their initial construction and use in the United States, although such associations apparently exist in both Canada and Australia. In California, previous work on domed rock structures found in isolated placer mining areas has ascribed them either to Italian immigrants or to Sonorans and Chilenos. Elsewhere, researchers have suggested that rock ovens found in certain railroad camps were built by Italian or Greek laborers.

In order to provide a starting point for others wishing to pursue more intensive studies of their distribution, ethnic affiliations, dating, and construction techniques, what is presently known about domed rock ovens is reviewed in this paper. Related bibliographical information on these and other types of outdoor ovens also is included. The paper focuses on rock ovens associated with railroad construction camp sites.

Construction and Use

While generally of a similar domed shape, the stone ovens exhibit a few different details of construction. They are built of local stone, and originally may have been mortared with mud. Although they usually now appear unmortared, this state is perhaps due to the original mortar having washed out over time. Ovens made of dry-laid masonry, however, have been described in Italy (Scheuermeier 1956:405). As long as ovens were rendered airtight by some other means, such as an earthen covering, they would not have needed to be mortared.

Contemporary photographs showing the ovens in use often depict them with an earthen covering. Ovens that are still standing today usually do not have an earthen covering; they may once have had one that has simply weathered away (Figure 1a). Most ovens remaining in good condition have a complete dome, with no top opening. Some have an opening in the top or in the side; all have a doorway in front, usually with a large stone lintel. Although it is generally agreed that these are ovens



FIGURE 1. Stone baking ovens in Boundary County, Idaho (10-BY-372) built in 1905/1906 at the time of construction of the Spokane International Railroad: a, exterior of one; b, interior of another.

for baking bread, the interiors rarely contain any charcoal or other signs of burning (Figure 1b).

The following account of the use of a stone oven is paraphrased from Costello (1981:23). First, a fire is built inside. After it burns down, the coals are raked out. The oven floor is swept clean and then sprinkled with corn meal or flour. Next the loaves are placed inside after closing the flue hole in the rear of the oven's roof; the door is sealed with a piece of metal or a damp cloth. The entire process took about two and one-half to three hours to prepare the coals, but only about 15 minutes of baking time at 450°F.

Several reasons can be given for the lack of charcoal or burning noticed in ovens associated with railroad construction camp sites. First, because the fire was built inside and then raked out and to one side, most remaining charcoal would be outside the oven. If it was not deliberately removed, and reports on sites with ovens have not

mentioned large amounts of ash and charcoal in trash disposal areas, it would have become dispersed over time. Second, the effects of rain and weathering could have removed evidence of burning from the rocks. Third, given the mobile nature of railroad construction crews, none of these camps would have been occupied for very long.

Geographical Distribution of Domed Rock Ovens

Numerous domed rock ovens have been recorded during site surveys done in the course of cultural resource management efforts by various federal agencies. There are certainly many more that are known only locally, or from in-house agency reports, or as yet are undiscovered. Because this study is not intended to be comprehensive or exhaustive, readers may know of other rock

ovens that are not included here. The author would be grateful if they could be brought to her attention to be shared with other interested researchers.

Rock ovens are known to have been recorded on railroad-related sites in Colorado, Idaho, Montana, Oregon, Utah, and Washington. Appendix 1 summarizes pertinent data on sites with rock ovens, including location, railroad, date of construction, ethnic association, and documentation of ethnic attributions. Suggested ethnicity will be evaluated more fully in the later section on ethnic origins.

One site in northern Idaho is typical of many railroad construction camps containing rock ovens. Two exceptionally well-preserved stone ovens are located on private property in Boundary County two miles south of the Canadian border near Eastport (Appendix 1, No. 6). Together with another ruined oven and several collapsed log structures, they are the remains of a railroad construction camp site (10-BY-372) dating to the building of the Spokane International Railroad (SI) in 1905/1906 (Morgan 1956:19). They are roughly circular in plan, measuring approximately 2.0 m in diameter and 0.9 and 1.2 m high and are built of local shale neatly laid in courses. While these appear unmortared, they may have been held together originally with mud mortar, since washed out. The shorter oven has a vent hole in its top, measuring roughly 11.5 × 15.0 cm (Ann Stevens 1989, pers. comm.). Both ovens have rectangular openings in front, with stone lintels.

Oven lintels were occasionally made of other materials. A photograph, taken in Washington State at Hot Springs, near Lester, shows a domed rock and earth oven in use by a baker working for the Northern Pacific (Figure 2). A loaf of bread is being inserted into the oven with a wooden paddle, and finished loaves are cooling on a plank nearby. The oven's lintel appears to be a short piece of iron rail (Wood 1968:89; Rossillon 1984:106).

Some other domed rock ovens in California, Idaho, Montana, Nevada, Oregon, and Washington were not related to railroads, but are included for comparative purposes in Appendix 2. Most of these are associated with placer mining. A particularly useful account is Julia Costello's work (1981) on Gold Rush archaeology in which she

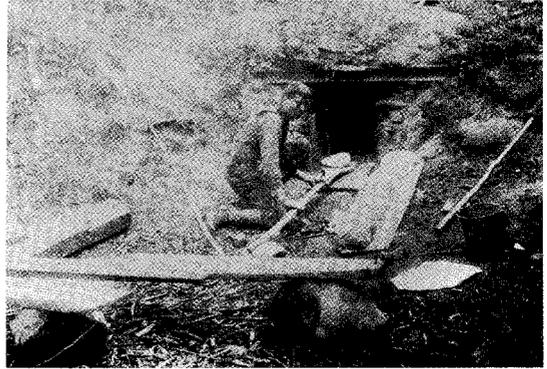


FIGURE 2. Baking bread in an earth-covered rock oven at Hot Springs, Washington, near Lester (courtesy of Ed Nolan; reproduced from Wood 1968:89).

provides an excellent descriptive analysis of ovens found in California's Calaveras and Tuolumne counties. Her characterization of oven construction and use is applicable to similar structures found on railroad-related sites.

On occasion, rock ovens appear in the literature but are not identified as such. Robert Ormes (1975: 52), for example, included photographs of two stone "forts" and one "fortlet" in south central Colorado. Of the three, the "fortlet" certainly appears to be an oven; it is domed and has a rectangular opening in the front. The locations of other "forts" and "fortlets" are indicated on maps; the "forts" are said, without supporting evidence, to be from the Royal Gorge War, a route dispute between the Santa Fe and Denver and Rio Grande railroads from 1878 to 1880 (Ormes 1975:48–52).

Besides the western United States, domed rock ovens also occur in Canada and Australia. While some of those in Canada are associated with railroads, those in Australia are not. Appendix 3 summarizes locational, occupational, and ethnic information for those few known to have been documented so far.

In Canada, for example, the Naramata Ovens, as they are termed (Figure 3), date to the time of construction of the Kettle Valley Railroad from 1911 to 1915; they are 5.0–6.0 ft. high and are approximately the same diameter (Wright and Wright 1970:18).

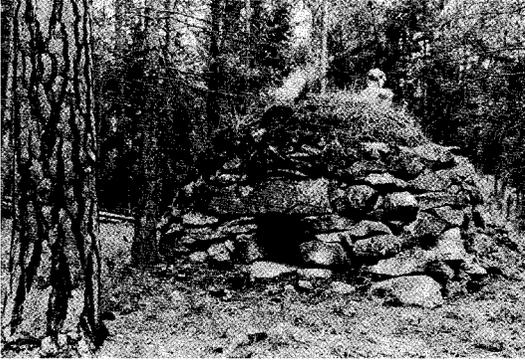


FIGURE 3. Rock oven in British Columbia, along the Kettle Valley right-of-way above Naramata, built between 1911 and 1915 (courtesy of Richard T. Wright; Eric Sismey, photographer).

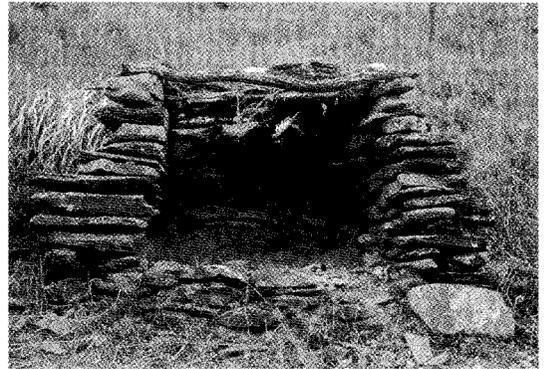


FIGURE 4. Domed rock structures on the Palmer River goldfield, Queensland, Australia: a, reputed "Chinese oven," one of three close together; b, reputed "Chinese fort" (courtesy of Gordon Grimwade).

Several domed rock structures in Australia are located some 60 km from the nearest railway. Those called "Chinese ovens" (Figure 4a) are adjacent to Cannibal Creek on the Palmer River goldfield. Three of them are within 8.3–14.0 m of one another; fragments of Chinese porcelain bowls were observed on the ground surface adjacent to them (Gordon Grimwade 1988, pers. comm., citing Van Kempen 1987:41).

Another Australian rock structure, whose pole roof has been added in recent years, also may have been used as an oven (Figure 4b). Although it is called a "Chinese fort," archaeologist Gordon Grimwade is skeptical of that term, noting that it would have been very confined for such use. In addition, no Chinese artifacts were observed on the surface in the vicinity (Gordon Grimwade 1988, pers. comm.). It has a flagstone floor, interior height and diameter dimensions of 1.3 m, and is also well away from any railroad.

Ethnic Origins

The history of outdoor ovens is a lengthy one, dating back as far as Neolithic times in Central and Eastern Europe (Frierman 1983:227); numerous references exist documenting their existence in

many countries. Jay Frierman, for example, identifies three types of freestanding ovens with different antecedents that not only had their origin in ancient times but also continue to exist today. One is a clay oven built over a wood frame that is characteristic of rural France and French Canada. Another is a rectangular, barrel-vaulted half-round oven of Roman origin, such as the folk ovens of isolated rural Italy, and also "known in both Anglo and Latin America;" such *hornos* are "characteristic of professional bakers in urban and village Mexico" (Frierman 1983:228). The third type is a domed oven, said to have originated in the Near East, introduced to Spain by the Moors, and



FIGURE 5. "Bread baking—Railroad Crew near Terry, MT. on Northern Pacific, ca.1909 Evelyn J. Cameron, Photographer" (courtesy of Haynes Foundation Collection, Montana Historical Society, Helena).

brought to America by the Spanish (Frierman 1983:227–228).

Frierman's first two types are not really of concern here; however, the history, construction, and use of Quebec's clay and brick bread ovens, Frierman's Type 1, are thoroughly discussed by Lise Boily and Jean-Francois Blanchette (1979). Although they found little information on, and no examples of, stone ovens, the ethnographic information in this excellent work has great applicability to analogous studies. Rural Italy's rectangular, half-round, barrel-vaulted ovens, Frierman's Type 2, are defined and discussed by Paul Scheuermeier (1956:205–206). Scheuermeier is said to have identified two Italian types, both "never dome-like" (Frierman 1983:228). Frierman's interpreta-

tion of this German source is disputed by the present author, and will be discussed later in this paper. According to Frierman, one of these types is built under a shelter and is found only in the Alps; the other, without a shelter, occurs in Middle and Southern Italy. Normally made of brick, "the most primitive are made of dry laid field stones" (Frierman 1983:228). What appears to be a half-round, barrel-vaulted oven is partially shown in a photograph of a Northern Pacific crew baking bread in Montana (Figure 5).

Numerous other sources mention the outdoor ovens used by various ethnic groups. Some of these are briefly discussed by Rossillon (1984: 104–107); a few are illustrated. One site in Texas (41-VV-588) held a half-round, elongated dressed

stone oven probably constructed by German immigrants; it was relocated and restored (Rossillon 1984:106, Fig. 46, reproduced from Patterson 1980). Also illustrated is a fine example, from Colorado, of an outdoor domed "Mexican" adobe bread oven (Rossillon 1984:107, Fig. 47).

Rossillon (1984:104, citing Long 1964:17–18) also mentions large Pennsylvania Dutch square ovens with timber roofs. Henry Glassie (1968:9) describes these as being a "form found today in Central Europe and Scandinavia." This form was introduced to America from the Continent, and it is now found in upstate New York and in western and, especially, southern Pennsylvania (Glassie 1968:9–10, Fig. 1). Glassie cites Pennsylvania examples from Raymond (1931:94) and Stotz (1936:147, 149) and also notes that "Pennsylvanians built outdoor bakeovens exactly like those found in Switzerland" (Glassie 1968:42), illustrating one and citing a number of sources to prove his point (Thomas 1917:574–576; Jaekel 1917:579–586; Rosenberger 1923:52–53; Zinsli 1941:2–5; Währen 1962:17–22; Long 1962–1963:11–14, 31–32; 1964:16–29; Culbertson 1966:83). A Pennsylvania-German bake oven is reportedly on display at the Winterthur Museum in Wilmington, Delaware (Olmert 1989:67). Other groups building outdoor bake ovens were Latvians in Mississippi and Belgians in Wisconsin (Glassie 1968:204–205, citing Heberle and Hall 1950:60–61 and Holmes 1944:164, photo following 134).

Outdoor ovens also were part of the culture of rural south Louisiana. The major groups building such structures were French, Hungarians, Mexicans, and Italians (Kniffen 1960:26). The Italian oven was introduced by Sicilians and south Italians towards the end of the 19th century and was "abundant" even in New Orleans into the 1930s (Kniffen 1960:26).

Origins of Railroad-Related Rock Ovens

Several ethnic groups have been mentioned in connection with rock ovens on railroad construction camp sites, including Chinese, Scandinavians, Greeks, and Italians.

Chinese

For those domed rock structures that have been identified as ovens, whether at railroad construction camps or other sites, evidence is substantial that they were not built by Chinese. Such proof is largely negative, in that to date no report examined for any of the oven sites in the United States has documented with certainty a Chinese association. Chinese attributions, where undocumented, probably stem from the fact that where rock oven origins are unknown, the ovens are considered "mysterious" and are therefore wrongly assumed to be of Chinese manufacture. Local newspaper headlines, such as "... Mystery Mounds ..." (Blonk 1983), "The mystery of the 'Chinese ovens'" (*Bonnors Ferry Herald* 1987), and "Stone oven—recipe for mystery" (Briley 1989), only encourage and perpetuate such stereotypical beliefs. Similarly, local names such as "coolie houses" or "coolie huts" (Buckles 1976:237) have been used to describe rock ovens. Not one of these assertions is as yet accompanied by an oral historical documentation in the form of a quote from a named person, such as those characteristic of the Greek and Italian identifications, below.

Although rock ovens on one Idaho site (Appendix 1, No. 6) are known locally as "Chinese ovens" (Ann and Norris Stevens 1986, pers. comm.), local historian Paul Flinn believes there is "no indication that the ovens were built by Chinese railroad workers;" he has never come across any references in old issues of the *Bonnors Ferry Herald* "to indicate that Chinese railroad workers ever worked in Boundary County" (*Bonnors Ferry Herald* 1987:1), or that they were (or were not) employed by the Spokane International (Paul Flinn 1987, pers. comm.). Another informant stated emphatically that Chinese were not used on the SI (Chuck Peterson 1987, pers. comm.).

One enigmatic reference connecting Chinese with a baking oven in Idaho refers to the location of an Idaho mining claim, not yet located on the ground (Appendix 2, No. 4), stating that it runs to the "northwest corner of the bakeoven at the west end of the cabin formerly occupied by Ah Keet and Company" (Pierce Mining District Records 1866:

159). Because this could also represent Chinese reoccupation of a Euroamerican site, it cannot be used as definitive evidence for oven construction or use by Chinese.

Many reports mention Chinese construction as a local, undocumented, belief held about a number of sites, including one in Idaho (Appendix 1, No. 6) and some in Oregon and Washington (Appendix 1, Nos. 16, 21, 23, 27; Appendix 2, Nos. 10, 11). Other rock ovens in Montana (Appendix 1, Nos. 11–14) suffer from similar, unsupported, attributions, although in one case the alleged Chinese association is discounted (Shea 1977:83–84) and in the other it is pointed out that it is unlikely the ovens are Chinese, “since so little of what the Chinese ate could be cooked in them” (Heritage Research Center 1984:166).

Domed stone ovens, in fact, are not a part of Chinese culture. One authority noted that “the art of baking is not well understood by the Chinese. . . . The bake-oven, so highly developed as a kiln for porcelain and pottery, is only sporadically used for culinary purposes” (Hommel 1937: 105). A lengthy essay on the food of southern China does not mention baking at all; wheat flour is used to make buns, but these are always steamed (Anderson and Anderson 1977:337). “Baked grain products such as bread are minor or absent except in some western montane areas” (Anderson 1988: 112). Only the “Uighur and their neighbors . . . part of the Persian food world . . . make true bread, sticking the dough in large folded sheets to the inside walls of a sunken oven” (Anderson 1988:117). Not until recent times have Western baked goods become “popular and widespread in China;” formerly, fuel was too expensive, and space and materials for ovens were difficult to find (Anderson 1988:154).

A Taiwanese man, when told about the supposed “Chinese ovens” on the Snake River at the base of Nisqually John Canyon in Whitman County, Washington (Appendix 1, No. 27), speculated that they might be Taoist shrines for burning spirit money; he noted that the southern Chinese, who made up most of the Chinese laborers in this country, boil or steam their food, and do not bake bread (Frank Leonhardy 1987, pers. comm.).

While the structures in question are not Taoist shrines, the guess was a good one. Such shrines do occur in Chinese cemeteries in this country, but their design is completely different.

In Australia (Appendix 3, Nos. 10–11), Chinese men in their late 50s did recall the use of domed rock cooking ovens in North Queensland (Gordon Grimwade 1988, pers. comm.). There, archaeological and documentary research has found no other ethnic groups in the study are during the time period that the ovens were apparently constructed, although by 1890 Italians began “to supersede the Chinese as charcoal burners and timber cutters on the mining fields” (Gordon Grimwade 1988, pers. comm., quoting Bolton 1972:159).

In Australia and Canada (Appendix 3, No. 5), however, Chinese artifacts have been found on the surface in association with certain rock structures identified as ovens. Such occurrences are most intriguing and warrant further study by researchers in those countries. Archaeologists here also should be aware of that possibility, although to date no such definite associations are known to have been substantiated within the United States.

Scandinavians

Ovens in Naramata, British Columbia (Appendix 3, No. 4), are said to be associated with men, “usually Scandinavian,” who were engaged in heavy rock work (Sismey 1972:28). There is no supporting documentation for this statement, nor is a Scandinavian affiliation mentioned in any other source consulted in relation to rock ovens on railroad construction camp sites. This ethnic attribution can therefore be dismissed; in any case, outdoor ovens associated with Scandinavians are reported to be square, with timber roofs (Glassie 1968:9).

Greeks

It has been speculated that the ovens found adjacent to Montana’s Troy-Libby Highway (Appendix 1, No. 11) “probably were constructed by immigrants from Greece or another country in



FIGURE 6. "Baking bread at Greek's Camp Natron Extension construction 1909–1910" depicts an Oregon oven associated with the first construction phase of the Southern Pacific's Natron Cut-Off (courtesy of Lane County Historical Museum, Eugene, Negative No. T6N/L79–416c).

southeast Europe;" an elderly local resident who was a clerk for the Great Northern Railroad believed the ovens were constructed by the Great Northern's Greek workers in the early 1890s (Heritage Research Center 1984:74, 166). This report is substantiated, although for a somewhat later time period, by a 1976 interview with William Romek of Billings, who worked for the Northern Pacific as a timekeeper during World War I. In early 1918

[I] was assigned to a gang of nearly 70 Turks, Greeks, and Armenians. . . . We lived in converted box cars, our beds were a canvas nailed on a frame spiked to the side of the car. We were assigned a Greek member of the crew to cook our meals. The first thing that the crew did at any location was the construction of their earthen and rock ovens and we had delicious bread, fresh every day, in round thick crusted loaves (Rossillon 1987:4).

A Greek man is reported to have baked bread for railroad crews in a stone oven near Careywood,

Idaho (Appendix 1, No. 5). An Oregon photograph on which is written "Baking bread at Greek's Camp" (Appendix 1, No. 17) depicts two men engaged in bread baking in what looks like an earth-covered stone oven (Figure 6).

Italians

California archaeologist Julia Costello, in an examination of a number of rock ovens in New Melones' Angels Creek mining area (Appendix 2, No. 1), found that many ethnic groups could have occupied the area during the latter half of the 19th century. Census records in particular suggested that these people were Italians (Costello 1981:22) who were all gone from Angels Creek by 1880 (Costello 1981:20). The ovens are attributed to them based on census documentation, oral histories collected from Italian American informants in

the area, and examination of similar ovens known to have been constructed by Italian Americans in more recent times between 1880 and 1910 (Costello 1981:26; 1990, pers. comm.). One New Melones oven, dating from the 1850s, was attributed "fairly certainly" to Mexican settlement (Costello 1981:26).

Later researchers in the same area (Appendix 2, No. 2) attributed almost all the ovens to Sonorans or Chilenos, a conclusion based upon the early and numerous presence of these ethnic groups and upon their known use of domed ovens (Greenwood and Shoup 1983:232). An Italian identification was rejected, primarily because these researchers believed "bread ovens in Italy were, and still are, barrel vaulted in shape rather than domed," although they felt that some of the ovens, particularly if 1880 or later, might indicate an adaptation of the *horno* (Greenwood and Shoup 1983:232). The Italians were believed to have been historically associated only with half-round barrel-vaulted ovens that were said to be not characteristic of the ovens found in the project area (Frierman 1983:227–229; Greenwood and Shoup 1983:229–232). Frierman's evidence for his belief that domed ovens were not used by Italians is compelling (Frierman 1983:228–229), as is Greenwood and Shoup's for the age of the ovens and the earlier presence of Sonorans and Chilenos as compared with Italians (Greenwood and Shoup 1983:232); however, Costello's photograph of a domed oven known to have been built in 1899 by a Calaveras County Italian immigrant and accounts of local Italian families of the common building and use of these ovens in the late 19th century are equally compelling (Costello 1981:21; 1990, pers. comm.).

A careful reading of portions of Paul Scheuermeier's definitive works on peasant labor in Italy (Scheuermeier 1943, 1956) has established that the actual shapes of the ovens there are, in fact, not specifically mentioned (Scheuermeier 1956:205–206). Of those that are illustrated, some appear to be half-round barrel-vaulted ones, while others could be domed (Figure 7). The latter (Scheuermeier 1956:405, Pl. 315) is described as "freistehender Backofen, *forno*, von Trockenmauer



FIGURE 7. Rock oven, probably circa 1930s, at Pietralunga, Umbria, Italy (courtesy of Dr. Jakob Stämpfli, Verlag Stämpfli et Cie, Bern; after Scheuermeier 1956: 405, Pl. 315).

umgeben und gedeckt," which translates as "free-standing oven, 'forno,' surrounded and covered by dry-laid masonry" (translated by the author; accuracy confirmed by Elizabeth Steinhagen 1989, pers. comm.).

In the Apulia region of Italy, unmortared limestone structures with corbelled domes, called *trulli*, have been built for centuries (Allen 1969:1). They have been used for "agricultural day shelters, toolsheds, or huts for occupancy during harvest time" and less often as permanent homes (Allen 1969:22). Doorways of such structures are often capped with a stone lintel (Allen 1969:24, 38, 43). Frierman (1983:228) believes that the shape of Italian ovens is "never dome-like" and that corbelled conical roofs made of local field stones are characteristic of other southeastern Italian structures such as small storage or tool sheds, but not ovens (Frierman 1983:229). Nevertheless, Italians knew of this type of construction, and they did in fact use a domed style for ovens at times (Figure 7).

Also in southern Italy, particularly in Apulia and Sicily, cheese-making kettles often are placed in "einem gemauerten, zum Teil mit Lehm verstrichenen Herd," that is, "a mortared hearth that is partially covered with clay" or hanging from a crossbar placed over a wide, round, masonry

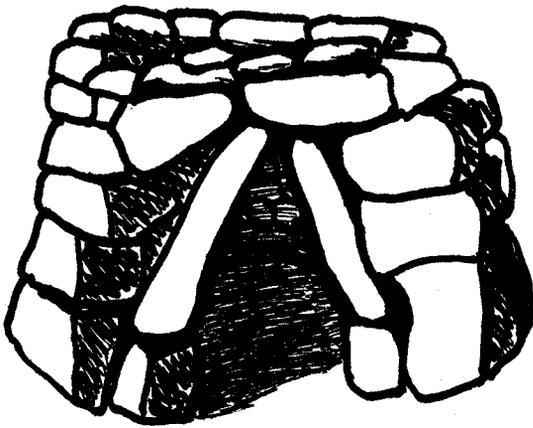


FIGURE 8. Hearth for making cheese, probably circa 1930s, in lower Italy (adapted from Scheuermeier 1943: 38, Fig. 97).

hearth (Scheuermeier 1943:37–38, Fig. 97; translated by Elizabeth Steinhagen 1989, pers. comm.). Although no dimensions are provided, a drawing of such a hearth shows that it is strikingly similar to a domed rock oven in design (Figure 8).

Surely it is not too far-fetched to speculate that Italians, faced with the task of constructing small ovens for short-term use by small groups of men at railroad construction camps, might have adapted known construction techniques to new purposes. It is therefore interesting to note the following description, accompanying illustrations of outdoor ovens in rural south Louisiana, that the “distinction between oval French and beehive-shaped Italian ovens in Louisiana is obvious, and neither would be confused with the dome-form oven of Spanish America” (Kniffen 1960:28–29). Although Kniffen’s Italian oven example is a front view, the shape of the oven illustrated bears a marked similarity to the one mentioned earlier that was built by an Italian immigrant in California’s Calaveras County in 1899 (Costello 1981:21) and to others of similar shape that numerous Italian Americans in that area said they had built (Julia Costello 1990, pers. comm.).

Mary P. Rossillon noted that “bread was one of the foods that the Italians usually cooked for them-

selves; this they baked in stone ovens specially built for that purpose” (Rossillon 1984:56, citing Iorizzo 1970:50). The citation of Iorizzo (1970:50) in this context is perhaps an error. Although that source does mention bread baking by Italians (Iorizzo 1970:56), nowhere are “stone ovens” referred to specifically as such.

Another author, writing on the folkways of southern Italy, observed that most of the cooking took place outside the home, to avoid fumes given off by burning wood and charcoal. “In addition to the stove or brazier, every family except the very poor also had an outside oven (fornello) for baking. This large structure, built of stone or brick like its American rural counterpart, occupied a corner of either the kitchen, yard, or garden” (Williams 1969 [1938]:59). Women baked once or twice a week because wood and charcoal were scarce and expensive. Also, “Bread baked with wood was thought to have a particularly tasty flavor. Even when rich, the South Italian much preferred to eat homemade bread rather than any he could buy” (Williams 1969 [1938]:53). Descriptions of Italian bread baking in America sometimes mention the outdoor ovens used. Emily Fogg Meade’s report on Italians in the United States focused on southern Italian berry pickers in New Jersey. She described their cooking arrangements, and noted that, “In some cases the old-fashioned beehive oven, made of brick and cement, has been erected and is used by several families. This is filled with wood, and after the wood is burnt and the oven heated the bread is put in to bake” (Meade 1907: 508).

Other accounts mention the construction and use of rock ovens by Italian railroad workers in the West. During the late 1880s, for example, Northern Pacific construction in Washington State employed Italians (Appendix 1, No. 23). They lived in tents or shacks, and their camps were separate from the main construction camp. The Italians cooked their own meals; these included stews made from local jackrabbits. According to Joseph Janni of Wenatchee, whose father was a waterboy, they made ovens from basalt along the tracks in various places. A fire would be made of sagebrush in the interior, and then the bread to be baked was

placed on flat pieces of driftwood found along the nearby Columbia River. These were then shoved into the hot oven with a driftwood paddle. The resulting bread was said to be "so hard that if a man was struck in the head by one of the loaves it would have killed him" (Blonk 1983:3).

The United States Immigration Commission's 1911 report on immigrants in industries makes several observations on bread baking in railroad construction camps. One of these noted that freight cars often were used as sleeping quarters. The "camp" could then be moved as needed, "causing the men no other inconvenience than, in the case of those who bake their own bread, the building of a new bake oven—a small cave in an embankment or hillside" (United States Immigration Commission 1911:427). Discussing Croats, Greeks, Bulgarians, and Italians, the report noted that each gang was a "racial unit," living in separate cars and often separate camps. If they worked close to a city they bought their bread there, but otherwise:

The bread was baked in the camps, holes being hollowed in an embankment, filled with burning embers, emptied when well heated, and then filled with the loaves, the entrance being sealed with stones and mud. The management of the oven is left to volunteers, the cook mixing and forming the dough only. . . . In one camp the interpreter of a gang of Italians bought the flour and baked the bread himself, selling it at 10 cents per loaf with considerable profit (United States Immigration Commission 1911:428).

Archaeologist William Buckles, working in central Colorado's Summit County (Appendix 1, No. 4), investigated eight rock ovens on a large railroad construction camp, related to construction of the Tenmile Canyon lines of both the Denver and Rio Grande (D&RG) and Denver South Park and Pacific (DSP&P) (Buckles 1976:322). His sources show that each of these railroads employed Italian workers at various times, some of whom were specifically associated with DSP&P construction in Tenmile Canyon (Buckles 1976:64, 75–76, citing Poor 1949:252, Fiester 1973:103). Buckles interviewed a woman of Italian descent, whose father arrived in Colorado about 1910; she saw a photograph of a "dome" (either Lavallee 1974:Fig. 294 or Wood 1968:89):

and volunteered the information that it looked like the baking oven her father and many Italian neighbors construction (sic) in a small truck farming area near Cañon City. These persons were mostly miners who came as immigrants to the mines of southeastern Colorado (Buckles 1976:64).

Although Italians were not definitely known to have resided at the 5-ST-2 site where the ovens were located, Buckles suggested that stone domes are related to both railroads and bread baking, and speculated that Italians might have been the ethnic group responsible for the ovens (Buckles 1976: 318–319). Similar structures were known to have been built by Italians in southeastern Colorado "as recently as World War I" (Buckles 1976:325).

Rossillon (1984:54,103) tentatively identified Italians as the builders of the rock ovens found on the line of the Denver and Rio Grande Railroad's Lake City branch at Marion, Colorado (Appendix 1, No. 2). The identification is based on the report of a camp of unskilled Italian laborers about six miles from Marion at what was Grabiola, "a big construction camp for Italian laborers" who worked on the 1889 Lake City extension of the Denver and Rio Grande (Vandenbusche and Borneman 1979:55; Vandenbusche 1980:161). In common with the practice on many other rail lines, contracts to build the D&RG's branch to Lake City were let to a number of individual construction and timber contractors all along the route; some of this work was then subcontracted out (Vandenbusche and Borneman 1979:42). Two such subcontractors are known to have employed about 700 men, most of whom were Italians, for grading the line of the new branch:

Scullan and Stacy, sub-contractors grading the extension, had 700 men, mostly Italians, working on the grade. The Italians resembled a small army as they scattered along the Lake Fork in numerous camps, digging, blasting, building the road bed, and laying the track in rhythmic fashion (Vandenbusche 1980:159).

It has not yet been determined if the contractor who employed the Italian laborers at Grabiola, and the contractor for the Marion portion of the route, were one and the same, but it would seem likely they were.

While Rossillon, on the basis of substantial circumstantial evidence, has attributed Italian ethnic-

ity to the builders of the ovens she recorded, she is careful to note that vernacular architecture alone cannot yet be used as a positive indicator, without other material culture evidence (Rossillon 1984:109). No other features or artifacts were found that could be positively identified as Italian (Rossillon 1984:126); indeed, very few Italian artifacts have ever been found even on archaeological sites known to have been occupied by Italians (Rossillon 1984:107–108). An exception is Shoshone Wells in Nevada's Cortez Mining District (Appendix 2, No. 6). A cluster of four stone houses, known through written documents to have been occupied by Italian woodcutters, had outdoor earth ovens in association with two of the houses, and Italian biters bottles were recovered archaeologically (Hardesty and Hattori 1982:39; Hardesty 1988:84).

Rock ovens at certain other railroad construction camp sites can be demonstrated to have at least circumstantial connections with Italian laborers. One such camp is located above the Moyie River and about two miles south of the Canadian border town of Eastport, Idaho (Appendix 1, No. 6; Fig. 1). It was built in 1905/1906 during construction of the Spokane International Railroad (SI), a line extending from Spokane, Washington through Bonners Ferry, Idaho, and into Canada. Contracts for specified portions of the route were let to various contractors (*Bonners Ferry Herald* 1905, 14(49):1; 15(1):1; 15(7):1). Some of the contractors for the SI employed Italians in unspecified numbers. Of the 1200 laborers hired by September 1905, "a majority" were Scandinavians and Italians. These, together with Japanese, were said to be replacing the Irish. Other nationalities represented were Austrians and "Scotch" (*Spokesman-Review* 1905, 23(100):9).

The *Spokesman-Review* sent an artist and a reporter-photographer along the Spokane International construction line, and they produced a series of illustrated feature articles. One, entitled "Railroad Camp Sunday Scenes," noted that:

The fellows in the Italian Camp had been supplied with liquor and some of them were intoxicated. When a camera was produced they came running from all directions to have their pictures taken. . . . The different nationalities did not mix in the conversation and in the lounging groups . . . the

Italians and the Japanese were more distant than any of the others. Each of . . . these nationalities is proud of his race, and seems to think he is better than the other fellows . . . The Italians are said to be of the belief that no railroad could be built without their assistance (*Spokesman-Review* 1905, 23(101):Pt. 4, 1).

A number of the Italians worked for a "veteran Italian railroad contractor" named Mike Lungo making railroad ties. Lungo, who ran a camp with a hotel, store, and stable some 17 miles north of Bonners Ferry (*Spokesman-Review* 1905, 23(99):14),

has made and lost fortunes in railroad contracting. He has worked Italian crews from Mexico to British Columbia. Mr. Lungo speaks broken English, and is . . . quick witted. . . . He carries on a mercantile and hotel business as side issues to his railroad contracting (*Spokesman-Review* 1905, 23(101):Pt. 4, 1).

Lungo's boarders paid 25¢ per meal, or \$5.25 per week (*Spokesman-Review* 1905, 23(98):1). More commonly, Italians did their own cooking, for about \$8.00 to \$9.00 a month on wages of \$2.00 per day (*Spokesman-Review* 1905, 23(100):9). More usual wages were \$2.25 to \$2.50 per day, depending upon experience (*Spokesman-Review*, 1905, 23(98):1).

Newspaper accounts of subsequent events involving SI Italian employees, together with other evidence, provide an almost certain linkage of Italians with the rock oven site 10-BY-372 (Appendix 1, No. 6). In late December 1905, a newspaper story was headlined "Wild Riot in a Corbin Camp; Italians Rear Up and Buck on the Spokane International" (*Spokesman-Review* 1905, 23(195):2). "A bunch of Italians" had engaged in "a pitched battle . . . at Hasting's grading camp, on the Moyie, near the International line." The Italians wanted a 25¢ raise, to \$2.50 per day, and reportedly assaulted the foreman with a shovel when he ordered them to work or leave, and "did considerable shooting, evidently with the object to scare" since no one was killed or wounded (*Bonners Ferry Herald* 1905, 15(26):1). It was reported that the site of the fray was at "Molia, 30 miles north of Bonners Ferry" (*Rathdrum Tribune* 1905, 11(38):1). The present owners of the property where the oven site 10-BY-372 is located believe

that this is where Hasting's camp was situated: ". . . all this area was called the Moyie after the river. Different people spelled it and pronounced it different ways—Molin, Moyin, etc." (Ann Stevens 1989, pers. comm.).

An earlier article noted that Hastings and Dignan had the contract for the eight miles extending south from the Canadian border, and that they had a camp of 100 men (*Spokesman-Review* 1905, 23(99):14). The camp with the ovens, 10-BY-372, is two miles south of the border. While the immediate area has several collapsed log structures and the remains of possible tent platforms, the number of workmen it actually housed cannot be determined. It is a Hastings and Dignan camp, or one belonging to one of their subcontractors, however, since it is within their eight-mile contract. It was common for construction camps, of varying sizes, to be located "every mile or less" (*Spokesman-Review* 1905, 23(97):1-2), or no more than one-half hour's walk from each other (*Spokesman-Review* 1905, 23(99):14).

Italian laborers who helped build the Spokane, Portland, and Seattle Railroad near Cheney, Washington, also built rock ovens there (Appendix 1, No. 26). Two sites in the Turnbull National Wildlife Refuge, each with one oven, have been nominated to the National Register of Historic Places. According to information obtained ca. 1976 from a Mr. John Van Brundt of Cheney, who was raised on a homestead near the rock ovens and was present during the construction period, they were built

by Italian laborers who worked on construction of the Spokane, Portland and Seattle Railroad in 1906. . . . The nearest labor camp to these ovens was at Mock, about 1-2 miles to the southeast. About 50 to 75 men worked out of this camp, which was run by an Italian subcontractor named Gabriel Ballante (National Register of Historic Places n.d.).

Other definite associations of Italian railroad workers with rock ovens are known. One woman, Mrs. Nannie Kidwell, together with her husband and children, arrived in Russell, Washington, near the Canadian border, in 1901. The Washington and Great Northern Railroad was under construction, and she remembered that many of the construction men were from places like Italy, Austria, Sweden,

and Norway: "The construction camp was located about two miles south of town. There were lots of men living in tents. They had camp cooks—mostly Italians—and they baked their bread in big rock ovens" (Lakin 1976:125). Several of these ovens remain and can be seen adjacent to the present Burlington Northern tracks west of the Kettle River in northeastern Washington (Appendix 1, No. 22). They are known locally as the "Italian Rock Ovens" (Madilane Perry 1988, pers. comm.).

Discussion

In summary, then, the domed rock ovens have been attributed to several ethnic groups. In many cases, however, these attributions have been based on undocumented assertions that the particular groups cited were believed to have worked in the area under study. What does emerge is a trend suggesting that the domed rock ovens associated with railroad construction camps were made and used primarily by people of Italian, and to a lesser extent Greek, heritage. This is especially true in the few cases where the presence of those particular ethnic groups can be documented on sites where such structures are found.

At the moment there is not enough known about the differences between Greek and Italian outdoor ovens to allow archaeologists to distinguish between them. Although one cannot yet say with certainty that domed rock ovens *prove* the presence of Italian laborers on a site, the preponderance of evidence indicates that Italians were primarily responsible for their construction and use. Besides the historical associations already detailed, excellent documentation for the building of domed rock ovens by Italians in the western United States is provided in a photograph taken near Anaconda, Montana (Figure 9), showing a group of men (miners, lumberjacks, or railroaders), one of whom holds a sign, in Italian, reading "Questo è il nostro Forno 9 Marzo 1906," translating "This is our oven 9 March 1906" (Maria Pasti 1989, pers. comm.).

Italian laborers were frequently hired as section



FIGURE 9A

FIGURE 9. Rock oven at French Gulch, south of Anaconda, Montana. The sign held by the man second from left is in Italian and reads "Questo è il nostro Forno 9 Marzo 1906," translating as "This is [the] our oven 9 March 1906." A, complete photograph; B, closeup of sign (courtesy of Maureen and Mike Mansfield Library, University of Montana, Missoula, No. 77-140).



FIGURE 9B

hands once railroad construction was completed (United States Immigration Commission 1911: 340, 342). Although working in the open air was thought to appeal to Italians because it was "healthful" (United States Immigration Commission 1911:427), a medical student working as a summer employee on a track gang graphically described the inhumane and dehumanizing conditions that prevailed for Italian section gang workers during the early 20th century (Ciolli 1916). Wages were low; section hands were generally paid about 13 cents per hour (United States Immigration Commission 1911:340).

While most of the rock ovens in this study are associated with railroad construction, others were made and used by Italians working on later section gangs. Two ethnographic accounts provide a few details. Charles Carbone, for example, arrived in the United States from Italy in 1909 and by 1910 was working on a section gang in Montana. Five or six men would live together in a boxcar. They did their own cooking and

... used to have an oven, into the hard ground, or in bricks, even out of rocks. . . . [The oven looked] just like a dog house and we used it to bake the bread. The way we made bread, we [used] fifty pounds of flour at one time. . . . And when [the dough had risen] and you had cut [it into loaves] then you put fire into that oven that we had. We put wood in there. And when those bricks they would get white like or a different color, why, then we took the fire all out. There was a brick on the bottom and we cleaned that and put the bread in there and about forty-five minutes to an hour that bread was [ready]. Oh, that bread tasted good . . . (Mercier 1983:40).

One woman recalled growing up near an Italian family in Whitefish, Montana. The father was a laborer on the Great Northern Railroad, and his wife baked "a fifty-pound sack of flour at a time, in round loaves, and her oven was out in the back yard made of bricks or stones or concrete . . . and shaped like a beehive" (Johnson 1976:65).

A photograph of Northern Pacific workmen taken in Montana (Figure 10) is labelled elsewhere "Joe (sic) Oreste Group, Terry, Montana, 1902." It shows seven men standing on or near a handcar, with a caption implying that they are Spanish or Basque (Nolan 1983:128). Although the surname "Oreste" can be Basque (Mary Anne Davis 1989, pers. comm.), it has also been identified as Italian (Maria Pasti 1989, pers. comm.). The latter would seem to be the more likely identification, judging from the large numbers of Italians employed as railroad workers around the turn of the century. Basques were apparently few in numbers; no other references to them were noticed while preparing this paper.

Finally, an archaeological site with an outdoor oven that was "excavated into the side embankment of the railroad grade" at Bovine, Utah (Ap-

pendix 1, No. 19) should be mentioned. Although Bovine was a Central Pacific section station employing Chinese section hands in 1869, the Southern Pacific built other structures there in 1885, and the site was in use by that railroad until about 1905 (Raymond and Fike 1981:36). Because no bake ovens have been reported for other Central Pacific sites where Chinese workers were employed, the Bovine oven is more probably associated with persons of non-Chinese ethnic origin who built it sometime between 1885 and 1905.

Statistical Survey of Italian Railroad Workers

Although many ethnic groups made and used rock ovens, those that are found on early 20th-century railroad-related sites are more likely to have been built by Italians simply because that ethnic group constituted the majority of railroad laborers in the United States at that time. Italians were first employed on the railroads in the 1870s; within 10 years, and certainly by the 1890s, they monopolized the laboring jobs on most lines in the United States and Canada, particularly in the northeast (La Sorte 1985:64; Riegel 1964 [1926]: 238-239). This may have been because they were willing to accept lower wages; the Italians in particular were known to work for up to one-third less than the Irish (La Sorte 1985:65).

Numerous references, with varying points of view, document Italian railroad construction workers and, later, section hands. Recruitment of workers in Italy (Athearn 1962:102; Rolle 1968:151, 170) and the employment of Italians on railroads in Colorado (Hitchcock 1889:541; Beebe and Clegg 1958:127; Buckles 1976; Poor 1976:211; Rossillon 1984), in Idaho (Cork n.d.:55; Wood 1983:31-32), in Oregon (*Semi-Weekly East Oregonian* 1882; Lewty 1987:141), and in Washington (Nicantri 1978:35-36) are mentioned. Italians are reported to have worked on a number of specific railroad lines, such as the Colorado Midland (Griswold and Griswold 1958:241-244; Buckles 1976: 68); the Denver and Rio Grande (Vandenbusche and Borneman 1979:55; Vandenbusche 1980:161);



FIGURE 10. Photograph of a section gang, probably Italian, depicting the "Jim Oreste Group, Handcar, Terry, Montana, Oct 23, 1902" (courtesy of Haynes Foundation Collection, Montana Historical Society, Helena, No. H-4789).

the Denver and Rio Grande Western (Rolle 1968: 153); the Denver, South Park, and Pacific (Fiester 1973:103; Poor 1976:252); the Southern Pacific's Eastern Division (Briggs 1974:33, 35, 38); on Canadian Pacific construction in the mid-1880s (Berton 1971:277, 295, 411; 1972:248, 262); for the Great Northern in the early 1890s (Heritage Research Center 1986:19); and for the Rio Grande Southern in 1890 and 1891 (Crum 1961:5, 12, 85-86; Buckles 1976:75). Other accounts detail personal reminiscences of Italian railroad workers (Crum 1961:12-13, 27, 88), working conditions (United States Immigration Commission 1911:

428; Rolle 1968:155; Lopreato 1970:101-109; Nicandri 1978:36), and comparisons of Italians with railroad workers from other ethnic groups (United States Immigration Commission 1911:341; Foerster 1919:357-362).

A summary and discussion of an unskilled immigrant Italian labor force can be found in the site report for Marion, an historic railroad camp in Colorado (Rossillon 1984:54-56). Information is synthesized from Lopreato (1970:93-97) and other sources (United States Immigration Commission 1911; Ciolli 1916; Nelli 1964; Rolle 1968; Iorizzo 1970). Other references can be added, including

TABLE 1
 APPROXIMATE NUMBER OF ITALIANS EMPLOYED IN RAILROAD CONSTRUCTION
 AT THE TURN OF THE CENTURY¹

Railroad	N
United States	
Chicago and Northwestern	1,100
Chicago, Milwaukee, and Puget Sound	1,500
Great Northern	1,500–9,000
New York, New Haven and Hartford	10,000
Pennsylvania	10,000–13,500
Union Pacific	2,000
Wabash	800
Subtotal	26,900–37,900
Canada	
Canadian Pacific	3,000
Other Canadian lines	3,000
Subtotal	6,000
Grand total	32,900–43,900

¹After Rolle (1968:153) with additions from Foerster (1919:359). Sources do not state whether track maintenance workers are also included.

Sheridan (1907) and other sources listed in Haskett (1956:236–238), regarding the *padrone* system used by Italian and other labor contractors for providing transportation, wages, housing, and meals. Still other sources recount experiences of section laborers from various ethnic backgrounds (*Cornhill Magazine* 1888; Sonnichsen 1930; Reinhardt 1970:230–237).

Documents and statistical surveys do not always differentiate between railroad construction workers and later track maintenance crews. The approximate number of Italians employed about 1900 in railroad construction is given in Table 1. Other sources indicate that in New England, New York, Pennsylvania, New Jersey, Delaware, and Maryland, track laborers numbered over 70,000 and were “largely Italians;” in Ohio, Indiana, Michigan, Illinois, Wisconsin, Minnesota, and Iowa more than 100,000 “largely Italians and Slavs” were so employed (Foerster 1919:357–358, citing Sheridan 1907:434). In 1906, of the Italians sent out of New York by employment agencies, 56 per-

cent went as railroad laborers (Sheridan 1907:421). Unspecified numbers of Italians were included in the “mixed races” working for railroads in the West (Foerster 1919:357–358, citing Sheridan 1907:434). Table 2 shows numbers of track laborers working there in 1900.

Because the various authorities consulted do not clearly distinguish between construction workers and maintenance workers, it is difficult to establish just how many Italians, or what percent of the total, performed each function. Some generalizations can be made, however. In 1900, out of a total of 23,753,836 employed men, 580,462 (2.4%) were steam railroad employees (United States Bureau of the Census 1904:cvi). Of these, some 311,000 (53.6%) were track laborers (Foerster 1919:357). Of the 580,462 steam railroad employees, 127,725 (22.0%) were foreign-born (United States Bureau of the Census 1904:cviii).

It seems safe to say that the vast majority were track laborers rather than engineers, conductors, and so on; that is, some 40 percent of the total of

TABLE 2
NUMBERS OF TRACK LABORERS IN
WESTERN STATES, 1900¹

State	N
Arizona	1,324
California	5,237
Colorado	2,947
Idaho	1,670
Montana	5,351
Nevada	527
New Mexico	1,056
Oregon	2,361
Utah	1,649
Washington	3,693
Wyoming	2,644
Total	28,459

¹United States Bureau of the Census (1904:96-97, 106-107). No distinction is made between construction workers and maintenance workers. In some cases the same person did both, at different times. One source, for example, reported that from 1908 to 1909 some 9,000 Italians worked on railroad construction in the West, and many stayed on as section hands (Rolle 1968:153).

311,000 track laborers were foreign-born. Figures for Italians in the United States in 1900 show that 93,864 (32%) of all men whose parents were both born in Italy were laborers (United States Bureau of the Census 1904:ccii). Most of these were probably railroad laborers, since the figures for agricultural and mining/quarrying laborers are presented separately. This means that in 1900 some 30 percent of the 311,000 track laborers were Italians, or over 70 percent of the 127,725 foreign-born laborers.

Dating Domed Rock Ovens

At the risk of overstating the obvious, the domed rock structures that are adjacent to railroad tracks doubtless date to the construction of the railroad line with which they are associated. Some appear to have two periods of use, dating both to

grading and to subsequent tracklaying operations. In at least one case, rock oven use is most likely related to later section gangs involved in track maintenance.

The rock ovens mentioned in the United States portion of this report range from the 1881 date of 5-ST-2 (Appendix 1, No. 4), a rock work and grading camp for the Denver and Rio Grande Railroad in Tenmile Canyon, central Colorado (Buckles 1976:322), to the 1911 date of a camp near Reubens, Idaho (Appendix 1, No. 10), associated with a logging railroad for the Craig Mountain Lumber Company (Bilger 1969:86). Rock ovens may have gone out of use by Italians shortly thereafter; a 1916 account of Italian section workers mentions that they used perforated tin boxes as stoves and bought their bread (Ciolli 1916:61, 64). Greek section workers are known to have constructed earthen and rock ovens as late as 1918 (Rossillon 1987:4).

In Canada, the earliest railroad-related oven so far known is in Yoho National Park, British Columbia (Appendix 3, No. 1), and was built about 1884 during the construction of the Canadian Pacific railway (Lavallee 1974:294-295). The most recent Canadian examples were built sometime between 1911 and 1915 at Naramata, British Columbia (Appendix 3, No. 4), during the construction of the Kettle Valley Railroad (Wright and Wright 1970:18).

Anderson (1983:227-236) lists four main types of domestic railroad structures found within the Golden Spike National Historic Site at Promontory Summit, Utah. Baking ovens are not included. The Central Pacific/Union Pacific railroads were completed and joined in 1869; the fact that no stone ovens seem to be associated with them probably means that the construction crews were not made up of persons whose ethnic group origins would dictate the need for such structures. For the two railroads mentioned, the crews were primarily Chinese and Irish, respectively. Anderson's decision (1983:236) to illustrate an "enigmatic rock mound" is puzzling since she does not speculate on whether it might be ruins of a structure or is simply another one of the West's ubiquitous rock piles.

Conclusions and Future Research

In conclusion, then, the available evidence strongly points to the fact that small domed rock structures found on railroad-related sites were used for baking bread, mainly by men working on the original construction of the associated railroad line, or, in some places, by later section gang workers. The oven makers and users appear to have been primarily Italian and occasionally Greek immigrants, although the oven making and using technology may have been copied in later years by persons from other backgrounds. While the term "Chinese ovens" has entered the folklore, there is at present no hard evidence to connect that ethnic group with either the construction or the use of domed rock ovens in the United States, although Chinese may have built and used similar ovens in Canada and Australia.

The main aims of the research described here were to locate railroad construction camps that have one or more domed rock structures and to identify the ethnicity of their builders. Although camps lacking such features were not identified, it would be useful to see if it can be established whether domed stone ovens are ethnicity-dependent, railroad-line dependent, time-dependent, a combination of one or more of those characteristics, or even whether sites without ovens simply lack sufficient suitable stone. An example of the latter may be provided by the Joso Trestle construction camp site in eastern Washington, occupied from approximately 1913 to 1914 by workers of unknown ethnicity engaged in the erection of the Joso Bridge for the North Coast Railroad (Wegars and Sprague 1981:1, 2, 51, 54). Although the site is within the time period of rock oven use, no stone ovens were recorded there—but many metal stove and oven parts were found.

Related research could focus on rock ovens at non-railroad sites, such as homesteads, mining claims, and logging camps. Here one would investigate the ethnic origins of the site's occupants, and try to determine conclusively if rock ovens are ethnicity-dependent. Excavations of the rock ovens associated with the Chinese in Canada and Australia might establish that ethnic identification with

more certainty and would have great applicability, should such sites eventually be identified in the United States. Research in contemporary newspapers has proven to be a fruitful field for the identification of the ethnic composition of the workers building a particular railroad line. Although rock ovens are seldom, if ever, mentioned, knowledge of the ethnicity of the work force can provide important evidence for identifying such structures.

More ethnographic accounts may eventually be located that will allow construction styles of Italian and Greek ovens to be distinguished, so that these can be identified with more certainty when they are encountered. Other information also may emerge about the construction and use of similar structures by other ethnic groups not reported upon here. Even if archaeologists are eventually able to predict ethnicity based upon the presence of such structures, caution dictates that archaeologists be equally prepared for the possibility that oven construction techniques peculiar to one ethnic group may occasionally have been appropriated by people from other ethnic groups whose "foodways" would predispose them to appreciate a loaf of bread fresh from the oven.

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APPENDIX 1
LOCATION AND ETHNICITY OF SOME RAILROAD-RELATED ROCK OVENS ON UNITED STATES SITES

No.	State	County	No. of Ovens	Description ²	Railroad	Date of Construction	Ethnic Association	Documentation of Ethnicity	Comments	References
1	CO	Garfield	4 ³	Unknown ⁴	Unknown	Unknown	Unknown	Unknown	5-GA-700; railroad camp near Kremmling	Rossillon 1984:91, citing Kranzush, Viola, and Firebaugh 1982; Appendix E
2	CO	Gunnison	20	Rossillon 1984	Denver and Rio Grande, Lake City Branch	1889	Italian	Contemporary newspaper accounts	5-GN-1664, Martion (4); 5-GN-1692(3), -1693(3), -1694(1), -1695(1), -1696(4), -1698(3), -1699(1), Lake Fork Canyon	Vandenbusche 1980: 159; Rossillon 1984: 57, 59, 73-75, 92-99
3	CO	La Plata	5	Collins et al. 1986	Denver and Rio Grande Southern	7/1890-10/1891	Italian	Cites Rossillon 1984: 108-109; no independent documentation	5-LP-1915, -1922, -1923, -1924	Collins et al 1986:28, 31-32, 36-37
4	CO	Summit	8	Buckles 1976	Denver and Rio Grande; Denver, South Park, and Pacific	1881; 1883-1884	Italian	Inferred from similar Italian-built structures in SE Colorado	5-ST-2, Tennale Canyon	Buckles 1976: 237-250 (Figs. 42-50), 322; Buckles 1983:218-219 ⁵ ; Rossillon 1984: 103
5	ID	Bonner	1	N/A ⁶	Not stated	Unknown	Greek	Not provided	Careywood; a Greek "baked bread for the railroad men"	Pratt n.d.:4
6	ID	Boundary	3	Wegars 1988	Spokane International	1905-1906	Italian	Newspaper accounts associating Italians with SI construction	10-BY-372	Morgan 1956:19, Wegars 1988
7	ID	Boundary	1	N/A	Spokane International	1905-1906	"Chinese Ovens" Italian	Unsubstantiated local attribution Newspaper accounts associating Italians with SI construction	"South of Bonners Ferry towards Mora via"	Chuck Peterson 1987, pers. comm. ⁷
8	ID	Boundary	1 or more	N/A	Great Northern	Not stated	Not stated	Not stated	Near the Kootenai River	Choquette and Holstine 1980:116
9	ID	Idaho	1	Sisson 1988	Camas Prairie	1906-1907	Not stated	Not stated	10-IH-1865; walls made of railroad ties	Bilger 1969:77-78; Sisson 1988
10	ID	Lewis	1	N/A	Craig Mountain Logging	1911	Not stated	Not stated	Off Highway 95 2.8 m north towards Reubens	Bilger 1969:86; Jeanette Gaston 1986, pers. comm.
11	MT	Lincoln	12	Heritage Research Center 1984, 1986	Great Northern	Early 1890s	Greek/SE Europeans Italians Chinese	Oral history interview Oral history interview Local unsubstantiated belief	24-LN-735(1), -740(10), -762(1)	Choquette and Holstine 1980:115-116; Heritage Research Center 1984:73-74, 164
12	MT	Lincoln	2	Havercroft and Manning 1978	Great Northern	1889	"Chinese ovens"	Not provided	24-LN-115	Havercroft and Manning 1978:3, ff. (continued)

APPENDIX 1 (continued)

No.	State	County	No. of Ovens	Description ²	Railroad	Date of Construction	Ethnic Association	Documentation of Ethnicity	Comments	References
13	MT	Lincoln	8	Fredlund and Fredlund 1974	Not stated (Great Northern implied from location)	Not stated	"Chinese Diggings"	Not provided	24.LN-2006; no Chinese artifacts were reported	Fredlund and Fredlund 1974:[1, 3-5]
14	MT	Lincoln	3 or more	Shea 1977	Great Northern, Columbia Falls Cutoff	1904	"Chinese Ovens"	Not provided; Chinese attribution questioned	Beside the Tobacco River, near Eureka; no associated Chinese artifacts	Shea 1977:83-84, 132, 216; Atkins 1987
15	MT	Prairie	1	Fig. 5	Northern Pacific	ca. 1909	Not stated	Not stated		Montana Historical Society photograph Russell 1984:19
16	OR	Hood River	1 or more	N/A	Unknown	19th C.	Chinese	Not provided	Columbia River Gorge; "Chinese bake ovens associated with 19th century railroad construction"	Rossillon 1984:105; Baker 1950:10E
17	OR	Lane	1	Fig. 6	Southern Pacific Natron Cutoff	1909-1910	Greek	Captioned "Baking bread at Greek's camp"		
18	OR	Malheur	2	N/A	Not stated	Not stated	Not stated	Not stated	Near Riverside, on the Malheur River, near a railroad trestle (Union Pacific)	Geoffrey L. Dorsey 1987, pers. comm.
19	UT	Box Elder?	1	N/A	Southern Pacific	1885-1905	Not stated	Not stated	Bovine; site originally Central Pacific, 1869	Raymond and Pike 1981:36

20	WA Benton	1	WARC ⁸ 1977	Union Pacific	Not stated	Not stated	Not stated	24-BN-244	WARC 1977
21	WA Benton	1 ⁹	WARC 1975	Not stated	Not stated	"Chinese oven?"	"Chinese oven?"	24-BN-190, "near Yellepit siding"	WARC 1975
22	WA Ferry	2	Perry 1980	Washington and Great Northern	1901-1902	Italian	Oral history interview	West side of the Kettle River	Lakin 1976:123, 125; Perry 1980
23	WA Grant	38±	Blonk 1983	Great Northern	Late 1880s or 1892	Chinese Italians	Not provided	Near Trinidad	Kerr 1980; Blonk 1983
24	WA Grant?	1	Blonk 1983	Great Northern?	Not stated	Not stated	Not stated	Tumwater Canyon; found by railroad officials	Blonk 1983
25	WA King	1	Fig. 2	Northern Pacific	Not stated	Not stated	Not stated	Hot Springs, near Lester	Wood 1968:89; Rossillon 1984:106
26	WA Spokane	2	NRHP ¹⁰ n.d.	Spokane, Portland, and Seattle	1906	Italian	Oral history interview	45-SP-35, 45-SP-36	NRHP n.d.; Heritage Research Center 1984:75
27	WA Whitman	2	WARC 1983a, 1983b	Snake River Valley/Camas Prairie	1908	"Chinese cooks"	Not provided	Turnbull National Wildlife Refuge, near Cheney	Critchfield 1964:64-66, 1968:64-66; WARC n.d., 1983a, 1983b

¹Includes both complete and collapsed ovens.

²May discuss one or more of the following: dimensions, materials, condition, openings, burning, excavation report.

³Identified as ovens by Rossillon (1984:91).

⁴Not in Rossillon (1984:91); possibly in Kranzush et al. 1982:Appendix E.

⁵An evident typographical error attributes Fig. 4 to 5-ST-1 rather than 5-ST-2; the former site had no stone ovens (Buckles 1976:325).

⁶Not available.

⁷Personal communication.

⁸Washington Archaeological Research Center.

⁹"Rectangular 'foundation' of basalt rocks approx. 6 x 4 m—Chinese oven?"

¹⁰National Register of Historic Places.

APPENDIX 2
LOCATION AND ETHNICITY OF SOME ROCK OVENS FROM NON-RAILROAD SITES IN THE WESTERN UNITED STATES

No.	State	County	No. of Ovens ¹	Description ²	Occupational Association	Date of Construction	Ethnic Association	Documentation of Ethnicity	Comments	References
1	CA	Calaveras, Tuolumne	21 ³	Costello 1981	Ranches (2), large mining camps (2), cabin sites on isolated placer claims (17)	Later half of 19th C.	Italian	Census, oral histories, identical ovens built into the 1900s by local Italian Americans	New Melones project area, secondary occupation by Chinese	Costello 1980, 1981
2	CA	Calaveras, Tuolumne	28 ⁴	Greenwood and Shoup 1983	Residential (may have agriculture), mining sites with residential activity	1850s Pre-1880s	Mexican(1) Sonorans or Chilenos	Not stated Census records; belief that Italian bread ovens were "never dome-like" (Frierman 1983:228)	New Melones project area; Chinese artifacts noted, but Chinese not responsible for original site formation	Costello 1981:26 Greenwood 1982:19, 22, 64-66, 160, 167; Greenwood and Shoup 1983:222-232, Appendix 2, 367-380, 404-405 Flory 1987:18-19
3	ID	Boundary	1 or more	N/A ⁵	Mining, road building	Pre-1893-early 1900s	Italian	Map	Called "dirt ovens"	Pierce Mining District Records 1866:159
4	ID	Clearwater	1	N/A	Mining	Pre-1866	Chinese	Bake oven associated with former Chinese occupancy		
5	MT	Deer Lodge?	1	Fig. 9	Purported "logging camp" ⁶	ca.1906	Italian	Sign in photo written in Italian	French Gulch, south of Anaconda	Farr and Toole 1978:72
6	NV	Lander	2	N/A	Woodcutting	ca.1860-1910	Italian	Documents, artifacts	Shoshone Wells, Cortez Mining District	Hardesty and Hattori 1982:39; Hardesty 1988:84
7	OR	Wasco	1	N/A	Irrigation canal construction	Not stated	Not stated	Not stated	Mount Hood National Forest; Bear Springs Ranger District	Susan Marvin 1989, pers. comm. ⁷
8	OR	Hood River	1	N/A	Military wagon road construction	1870s?	Not stated	Not stated	Mount Hood National Forest; Columbia River Gorge	Susan Marvin 1989, pers. comm.
9	WA	Okanagan	1 or more	WARC ⁸ 1985	Placer mining	1850-1860	Not stated	Not stated	45-OK-414; present Burlington Northern tracks are nearby ⁹	WARC 1985; Joseph Randolph 1988, pers. comm.
10	WA	Okanagan	1	Briley 1989	Unknown (possibly Great Northern Railroad)	Unknown [1906-1907]	Native American	Surmised ¹⁰ Chinese? Local attribution; no documentation found	Near Chopaka, close to route of Great Northern	Briley 1989
11	WA	Stevens	1	Chance 1967	Not stated	Not stated	Chinese	Not provided	45-ST-96	Chance 1967, 1970

¹Includes both complete and collapsed ovens.

²May discuss one or more of the following: dimensions, materials, condition, openings, burning, excavation report.

³These are included in listing No. 2.

⁴28 ovens from 25 sites (Greenwood and Shoup 1983:225); these figures are contradicted by their Table A.2.8, 26 ovens from 23 or 24 sites (1983:404-405).

⁵Not available.

⁶Photo from University of Montana Mansfield Library; their records do not mention "Logging camp" (Dale L. Johnson 1989, pers. comm.)

⁷Pers. comm.

⁸Washington Archaeological Research Center.

⁹Called "beehive charcoal ovens" or "kilns" (WARC 1985).

¹⁰Oven not as "finely wrought" as local railroad ones (Briley 1989).

APPENDIX 3
SOME ROCK OVENS ON RAILROAD AND NON-RAILROAD SITES IN CANADA AND AUSTRALIA

No.	Country	Location	No. of Ovens ¹	Description ²	Occupational Association	Date of Construction	Ethnic Association	Documentation of Ethnicity	Comments	References
1	CAN	Yoho National park, B.C.	1	Lavallee 1974	Railroad/Canadian Pacific	1884	Not stated	Not stated	Kicking Horse Pass	Sisney 1972:28; Lavallee 1974:180-181
2	CAN	Cascade, B.C.	3	N/A ³	Not stated	Late 1860s	Not stated	Not stated	Dewdney Trail Park	Sisney 1972:28
3	CAN	Okanagan Lake, B.C.	1 or more	N/A	Railroad/Kettle Valley	1910-1913	Not stated	Not stated	East side of lake	Sisney 1972:28
4	CAN	Naramata	4	Fig. 3	Railroad/Kettle Valley	1911-1915	Scandinavian	Unsubstantiated		Wright and Wright 1970:18; Sisney 1972:28
5	CAN	Fraser River, B.C.	1	N/A	Mining; possible railroad nearby	Not stated	Chinese	Chinese artifacts found on site	Five miles up river	Richard T. Wright 1988, 1989, pers. comm. ⁴
6	CAN	Quesnel, B.C.	1	N/A	Mining; no railway	Not stated	Not stated	Not stated	East of Quesnel, near Horsefly, on China Creek	Richard T. Wright 1988, 1989, pers. comm.
7	CAN	Pemberton, B.C.	1	N/A	Not stated	Not stated	Not stated	Not stated		Richard T. Wright 1988, 1989, pers. comm.
8	CAN	Thompson River, B.C.	1	N/A	Railroad/not stated	Not stated	Not stated	Not stated	South of Spences Bridge, "in perfect shape"	Richard T. Wright, 1988, 1989, pers. comm.
9	CAN	Kootenay Mountains B.C.	1 or more	N/A	Railroad/not stated	Not stated	Not stated	Not stated		Richard T. Wright, 1988, 1989, pers. comm.
10	AUS	Queensland	3	Fig. 4a	Mining	1872-1879?	"Chinese stone ovens"	Chinese artifacts on surface; oral historical associations	Adjacent to Cannibal Creek, Palmer River goldfield ⁵	Gordon Grimwade 1988, pers. comm., quoting Van Kempen 1987:41
11	AUS	Queensland	1	Fig. 4b	Mining	Pre-1887?	"Chinese fort"	Local attribution; no Chinese artifacts observed	Palmer River goldfield	Gordon Grimwade 1988, pers. comm.

¹Includes both complete and collapsed ovens.

²May discuss one or more of the following: dimensions, materials, condition, openings, burning, excavation report.

³Not available.

⁴Personal communication.

⁵60 km from nearest railway.