

Are people in some societies inherently more cooperative? . . . Does the lack of development in many countries have to do with the belief systems in peoples' heads? . . . Our experimental data speak directly to this question and yield some rather surprising results.



Left: In a grass hut in an Orma village in Kenya, the games master, right, recaps the rules of the Ultimatum game to the player on the left, who's been given 100 Kenyan shillings (about \$2) and now has to decide how much of that he's prepared to offer to another, anonymous player. If his offer is accepted, he gets to keep what's left, but if it's refused, he'll lose everything. This game was played in 16 societies around the world, including Hamilton, Missouri, above, and Papua New Guinea, right.

From Nomads in Kenya to Small-Town America: Experimental Economics in the Bush

by Jean Ensminger

Why are some countries rich and others poor? It's something that's still not well understood. We know there's a relationship between economic performance and the way a country is governed, and we know it has something to do with the way governments enforce the law and set incentives for production and exchange, but we also think that informal social institutions at the local level play a role. And this gets us into the fuzzy domain of "social capital": Are people in some societies inherently more cooperative? Do they have richer social networks that oil the wheels of trade? Are they more trusting of one another? Do notions of what constitutes fair dealing and sharing with others vary? If so, how and why? Presumably all of these characteristics have a bearing on economic exchange, but it's very difficult to measure such things precisely across different societies. I've been interested in these issues for some time, but it was only in the last couple of years that I began using a methodology that I think has tremendous promise for getting at them in a much more rigorous way. So when I was given the opportunity to join a project applying experimental economic methods to these social characteristics in a lot of different cultures around the world, I happily agreed to participate.

For a cultural anthropologist like me, this is a rather unusual form of research, and not just because it's about economics. Most of us are engaged in some variety of descriptive case study, and much of our research is qualitative, whereas the research I'm talking about here is quantitative, and even experimental. It's not what anthropologists usually do. But let me add, it's also unusual from an economic standpoint, because the way I do experiments is not the way they're usually done at Caltech, a world center for experimental economics. The experiments are pitched as games, because they usually involve some sort of bargaining situation between the individuals taking part. When Caltech economists do experiments, they

often do them in laboratories down in the basement of Baxter Hall with undergraduates. But Caltech undergraduates are not your average Americans—at least we certainly hope not! I'm interested in the economic behavior of *average* people, people of all age ranges and all socioeconomic brackets, so I want to play economic games with a more representative sample of the population. I want to use these games to study the norms of altruism, trust, and cooperation of people



in places like New Guinea, the Amazonian rain forest, Kenya, and rural and urban Missouri. Among other things, studying a diversity of societies, from isolated family groups to complex urban communities, may shed light on the evolution of social norms. As anthropologists, we have often lived in a society for years, and have gotten to know people well—their family relationships, traditions and beliefs, relative prosperity, social standing, and much more.

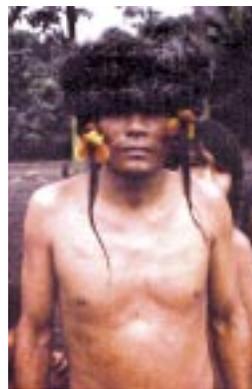
There were several motivations for this project. We already knew from laboratory experiments in the United States that subjects often did not behave according to narrow economic assumptions of self-interest. Instead of playing in a totally selfish way, players often offered their partners substantial portions of the pot. A couple of years

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The Machiguenga live in isolated family groups along rivers in the Peruvian rain forest as slash-and-burn farmers, growing crops like manioc, bananas, and maize, supplemented by hunting and fishing. When Joseph Henrich took the Ultimatum game to them, they played more as game theory predicts—making very low offers and rejecting none—than university students did. This surprising result inspired the present study.



Two subsistence-farming societies of the Ecuadorian Amazon studied by John Patton often intermarry, but play the Ultimatum game differently. The Achuar (near right) have one of the highest murder rates in the world—the men kill each other for status—but were more generous players than their less murderous Quichua neighbors (far right).



Francisco Gil-White studied nomadic herders of cattle, sheep, and goats on the steppes of Mongolia (shearing goats, above, and racing horses, below). Neighboring Mongols and Kazakhs have deep cultural and historical differences, but were more generous when they played the Ultimatum game against each other than against their own people, perhaps due to higher fear that their offers would be rejected.



ago, a young anthropologist named Joseph Henrich decided to find out if the people in the Amazon behaved in the same way as American university students when they played these games, and lo and behold, they didn't. So the MacArthur Foundation sent people out to look at a variety of small-scale, close-knit societies around the world to see if the results from the Amazon would be replicated in other places, or if they were just a fluke. Anthropologists who already had considerable field experience were asked to return to their field sites to play some simple economic games for real money. We looked at 16 societies in all: one in New Guinea, one in Indonesia, one in Mongolia, five in Latin America, six in Africa, and two in the United States. They included hunter-gatherers, slash-and-burn subsistence farmers, nomadic herders, cash-crop farmers, and wage workers in an

industrial society. I'm going to tell you about three of the games that we played, and what insights the results have given us about the relationship between social norms and economic development.

There's a debate raging among social scientists right now about the role of culture in economic development. Does the lack of development in many countries have to do with the belief systems in peoples' heads? Do some cultural beliefs constrain development? For example, many small-scale societies, such as those of hunter-gatherers and subsistence farmers, require food to be shared among family and close neighbors. Some scholars maintain that this "taxation" is a disincentive to production—why work harder if you have to share your profits with the lazy ones?—and that this could explain why such economies don't develop. Our experimental data speak directly to this question and yield some rather surprising results that support an entirely different perspective.

A second debate concerns the role of trust in the economy. Most scholars agree that trust is important for economic growth. Without trust there would be no credit cards and no checking accounts; can you imagine if every transaction had to be a face-to-face meeting where each person had

Like many other Amazonian subsistence farmers, the Tsimané of eastern Bolivia grow plantains, maize, rice, sweet potatoes, and papayas—and sweet manioc for beer—in small gardens cleared out of the forest, supplemented by hunting, fishing, and foraging. Households of related families often pool food, but there's little cooperation with unrelated family groups except for occasional home-brew parties and group fishing expeditions. Introduced to the Ultimatum game by Michael Gurven, they made low offers and rejected none.



one hand on the goods and one hand on the money? In the United States, we have very strong institutions of legal enforcement, but there's still an awful lot of business transacted without every single contingency being written into the contract. We have certain norms of acceptable behavior, and trust is a lubricant that lets a lot of economic behavior move along. A number of scholars argue that trust is a “cultural primitive”—some cultures are very trusting, and some are not—and a culture that is very trusting is likely to do better economically. The natural conclusion of this line of thinking is that if you happen to reside in an untrusting culture, you are out of luck when it

comes to economic development. The data from this project allow us to explore alternative explanations.

One of the greatest challenges of any cross-cultural experimental project is to keep the controls tight, so that all the results are really comparable. Given the vast diversity of the societies in which we are working, it's impossible to achieve this perfectly. We put considerable effort into thinking through this problem before we headed out to our respective sites, but in many respects we fell short of the level of controlled experimental design we would have liked. Though most of us had considerable field experience in our areas, we truthfully had no idea if this was even going to work, much less any idea about the specific nature of the logistical complications that we would each encounter. Needless to say, in this first phase of the project we all had to do some creative improvising on the spot. We have learned a great deal from this first round, however, that will allow us to tighten up the controls considerably in the next phase of the project now under way, funded by the National Science Foundation and the Russell Sage Foundation.

We did make efforts to control a number of obvious issues across all the sites. We all set out with the same game scripts to be translated into the local dialect. No deception was used in the games—we were careful to do exactly what we told people we were going to do. All games were played for real money, and the stakes in the games were controlled across sites to be equal to one day's minimum wage in the local currency (thus, 100 shillings, or \$2, in Kenya; \$50 in rural Missouri; and \$100 in urban Missouri)—a fairly substantial sum in each location. All of the games were also played as one-shot games, and players did not play more than one game. The games were anonymous, in that no players ever knew the exact partner with whom they were paired, although people knew they were playing with fellow members of their



The Au of Papua New Guinea grow taro and other crops in small clearings, keep pigs, and forage and hunt in the forest. They place a premium on generosity. In this society, accepting a gift puts the recipient under obligation to the giver, which may explain why game players often made illogically generous offers, which were often (again, illogically) refused. A mother (above) is being taught the Ultimatum game by David Tracer. A girl (left) is carrying her kid brother.





Jean Ensminger had to do quite a bit of driving across the grasslands of northern Kenya to take the games to the nomadic Orma herders, who move their cattle from pasture to pasture (above), far from towns, markets, and shops. They take their few belongings with them (below), and live off their cattle, especially the milk (right).



community. It was essential to replicate this characteristic in the United States as well, where we used a rural community with a total population not that much greater than some of our developing societies; in urban Missouri we used coworkers.

There is a reason that we played games for real money. You can ask people hypothetically, “Imagine that I gave you \$100, how much of it would you share with an anonymous partner from your community?” You may or may not get an answer that corresponds with real behavior. Instead, put \$100 on the table and say, “Here’s \$100, now tell me how you want to split that with an anonymous partner. You get to take home whatever you don’t offer to the other player.” Playing with real money is a much better measure of people’s real behavior than asking a hypothetical question.

My first experimental subjects were the Orma, whose economy and society I’ve been studying for nearly 25 years. They live in northern Kenya near the Somali border, and are traditionally nomadic, living off large herds of cattle, although many have now adopted a settled lifestyle. Orma territory is still largely inaccessible and undeveloped. Almost everyone lives in a grass house, and there is no running water, no electricity, and few possessions other than clothing and cooking pots. Nevertheless, there is surprising differentiation among the population in terms of their degree of involvement in the market economy. The nomads tend to have a more subsistence-based lifestyle, their diet consisting mainly of milk and other cattle byproducts—and are a long way from towns and trade. The settled populations, on the other hand, send their sons, and occasionally daughters, to primary school for a few years. Though almost all are still tied to the cattle economy, many do wage work, others are tradesmen, and some grow a few food crops in rainy years. All are strongly tied to the market economy.

When I first started planning these games, I thought there might be resistance, but that wasn’t the case—the Orma loved them, and wanted me to come back soon to play more. Many found it both fun and intellectually amusing, along the lines of “I’ll be spending years trying to figure out what this all meant.” Many of my concerns about logistics were also ill-founded. The grass houses, which I thought would be too permeable to keep the proceedings inside away from prying eyes and ears, turned out to be the perfect size for isolating the player from the rest of the group who were waiting their turn outside. And when I explained they could not talk about the game during play, they complied with remarkable discipline.

Before beginning the experiments, I held a large public meeting to explain that I would be playing fun games with real money, and that these games were going to be played all around the world. This led to a lot of amusement at the “insanity” of

Western ways, and how Westerners “had money to throw away on such foolishness.” I might add that the reactions were not much different in Missouri!

Every household in each of five villages was asked to take part voluntarily in a detailed household demographic and economic survey, and I promised to invite at least one adult from each



A wedding house under construction (left), a nomad's house (center), and the more substantial house of a settled family (right).

household to play a game. In addition to the money they might win for the games, each player was paid a show-up fee of one-third of a day's wages at the start of the games, to make them appreciate they were playing with real money, and to compensate those who would not win much in the games.

The first game I will discuss is the Ultimatum game. Here's how it worked. Approximately 20 people from a village were gathered together. All of them then learned the rules of the game. One by one, they were called to play the game, at which point I told them what their role was: I randomly assigned half to the role of Player One and half to Player Two. Each Player One was given a day's casual labor wage (about \$2 in Kenya), then had to decide how to divide that money between himself or herself and an anonymous partner, Player Two. Each Player Two was informed how much he or she had been offered by Player One, and could either accept or refuse. But if Player Two refused, *neither* player got anything. So those assigned to the role of Player One, if they wanted to be greedy and keep as much of the money for themselves as they could, had to decide how low an offer they could make that would not be refused. They were told

on a later occasion whether their offer had been accepted (in which case they got some money) or refused (in which case they got nothing), but neither player ever knew whom they had played against.

The game theoretic prediction based on the standard assumption that people act strictly in their own narrow economic self-interest is that Player One should offer the smallest amount possible, because it would be completely irrational for Player Two to refuse even a penny. After all, Player Two still comes away a penny richer, and has nothing to gain by refusing the offer. But in the



United States, real people (well, students) don't play the game that way, and they don't play the game that way elsewhere in the world, either.

The way the Orma played didn't depend on gender, age, education, or wealth of household—the only variable that predicted the result was whether or not they were involved in the market economy. This variable is closely correlated with whether they were involved in wage labor or trade. The people involved in the market economy made



Settled Orma live in villages or towns with rows of shops like these on the right. Inside (far right), they're stocked with the basics of a settled life: clothing and cooking gear.



The Sangu of Tanzania were studied by Richard McElreath. Some are settled farmers (growing mainly maize), while others are nomadic cattle herders, much like the Orma. They are at the same level of market integration, and the herders and farmers made the same mean offers in the Ultimatum game.

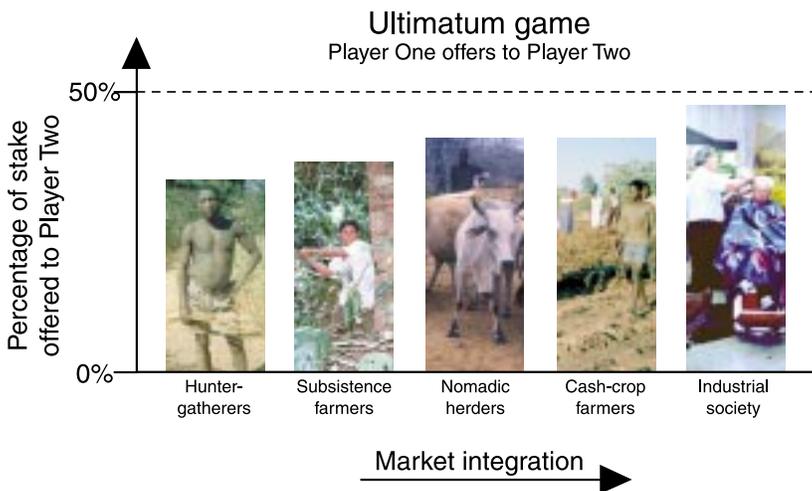


more generous offers, with 80 percent of the players offering 50 percent of their stake to Player Two. The nonmarket people were evenly split between 30, 40, and 50 percent offers. There appeared to be no norm among the nonmarket people, but clearly a very prominent norm for the people involved in the market. Interestingly, no one made an offer below 30 percent. Were they afraid that a low offer would be refused? Perhaps they were, although out of 13 players who received 30 percent offers, only two refused. In this game we cannot disentangle high offers that are strategic from those that are motivated by fairness.

What happens when we look at how other parts of the world played? To date we have comparable data on the Ultimatum game for all 16 societies. We also have a ranking of those societies by their degree of market integration, from a subsistence-oriented, nonmarket economy of pure hunters and

gatherers at one end, to an industrialized but close-knit community in rural Missouri at the other. The results are counterintuitive, but they're consistent with what we found within the Orma: the lower the level of market integration, the less generous the offers. The most market-savvy society, rural Missouri, was also very generous, with players offering an average of 48 percent of their stake. While the results for those 16 societies are statistically highly significant, and higher market integration correlates with higher offers, some individual subsistence-farming societies diverged considerably from this pattern. It remains to be seen whether these exceptions are the result of differences in the way the games were played across sites, or whether they represent actual cultural differences. We hope Phase II of our project will shed light on this. But interestingly, those differences evaporate when we lump the societies by economic subsistence strategy, as in the graph on the left, and we see that again there is an increase in offer size from low to high market integration.

As noted above, one of the drawbacks of the Ultimatum game is that we can't separate strategy from fair-mindedness. Are people really being fair-minded, or are they just making a high offer because they think they're going to get rejected if they don't? Well, fortunately we have another game, an even simpler one that allows us to isolate fair-minded behavior, called the Dictator game. In this game, I again endow Player One with a day's wages, which can be split any way the player likes with his or her partner, who remains anonymous—and that's it. Player Two doesn't have to decide whether to accept or reject the offer—what Player Two is given by Player One is what Player Two takes home. This is the purest measure we have of altruistic behavior. Player One doesn't have to worry about being rejected and ending up with nothing at all, so any offer above a penny is sheer generosity. When we looked at how the





In Missouri, the good folks of Hamilton (the two photos on the far right) and St. Louis (near right), studied by Jean Ensminger and Kathleen Cook, were fair, trustworthy, and trusting in the way they played the games.



Orma played we found, not surprisingly, that the offers went down for both the nonmarket and the market people, although the market people were still considerably more generous than the non-market. Now only 50 rather than 80 percent of the market people were dividing their stake 50/50, and the rest were simply all over the map. We still have no particular pattern among the non-market Orma, though there was a nice spike at the 20 percent offer, meaning that many of them chose to keep 80 percent.

I don't have the results of this game for all 16 societies, but I do have it for two others, the

important to economic development. In the Trust game, *both* players are given the same amount, let's say \$40 in the rural United States. As before, Player One can give any percentage of the \$40 he or she wants to Player Two. Whatever Player One doesn't send over, Player One keeps. But whatever Player One sends to Player Two will be tripled by me, and then Player Two has the option of sending something back. There's no confounding with fair-mindedness here—Player Two already has his or her stake, so Player One has no obligation to give anything to Player Two. So now the dilemma for Player One is that the more money he or she sends, the more money there is in the game, due to the tripling, but Player Two is the sole determiner of how that money is divided. If Player One trusts Player Two and sends all of the money over, and if Player Two is trustworthy and returns two-thirds of the tripling, they can both double their initial stake. But does Player One trust Player Two to do that? And how do the behaviors of both players vary cross-culturally? We've only played this game in a few societies so far, but the results indicate that in the small-scale societies of the developing world, there is less trust, and in the United States there is more (in both rural and urban Missouri).

What if Player One is trusting, but his trust is not repaid—he gets taken for a ride by Player Two? The amount Player Two gives back is a measure of his trustworthiness. As it turns out, trust and trustworthiness are highly correlated within societies, as we would expect them to be. The most trusting players, those from the United States, have their trust repaid. Thus in the United States, where trust is high, people (Players Two) are also very trustworthy. The Orma are the least trusting, and also the least trustworthy.

Could these findings correlate with the quality of a country's institutions? Could it be that if a government has very strong, effective institutions (such as well-enforced rules of law, and clear-cut

One of the last true hunter-gatherer societies, the Hadza, studied by Frank Marlowe, live in groups of 20–30 people in the Tanzanian savannah-woodland. Food, especially big game, has to be shared with the whole camp, otherwise the selfish person is gossiped about. Therefore it is handed over, unless it can be snuck into the family shelter under cover of darkness. The constant sharing and lack of privacy must get to them, because they were the least generous of all the Ultimatum game players: offers were low, and both high and low offers were often rejected.



Hadza (a society of pure hunter-gatherers from Tanzania) and the rural Missourians. The results relative to market involvement look even more striking than they do for the Ultimatum game. The Hadza (at the lowest end of the market scale) kept 80 percent of their money and gave 20 percent, the Orma kept 66 percent and gave 34 percent, and the people of Missouri gave 48 percent, close to 50/50, even in the Dictator game where there was no worry about being rejected. Once again we find that market integration correlates with higher offers.

We also played an interesting game designed to measure trust—that very elusive quality so

The Mapuche of southern Chile run small commercial farms and, like many small-scale farmers, distrust neighbors and don't welcome uninvited visitors. They believe that illness and bad luck are caused by the spite and envy of others. In the Ultimatum game run by Joseph Henrich, offers were a fairly good 34 percent—perhaps less out of fair-mindedness than fear of being rejected by a spiteful responder.



property rights), it pays people to be trustworthy, because they're unlikely to get away with cheating, or renegeing on contracts? I was able to test this hypothesis using data provided by an organization called Transparency International, which compiles a corruption index that ranks countries by the quality of their institutions. Much of Africa is at one end, and the United States is pretty high up at the other end. (Though it's not the most uncorrupt country in the world. The Scandinavian countries have that honor, and soon I'm going to see how the people there play the games.) When I plotted the results of the Trust game for Player One offers for the people of three nations—Kenyan herders (the Orma), Zimbabwean cash-crop farmers (the Shona), and Americans in rural and urban Missouri—against the corruption index, they were dead on the line, that is, there was nearly a perfect correlation between higher trust and lower corruption. But so far we have only three cases, and these results need to be replicated at many other sites.

So what can we make of the results from these three games? Can they guide us toward formulat-

ing policies to promote economic development? As we've just seen, the trust data could have to do with the quality of a country's institutions. When there is little corruption—that is, the police and the courts are not bribable—it often does not pay to break contracts and cheat. Untrustworthy people are more likely to be caught and punished. When untrustworthy behavior does not pay, there is generally less of it, and thus the probability that an individual will find himself in an exchange with an untrustworthy person goes down. Under these circumstances we can hypothesize that people are more likely to be trusting because trust is often rewarded. The data are consistent with this hypothesis, though they cannot tell us whether trust is the *result* or the *cause* of good institutions. This is a puzzle we are about to attack through formal economic modeling.

It's much more problematical to try to figure out the correlation between fair-mindedness and the degree of market integration. We do know, however, that our data are quite inconsistent with the theory I mentioned earlier: that societies like hunter-gatherers and subsistence farmers (the ones



The Shona, Zimbabwean farmers growing cash crops such as maize, tobacco, and peanuts, and studied by Abigail Barr, divide into two societies—those who have always lived in the same village, and those resettled onto vacated commercial farms taken over by the government since independence. When they played the Trust game, the resettled farmers were less trusting than the unresettled.

Commercial whale hunters, the Lamalera of Flores (the third island east of Bali), studied by Michael Alvard, catch large whales in these small rowing boats, a very dangerous thing to do. Their close-knit, cooperative lifestyle was reflected in the way they played the Ultimatum game: offers were often overgenerous, and few were rejected.



that were very greedy in the Ultimatum and Dictator games) are locked into cultural patterns of sharing that prevent them from taking advantage of economic development. If that were the case, we would expect our small-scale societies to be the most generous, and the United States to be the least, which is exactly the opposite of what we found.

Many of the hunter-gatherers and subsistence farmers weren't very generous when they played the games, yet in other aspects, such as the way they share meat from a hunt, they appear to have a high sense of fair-mindedness. I would argue that the rules for sharing a kill among the people in a camp or village are highly specific to that activity. However, when we look at the development of various societies, we want to understand how their

rules generate principles of behavior that eventually impact on *impersonal* exchange, which is what often goes on in the marketplace. And contrary to what one might think intuitively, I think these games actually mirror the real-life situation of what it's like to face a completely novel economic opportunity. This, I believe, gives us a better prediction of how people might respond to new economic opportunities than does extrapolation from a highly specific activity such as meat distribution. The latter is externally enforced (often very strictly: an Au villager in New Guinea who doesn't share his catch can be attacked or even killed), while what we appear to pick up from cross-cultural data is that norms of equity are internalized, or self-enforced, in more complex societies.

So why are some societies more fair-minded? Is it just a luxury, so that we find more fair-mindedness among wealthy societies? There are a couple of problems with this explanation: if that were the case, we might expect wealth within a society to predict fair-minded behavior. This doesn't happen, though we will continue to test for it. We also might expect to see a plateau in the data comparing the way the games were played in the different societies once a society rises above some minimum subsistence level, and we don't see any plateau—just a gradual incline across societies with offers rising in line with market integration.

Another possibility is that people in market-oriented societies learn that it's convenient to develop rules of thumb for dealing with anonymous exchange situations, and that a 50/50 split is a very nice convention for dealing with a lot of unknown situations.

A third, and related, possibility has to do with reputations. In a market economy, people have to think beyond making one quick killing, and they develop a set of behavior patterns based on the fact that they make a living by doing a lot of small deals. Fair-minded behavior is a very powerful

The Aché of Paraguay, studied by Kim Hill and Michael Gurven, are subsistence farmers who grow mainly manioc, but who often go off for several days on hunting expeditions. A hunter modestly leaves his kill at the edge of the village to be found by others, who divide it up fairly (right), without favoring the hunter's family in any way.



Jean Ensminger has lived with the same Orma family for a total of over four years since 1978 and watched much generational change. The chief (far right and below) was her first research assistant, and the baby girl in his wife's arms (right center) is now the young woman in the leftmost photo, who has daughters of her own.



signal to potential exchange partners that you're a good guy, a guy with whom one would want to engage in repeat business. Someone who gets a reputation for ripping people off may find that no one wants to trade with them.

The results of this project are highly counter-intuitive to most people. Highly market-oriented folk turn out not to be the greedy capitalists we might expect, and those in small face-to-face societies with strict norms for sharing in some areas don't appear to apply those fair-minded principles in other situations. Or at least not when no one is looking! Our data are also consistent with the hypothesis that clean government fosters

both trust and trustworthiness. As yet we understand little of the processes by which fair-mindedness comes to be internalized as part of the way people behave toward each other, rather than having to be enforced externally. But this, together with the capacity to trust, undoubtedly contributes to a better-functioning economy. □



As a young English-literature major at Cornell, Jean Ensminger spent two years in Kenya helping paleontologist Louis Leakey write a book on the Kikuyu people. Seeing how big a role economics played in the day-to-day lives of the poor people there sparked her interest in anthropology and economics, and she changed to an anthropology major, earning a BA in anthropology in 1974, and, from Northwestern University, an MA in 1976, and a PhD in 1984. At Washington University in St. Louis, where she worked from 1985 until joining Caltech in 2000, she became Tileston Professor of Political Economy, and a fellow of the Center for Political Economy. Now professor of anthropology (indeed the only anthropologist on the faculty), she has just been appointed chair of the Division of the Humanities and Social Sciences, the first woman to lead a Caltech division. Her Kenyan experiences, which included living in the compound of the chief's family off and on since 1978, have given her an unusual insight into bottom-up administration that may help her in this new venture. This article is adapted from a talk given to the President's Circle of the Caltech Associates.