

Of men and machines:

Technological change and people in agriculture

Part 1: *Changes in farm enterprises and farm families*

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Much attention in recent years has focused on the impact of agriculture's technological changes upon people. The happy economic consequences have been relatively easy to document: greatly enhanced productivity, lower production costs, a generally higher farm income, and relatively low food bills for the average American consumer. Critics have, however, pointed out some significant negative social effects: decreasing numbers of farmers (long considered to be the nation's backbone), decreasing opportunities for employment on farms, declining quality of life in rural communities, and concentration of agricultural wealth in fewer hands.

The Agricultural Experiment Station, during 1978-79, decided to document the effects of technological change on California farm families. Fourteen families in three northern counties were invited to participate in wide-ranging tape-recorded interviews about their many decades in farming. All of the families had been in their current locations for at least 40 years, many longer. The family heads were, or had been, fulltime farmers. Some farms were of considerable scale and complexity, yet all were definitely family operations in which the operators owned their farms, assumed full management, performed at least a part of the physical labor required, and lived at the farm site.

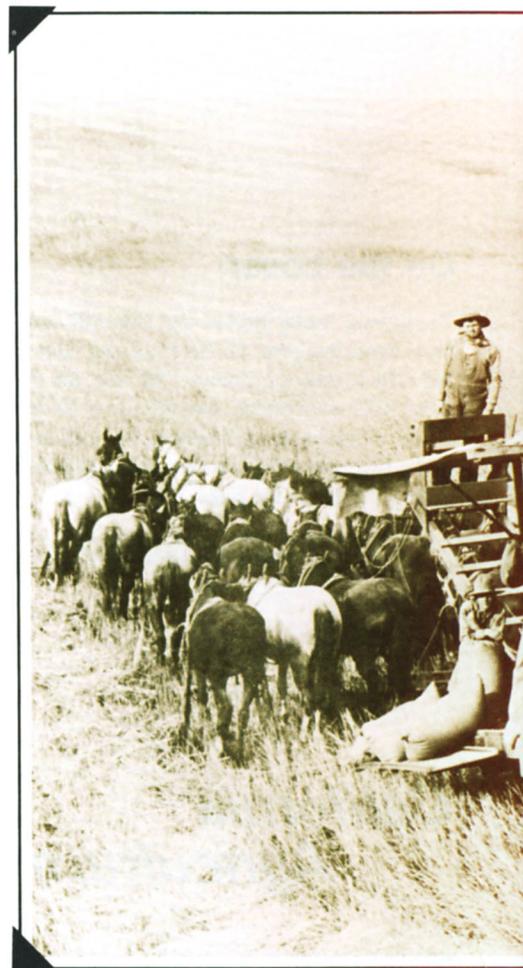
Interviews were conducted with three to seven persons in each family, men and women, ranging in age from 22 to 83. In each family at least two generations were represented; in some cases, three.

The project was an "oral history;" family members were encouraged to talk freely and the cumulative effect of their reflections — more than 600 pages of edited transcripts — is a broad and rich picture of family farming in California as it has evolved in considerable diversity.

The two-part article which follows suggests some of the recurring themes in the project. Because of space limitations, the excerpts here are brief, but they give us a sense of what farmers *were* as well as what they *are*, and how technological change has affected the texture and patterns of individual lives.

Technology and the farm

California agriculture, beginning with the Spanish missions, is not much more than a century and a half old. The bonanza wheat days, when vast acreages of virgin soil were "mined" for their fertility, had peaked out by the 1890's. Only since about 1900, when irrigation really began to be feasible, has intensive agricultural development been possible. Because of a peculiar blend of climate, geography, and historical circumstance in this state, agricultural development has been particularly far-reaching. Technology has drastically changed the landscape. Land and water have been so manipulated that many crops are now grown where they never could be before. Almost without exception, these families over the years have adapted their cropping patterns to a changing environment.



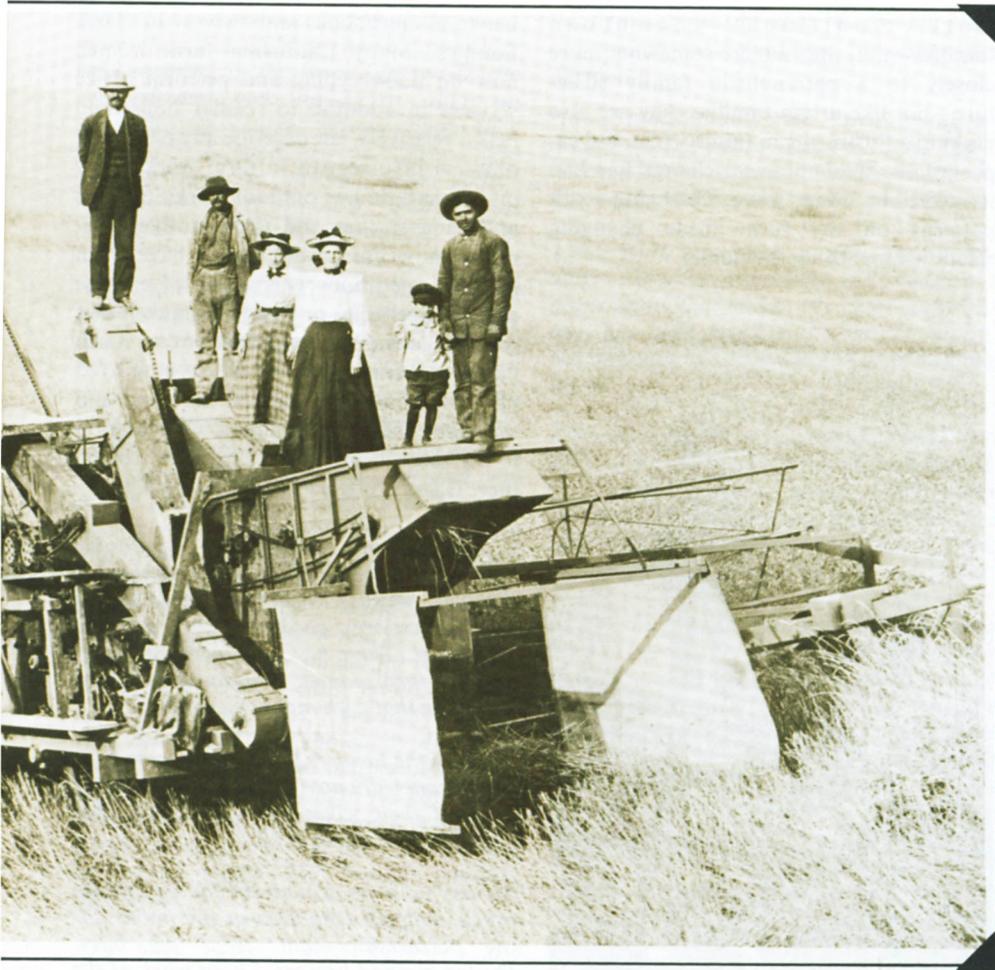
The whole family turned out in Sunday best for

We had a dryland farming operation through 1946. During the dryland time a lot of people around here had livestock; they grew their own grain and fed it, to make a few extra dollars. But since irrigation, livestock has gone out of this area. The fences have all gone down. We have leveled most of the land and farmed it all. Irrigation brought in more cash crops, like sugar beets. We never leave fallow fields anymore; we farm every acre every year. That wasn't true even in the 1950s.

East of here is a lot of rice. They never thought that poor land could do anything but just graze livestock. With leveling and soil management and fertilizer, why, there isn't any more poor land.

Along the foothills up there, used to be all dryland grain farms until that canal went through. Now it is all orchards. If some of them oldtimers could come back and see their old place, they would probably roll over in their graves.

New crop varieties, fertilizers, pesticides, and better farm machinery combined with irrigation to make today's farming very different from a generation or two ago.



the photographing of this Best Baby Junior side-hill harvester built around 1910.

Years ago half the ranch would be in grain, half was summer fallow each year. We didn't fertilize like they do now. You had to let the land rest to ensure you could bear a crop. We grew barley. Now they plant wheat.

We've got heavier equipment now. The more horsepower we've got, the more we've been able to go down and break up subsoils, ripping two feet down, and we landplane now, so the ground irrigates better.

With the sprays and the fertilizers, and, of course, irrigation, almond growing is much better than it was years ago. Production has increased substantially, not just per acre, but in overall acreage too. The almond industry would have stayed relatively small if it hadn't been for technological advances.

Farming with mules, when I was a kid, was an entirely different way of life. A good portion of what we raised fed the work animals. If the whole country was operating on horse and mule power today to feed the population, a major output would be required just to keep the animals alive and in working condition.

My two sons and I grow 650 acres of wheat all ourselves. We hire nobody else to do it, from planting all the way through to irrigating and harvesting. Everything is handled bulk now. Years ago we sewed sacks by hand, which required a harvest crew of six, and took much longer. If we have just a few days of good weather now, we can harvest a crop—whereas 20 or 30 years ago it took maybe weeks to do the same thing.

Some of the risks and the strains inherent in farming have been alleviated or minimized by new technologies.

In 1926, when I was about 10 years old, my father had a little truck farm and we peddled vegetables in town. In the morning, my father would harness the horse, my mother would hold the one-row cultivator, and I would drive the horse. My mother was real small; I don't think she was even 5 feet tall. We had to work pretty hard.

They got things pretty easy now, compared with the old tractors back then. They were mankillers. Now they have hydraulic, and it just takes one finger.

In the 20s, we planted the rice, like other grains, on dry land. Then we flooded it. The black birds would pick up a lot of that seed right off the ground, so we started trying to sow it in the water, pulling the broadcast, crawling over the checks. Oh man, what a problem! Right after World War II, as soon as the planes came in, everybody started sowing by airplane. It just wiped out the other method because it was so far superior.

Pesticides have really cleaned up the crop. Last year we had no thrip problem, no problems with the omnivorous leaf-roller.

I don't have to work as hard as my father did. Things are so much more mechanical now, that the actual real hard physical work—hoeing around trees, shoveling, chopping weeds—has just been minimized tremendously. Nobody needs to do that anymore.

Coupled with less laborious ways of doing things, increasing productivity and marketplace pressures have led to gradual enlargement of operations among these successful farm families.

Once I thought 10,000 birds was a good number. Today I have six times that many. In order to stay in the fulltime business of farming, it's been necessary to increase volume much more than we ever would have anticipated even 20 years ago. One man can take care of 50,000 or 60,000 birds today, if he's got a fully automated house. Earlier, that would have been unheard of. The pressure for volume grew as other businesses around you got bigger. We decided we had to buy feed in bulk—our feed costs would have been tremendously high for anything less than several thousand chickens. Today you have increased feed and delivery costs for anything less than 20,000 or 30,000. These pressures are great. Suppliers don't want to send their delivery trucks out for a little operation. Most of the ranches are 100,000 birds. If you have just 5,000 you don't have any economic pull. But there is more than that—return per bird has actually dropped over time. You have to sell more to make the same total income.

When we started, 20 cows was considered a string, based on the number that one man could milk. Now it's 200. Production per cow is at least three times what it was then. Any time a cow then made 400 or 500 pounds of butterfat a year, she got her name in the paper. Now if she does that on her first lactation, she goes to the butcher.

Farmers are now operating under greater financial pressure, and their dollar risks are much greater than in the past. Keeping up with new technology is essential, but the costs are high.

A retired neighbor of mine was doing some planting for me with our new 13-foot, 6-inch drill, which takes 1800 pounds to fill the seed hoppers. He started at 6:30 and went home at 5:30, and planted over 75 acres of grain. He was just shaking his head, because he said that if he planted 20 acres a day in the early 50s, he'd had a big day. So now it's easier, but it's capital intensive.

We have to produce more to cover steadily rising production costs. You can't be an average or below-average farmer or you won't stay in business. You have to produce as much as possible from a given acreage.

When we farmed, we just put the grain in, and had grain. Now our sons plant beets, they have almonds. They irrigate—they have to move the sprinklers. We had leisure time in between work periods. But they are always busy.

An underlying current of anxiety is expressed by some farmers. Technology itself is not the scapegoat, but its costs contribute to the economic strain felt by those who remain on the land.

The small guy doesn't have a prayer. If you net \$100 an acre, on 100 acres that is \$10,000. When I started farming 10 years ago, I had it in my head that if I could make \$10,000 a year I would have it made. Today I would hate to have to live on that.

This country is going to be like it was in the Old Country; the land belonged to the noblemen, who leased it out to the peasants. I think the way things are going in this country, land is going to belong to the exceedingly wealthy, and they will lease it back to us peasants.

We're really trying to plan against hard times. We three brothers are up to our necks in debt, but at least Dad is still liquid. Our goal is to keep him that way; that means the land will still be here. Even if we go bankrupt, no big deal, as long as the family can hang onto the land. But I don't know how we're going to do it.

Changing farm families

Far-reaching economic and social change in agriculture cannot be attributed solely to new kinds of technology on the farm. Other factors are involved as well—greater mobility on and off the farm; the rise of the mass media; increasing centralization in markets, and in government; even changing mass values. This is particularly true when we look at changing patterns in farm families.

In some ways rural farm families are still

more “traditional” than urban families—i.e., they adhere somewhat more closely to a paternalistic family structure—but like urban families they are also making adjustments in family roles and expectations. Technological change has had its effect in subtle ways. Changing work patterns on the farm mean changing relationships within the family.



This threshing crew poses in front of its thresher built around 1900 by the Advance Thresher Company of Battle Creek, Michigan. Operated by PTO (power take-off) belt, the separator, by means of a series of shaking screens, separated the grain (in bags, foreground) from the straw.

A more complex division of labor resulting from technological innovations (and, concurrently, enlargement of operations), has had some impact on marital roles. Whereas women in farm families are less tied down to domestic chores now than in years past—because of the advent of labor-saving devices for the household, and because of less necessity to perform such farm-linked services as feeding harvest crews—there appears to be still a fairly clear division of outdoor-indoor activities

between husbands and wives in farm families. Many California farm women now do bookkeeping and perform office services in addition to regular household tasks; relatively few describe any particular physical involvement in farm work. They may indeed do less outdoor work on farms and ranches than did their mothers, because most farms no longer have “pin money” operations where farm wives raise chickens, sell eggs or cream, or make other on-farm economic contributions to farm income. (More farm wives are employed off-farm, however, than in the past, and they may make an economic contribution to the farm in this way.) For farm women there is less drudgery and more freedom.

I am less involved in the day-to-day activities on the ranch than my mother-in-law was, because I never had to do any of that harvest crew cooking or boarding the hired men. There has been increasing freedom for farm women. Our daughter-in-law is finding that even more true than I.

Some of the farmers I know who were born on the ranch are now living in town. I don't know if their wives know much of what goes on at the ranch at all.

My day revolves around the family and the ranch, helping Chuck keep the books for the partnership—that keeps me busy. During almond harvest, I keep track of the boxes. But I try to stay away from the huller as much as I can.

Younger farm women are taking a different role now than our generation did. They are becoming more interested in the problems that agriculture is facing. Transportation is much easier now; they can go to meetings and be more involved in the outside world. When we had our children, no one even thought of a babysitter—I don't think we even knew the word.

A more complex division of labor has also had impact on parent-child relationships. Children's labor is no longer needed, or, in fact, even utilizable as farm tasks have become more complex and dangerous. Children still work on the farm, but less than they used to, and not nearly so early. Some feel that this has had a negative effect on children's development of a sense of responsibility at an early age.

In those days youngsters were expected to work. By the time you were 12 years old, in most types of farm work, you could handle a man's job. Grain sacks might be a little heavy—wheat weighed about 135 pounds a sack, and barley about 110—but two 12-year-olds could handle them.

We had chores for the children to do, many more than the children have now. Ours used to bring in the wood, go out in the orchard and pick up brush, rake up almonds. Of course, in our time, they knocked the almonds on sheets and dragged them up on sleds—they didn't operate like they do now, with pickup machines, where it's all mechanical.

A boy who grows up from the time he is 5 or 6 years old, taking care of milking the cows, getting the eggs and taking care of the animals, and knowing that if he doesn't do it, the family will suffer, learns two major things—first, he learns responsibility. He's got to take care of that animal or it starves. Second, he is an integral part of the family, and he is needed. We grew up knowing that if we didn't work, we didn't eat. My folks didn't manufacture jobs for me to do so I could learn responsibility; there was more work than could possibly get done, and it had to be done. I didn't bawl my older son out for breaking a few eggs; he cried because he broke them. My younger boy, now, has come to realize that Dad could hire somebody else if he didn't do the work, and that has not had as desirable an effect on him. Of course, we like better times, and I don't wish hard times on anybody. But they did have a sobering effect on young people, obviously.

The boys have worked summers and occasionally on weekends, but not doing daily chores. As they were growing up, my husband was so busy. He was usually too busy to stop and have the little ones come along, so they really didn't get into it until their early teens.

He doesn't see much of the kids in the summer. When he leaves in the morning, the kids are still in bed. And then they are in bed when he comes home at night.

While labor needs within the family have decreased, there is now much more emphasis on management. With increasing complexity in farming, much more knowledge is needed for decision-making, even as increasing financial risk has made decisions more crucial. The intricacies of farming nearly any crop today mean that management rests more and more in the hands of the resident expert in technology; the explosion of new scientific information and specialized methods demands that the farm manager be specially skilled. In successful farm families wives tend to be mainly supportive and only peripherally involved in decisions; agriculture is a male-dominated business. Farm wives are assuming new roles (outside employment, careers, participation in organizations) as

the demands of old ones lessen, but they are not, in these families, full managing partners.

Harry talks about what he is trying to decide on the farm. Usually I just listen because he knows so much more. I defer to him because he has the special knowledge.

There isn't too much a wife has to say about farming—especially me, because I don't know that much. My chief contribution has been keeping the farmer happy. Keeping him clothed and fed, that's about it.

Farming is such a hassle—it always has been, but I think it is becoming more so. A wife has to be very supportive. If she thinks of herself only, it is almost impossible for a man to farm. The farm must come first, before the family.

My mother had to run errands, go get parts and deliver items out in the field when needed; and domestic land right around the house was her territory (the garden, the chickens, and that). But she wasn't included on the big decisions. That was a source of frustration. She would have liked to contribute more.

I am the jack-of-all-trades and general flunky. I have no say in what goes on at the ranch, really. That is Frank's and his parents' business. But I do everything else. If the sheep are lambing and a ewe is in trouble, I am supposed to go out and pull the lamb, or get somebody. But on the other hand, I have nothing to say about the sheep operation.

The necessity for specialized training in technology has had additional impact on traditional family structures in that older farmers must now sometimes relinquish some authority in favor of their college-educated sons who have brought home more sophisticated views of modern agriculture. Those sons are also more likely to bring home wives whom they have met in places other than the local community.

Developing technology has also contributed to a gradual professionalization of agriculture. This in turn has impact on farm family life. Farming has always been a highly time-consuming activity; but its professionalization means that much of that time can no longer be shared with family members. Less labor is needed, but the expanded scope of operations means that successful farmers may spend less time with family than in the past; the necessities of keeping up with enlarged operations, of attending professional meetings and participating in agricultural organizations, of taking part in "in-service" education,

mean that the modern farmer is much more frequently away from his home base. Professionalization leads to increasing interchange with peers, often at longer distances; many of these farmers described intensive participation in organizations with statewide or national activities. Their frames of reference are often less local and more cosmopolitan in scope.

Viewed in this way, technological change may have the effect of somewhat loosening traditional strong farm family ties, while increasing educational opportunities, mobility, and the influence of mass communications tend to have a similar effect. Still, rural families have built-in stabilizing factors—e.g., physical isolation; attachment to the land with the intergenerational transfer of property; business involvement in a common enterprise; the continuing presence of an extended family residing in the area, with a tendency to preserve authority in the father (and chief landowner). These factors tend to keep the rural farm family cohesive. Individual differences in families and in individuals, however, make general statements suspect. Perspective is important also; for statements about families tend to be fraught with value judgments. Technological change has caused a "shift from hierarchical authority and functional economic interdependence"—or as having contributed to a broadening of opportunity and a greater ability to make choices in occupation and lifestyle.

Summary

Today's farm families are very clear about the benefits of technological change: better production of foodstuff with less backbreaking labor and less risk. Most of them have seen the quality of their lives improve over the years—as judged by freedom from strain, income, opportunities for education, ability to make choices. Yet some express lingering uncertainties about the price of social and economic change. Burgeoning technology, coupled with inflation, has created more financial pressure for today's farmer. As he becomes increasingly professional, old rural patterns of family and community life evolve into something more modern, to be evaluated from differing perspectives.

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—Photos courtesy of F. Hal Higgins Library of Agricultural Technology, University of California Library, Davis

Next: Part II, Changes in hired farm labor and in rural communities.