

# *Culture and Fairness in the Development of Institutions in the California Gold Fields*

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Earlier accounts of the creation of property rights in the California gold fields ignored culture and are incomplete. We argue that culture matters in solving collective-action problems. Such problems in the California gold fields were solved through reliance on cultural focal points. Focal points included individualism, equality, respect for property, and rewards commensurate to work. Cultural concepts of fairness served to create norms and institutions that miners were willing to defend, which included majority rule, election of officials, trial by jury, allocation of a first-come, first-served basis and rules for working claims.

After 1848 thousands of relatively young, armed, male miners from 31 countries poured into California in search of gold. They entered a region essentially devoid of government control, at a time when “a generally applicable mining law or policy simply did not exist.”<sup>1</sup> *The Polynesian*, a newspaper published in Honolulu, wrote at the time:<sup>2</sup>

The love of it [gold] arouses all the baser passions of man’s nature, and we fear the gold regions of California will be the theater of tragic events—the scene of bloodshed and strife. The Sun never yet shone upon a more motley crowd than will be assembled there. We tremble for the result upon the morals of the people and the peace of the country. In the confusion which must prevail there for the next twelve months, the law will be powerless, rights will be disregarded, reason dethroned and brute force will reign triumphant.

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<sup>1</sup> Leshy, *Mining Law*, p. 11. Until 1850 California was nominally under Mexican and military law; thereafter it developed its own U.S.-style constitution and came under Federal jurisdiction. Nevertheless, especially in the gold fields from 1848 through the early 1850s, there was little or no effective authority flowing from, or sanctioned by, a higher government. Pre-existing Mexican and U.S. military forces had deserted to the gold fields.

<sup>2</sup> As reported in *The Californian*, San Francisco, 17 May 1948, 3(6).

The prediction that the mines would be the scene of chaotic violence was wrong.<sup>3</sup> Rather than anarchy or violent gang rule, what quickly emerged in the California goldfields were social institutions and rules for gold mining that relied upon a system of norms without unusual violence. Each mining district drew up an explicit contract, usually in writing. As one observer wrote in 1848, “It is curious how soon a set of crude regulations sprung into existence, which everybody seemed to abide by.”<sup>4</sup> By the spring of 1849 the custom had become a set of rules that “placed the strong and the weak upon a footing of equality, defined the claims that might be set apart, protected the tools left on the ground as evidence of proprietorship, and permitted the adventurers to hold their rights as securely as if they were guaranteed by a charter from the government.”<sup>5</sup>

In this essay we attempt to explain the society formed by the California gold miners in the early years of the gold rush, 1849/50. Our account supports earlier rational-choice interpretations that property arrangements settling the American Western frontier were based on the marginal costs and benefits of defining and enforcing property rights.<sup>6</sup> We contend further, however, that culture mattered in these choices, not only by affecting the costs of defining and enforcing rights, but probably in the speed and nature of institutional change in response to changing prices. Culture also provided a focal point that lowered the costs of collective action necessary to supply these institutions. Our account extends John Umbeck’s explanation of the gold fields, based on a theory of violence, by appealing to cultural norms to better explain the miners’ behavior and by offering a theory of the evolution of institutions based on these common norms.<sup>7</sup>

The civil society of the California gold miners was one of many possible equilibria. How was this particular equilibrium selected? Culturally derived

<sup>3</sup> The account here is, of course, stylized. For more detailed accounts see Umbeck, *Theoretical and Empirical Investigation*, “California Gold Rush,” “Theory,” *Theory*, and “Might”; Bancroft, *Works, Popular and Works*; Clappe, *Shirley Letters*; Caughey, *Gold*; Decker, *Diaries*; Harlow, *California*; Hittle, *Mining*; Holliday, *World*; Howe, *Arguments*; Jackson, *Gold Dust*; Mann, *After the Gold Rush*; Marryat, *Mountains*; Martinez and Drummond, *History*; McGrath, *Gunfighters*; Paul, *Mining Frontiers and California Gold*; Rodman, *History*; Royce, *California*; Senkewicz, *Vigilantes*; and Shinn, *Mining Camps*.

<sup>4</sup> Brooks, *Four Months*, p. 77.

<sup>5</sup> Williams, *History*, p. 70.

<sup>6</sup> Other accounts of the American West tend to focus on the character of the settlers, as either “triumphant frontiersmen” or “villainous exploiters,” rather than examining behavior, and the evolution of institutions, in response to costs and benefits (Anderson and Hill, *Political Economy*). For other rational choice accounts of property rights in the American West, see Alston, Libecap, and Schneider, “Demand”; Allen, “Homesteading”; Libecap, “Economic Variables”; and Anderson and Hill, “Evolution.”

<sup>7</sup> Umbeck’s (*Theoretical and Empirical Investigation*, *Theory*, and “Might”) account does not explain majority rule by the miners, cooperation to punish violators, the language of fairness in the miners’ own accounts, the relative absence of intraethnic violence, the existence of interethnic violence, the use of judges, and the first-come, first-served allocation procedure for claims. His account predicts incorrectly that all miners on the site would receive a claim.

norms of fairness embodied in familiar institutions helped to facilitate collective action and produce order among the California gold miners, by acting as focal points to solve the initial coordination problem.<sup>8</sup> By embodying familiar and fair principles these institutions provided for cooperation in the gold fields.<sup>9</sup> First, many of the miners shared a common culture and held similar principles that provided the basis for focal points. Second, the particular social institutions chosen by the miners were viewed as fair because they embodied these common cultural principles and hence were focal. Differences across ethnic groups are discussed, and we end by discussing why this cooperative equilibrium began to unravel in 1850. We illustrate the plausibility of our thesis by examining specific examples of fair rules and procedures in the California gold rush: the decision-making process of majority rule and trial by jury, and the rules to determine claim size, work claims, and allocate by a first-come, first-served procedure. This thesis is consistent with a developing literature showing the importance of fairness, and of convention and norms in establishing order.<sup>10</sup>

#### THE EVOLUTION OF SOCIAL INSTITUTIONS

A rational-choice account of social interaction attempts to predict outcomes on the basis of reductionist assumptions about the agents' positions, strategic opportunities, and maximizing behavior. Yet many game-theoretic models, particularly ones with indefinitely repeated play, are plagued by a multiplicity of outcomes. This indeterminacy suggests that Umbeck's rational-choice account of property-rights formation in the gold fields is incomplete, as it fails to explain why the equilibrium he posits, and not some other possible equilibrium, is the one chosen.<sup>11</sup>

In the absence of violence, establishing viable social institutions first requires players coordinating to provide the institutions, where coordination itself is a public good, and then ensuring that these institutions embody

<sup>8</sup> As Doug Allen notes, we always make efforts to increase our shared experiences: microeconomists who do not follow football may nonetheless watch the Super Bowl so they have something to talk to macroeconomists about. For a useful summary of evidence refuting the view that government must be the solution to a collective action problem see Ellickson, "Critique," p. 84f.

<sup>9</sup> This is related to field evidence on how communities can avoid the "tragedy of the commons" without recourse to a central government. Examples are offered in Ostrom, *Governing the Commons*; and Bromley, *Making the Commons*.

<sup>10</sup> On fairness and justice see Elster, *Local Justice*; Zajac, *Political Economy*; Young, *Equity*; Sheppard, Lewicki, and Minton, *Organizational Justice*; Ellickson, "Critique"; Sugden, "Spontaneous Order"; Gordon, *Welfare*; Anderson and Hill, "American Experiment"; and Hoffman and Spitzer, "Entitlement."

<sup>11</sup> Umbeck (*Theory and "Might"*) assumes that each miner has an equal ability in violence, which eliminates much of the predictive power of his approach. This assumption seems wrong, since men do differ in their ability to form and to lead gangs of others, which seems relevant to potential violence [Tullock, *Edge* and personal communication]. In fact, violent confrontations in the gold fields generally involved groups rather than individuals.

incentives to cooperate.<sup>12</sup> “The problem of designing an institution, or evolving an institution, to accomplish cooperation is precisely the problem of agreeing upon one solution to a coordination game.”<sup>13</sup> The problem of repeated game multiple equilibria, therefore, can be viewed initially as a coordination problem, where appropriate actions, rewards and punishments, must be identified.<sup>14</sup>

Recognizing or creating focal points aids equilibrium selection by providing one way for players to coordinate.<sup>15</sup> A focal point provides a coordination mechanism that, prior to the play of the game, has mutual significance to the players based on their common past experiences.<sup>16</sup> These experiences, socially or culturally derived, help players to “know” what to do, and to be able to predict what other players will do.<sup>17</sup>

David Kreps proposes that the solution to the problem of multiple equilibria lies in the individual’s strategic expectations and social and normative environment.<sup>18</sup> That environment is composed of formal and informal institutions, such as cultural norms, that reduce information costs. Familiar institutions, therefore, can act as focal points to solve the equilibrium problem. “Institutions or conventions emerge to help economic agents solve a set of recurrent coordination and prisoner’s dilemma problems. The solution to these problems determines regularities in behavior that form the basis of our definition of a social institution.”<sup>19</sup>

We propose, contrary to Umbeck, that property rights in the California gold fields were not imposed by the strong on the weak. Rather, they were social conventions in a repeated game that were selected from among many possible ones because they were a focal point for the miners. We consider two levels of institutions or rules: the collective-choice rules through which the operational rules could be changed, which included majority rule and trial by jury; and the operational rules that governed day-to-day decisions on claim size, rules for working claims, and claim rationing through a first-come, first-served allocation rule.<sup>20</sup> Table 1 summarizes the different predictions for these rules and other

<sup>12</sup> Knight (*Institutions*, pp. 9–13) briefly summarizes the work on classical and contemporary theories of institutional evolution and change. See also the papers in the *Journal of Institutional and Theoretical Economics* vol. 154, no. 4, (December, 1998).

<sup>13</sup> Calvert, “Rational Choice Theory,” p. 243.

<sup>14</sup> Calvert, *ibid.*

<sup>15</sup> Schelling, *Strategy*. The idea of focal points as equilibrium outcomes in repeated games has been developed by Kreps, *Game Theory*; and by Miller, *Managerial Dilemmas*.

<sup>16</sup> Calvert, “Rational Choice Theory,” p. 244.

<sup>17</sup> Kreps, *Course*, p. 101.

<sup>18</sup> Kreps, *Course*, p. 772. See also Schelling, *Strategy*.

<sup>19</sup> Schotter, *Economic Theory*, p. 161.

<sup>20</sup> Ostrom, Gardner, and Walker (*Rules*, p. 46) distinguish among operational, collective-choice, and constitutional-choice rules. Our operational rules, in particular, correspond to several of Libecap’s (“Economic Variables,” p. 348) 15 categories to describe mineral rights.

TABLE 1  
PREDICTIONS IN A RATIONAL-CHOICE MODEL WITH AND WITHOUT A CULTURAL  
CONTEXT

Phenomena	Rational Choice without a Cultural Context	Rational Choice in a Cultural Context
Many possible equilibria exist	No basis for choosing among alternative equilibriums.	Furnishes a basis for choosing among alternative equilibria—through the use of cultural focal points.
Majority rule	Fails to predict its use.	Is consistent with the use of majority rule
Willingness to punish free riders—solution to prisoners dilemma problem	Recognizes a violence constraint but fails to consider how collective actions problems may be solved.	Is consistent with cultural solutions to collective action problems.
Claim size	Predicts claim size on the basis of marginal gains and costs of expansion. Correctly predicts larger sizes for less productive claims. Umbeck's prediction fails to account for left-out miners. *	Predicts claim size on basis of producerism which arguably corresponds with the economically efficient claim size. Correctly predicts larger sizes for less productive claims. Correctly predicts left-out miners.
Work rules <i>restrictions on number of days required to work to hold a claim</i>	Explains restrictions on the basis of the need to keep a large enough fighting force available.	Explains restrictions additionally on the basis of producerism by which no miner should hold more than he could reasonably work and that he must work what he has.
<i>restrictions on the number of claims a miner could own</i>		
<i>special exemptions for ill miners</i>	Fails to account for special exemptions.	Is consistent with special exemptions.
First-come, first-served rule for claim allocation	Fails to predict this rule.	Is consistent with first-come, first-served rule.
Interethnic and intraethnic violence	Fails to predict that interethnic violence would be greater than intraethnic violence.	Is consistent with greater interethnic violence.

\* The failure to predict left-out miners arises from the particular production function used by Umbeck. The existence of left-out miners is consistent with a different form of production function in a rational-choice account without cultural considerations.

phenomena of the gold fields under a rational-choice account with, and without, cultural considerations.

Both the collective-choice and operational rules used familiar forms that conformed to the miners' previously formed expectations about fairness—

the focal or organizing principle.<sup>21</sup> For a period of time, these institutions generated a stable set of outcomes and procedures for decision making. Since these forms differed according to cultural background, from a rational-choice perspective, culture matters.<sup>22</sup> We offer evidence to strengthen this argument by demonstrating that there was a common culture among many of the miners, support for the institutions created, and that these institutions were focal, that is, they embodied the majority's common cultural norms and views of fairness.

#### THE CULTURE AND CUSTOM OF THE MINERS

A common culture increases the likelihood of social institutions having mutual significance to individuals and hence of being a coordinating focal point. We describe some characteristics of the miners and suggest some common cultural views on government, work, and property that formed the basis for the formation and stability of the institutions. These common cultural views, we suggest, embodied notions of just deserts that we call Lockean fairness and Jacksonian democracy.<sup>23</sup>

#### *The Miners Themselves*

As Table 2 shows, about 75 percent of the miners were from the United States, and fully 90 percent were from either the United States or Europe. The miners were hardly the motley crew *The Polynesian* suggested. The evidence suggests that the emigrants were generally of higher-than-average social class and education. "The level of schooling among overland emigrants was high. . . ."<sup>24</sup> Many emigrants were physicians and lawyers or generally "working men of ordinary intelligence, farmers and mechanics. . . ."<sup>25</sup> The 1850 census showed an illiteracy rate for California that was about one-third of that for the rest of the country.<sup>26</sup>

<sup>21</sup> There is agreement among historians that the rules and customs developed in other mining jurisdictions before the California discovery were part of the stock of knowledge of some of the early miners who had experience in these jurisdictions, and that these rules influenced the developments in California. The relative influence of the Spanish practices, those in the Cornish mines, those devised by the federal government in administering leasing schemes in the 1830s and thereafter, or those developed in yet other jurisdictions remains the subject of debate (Leshy, *Mining Law*, p. 13; and Rodman, *History*, p. 88). We would expect variation in these rules among various jurisdictions to the extent that notions of fairness varied among the dominant cultures controlling them. A hypothesis that emphasized the effects of violence (Umbeck, *Theory* and "Might") would predict a variation based on the differing levels of extra-jurisdictional control.

<sup>22</sup> Some of this language was suggested by an early reviewer.

<sup>23</sup> Though some scholars may debate the use and content of Lockean or Jacksonian labels, our argument rests on accepting that the characteristics and views we describe, however labeled, formed a common culture.

<sup>24</sup> Reid, *Law*, p. 18.

<sup>25</sup> Reid (*Law*, p. 14) quoting Sarah Royce, one of the few women with experience in the camps.

<sup>26</sup> See also Jackson, *Gold Dust*.

TABLE 2  
BIRTHPLACE OF THE POPULATION OF CALIFORNIA, 1850

Country/State/ Region	Number	Percentage of Total
Great Britain & British America	7,401	7.99
Continental Europe	5,962	6.44
Asia	777	0.84
Mexico and Central/South America	7,370	7.96
Other	848	0.92
Total non-United States	22,358	24.15
Total United States	69,610	75.18
New England	11,736	12.67
Mid-Atlantic	15,688	16.94
South	18,205	19.66
Midwest	17,062	18.43
California	6,602	7.13
Territories	317	0.34
Total Population	92,597	100.00

Note: Calculated from Census of 1850.

### *The Role of Culture and Fairness*

Culture has been defined as “a set of shared understandings which makes it possible for a group of people to act in concert.”<sup>27</sup> Culture carries information, hence an important function of culture is to lower the transaction costs of determining if one’s partner is fair, and of punishing him if he is not fair. Membership in a culture, clan, or group that provides lower transaction costs can be seen as an asset whose loss can serve as an automatic penalty in case of contract breach.<sup>28</sup> In this case, culture can provide an external sanction. Culture can also create internal sanctions; violation of cultural norms can lead to a sense of guilt or shame.<sup>29</sup>

Culture can add structure to group process where group process is perceived as fair.<sup>30</sup> It can help provide determinacy by, *inter alia*, embodying notions of fairness that promote stability. For the gold fields conventions and norms, which are part of what constitute a culture, helped create political stability. These norms, as Edward Zajac points out, “. . . are related to fairness in that they form understandings or implicit contracts among members of society.”<sup>31</sup>

<sup>27</sup> Becker, “Culture”; and Meidinger, “Regulatory Culture.” De Tocqueville (*Democracy*) thought that a common morality or culture was necessary for the survival of democracy.

<sup>28</sup> La Croix, “Homogeneous Middlemen Groups”; and Williamson, “Credible Commitments.” This mechanism is explored in a series of articles (Landa, “Theory”; Carr and Landa, “Economics”; and Cooter and Landa, “Personal Versus Interpersonal Trades”) that point out that middlemen, for whom the problem of breach may be important, are often kinsmen, clansmen, or members of the same religious or ethnic group.

<sup>29</sup> Japan has far fewer lawyers per capita than the United States, arguably because it substitutes custom for law, and can do so at least in part because the culture is more homogeneous.

<sup>30</sup> Zerbe, “Origin.”

<sup>31</sup> Zajac, *Political Economy*, p. 115.

A Lockean notion of fairness that is consistent with the culture and custom of the miners incorporates a moral concept of the relationship between what one earns and what one receives, so that unfairness is that which frustrates one's legitimate expectations.<sup>32</sup> A procedure is also fair in this sense when the procedure treats people according to their just deserts.<sup>33</sup> These common standards of fairness were reflected in the miner's views of government, work, property, and punishment.

### *Views of Government*

Majority rule and trial by jury were part of the culture of the miners. The historian Jerome Steffen confidently claims that most American historians would agree that "concepts such as local autonomy and universal suffrage were already deeply ingrained in American thinking on the eve of the California gold rush."<sup>34</sup> He argues that not only was the miner population experienced in modes of local autonomy, but that "[A]mericans by 1848 were accustomed to establishing unofficial grass-roots organizations to fill the void left by ineffective official institutions."<sup>35</sup> James Hurst, speaking about settlers from the western border of the original colonies, explains, "these settlers from all over the central and midwestern states set up local governments in the form of 'claims associations,' elected officers with whom to record their land claims and from whom to obtain decisions of conflicts, and then generally abided among themselves by these records and decisions."<sup>36</sup> The Public Lands Commission of 1880 notes the importance of the miners' cultural background and records that instead of general lawlessness:

. . . the adventurers of 1849 spontaneously instituted neighborhood or district codes of regulations . . . to define and protect a brief possessory ownership. . . . In the absence of State and Federal laws . . . and with the inbred respect for equitable adjustment of rights between man and man, which is the inheritance of centuries of English common law, the miners only sought to secure equitable rights . . . with a well founded confidence, that no machinery was necessary to enforce their regulations other than the swift, rough blows of public opinion.<sup>37</sup>

<sup>32</sup> We owe this definition of unfairness partly to Paul Heyne. See also Hoffman and Spitzer, "Entitlement."

<sup>33</sup> Work that supports the proposition that fairness can be procedural may be found in Tyler, "What is Procedural Justice" and "Governing"; and Casper, "Having Their Day," and sources cited therein.

<sup>34</sup> Steffen, *Mining Frontiers*, p. 428.

<sup>35</sup> Steffen (*ibid.*, p. 248) and Hurst (*Law*, p. 6) noted that for settlers from the central and Midwest states, the law meant a force to "release individual creative energy and help increase the practical range of choices open to them."

<sup>36</sup> Hurst, *ibid.*, p. 5. This informal governance is consistent with Locke, who recognized weaknesses with the state of nature, such as the potential for men to violate the rights of one another. "Though the right to property is grounded in nature, it is not secured therein. It is one of the primary ends of the state to preserve the rights of property, as well as to make laws governing the use, distribution, and transference of property." Edwards, *Encyclopedia*, p. 499.

<sup>37</sup> From the Public Lands Commission of 1880, quoted by Davis, *Historical Sketch*.

*Views of Work*

Gold-digging is hard work, and its rewards should go to those who earn them, according to the articles appearing in *Alta California*, a San Francisco newspaper that began publication in 1849 and that followed the miners very closely: “Fortunes are not to be made in the mines in a few weeks. Those who have prospered in the mines have done so by labor incessant and severe.”<sup>38</sup>

Lockean fairness, in the sense that one deserved what one worked for, was an explicit tenet of labor reformers in the 1830s and 1840s and of the widespread “producerism” movement, or Jacksonian democracy.<sup>39</sup> Labor leaders of the mid-nineteenth century believed that labor primarily created all wealth.<sup>40</sup> “By labor, man removes things from a state of nature and makes them his property.”<sup>41</sup> Historians of the era note that the lust for acquisition and the constant pursuit of material goals were combined with this ethic. Among both major political parties of the time, there was an emphasis on men’s right to what they produce.<sup>42</sup> For Democrats, farmers and laborers were clearly producers, and maybe manufacturers, but certainly not banks, insurance companies, railroads, or lawyers who derived their wealth from the work of others. The Whigs felt that almost all occupational groups deserved respect and esteem.<sup>43</sup>

The ideal that emerged in Jacksonian America was that of the autonomous small producer.<sup>44</sup> The primary aim of the Jacksonians was to open the avenues of social advancement to all laborers, not to redistribute the property of the rich.<sup>45</sup> “The free labor outlook had a strong cultural authenticity.”<sup>46</sup> Eric Foner notes the applicability of a maxim from the 1830s: “don’t hire when you can do the work yourself.”<sup>47</sup> Even greater than the reluctance to hire was the reluctance to *be* hired. The notion of “wage slavery,” that is, “. . . that the wage earner was somehow less than fully free,” was widespread.<sup>48</sup> The idea of wage slavery, says Foner, “provided a critique of emerging capitalism in which workplace exploitation . . . took center stage.”<sup>49</sup> We predict, therefore, that the ownership

<sup>38</sup> *Alta California* for 10 May 1849. See also the issue of 24 April 1849, and the account of Webster, *Gold Seekers*, p. 101.

<sup>39</sup> Ashworth, *Agrarians*, p. 62; Pessen, *Most Uncommon Jacksonians*, p. 174; and Foner, *Free Soil*.

<sup>40</sup> Pessen, *Most Uncommon Jacksonians*, p. 174.

<sup>41</sup> Edwards, *Encyclopedia*, p. 499.

<sup>42</sup> Foner, *Free Soil*.

<sup>43</sup> Ashworth, *Agrarians*, p. 62.

<sup>44</sup> Foner, *Free Soil*, p. xvii.

<sup>45</sup> Foner, *ibid.*, p. 19.

<sup>46</sup> Bruchey, *Roots*, pp. 206–07.

<sup>47</sup> Foner, *Free Soil*, p. xiv.

<sup>48</sup> Foner, *ibid.*, p. xvii.

<sup>49</sup> Foner, *ibid.*, p. xix.

and operation of mines would favor the small individual producer rather than wage or gang labor.

### *Views of Property*

“Each man possesses himself absolutely, and therefore that with which he mixes his labor becomes his property.”<sup>50</sup> This emphasis on men’s rights to what they produce echoed those of Thomas Paine, who, writing late in the eighteenth century, distinguished between the land itself, properly the property of all, from improvements made upon it “which should go to the individuals responsible for them.”<sup>51</sup>

John Reid’s account, generally well regarded by historians, on the views of ownership and property held by overland emigrants from this time, applies as well to the forty-niners:<sup>52</sup>

Ownership remained the salient concept. There was indeed a whole set of vesting rights, and imposing obligations that was not limited to a command . . . from the “sovereign” backed by threats or by force . . . Law was the taught, learned, accepted custom of a people . . . It was not the law of the folk-of kinship or blood vengeance-existing in societies before government can command adherence to legislated standards. Rather, it was the expression of an agrestic, community-centered world we have lost, a custom-instilled into the marrow of social behavior.<sup>53</sup>

Reid notes that the emigrants carried with them, and acted upon, a sense of private property as fully developed as the one they had at home. Charity existed, but it was recognized to be charity, not a right to a more equal distribution, or even a right to steal when starving or dying of thirst.

### *Views of Punishment*

There was, among the miners, a willingness to participate in punishing defectors. We argue that this willingness stemmed from the common culture of the group, and that because the institutions were seen to be fair, the miners felt they were valuable and worth defending.<sup>54</sup> The miners’ sense of the worthiness of the rules was enhanced by the principles of fairness and democracy that were part of the culture of the American miners, and which were particularly associated with the western United States. As Frederick

<sup>50</sup> Edwards, *Encyclopedia*, p. 499.

<sup>51</sup> It is true that Skidmore’s views about the injustice of returns to capital were widespread and influential, but they did not represent the dominant view (Pessen, *Most Uncommon Jacksonians*, p. 149).

<sup>52</sup> We have used the suggestions of historians John Findley and Les Benedict in relying on Reid.

<sup>53</sup> Reid, *Law*, p. 361.

<sup>54</sup> Weingast (“Political Foundations,” p. 13) suggests that this is another condition for democratic stability.

Turner notes: “Here, by the thirties, Jacksonian democracy flourished . . . (and) was based on the good fellowship and genuine social feeling of the frontier, in which classes and inequalities of fortune played little part.”<sup>55</sup> John Davis refers to the miners’ “inbred respect for equitable adjustments or rights . . . which is the inheritance of centuries of English common law.”

Social norms such as a sense of fairness can promote cooperation and a willingness to help sanction those who do not cooperate, helping to overcome the free-rider problem of group action.<sup>56</sup> Cultural norms may also lead those who do not participate in punishing wrongdoing to feel shame or guilt.<sup>57</sup> Thus, a sense of fairness—or perhaps more accurately, a sense of justice—may lead not only to a desire to see the bully punished, but to participate in his punishment.<sup>58</sup>

Ideas of fairness that are common to a culture may have also been particularly attractive in the gold fields, where the absence of formal law may have given a heightened sense of the possibilities of a bargaining breakdown, with the consequences of such a breakdown particularly significant.

#### THE INSTITUTIONS OF THE GOLD FIELDS

We have argued that the culture of the miners was a fairly homogeneous one supporting the potential for focal points. By acting as focal points and specifying the rules and rewards of cooperation and penalties of defection, familiar institutions can help agents solve recurring coordination problems and achieve cooperation.<sup>59</sup> The next step, therefore, is to demonstrate that the particular institutions chosen reflected this common culture, and embodied these ideas of fairness. The base institutions in the gold fields were majority rule and trial by jury. Operating rules were in effect for establishing claim size, working the claim, and allocating claims based on first-come, first-served.

<sup>55</sup> Turner, *Frontier*, p. 49.

<sup>56</sup> We owe this point to Moshe Adler and Sethi and Somanathan, “Evolution.” The willingness to pay to resist unfairness and to punish individuals who have treated you unfairly has been demonstrated in laboratory experiments by Kahneman, Knetsch, and Thaler, “Fairness”; and by Guth, Schmittberger, and Schwarze, “Experiment.” In these experiments a sum of money was made available to “donors” who could then offer some portion of it to “recipients.” If “recipients” rejected the split, both “donor” and “recipient” received nothing. Even in nonrepeated games, “recipients” were often willing to accept nothing to punish a donor who proposed a split they felt was unfair.

<sup>57</sup> Part of the definition of culture is a common interest in conformity. Adam Smith (cited by Hardin, *Collective Action*, pp. 171–72) notes of nonconformity, “The glaring impropriety of this conduct, the gross insolence and injustice which it seems to involve in it, often shock and exasperate us more than all the mischief which we have suffered. To bring him back to a more just sense of what is due to other people, to make him sensible of what he owes us, and of the wrong he has done to us, is frequently the principal end proposed in our revenge.”

<sup>58</sup> We wish to thank Moshe Adler for this point.

<sup>59</sup> Calvert, “Rational Choice Theory”; and Schotter, *Economic Theory*, p. 161.

*Majority Rule*

The record suggests that majority rule was a preexisting norm and was consistent with the culture and custom of the American, and many of the European, miners.<sup>60</sup> As the influential William Leggett noted, for both Whigs and Democrats, democracy was about “preventing restraints on the many that will benefit the few.”<sup>61</sup> Evidence is convincing that majority rule was used to set claim size, to allocate claims, to set work rules, and to provide for a procedure to settle disputes.<sup>62</sup> Existing historical accounts show that majority rule was widespread and that its main purpose was to suppress violence.<sup>63</sup> Reid shows that majority rule was also the custom of the American immigrants. The following account is cited as typical by Umbeck:

The first workers on the bar had taken up claims of a generous size, and soon the whole bar was occupied. The region was full of miners and they came pouring down upon the river, attracted by the reports of a rich strike, until their tents and campfires presented the appearance of a vast army. Those without claims far exceeded in number the fortunate ones. A miners’ meeting was called to make laws. Majority ruled in a mining camp in those days, and it was voted to cut down the size of claims to forty feet. The claim owners were powerless to resist, but had to admit to the fiat of the majority. The miners were then registered in the order of the date of their arrival upon the bar, and in that order were allowed to select claims until all were taken. Even then there was a great crowd of disappointed ones.<sup>64</sup>

“Whenever the necessity arose there was instant appeal to the American expedient of popular decision, and no question was too important or too trivial for an ultimatum by the vox populi.”<sup>65</sup>

Majority rule may be consistent with fairness, as a nondiscretionary procedure discussed by Jon Elster.<sup>66</sup> Cheryl Eavey and Gary Miller demonstrate through a series of fascinating experiments that a majority vote can produce egalitarian results even when there is another result (a potentially winning coalition) that gives a greater monetary reward to a potential majority. This is true even when the only alternatives on which the majority can vote are under the control of a designated member of the potential majority.<sup>67</sup> Whether or not the simple fair result is produced, however,

<sup>60</sup> Reid’s (*Law*, pp. 171 n. 10, 287–88, 288 n. 9, 172 n. 8, 174, n. 20, 186–87, 191–92) account shows many instances of majority voting decisions on the Overland Trail, including among forty-niner wagon trains. Sometimes those with more property had a larger vote.

<sup>61</sup> Leggett, *Collection*, p. 140, and *Democratick Editorials*, p. 109.

<sup>62</sup> Umbeck (*Theoretical and Empirical Investigation*, p. 217) notes that the provisions of all of the nearly 200 contracts he examined were determined through majority rule vote.

<sup>63</sup> Shinn, *Mining Camps*; Paul, *Mining Frontiers*; Caughey, *Gold*; and Umbeck, *Theoretical and Empirical Investigation* and “*Might*.”

<sup>64</sup> From the Public Lands Commission of 1880, quoted by Davis, *Historical Sketch*.

<sup>65</sup> Williams, *History*, p. 68.

<sup>66</sup> Elster, *Local Justice*, pp. 310–13.

<sup>67</sup> Eavey and Miller, “Fairness.”

depends *inter alia* on the cost of fairness. When the reward to the potentially winning coalition is sufficiently large relative to the fair result, the fair result is less likely.

Majority rule, however, was not used everywhere or by all groups, which is consistent with our prediction that majority rule was more likely to be found where the culture of the miners predisposed them in this direction. Alternative organizational principles existed in the region—some of the Latin and Chinese miners worked as contract labor for wages, with the individual miners subject to the control of a company or controlling organization without rights to strike out on their own.<sup>68</sup> The numerical superiority of the majority and its consequent advantages with respect to violence are insufficient to explain the adoption of majority rule by American and European miners in connection with the nonadoption by the Chinese and some Latin miners.<sup>69</sup> A fuller and more satisfying explanation for the use of majority rule recognizes the prior acceptance and use of majority rule as a preexisting norm.<sup>70</sup>

Majority rule worked not just because of numerical superiority with its advantage in potential violence, or even because majority rule as a principle was seen as fair. The additional ingredient that made majority rule work was that the majority made fair decisions. The majority did not tyrannically exclude the minority from all property. The majority shared according to a producerism ethic and accorded first-come, first-served rights. In the absence of fair decisions by the majority, the minority might have been more likely to fight.<sup>71</sup> The following account by Charles Shinn is instructive:

William Dougherty and a companion found gold in a canyon on the Yuba River. They were doing well when, after several days, they were visited by a delegation of miners from a neighboring camp. The visitors, six or eight in number, proposed to share the find. A meeting was held and it was decided that each miner should be allowed to own a strip of land ten feet wide on the river and three hundred feet deep. Dougherty and his companion were in the minority, and could not have objected even had they wished; but the plan was so entirely in accordance with the usual

<sup>68</sup> See Choy, "Golden Mountains," p. 270; and Nasatir, "Chileans," p. 62. The American and European miners eventually drove out these wage-mining operations.

<sup>69</sup> Economies of scale in violence require only that the value of claims secured through violence, relative to the value of gold lost through mining labor foregone while engaging in violence, are greater for a group than for an individual. This condition is easily met, since an attack by many miners against one or a few could have only one predictable outcome in the absence of massive individual differences in fighting ability.

<sup>70</sup> Such cooperation is more likely where the game is repetitive, assuming that some monitoring of behavior is possible (Axelrod, "Evolutionary Approach"). The miners' game was repetitive because of the considerable movement of miners from claim to claim, and evidence for the high expectation of finding a profitable new claim elsewhere in the early years of the gold rush is definitive. See Umbeck, *Theory*; and Paul, *Mining Frontiers*, p. 35.

<sup>71</sup> See the experiments of Kahneman, Knetsch, and Thaler, "Fairness as a Constraint" and "Fairness and the Assumptions"; and Guth, Schmittberger, and Schwarze, "Experiment."

custom—the unwritten law of older camps—that they yielded a ready and cheerful acquiescence. In view of the fact that they were the discoverers, it was unanimously agreed that they should have first choice of ground.<sup>72</sup>

When decisions were seen as unfair, even those by elected officials, the majority would intervene. For example, most of the mining camps, and especially the larger ones, had an appointed decision maker—variously called Alcalde, recorder, arbitrator, or chairman—or a committee or miners' court to settle disputes.<sup>73</sup> These individuals were paid, usually from fees collected from recording claims.<sup>74</sup> The Alcalde was not usually trained for the job, but “followed his own uneducated notion of right and wrong. . . .” Historical accounts suggest that these men were often elected because of their expected ability to make both wise and fair decisions. When the Alcalde's decision was seen as unfair, however, the miners took action to ensure that the fair thing was done as in the following example:

Two mining partners, (Sim and Sprenger) worked a claim together. Sprenger met with an accident and was crippled and helpless. Against the custom of the camp, Sim ejected Sprenger from the claim. Sprenger took the matter to the local Alcalde or mayor.<sup>75</sup> Sim, it later transpired, bribed the Alcalde to support him. Without knowing of the bribe, the miners refused to accept the Alcalde's support of Sim, and “. . . over a thousand miners threw down their picks and shovels—and came to the main camp.” The miners formed a new court, reinstalled Sprenger as half owner of the claim; Sim was ordered to pay the costs of his partner, the Alcalde was deposed, and the miners, learning of the bribe, exacted the bribe from the Alcalde, and a new organization was set up to settle disputes, “The Hayden Court.”<sup>76</sup>

The actions of the Alcalde may have been unacceptable in any reasonably developed system of law. What is interesting here, however, is the demonstration of a legal system and the participation of such a large number of miners. This is consistent with the observation that fairness may foster participation in seeing the bully punished, and contribute to a reduction in the free-rider problem of group action.

This approach is also efficient if the custom of providing for an injured miner is regarded as a low-cost method of purchasing insurance against illness or injury. The miners' interest in the Sprenger case could be viewed as arising from their interest in preserving the insurance mechanism and in having an honest Alcalde.

<sup>72</sup> Shinn, *Mining Camps*, pp. 165–66.

<sup>73</sup> Caughey, *Gold*. See also Decker, *Diaries*, pp. 221–22, 233, and 292 n. 234.

<sup>74</sup> Caughey, *Gold*, p. 229; and Shinn, *Mining Camps*, p. 175. The Alcalde also usually recorded claims.

<sup>75</sup> For a fuller explanation, see Caughey, *Gold*; and Shinn, *Mining Camps*.

<sup>76</sup> Shinn, *ibid.*, pp. 190–98. Hayden later became Chief Justice of the California Supreme Court.

*Trial by Jury*

The certain and speedy punishment of defectors was one of the most widely reported aspects of the gold fields. Punishments were generally carried out with a sort of due process involving jury trials: “. . . cases are almost universally tried by jury.”<sup>77</sup> The widespread success of majority-rule jury trials for eliminating violence is consistent with the record. Miner William Swain noted that the general honesty “. . . is usually attributed to the prompt and severe punishment always ready for offenders.”<sup>78</sup> Arrest, trial and punishment rarely occupy more than a few hours.<sup>79</sup> Trial by jury is another example of an attempt to ensure a nondiscretionary mechanism.<sup>80</sup>

*Claim Size*

In the early days of the mines, 1848 to 1850, claims were mainly held and worked individually. In the earliest period some Native Americans were hired for wages, but this did not meet with approval and was soon stopped. Similarly, attempts to bring slaves into the mines were strongly and effectively resisted. The Jacksonian ideal of the small producer governed here. Both the wage laborer and his employer were held in contempt, and the use of gang labor was a source of tension between the Chinese and some Latins, on the one hand, and Americans on the other.<sup>81</sup> Claim size then was generally geared to the individual producer and not to contract or slave labor.

Our explanation of claim size is based on fairness, which contributes to political stability, and to which efficiency served as a constraint. The size of claims can be explained by the “producerism” concept that a man could only claim what he could reasonably work, and is consistent with the principle of Lockean fairness: “However, only so much as a man improves and can use belongs to him, nor may a man deprive another of the means of self-preservation by overextending his reach for property.”<sup>82</sup> This explanation is also

<sup>77</sup> Grivas, “Alcalde Rule,” p. 25, citing McCollum.

<sup>78</sup> For example, the penal code adopted at the camp of Mariposa in 1851 provided that: “Who so willfully does wrong to anyone to the value of fifty dollars shall be hanged by the neck until death shall ensue. The penalty for a lesser wrong shall be from five to fifty strokes of a switch on the fleshy parts of the body, stripped.” Perlot, *Adventures*, p. 105.

<sup>79</sup> Letter quoted in Holliday, *World*, p. 316. Buffum’s (*Six Months*, pp. 65–67) diary provides a dramatic example of speedy if severe justice.

<sup>80</sup> Elster, *Local Justice*, pp. 310–13.

<sup>81</sup> The use of gang labor is consistent with Lockean principles, but not with Jacksonian democracy. We have no judgement about whether or not gang labor or individual labor was more efficient. The evidence suggests that individual labor was more productive on productive land, but that gangs were more efficient on land that was to be reworked. See Umbeck, “Might.”

<sup>82</sup> Edwards, *Encyclopedia*, p. 499. These sentiments of Locke suggest that using contract labor to expand control was not in the spirit of Lockean fairness.

consistent with the miners' own language: "The claims were made small so everyone would have a chance to get one."<sup>83</sup>

What a miner could reasonably work is not dissimilar to the concept of an efficient-sized claim: "[T]he idea being in each case to afford every man a fair chance to accumulate wealth and with this object in view, to give him as much ground as he could possibly use."<sup>84</sup> John Caughey observes that, "The intention, however, was always to allot what a man could actually work, rather than a surplus that he would be tempted to sublet or hold for a speculative profit."<sup>85</sup> A miner reports:

The next morning we found a claim a short distance below on the opposite side of the river that had been worked for a considerable distance up the bank. . . . We learned that the men who had been working the claim had gone up river and were engaged in building a log cabin. We thought they were not entitled to hold a claim here and one in the mountains at the same time, so we moved the old machine out of the hole where it would not trouble us and we went to work.<sup>86</sup>

In *Jennisson v. Kirk*, the U.S. Supreme Court said "The codes were so framed as to secure to all comers within practicable limits absolute equality of right and privilege in working the mines. Nothing short of equality would have been tolerated by the miners. . . ."<sup>87</sup> Justice Stephen Field stated in *St. Louis Smelting and Mining v. Kemp* that "The extent of ground which each might locate was limited so that all might have an equal chance—in the struggle for wealth buried in the earth."<sup>88</sup> Justice Field's statement is particularly authoritative. He had been himself a forty-niner, an Alcalde in the gold fields, and a California legislator.

There was a norm for claim size, and efficiency, as well as fairness, may have helped define it.<sup>89</sup> We suggest that where there is an *a priori* fair procedural decision to set allocation rules, considerations of fairness are already satisfied and the efficient outcome is more likely to result (a fairness-efficiency hypothesis). The norm for claim size was first established by majority vote. In the California gold fields, the majority may have set claims at an efficient size, and because the procedure for determining the distribution of

<sup>83</sup> Browne, *Report*, p. 223.

<sup>84</sup> Hittle, *Mining*, p. 252.

<sup>85</sup> Caughey, *Gold*, p. 228.

<sup>86</sup> Webster, *Gold Seekers*, p. 113.

<sup>87</sup> *Jennisson v. Kirk*, 98 US 453.

<sup>88</sup> 104 US 636.650; 26 Lawyer Edition 875. Equal valued claims also avoided any conflict over allocating votes by dollars or by individual, since at least *ex ante*, each would lead to the same allocation. Of course, *ex post* claim values differed. Given the transience of the population and the costs of measuring and tracking *ex post* claim values, however, one vote per miner was probably the lowest cost allocation method.

<sup>89</sup> Umbeck, "Might." Sugden ("Spontaneous Order") notes the role of efficiency in establishing norms, and notes some respects in which efficiency is, and is not, a component of fair rules. Easterling ("Fair Rules") has shown in another context that efficiency itself may serve as a norm for fairness.

claims and the claim size was accepted as fair, efficient claim size served as a focal point for a fair distribution.<sup>90</sup>

The evidence is consistent with a correspondence between efficiency and fairness for claim size.<sup>91</sup> The efficient claim size is determined by increasing the ratio of miners to land until the miners' implicit wage rate (their opportunity cost) is equal to the marginal physical product of labor times the market price of gold. That is, the size of an original claim would be increased as long as the additional land added to the original claim was more productive as part of the original claim than as part of the new claim.<sup>92</sup>

If claim sizes are efficient, the size of claims on more productive land should be smaller. Absent such an inverse relationship between productivity and claim size, this hypothesis is rejectable. Umbeck establishes that claim size varies inversely with productivity, which is consistent with the efficiency hypothesis. Efficiency considerations would also lead claim size to change with technology, and is clearly the case in the historical literature.<sup>93</sup>

Neither simple equality nor an explanation ignoring group behavior explains claim size well. Simple equality, such that each miner on the spot at the time the mining district is formed receives a claim, does not explain claim size.<sup>94</sup> Simple fairness leads to an equal division so that everyone receives a plot. Given a sufficient number of men, these plots would be inefficiently small. This did not happen. There were nonviolent attempts to reduce the standard 100-foot claim to 25 feet by a class of latecomers called "twenty-five-foot men," which did not succeed. The simple equality hypothesis is also inconsistent with the accounts of left-out miners noted by Nancy Farriss and Smith.<sup>95</sup>

Umbeck presents a different hypothesis of claim size for individual miners but does not include a theory of group behavior. The violence hypothesis that Umbeck suggests is that "no wealth maximizer would accept less wealth than he could have through the use of his personal force, the agreed upon contract must initially endow each individual with the same amount of wealth as that which they could have had through violence."<sup>96</sup> But given majority rule, a miner would have gained little but punishment from violence. A simple theory of violence focused on group behavior suggests that

<sup>90</sup> The setting of efficient claim sizes is more likely when the losers have a chance of becoming winners and when the game is repetitive with an uncertain ending. Such was the case with the miners. Also, the rules establishing claim size at one place and time affected the rules chosen elsewhere because existing rules became norms.

<sup>91</sup> See, generally, Umbeck, "Might." For a demonstration of efficient norms see Ellickson, "Hypothesis."

<sup>92</sup> This equilibrium condition is different from Umbeck's.

<sup>93</sup> Rohrbough, *Days*; Royce, *California*; Jackson, *Gold Dust*; and Rickard, *Man*.

<sup>94</sup> Eavey and Miller ("Fairness") suggest the possibility that majority rule could result in a more egalitarian distribution of claims so that the size of claims may have been somewhat less than efficient.

<sup>95</sup> Farriss and Smith, *History*.

<sup>96</sup> Umbeck, "Might," p. 40.

claim sizes were set to prevent takeover of claims by outside groups. The more productive the land the harder others will be willing to fight (WTF) for it, and thus the greater the required force to defend it. For an individual, the marginal WTF for an additional piece of land is given by the ratio of the expected marginal product of land that one gains to that of the expected loss from fighting, which is the marginal product of labor. For a group, the condition is the same: as the number of claims and miners is increased beyond the efficient number, the marginal WTF decreases, but the additional miners serve as potential cooperating soldiers. Umbeck assumes a continually declining marginal physical product as the ratio of land to labor increases, which leads to the prediction that every miner on the scene has a claim. This is contrary to fact.<sup>97</sup>

The violence hypothesis was certainly reasonable, especially in the early mining days, when the ability to defend a mining camp or area of working claims was relevant. Nor are the violence and fairness hypotheses wholly incompatible.<sup>98</sup> Both predict claim size to vary inversely with productivity, hence it is not possible to reject either with this data. Perhaps the miners used fairness to determine outcomes with sociobiological underpinnings, the roots of which lie in potential violence.<sup>99</sup> But there is no evidence to suggest that the violence hypothesis should be accepted over the fairness hypothesis as the sole, or even the best, explanation for claim size.

The miners' own accounts favor the fairness-efficiency hypothesis.<sup>100</sup> Certainly, the role of majority rule in setting claim size was not one of pure force. In the account cited earlier, Dougherty and his companion were clearly outgunned, but the majority gave them first choice of claim even while reducing the size of claims. The size of claim chosen, "a strip of land ten feet wide on the river and three hundred feet deep," was in fact just the norm for productive land along streams.<sup>101</sup> Were a theory of violence based on group behavior the explanation, the claims of the majority would have been larger or more valuable than that of Dougherty and his companion.

<sup>97</sup> A sufficient and plausible condition for left-out miners to exist under either a violence or efficiency hypothesis is a region of increasing marginal returns to scale for land as the ratio of land to labor increases, which will require that efficient claim sizes be greater than some minimum level. Where the number of miners is large enough, the egalitarian claim size will be smaller than the efficient size, and the choice of efficient claim size will produce left-out miners.

<sup>98</sup> The violence hypothesis predicts smaller claim sizes than the fairness-efficiency hypothesis, but we do not have sufficient claim size data to test these differences. Mining technology changed after 1850 and the invention of the sluice increased the potential gains from combining small claims. See Umbeck, *Theoretical and Empirical Investigation*, pp. 153–54, and sources cited therein.

<sup>99</sup> See Beletsky and Orians, "Territoriality," vols. 1 and 2, and "Territoriality Among Male."

<sup>100</sup> We suggest that in many cases these rules, as products of fairness, may have enhanced efficiency. Sugden, "Spontaneous Order," discussing the forces by which conventions and norms arise notes some respects in which efficiency is, and is not, a component of fair rules.

<sup>101</sup> Umbeck [1981] *Theory* and "Might."

*Rules For Working Claims*

Agreements among miners in a district provided restrictions on the number of days a miner could leave a claim or requirements for the minimum number of days a miner had to work the claim, and restrictions on the number of claims one miner could own.<sup>102</sup> The existence or severity of minimum workday rules and of ownership restrictions were most likely to be found on the more productive land and tended to be found together. Average workdays per six months were 31.5 when contracts contained ownership restrictions, and 10.4 for contracts without ownership restrictions (a statistically significant difference at the 1 percent level). The likelihood of finding a requirement of a minimum number of workdays was much greater if there was also a restriction of ownership (also significant at the 1 percent level). This suggests that the purpose of the workday provision was the same as that of the ownership provision.<sup>103</sup>

For producerism, it is fair that if you keep others from working a claim, you must work it yourself. This would be the case *a fortiori* for more productive land; and it was the case that more productive land had more stringent work requirements.<sup>104</sup> Similarly, the more productive the land, the less fair it is for one person to have more than one claim.

Claims did not have to be worked during periods of the year when weather rendered them unworkable. A requirement in the contract specified the number of days the claim had to be worked rather than the number of days the claim holder had to be present. These facts suggest that producerism, rather than maintaining a sufficient fighting force, was the primary reason for the labor requirement.

A second piece of evidence consistent with fairness but inconsistent with the violence hypothesis was provisions for excusing people who were sick, or attending others who were sick, from working their claims. For example, a provision from a Siskiyou County mining district states “[t]hat no person’s claim shall be jumpable on Little Humbug while he is sick or in any other way disabled from labor, or while he is absent from his claim attending upon sick friends.”<sup>105</sup> Such provisions are not consistent with maximizing the number of fighting men. These provisions may be not only fair, but also efficient as insurance measures.

A third piece of evidence is provisions that forbade the holding of more than one claim by preemption, but allowing a larger or even indefinite num-

<sup>102</sup> Copies of many mining district contracts are present in the U.S. Census for 1850.

<sup>103</sup> Umbeck (*Theory* and “*Might*”) notes that efficiency suggests an inverse relationship between productivity and claim sizes, but dismisses this as the explanation, because it does not explain the work rules. Yet, if efficiency arises out of fairness, and if fairness can explain the work rules, the role of efficiency can no longer be dismissed. See also Decker, *Diaries*, pp. 217, 221–22, 233, and 292 n. 234.

<sup>104</sup> Umbeck (*Theory* and “*Might*”) explains the work rules as devices to keep at hand a sufficiently large fighting force.

<sup>105</sup> Davis, *Historical Sketch*, p. 30.

ber by purchase. Finally, work requirements existed in mining communities where government and legal institutions were firmly in place, so the prevention of violence cannot be an explanation. For example, the rules for mining districts as late as 1861 contain work provisions restricting the size, the number of claims held by one party, and pre-emption rights. Work requirements lessened as time passed and the claims were less productive, but they continued to exist. For example, the 1865 mining district laws for the Blind Springs Mining District in Mono County say that “all claims in theis [sic] district shall have at least 4 days work done on each 400 feet in each & every month till work is done to the amount of \$400.”

Umbeck assumes that disputes would be more likely on more productive land since the claims were smaller and contained more boundaries, and because the land was more valuable. Yet smaller claims can be better policed—the boundary per person *falls* as claim size is reduced. Boundary disputes could have possibly been more effectively reduced through more elaborate marking requirements than through work requirements.

#### *The First-Come, First-Served Allocation Rule*

First-come, first-served procedures were used by the California miners in establishing the choice of claims. Miners had to choose claims of standard size set by the mining district but choice was on the basis of their date of arrival, the first discoverer getting first choice, and so forth.<sup>106</sup> Why did the majority give special place to order of arrival and to first discoverers? First-come, first-served procedures can serve as focal points to avoid conflict because they appear to be fair.<sup>107</sup>

The advantages of such a social rule can be illustrated with the simple game of Chicken-Hawk, and the pay-off matrix in Table 3. In the context of the miners' situation, the Chicken-Chicken interaction is a solution in which the claim size chosen is inefficiently small as, for example, when every miner receives a claim. The Hawk-Hawk encounter represents mutual defection and violence: in the mining context the Hawk-Hawk outcome is equivalent to no property rights or to violence over claims. The off-diagonal encounters, Chicken-Hawk and Hawk-Chicken, represent the greatest total joint wealth.

In a one shot game of Chicken-Hawk, there are two pure Nash equilibria (H,C) and (C,H) and a mixed strategy equilibrium in which each player randomizes over C and H. To be a mixed strategy Nash equilibrium each player must play C and H in such proportions that the other player is indifferent between playing C and playing H.<sup>108</sup>

<sup>106</sup> Sometimes the first discoverer received two claims rather their first choice.

<sup>107</sup> This rule fits under Elster's “queueing” category, Elster, *Local Justice*, pp. 310–13.

<sup>108</sup> This turns out to be the case if each player plays C about 38 percent of the time.

TABLE 3  
CHICKEN-HAWK

	Chicken	Hawk
Chicken	4, 4	0, 20
Hawk	20, 0	-10, -10

When one considers this as a repeated game, all sorts of outcomes appear possible. The difficulty for a miner in deciding whether to be a chicken or a hawk is in knowing what the other player will do, and in knowing how ones' actions in one round may affect ones' reputation and thus the other players' actions in another round. It is easy to see why miners would have preferred a social rule that gave them an equal chance of having the first choice of claim. Suppose, in the absence of a social rule, that a miner expected "mistakes" that resulted in Hawk-Hawk interactions to be equal in frequency to Chicken-Chicken encounters. If a miner expected Hawk-Hawk encounters 27 percent of the time or more he would always prefer a social rule in which one was alternatively a chicken or a hawk. If a miner expected (H,H) (and (C,C)) encounters to occur only 10 percent of the time, he would have to expect to dominate as a Hawk 90 percent of the time or more in (H,C) or (C,H) encounters to not prefer the social rule. Even if the proportion of (H,H) and (C,C) encounters were different, for example with no (C,C) encounters and (H,H) encounters only 10 percent of the total, the miners would have to expect to dominate in more than 61 percent of (H,C) or (C,H) encounters to not prefer the social rule. A social rule then seems likely to be preferred by the majority of the miners.

To form a social procedure a rule is needed to indicate when one should act as a Hawk and when one should act as a Chicken. If a player knows what the other player will choose, the Nash equilibrium that maximizes joint wealth will be achieved. A way to accomplish alternating roles is to adopt a random assignment of Hawk or Chicken. A procedure that satisfies both of the Nash conditions and that maximized joint wealth would have a strong claim to emerge as a social institution. One such procedure would be first-come, first-served. This is a significant structural difference from the simple one-shot game. During each turn there is a random assignment of which player gets to go first based on first discovery. It is obvious that the player going first will choose H since he can reasonably anticipate that the second player's response to the first player choosing H is to choose C. A player's choice of C or H would be random in the sense that the determination of the first player is random.

The first-come, first-served strategy appears to have the advantage of stability—a stability rooted in fairness. Neither the lottery nor other proce-

dures such as last-come, first-served recognize the moral claim of the first discoverer or of earlier arrivals.

The first-come, first-served procedure has some local efficiencies aside from those connected with fairness.<sup>109</sup> The first-come procedure encourages further, and faster, discovery of gold, as it encourages the mining of gold before others arrive; it retains the advantage for the first discoverer; it obviates the need for the earlier miners to resettle; it eliminates the problem associated with last-come, first-served that there could always be a new last person; and it recognizes that the earliest miners would develop special knowledge about particular claim sites.<sup>110</sup> It also implicitly recognizes the advantage in violence to the first-comers since the miners earliest on a site will generally have known one another longer. They are, therefore, better able to form a cohesive group, to present an effective fighting force, and to constitute the core of the majority and, as the majority, to vote in favor of the self-serving first-come, first-served rule.<sup>111</sup>

If Lockean notions of fairness influence outcome, not only should a moral entitlement give one a larger share, but the stronger the moral entitlement, the greater the share. This is consistent with the miners' practice of claim choice by order of arrival, and with a truly fascinating aspect of the Elizabeth Hoffman and Matthew Spitzer experiments suggesting that an egalitarian result is substantially more likely in the absence of moral differences.<sup>112</sup> Coming earlier to a claim seems to have been sufficient to establish the order of choice by which miners were allocated claims.

#### ETHNICITY AS A TRANSACTIONS COST: THE FAILURE OF COOPERATION

The best evidence for the cultural hypothesis suggested here lies in the variance produced by culture. Culture provides a common language for cooperation and a common focal point for agreement. If culture is a device for reducing transaction costs, then transaction costs should be greater cross-culturally than within a culture.<sup>113</sup> This was indeed the case. Violence and the failure of cooperation in the gold fields were primarily among racial or ethnic groups, such as between Whites and Hispanics, Whites and Chinese,

<sup>109</sup> Although the first-come, first-served procedure is fair and is locally efficient, it is not globally efficient. Sugden ("Spontaneous Order") points out that this strategy can encourage a wasteful expenditure of effort to be first.

<sup>110</sup> Some of these arguments were suggested by Robert Ellickson. For an interesting account of the optimal timing of rights and land policies for settling the American West, see Anderson and Hill, "Race."

<sup>111</sup> The work of Beletsky and Orians ("Territoriality," vols. 1 and 2, and "Territoriality Among Male") is instructive in considering the origins and efficiency of first-come, first-served procedures.

<sup>112</sup> Hoffman and Spitzer, "Entitlement."

<sup>113</sup> Landa (*Sows*) provides a number of examples in which cross-cultural differences force solutions that would be inefficient within a culture.

Americans and non-Americans, or to a lesser extent, American and European (particularly French) or Australian miners. The American miners especially harassed the Chilean, Mexican, Chinese, Native American, and French miners, and the Australians, the latter being regarded by some as rather lawless elements.<sup>114</sup> The American spirit of individualism and equality seemed to find wage labor as practiced by the Mexicans and Chinese particularly offensive.<sup>115</sup>

Some of perhaps the most intense violence and discrimination was against Mexicans. This has been attributed in a careful study by Richard Peterson to “the American anti-Mexican cultural predisposition.”<sup>116</sup> This predisposition increases the transaction costs of contract formation and solving the collective action problem.<sup>117</sup> Abraham Nasatir notes that miners from Latin countries often worked in a sort of corporate venture, whereas Americans and Europeans worked individual claims.<sup>118</sup> The Americans considered the claims of Latin companies in Calaveras county staked in the name of wage workers illegal, and this conflict led to the “Chile War of 1848.”<sup>119</sup> The *Democratic Review* in 1849 developed a harsh but not untypical critique of the Latin miners, and suggested that while the unworthy Latins had lingered in California for many years without doing anything productive, the Anglo-Saxon race would utilize the gold for national progress made worthy by hard work.<sup>120</sup> There were resolutions by mining camps that prohibited foreigners altogether.<sup>121</sup>

In 1850 California passed the notorious tax on foreign miners, which was applied most strongly against the Chinese.<sup>122</sup> As with the Mexicans, discrimination against the Chinese was widespread and notorious.<sup>123</sup> The Chinese,

<sup>114</sup> See Nasatir, *French Journalist*, p. 189f, and “Chileans”; Choy, “Golden Mountains”; Rawls, “Gold Diggers”; and Monaghan, *Australians*, p. 135.

<sup>115</sup> Pessen, *Jacksonian America*, chap. 2. There is no evidence of significant use of slaves in the mines; black Americans appear to have been better treated than many foreigners (Lapp, *Blacks*).

<sup>116</sup> Peterson, *Manifest Destiny*, p. 45.

<sup>117</sup> There can be little doubt that economic rivalry intensified this predisposition.

<sup>118</sup> Nasatir, “Chileans,” p. 62. See also Giacobbi, *Chile*.

<sup>119</sup> Faugsted, *Chilenos*. There was also some antagonism between Chileans and Argentines (Giacobbi, *Chile*).

<sup>120</sup> For a similar account see Marryat, *Mountains*, p. 294. A French gold journalist in the mines also viewed the Mexicans as lazy (Nasatir, *French Journalist*, p. 128).

<sup>121</sup> Sylva, *Foreigners*, pp. 45–46.

<sup>122</sup> In April of 1850 the California legislature passed a foreign miners’ tax of \$20 per month upon all noncitizens working in the California mines. The act further authorized license collectors in the mining counties to retain \$3 of each \$20 payment as compensation for collection, and sanctioned forcible removal of aliens from their mining sites for failure to pay the tax. Sylva, *Foreigners*, pp. 45–51.

<sup>123</sup> For example, the miners in a mass meeting at Diamond Springs in El Dorado County in 1858 adopted the following:

Whereas, the great influx of Chinamen into this district. . . ; and, whereas the Chinamen are continually committing outrages upon the miners in the district by robbing sluices and plundering their cabins, their immediate expulsion has become necessary; therefore,

Resolved, that the Chinamen in Diamond Springs township . . . who have not purchased claims

like some Latins, were not organized in accordance with producerism theories, but worked as employed groups. For the American miners particularly, this was an immoral arrangement. As Zajac points out, however, fairness arguments can also be strategically used to promote self-interest: restricting contract labor may have gone against the producerism ethic, but it could also have also conveniently reduced any advantage arising from gang labor that was less likely to accrue to white Americans.<sup>124</sup> Nonetheless, as Edward Pessen notes, high on the American's scale of values was his egalitarian belief that one man—particularly an American—was as good as any other; certainly, that he should be treated like any other. White Americans simply would not be known as “servants.”<sup>125</sup> The discrimination was, however, less in the early period of greatest abundance.<sup>126</sup>

The evidence of reduced discrimination against the Chinese in flush times is also consistent with the reduced need for cooperation when there is less scarcity. The absence of slave labor used by Southerners and of paid Indian labor generally after 1849 is explained by the newcomers' jealous opposition to the whites in California who were able to control or otherwise exploit the labor of Indian miners. Such exploitation was viewed by the new Californians as an unfair advantage. This hostility was expressed also toward white southerners who attempted to bring black slaves to work their claims.<sup>127</sup>

Consistent with the cultural hypothesis is the higher level of interethnic violence that was found between, compared to than within, cultural groups. Similarly, the organization of work gangs rather than the use of small individual claims among some non-American and non-European cultures and the absence of majority rule is consistent with this hypothesis.

#### CHANGES IN THE SOCIETY OF THE MINERS

In 1848, before the hordes of miners had descended upon the fields, disorders were rare; observers report a period of “almost Arcadian honesty” that lasted well into 1849.<sup>128</sup> “The people here are civil and mind their own business,” a forty-niner from Michigan wrote of conditions on the middle fork

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(bona fide) before this date, be notified to leave the mines . . . within ten days after such notice be given them, and in the case of their refusing to comply within the ten days, we will oust them and convey them beyond the limits of this district. . . . That we pledge ourselves each to the other, that we will enforce the foregoing resolution-peacefully if we can, forcibly if we must.

See Siolo, *Historical Souvenir*. See also Sylva, *Foreigners*, p. 27. For a fictional account of a real 1887 massacre of Chinese miners in Oregon, see Leslie, *Riversong*.

<sup>124</sup> Zajac, *Political Economy*, p. 135.

<sup>125</sup> Pessen, *Jacksonian America*, p. 12.

<sup>126</sup> As late as 1882, there were camps where no “Chinaman” was allowed to set foot even as an employee (Shinn, *Mining Camps*, p. 213).

<sup>127</sup> Rawls, “Gold Diggers,” p. 38.

<sup>128</sup> Williams, *History*, p. 75.

of the American River. “I hear of no thefts, robberies, or murders.”<sup>129</sup> There were in fact, very few. “Any miner, . . .” a second forty-niner said of Weaverville, “. . . can leave his things loose in his tent, and be gone a week, or month, and come back and find them as he left them.” Similar statements could be quoted from such geographically diverse locations as the Yuba River, Mormon Island, Hangtown, Murphy’s Diggings, and Mariposa.<sup>130</sup>

The components of the miners’ society later changed, however. “[T]he camps of 1849 are described, by those who best knew them, as on the whole remarkably orderly. By the middle of 1850 we meet with a few great disturbances, like those in the Sonora. By the beginning of 1851, however, complaints are general and quickly lead up to violence. . . .<sup>131</sup> The ability to form focal points around familiar institutions gave way to an influx of workers with different cultures, the pressure of greater numbers of miners relative to the claims available, and technological changes favoring more capital-intensive mining with wage labor and larger claim sizes that undermined the ideals of individual producerism.<sup>132</sup> These forces changed the marginal costs and benefits of the gold field institutions, and led in Malcolm Rohrbough’s words to “. . . a gradual unraveling of the consensus of the rules of behavior that characterized the first mining seasons. . . .” The work rules of the earlier miners no longer sufficed, and indeed proved to be inefficient and litigious. The break up of the consensus led first to an increase in violence and robbery, and then as order was imposed from without, to war by litigation, or what has been called “court-room mining.”<sup>133</sup>

#### SUMMARY

We have argued that fairness serves to provide focal points around which collective action problems, such as the creation of institutions and providing for property rights, can be solved. Focal points arose from a common culture in the gold fields that stressed individualism, equality, respect for property, and rewards commensurate to work. The California miners used fairness to help create norms and institutions that included majority rule, election of

<sup>129</sup> Some forty-niners wondered why “beyond the jurisdiction of the law they were still law abiding” Reid, *Law*, p. 7.

<sup>130</sup> Reid, *ibid.*, p. 5.

<sup>131</sup> Williams, *History*, p. 86.

<sup>132</sup> Placer mining first gave way to the use of sluice boxes requiring several men and then to expensive river damming and to quartz or vein mining. Rohrbough, *Days*, pp. 186, 188, 197, 218, 267, and 268; Royce, *California*, p. 221f; Jackson, *Gold Dust*, pp. 303, 314–15; and Rickard, *Man*, p. 730.

<sup>133</sup> The law developed in accord with the earlier miner rules. See Leahy, *Mining Law*, generally for a discussion of the enormous quantity and expense of litigation this occasioned. This phenomenon is similar to Libecap’s (“Economic Variables”) analysis of litigation and refinement of mineral rights in Nevada, though the record suggests that adjustments in property laws were slower in the case of the California gold fields. For discussion of how efficient gold-mining rules became inefficient law, see Zerbe, *Economic Efficiency*, chap. 9.

representative officials, trial by jury, first-come, first-served allocation procedures, and rules for working claims based on claim productivity and on what could be efficiently worked. Because the majority of miners believed these institutions were fair and worth defending, they were willing to participate in punishing defectors, and social cooperation existed for some period with a minimum of violence in the California gold fields.

After 1850 changing conditions compromised the efficiency of many of the California gold field institutions on which we have focused. Evidence suggests that institutions change in response to changes in relative prices. Less clear are the mechanisms of change. Gary Libecap, for example, has shown that an important source of change in property rules comes from major rights holders positioned to gain from more efficient rules that reduce ownership uncertainty. Our account provides further support for a rational-choice explanation on how institutions evolved on the frontier, but stresses the importance of culture and fairness for solving collective-action problems and suggests their role in determining the speed and nature of change.

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