fit a "psychopathological" model in which all worker discontent was viewed as a manifestation of personal and social maladjustment.

Mayo's success owed more to his personality than to his intellect, notwithstanding his wide-ranging intellectual interests. He was the dominant figure in a network of scientists, executives, managers, personnel experts, and foundation officials that was held together by his personal charm and through which he acquired the influence to effect a single, authoritative interpretation of these experiments. Herein lies the key to how the Hawthorne experiments were produced and consumed as scientific knowledge.

The experiments were turned into scientific knowledge at Mayo's Industrial Research Department at the Harvard Business School. Harold Wright and William Dickson, two of the company researchers most involved in the bank wiring room experiment, temporarily left Western Electric and moved to Harvard, with their salaries coming out of Mayo's Rockefeller Foundation grant. It was at Harvard that the mass of inconclusive data and conflicting interpretations were reconciled, in books such as *The Human Problems of an Industrial Civilization* and Roethlisberger and Dickson's *Management and the Worker*, into a homogeneous account stressing scientific method in the experiments and human relations in the workplace.

Much of the subsequent debate over the Hawthorne experiments has concerned whether the five assemblers in the relay assembly room were indeed cooperating with the experimenters, as the official accounts have stated, or were coerced by economic circumstances and managerial discipline into increasing their production. What this debate has missed, as Gillespie emphasizes, are the organizational contexts in which the experiments occurred and in which the experimental data were subsequently turned into knowledge. The Hawthorne experiments, after all, were conducted by company managers upon company workers and were thus embedded in relations of hierarchy and authority. Each side not only had its own interpretations of the experimental outcomes but also used the experiments to protect or advance its interests. For example, the women in the relay assembly test room argued, in their discussions with company researchers, that their increased output was due to improved working conditions in the test room—the rest breaks, the morning refreshments, and the reduction in the variety of relay types, which made their work easier and faster. When, in period 12, these privileges were withdrawn, the women simply took unsanctioned rest breaks and brought their own refreshments, until the researchers forced them to comply with the experiment. They continued to talk and laugh during working hours, despite the disapproval of the researchers. In addition there was evidence that the workers were taking advantage of their special group piece rate to increase their earnings by increasing their production.

Some of the company researchers similarly believed that the rest breaks, the limited number of relay types, and the pay incentive were primarily responsible for increased production, whereas others, influenced by Mayo's psychopathological approach, rejected this argument and stressed instead the improved mental attitude of the relay workers resulting from the looser supervision in the test room. Although there was no way of deciding which of these arguments was correct, when the experiments were written up at Harvard credit for increased production was given to the experimenters' adopting a supervisory style that paid attention to the human needs of the workers; the workers' own views were ignored.

The interpretation of the bank wiring room experiments displayed a similar evolution: a variety of interpretations of output restriction during the time the researchers were at Hawthorne, followed by a single, dominant interpretation when they were at Harvard under the influence of Mayo's theories of worker behavior. Clarity and certainty of argument were achieved by denying that workers' restriction of output had any political or economic motive—even though Dickson had in fact argued in one of his early reports that this practice was a form of both resistance to managerial control and economic self-defense—and attributing it instead to personal maladjustment.

Richard Gillespie has written a masterly account of how scientific knowledge is produced. It will surely become the definitive history of the Hawthorne experiments. My only complaint is that he concludes by defending the Hawthorne experiments of the charge that they were "bad science" by asserting that all science is an inherently social activity and that all knowledge will bear the imprint of the social context in which it has been produced. I find this an excessively and unnecessarily relativistic position. As Gillespie himself has demonstrated, the authoritative interpreters of the experiments, that is, Mayo and his colleagues, used the data selectively in order to promote the validity of their methods and theories. They lacked the receptivity to alternative explanations that one expects in scientific analyses. It is interesting to speculate what the result might have been had, say, W. Lloyd Warner, who was a better social scientist and whose anthropological approach was central to the research design of the bank wiring room study, been directly involved in writing the final accounts. My hunch is that we would have seen a better interpretation of the Hawthorne data.

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Men at Play

Southern Hunting in Black and White. Nature, History, and Ritual in a Carolina Community. STUART A. MARKS. Princeton University Press, Princeton, NJ, 1991. xviii, 327 pp., illus. $24.95.

Hunting is the "quintessentially masculine activity." A substantial body of recent social science has explored the world of women, but this book takes us to a less studied domain, the private and public realms of men at play. Stuart A. Marks charts North Carolina hunters—blacks, whites, and Lumbee Indians—over the last 200 years. The book presents a synthesis of recent interpretative approaches in anthropology with traditional concerns with symbol, social conflict, and ecological change. At times the exposition is overburdened by this effort, but overall the interweaving of narrative, fiction, interviews, observations, and social history is highly productive.

Hunting traditions reveal central values, symbols, and tensions in American life. Some hunting traditions have elite origins, which Marks contrasts with the democratic ethos of the American frontier. In the antebellum period, wealthy planters affirmed aristocratic ideals through the hunt. The planter ventured forth in leisure, on horseback, with trained dogs and a retinue of trusted slaves and friends. The hunt was a coordinated "vortex of action, surrounded by the roaring swirls of peers and subordinates, of horses and hounds, all focused on a common objective." A commander, the gentleman hunter reaffirmed by his hunting expertise that the basis for his superior place in society was achievement and skill, not chance. Patrician generosity was expressed through largesse with the meat obtained.

In contrast, poor whites and slaves relied on hunting for an important part of their diet. Small landowners resisted the dominance of upper classes over the landscape and articulated democratic hunting rights. "What right does the planter have to reserve the deer for his own purposes merely because he owns the land?" protested an overseer.

With emancipation, racially mixed groups of hunters became rare, and forms of hunting are now strongly linked with race. Blacks and Indians specialize in squirrel, rabbit, and raccoon, less often seeking deer, dove, or quail. The author remarks that "blacks are not likely to congregate in large armed groups and engage in quasi-military activities, as many whites do" and links this differentiation to past violence against blacks. White elites turned their attention from "fur to feather" and elaborated the hunt of quail. "You had to approach him gentleman to gentleman . . . [the quail] was worthy of respectful shooting." Landowners "lay claim to a genealogy of status and control over the good stuff of life" through their pursuit of the bobwhite.

As industrialization spread south, railroads penetrated the region and lured sportsmen from the north on hunting excursions. These excursions devastated local wildlife, and by 1905 most of the land had been posted against outsiders. Demands of towns for game, combined with the democratic disrespect for the rights of landed proprietors, led to a "great commercial slaughter of game throughout the continent."

Crusades to protect wildlife grew in the late 1800s, and journals and sportsmen's organizations were established. Technological advances in hunting echoed technological breakthroughs in other domains of American life. Breech-loading, hammerless guns and center-fire cartridges made shooting more pleasant and more rewarding. Ironically, hunting interest groups that spanned a range of social classes sought to uphold aristocratic rights to wildlife on private property under the banner of respect for nature and wildlife preservation. A coalition of sportsmen and urban naturalists won new legal restrictions on hunting and the creation of wildlife preserves and game commissions, and other institutional constraints. The history of hunting regulations reveals the growing power of government in an industrial society.

The transformation of the southern landscape with the collapse of tenancy and the mechanization of agriculture was followed by the industrialization of the region and its incorporation into the American mainstream. In Scotland county, North Carolina, industrialization through international companies brought new in-migrants and new cultural traditions, creating "a hodgepodge of provincial and cosmopolitan attitudes." Within this diversity, hunting serves as an important marker of identity and social ranking.

The concept of wildlife is socially constructed, argues Marks, and the biological species of deer, quail, rabbits, and raccoons are invested with local meanings. Deer hunting involves expenditures for powerful guns, distinctive clothing, the maintenance of dogs, licenses, and club fees, making it an opportunity for a certain kind of display. Deer hunters span a range of occupations, and their hunt clubs are sharply ranked by prestige. Both fox hunters and raccoon hunters show their dogs in bench shows, judge them in the hunt, and award themselves trophies, but the groups they form mark the chasm between the lawyer and the mill worker. The fox hunters, mostly men, and the society hunters, elite women who accompany the hunt on horseback, value the tight social circles in which they move. The hunt marks a social boundary as well as a competitive ritual, as the participants travel across state lines to follow a sequence of hunts and attendant social activities.

In contrast, the traditions of squirrel and rabbit hunting "ritualize propinquity." Familiarity with the land echoes the agrarian past, and this more mundane kind of hunting reinforces enduring relationships with neighbors and kin. Newcomers to the community find groups with similar values through hunting networks, and a new businessman can cement his networks with this pastime. Raccoon hunting attracts all races, but tends to be more popular among blacks. Night competitions are based on performance, not pedigree, and the satisfactions of coon hunting permit the unregistered dogs owned by "blue collars" to outcompete the "blue-blooded" dogs of the wealthy. "Coon dogs, like their owners, are workers."

Cultural symbols permit us to identify highly esteemed personal traits. Central to hunting is the value of fair play; wild animals should always be given a chance to escape: "It's important to give animals a fair shake. I don't know if you could trust another person to give you a fair deal if he wouldn't give it to the game."

Desired human qualities are projected onto the game: "The buck is the epitome of a masculine mystique. He is cool and collected in the trying and risky moments of performance. He uses his mind instead of his emotions in situations where discretion is essential before action." For a buck, a big rack of antlers symbolizes a long life of doing what it takes to survive and "make it" in the real world. The big rack on the den wall asserts a similar accomplishment for the hunter.

Sportsmanship also includes keen observation, self-reliance, patience, and unselfishness. "I recommends huntin' for younger people. It gives them somethin' to look forward to and enjoy. They will work harder and plan harder and it gives them a chance to prove theirselves." Thus, hunting is an arena for the demonstration of character and accomplishments, forming the basis for friendships and companionship, but also for competition. Said a fox hunter, "I love to come see these people. I didn't come to play with them. I come to whip them if I can, honest. I don't want it no other way."

Participation in hunting is part of men's assertion of masculine identity and independence and is often a domain of contestation between husbands and wives. Marital conflict over hunting goes back to antebellum plantation days, when wives complained of neglect, of their husbands' "devotion to dogs, guns, horses, and grog . . . and boorish hunting friends." Today, hunting has become a way to reaffirm traditional gender roles in a world in which "the lines of demarkation between the sexes are blurred and where the presumptions of male 'superiority' are being questioned." As the family eats the game brought home by the hunter, it marks a symbolic dependency of the household on masculine skills. The deer head mounted in the house is "a tangible assertion of masculine dominion within the woman's sphere of influence."

Women distrust guns, abhor the violence of hunting, and object to the costs of guns and licenses, the loss of companionship, and the reinforcement of masculine values among peers. Said a machinist, "I think women have much more love for life than a man does. A woman ain't never had to be a protector. It's never been bred into the woman that she's got to be the food supplier, in the case of hunting, or in the case of war, the protector. It's just never been bred into her." Through his role as meat provider and manipulator of the technology of violence, the hunter claims the legitimacy of that violence and the traditional male dominance that goes with it.

The specter of ecological degradation haunts the hunter, blue collar and white collar alike. "Habitat's shrinking, the pesticides they're using are killing a lot of small game. I wonder if when my son gets to be my age . . . he'll have the opportunities I had." Hunting celebrates the connectedness of life, but this very connectedness creates the vulnerability of habitat and game to industrial society.

Hunting is the youth's introduction into his father's fraternity, into the special vocabulary, alcohol consumption, gossip about neighbors, guns, dogs, and the chase—"the best of all possible listening" according to William Faulkner. The love of the hunt and the desire to pass it on to sons is also a desire to reaffirm basic values and continuing social forms. A context for display, competition, achievement, and ritualized dominance, hunting provides, at the same time, democratic opportunities for all men to partici-

pate and achieve mastery—a quintessentially American pastime.

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Geoculprit

The San Andreas Fault System, California. ROBERT E. WALLACE, Ed. U.S. Geological Survey, Denver, CO, 1990. vii, 283 pp., illus. Paper, $20. USGS Professional Paper 1515.

"California Does Have Its Faults." Rarely a week goes by that I fail to encounter this expression on a tee shirt or a bumper sticker in my town of Santa Cruz. Despite some tongue in cheek, the banner underlies the fact that there has never been a time when public awareness of California's geological faults and the earthquakes they cause has been so acute. The United States Geological Survey seems to have sensed this increasing interest and demand for authoritative information in publishing *The San Andreas Fault System, California.* Released in the summer of 1990 and now in its second printing, the volume contains 10 reviews that cover diverse aspects of geology, geomorphology, seismology, geodesy, and geophysics. Written at a level comparable to that of *Scientific American*, the reviews aim to be both a popular presentation to a general audience and a lasting resource to earth scientists. The former goal is reinforced through a generous number of maps, photos, and illustrations. The book's resource value stems from more than 1000 follow-up references.

In its title and throughout its text the book strives to distinguish the San Andreas fault from the San Andreas fault system. The system of course includes *the* fault, plus two-score less familiar ones like the Maacama, the Rinconada, and the South Cuyama, which also account for a portion of the 5 centimeters per year of relative motion between the Pacific and North American plates. Evaluating the configuration and current seismic potential of each fault in the 200-kilometer-wide system is a complicated task that occupies much of the book, as it does much of the professional time of the authors.

In its present form, the San Andreas fault system has been working the landscape of California for about 5 million years. The first several contributions in the book amount to a mystery story in which displaced marine terraces, alluvial fan deposits, and stream channels are the clues and the geodetectives try to unravel the rates, styles, and even dates of culprit faultings. "A photographic album of fault features," a sequence of 41 captioned air photos of the San Andreas, nicely portrays the battle between erosion and tectonic slip, folding, and warping that together mold its geomorphic expression.

Annually, the system endures about 8000 tremors. A dozen maps and cross sections in chapter 5 locate 64,000 recent quakes. Surprisingly, minor faults often present a clear signature in seismicity, whereas large sections of some major faults lie ominously quiet. The geographical variability of earthquake mechanisms and the fact that the majority of seismicity in the system does not occur on the San Andreas fault are not lost here or in the following chapter, which compiles the size and location of all significant historical earthquakes from 1769. Still more detective work: Did the stone roof of Mission San Juan Capistrano fall in 1812 because of strong shaking from a large, distant quake, strong shaking from a smaller, closer one, or weak shaking from a