predicted just that from his fission theory in 1969 [*Bull. At. Sci.* **29** (No. 9), 26 (November 1973)].
55. R. N. Clayton and T. K. Mayeda, *Proc. Lunar Sci. Conf.* **6**, 1761 (1975).
56. H. Wänke, *Top. Curr. Chem.* **44**, 115 (1974).
57. Letter from J. A. O'Keefe to H. Wänke, "file date" 16 October 1974; Wänke to O'Keefe, 23 October 1974; O'Keefe to Wänke, "file date" 1 November 1974.
58. Letter from J. A. O'Keefe to H. C. Urey, 4 November 1974.
59. V. M. Goldschmidt, *Geochemistry* (Clarendon, Oxford, 1958).
60. E. Anders, *Annu. Rev. Astron. Astrophys.* **9**, 1 (1971); J. W. Larimer, *Geochim. Cosmochim. Acta.* **31**, 1215 (1967).
61. Letter from H. C. Urey to J. A. O'Keefe, 8 November 1974.
62. H. C. Urey, *Geochim. Cosmochim. Acta* **40**, 570 (1976).
63. The paper was rejected on 2 December 1974 (letter from the editor, D. M. Shaw, to S. G. Brush, 21 April 1981), but correspondence about it continued into the following year.
64. J. A. O'Keefe and H. C. Urey, *Philos. Trans. R. Soc. London Ser. A* **285**, 569 (1977).
65. Y. Nakamura, G. Latham, D. Lammlein, M. Ewing, F. Duennebier, J. Dorman, *Geophys. Res. Lett.* **1**, 137 (1974); see also M. J. Wiskerchen and C. P. Sonnett, *Proc. Lunar Sci. Conf.* **8**, 515 (1977).
66. A. E. Ringwood, *Origin of the Earth and Moon* (Springer-Verlag, New York, 1979).
67. C. C. Mason, *Strolling Astron.* **24**, 107 (1973); A. B. Binder, *Proc. Lunar Planet. Sci. Conf.* **11** 1931 (1978); G. M. Brown, in *The Origin of the Solar System*, S. F. Dermott, Ed. (Wiley, New York, 1979), pp. 597–609; W. Rammensee and H. Wänke, *Proc. Lunar Sci. Conf.* **8**, 399 (1977); E. M. Shoemaker, in *Impact and Explosion Cratering*, D. J. Roddy, R. O. Pepin, R. B. Merrill, Eds. (Pergamon, New York, 1977), pp. 1–10.
68. R. Jastrow, in *Space Science Comes of Age: Perspectives in the History of Space Sciences*, P. A. Hanle and V. D. Chamberlain, Eds. (Smithsonian Press, Washington, D.C., 1981), pp. 45–50.
69. Letter from J. A. O'Keefe to H. C. Urey, 17 September 1974.
70. I. I Mitroff in (*54*), p. 268); personal communication.
71. D. E. Wilhelms, personal communication.
72. Letter from H. C. Urey to J. A. O'Keefe, 5 May 1977.
73. A. G. W. Cameron and W. R. Ward, *Lunar Sci.* 7, 120 (1976).
74. I am grateful to J. A. O'Keefe for providing the information on which a significant part of the paper is based and, for permission to quote from unpublished materials, to him, Mrs. Harold Urey, D. E. Wilhelms, and D. U. Wise. (Letters quoted in this paper are in the possession of the addressees unless otherwise indicated.) For suggestions and comments on an earlier draft I thank M. A. A'Hearn, F. El-Baz, E. M. Emme, N. Hetherington, I. Mitroff, H. Newell, W. H. Pickering, M. Rothenberg, and E. Shoemaker. L. D. Saegesser helped me locate materials in the NASA archives. A. Musgrave sent me a copy of the rare pamphlet of Nolan (*32*). Supported by the Alfred P. Sloan Foundation.

The Organization of Work in China's Communes

Nancie L. Gonzalez

There has been much speculation about what is happening in the Chinese countryside since the fall of the Gang of Four. Recent articles in the United States and in Chinese newspapers suggest there has been a trend in the agricultural sector toward what many in the United States might think of as "creeping capitalism." A new way of organizing agricultural work, referred to in China as the "job responsibility system," has been implemented widely since 1979. It is usually described in terms of individual farmers being assigned specified plots of land on which to grow negotiated quotas for sale to the state. This assignment of land is in addition to the assigned house sites and the small "private plots" on which families or households have long been permitted and sometimes encouraged to raise supplementary crops for their own use. The job responsibility system represents an apparent retreat from the collective agricultural work patterns usually associated with the units known as production teams and brigades, and is therefore of interest to social and agricultural scientists concerned with the relations between productivity and social organization.

In August and September of 1981 I was able to gather firsthand microlevel data on the job responsibility system (*1*). During this 8-week period in China I visited rural communities representing what the Chinese considered to be successful, middle-level, and lesser developed agricultural efforts and traveled by train from Liaoning in the northeast (formerly Manchuria) to Guangdong (Canton) in the south. I talked with leaders (cadres) at different organizational levels, including national, provincial, county, commune, brigade, and team locations, and visited peasants at their homes and observed them at work (*2*). Here I report what I found and describe some of the complexities and implications of the new and old organizational systems in the 17 communes that I visited.

Domestic Organization, Work Assignments, and Income

Official party policy concerning how labor should best be mobilized and organized to accomplish the goals of industrialization on the one hand and increased production of food on the other has from the beginning vacillated between the mere encouragement of cooperative work groups and the attempted enforcement of near total collectivization. The latter pattern, in which collective income and surpluses are divided evenly regardless of the amount of work contributed, was an ideal during the Cultural Revolution and is today in some areas referred to bitterly as the policy of "eating out of the same pot." Regardless of how strictly it was enforced or how the peasants felt about this policy, it is clear that in many areas agricultural production suffered greatly and that lack of motivation was only part of the problem (*2*).

The income of individual peasants is derived from their share of the collective's sale of grain crops to the state (*3*), from the sale of so-called "sidelines," such as crafts, livestock and animal products, silkworm cocoons, cultivated pearls, fish, mushrooms, and herbal medicines, to the state or to the collective which in turn markets the products, and from the sale of vegetables and animal products at local or regional markets. The markets I observed were only minimally regulated, prices being determined largely by supply and demand. Thus they are called "free markets," meaning that they operate outside the state-run procurement and sales apparatus.

Peasant family incomes are increasingly augmented by some members being given the opportunity to work in rural industrial or craft enterprises at the team, brigade, or commune levels. Some family members may work full-time in local workshops and factories or in transportation or construction, joining the agricultural effort only during the busy harvest season. Others, whose primary work assignment is in agriculture, may engage in certain industrial or

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handicraft enterprises during the slack season.

Households vary in composition, depending on region, affluence, and individual circumstances, but in the rural areas they are usually somewhat larger and more complex than the nuclear form, commonly incorporating one or more married sons (or sometimes a daughter) and their children (*4*). Because the average marriage age is rising, rural households may benefit from their children's labor for several years after they reach maturity. Even young children are economically useful to their families in housework, sidelines, and in the fields. Often schools are recessed for a week or two during harvest seasons to permit both teachers and students to help bring in the crops.

Young people are given their first work assignment at the age of 18, or a few years earlier if they elect to leave school after junior high. Leaving school early is more common in the countryside than in the city, and is disproportionately common among girls. Whether or not young people go to a factory or to the fields, their labor contribution is usually reckoned in terms of work points, which are calculated on the basis of (i) the kind of work done, (ii) the presumed physical capacity of the worker, and (iii) the number of hours worked. An able-bodied, experienced male agricultural worker may earn from 10 to 15 work points per 8-hour day, depending on the evaluation system of his collective. Women, regardless of their skill or strength, receive less, as do younger and older persons. But once a value for a particular kind of work and worker has been decided on, that is what the worker receives regardless of the amount of work he or she actually accomplishes.

Work points for other kinds of contributions, such as for schoolteaching, being a barefoot doctor, or doing factory work, are commonly calculated in terms of the standard set for field labor. For example, in one team I visited, the barefoot doctor and the schoolteachers earned the same number of work points in a year as the eighth most productive field laborer. This remuneration was decided on by the collective as a whole after discussion of the relative contributions of the different types of work. Such a system permits no "merit" reward to the teachers and paramedics, whose yearly salaries thus depend on the productivity of their fellows.

The cash value of a work point depends on the total earnings of the collective during the fiscal year, and thus varies not only from place to place but also from year to year for any given group. The basic accounting unit is most often the team, but it may also be the brigade or, rarely, the commune itself. From gross income, the collective deducts the costs of management and materials, taxes, a percentage to be held in reserve for helping the needy, and a percentage for capital improvements and investment. In addition, a portion of the total food grains produced may be withheld by the collective for seed and for animal feed, and in some collectives team members will be given shares of grain in kind, which may be eaten or sold individually.

Summary. There has been speculation that China's communes are undergoing drastic changes and that work patterns are being redefined so as to make individuals or households the basic production units in agriculture. A brief but intensive anthropological study in 17 communes suggests that, although collectivization is still considered to be the ideal form in more advanced areas, responsibility for some tasks is being assigned to households in some poorer communes in an effort to increase production and farm incomes and enhance development. Significant permanent improvements seem hinged to the rise of rural industry, which increasingly rewards individual efforts within the context of a basically collective social organization. The system is complex and is more flexible than it has been in the recent past.

Collective profits are then divided among team members according to the number of work points they have accrued, the value of a point being the quotient of the team income divided by total work points. The peasants I interviewed always knew how many total work points they were "worth" in a year, but were often unable to state with certainty either their former or their anticipated total incomes. This is because incomes vary both with the total collective enterprise and with the sideline activities of the individuals and their free-market sales. Work points are sometimes used as a medium of exchange among members of a given collective who sell services or goods to each other. This amounts to a kind of credit system, since payment occurs only after the collective accounts are settled at the end of the fiscal year.

In the recent past the guiding principle behind the assignment of work point "salary" scales was that incomes should not differ drastically from household to household, and that efforts should be made to enhance collective productivity and thus, everyone's well-being. The assumption was that all would work as hard as possible, but in practice even the quicker and stronger slowed down to match the pace of the least capable. In part this was due to the high value the party then placed on working together in large groups. Thus, individual merit in the workplace was not considered relevant in calculating income (though it might well have earned praise and "moral" rewards). Thus strength and size brought more work points per day than hard work. Favorable assignments—that is, assignments that conferred prestige or perquisites of various kinds—tended to follow party loyalties, though there is some reason to believe that the party selected for skill and intelligence as well as political commitment (*5*).

There was widespread agreement in the areas I visited that "eating out of the same pot" benefited the lazy, the weak, and the less intelligent. Some peasants recounted how they and their friends "protested" by simply slowing down or even stopping work while they played cards, smoked, and slept on the job. Women took knitting or other handiwork with them to the fields, and all kinds of excuses were found to explain why work did not get done as scheduled. Although crops were planted and harvested, yields were unimpressive and quotas were barely met, if at all.

At the same time, peasants exerted themselves admirably in activities that increased their incomes. The sale of sidelines was possible even when free markets were not permitted. Townsfolk were glad to obtain fresh vegetables, eggs, chickens, crabs, and fish directly from the producers, even though this was, in theory, frowned on by the state. Tea was harvested from privately owned bushes to the extent that many plants were permanently damaged, according to some local cadres with whom I spoke. It was explained that the price for tea was so high that some people could make a living from it even when grain crops failed.

The more the peasants worked at sidelines, the more they found obstacles in their way, since it was perceived that sidelines took their attention away from the fields. Because poultry and pigs were likely to be fed on grains intended for the state, peasants were discouraged from raising them in the mid-1960's and especially in the early 1970's. I was informed,

Table 1. The effects of recent, rapid industrialization in Ma Lu Commune, Jia Ding County, Shanghai.

Year	Number of		Industrial output		Sidelines output		Agricultural output		Grain production (catty/mu)*	Oil-bearing crops (catty/mu)*	Income per capita (yuan)
	Factories	Employees	Value (yuan × 10^6)	Percentage of total value	Value (yuan × 10^6)	Percentage of total value	Value (yuan × 10^6)	Percentage of total value			
1977	63	4000	19.31	66	5.03	17	4.7	16.0	1726	144	201
1980	85	7500	38.36	71	10.59	19	5.2	9.7	1265	237	367

*One catty is equivalent to 500 grams. The mu, or mou, is usually equivalent to 0.1518 acre.

however, that many of the local cadres were peasants themselves and tended to be sympathetic toward the many people who continued to raise such livestock. All efforts were supposed to be concentrated on increasing the grain supply, and stories abound describing the devious ways in which harvest figures were exaggerated or falsified from team through the national levels. One man recounted how he personally took part in "planting" rice stalks harvested that day from one field into another nearby so that the next day's harvest of the second field might appear as a record breaker before invited journalists and higher-level officials.

Rural small-scale industry, now so important in raising peasant incomes, was said not to have been one of Beijing's highest priorities during the Cultural Revolution. Nevertheless, many local and some national leaders recognized that where land was scarce and populations large, some alternative employment opportunities would be beneficial, if not necessary, for survival. Small factories began to appear during the 1970's in many rural areas, especially those near large cities such as Shanghai and Canton. I probed deeply into this, since it was clear that the present level of industrialization and the peoples' dependence on it had not come into being overnight. Apparently many of these enterprises began through connections made when urban young people were sent out to work on communes during the late 1960's and early 1970's. Because most rural areas could not absorb this extra labor, they agreed to accept it only if the city would help finance a factory, sending both money and technical assistance to help them get started, and providing outlets—often through the large retail store system—for the finished products. At first these factories were run with labor from the city, but gradually the commune's own young people learned the appropriate skills, and when the last townsfolk left in 1979, the communes had no problem maintaining production. Furthermore, many of the local leaders became experts in industrial management and continued to seek new enterprises, which are now vigorously encouraged by official national policy. Tables 1 and 2 give an idea of how important industrial development has been for some rural units in recent years.

Since 1979, massive changes have occurred in the communes. Most pervasive of all is the return of the philosophy of the early 1960's: "To each according to his work; more work, more pay." Although the work-point payment system is still prevalent, there are signs that it is being greatly modified, and in some cases abandoned altogether in favor of cash. The job responsibility system, which actually refers to a variety of different contractual and organizational mechanisms, is rapidly becoming a household phrase, and I will now explain how it works, describe the results it seems to have had at the local level, and discuss what it portends for the future.

The Job Responsibility System

According to the literature and my informants, the job responsibility system first began in 1954 during the elementary cooperative stage of China's modern development under communism. Under the influence of a more leftist line it was abandoned in 1957, but after communes were established in 1958 there was continuing discussion about its merits. Finally, the "Sixty Articles Concerning Agriculture," a policy statement published in 1963, established guidelines for various types of contracting procedures, some of them quite similar to those now in existence. Two years later, however, there was a move toward extreme collectivism, epitomized by the model brigade, Dazhai. Mao's 1965 interview with the head of that brigade was highly publicized, and all of China was exhorted to "learn from Dazhai," which meant working together in large groups, living in dormitories, learning together, and sharing everything equally. Although the head of the Dazhai brigade traveled extensively about the country instructing others on how to emulate his group's success, what was not made clear was the extraordinary amount of technical assistance received, which was at least as important as the human factors. Furthermore, current reanalyses suggest productivity was exaggerated for publicity purposes. Nevertheless, many areas did adopt the philosophy, though rarely did the brigade or the commune become the accounting unit. The results were satisfactory, if not always spectacular, often enough that many today refuse to give it up.

However, what worked for Dazhai and for some other units clearly did not work for all, and by 1977, after the death of Mao and the fall of the Gang of Four, there was again talk of change. Anhui Province, one of the poorest and least developed, was then headed by Wan Li, today the Vice Premier in charge of agriculture and one of Deng's staunchest supporters (*6*). Wan Li initiatied a number of studies to determine what might be done to help Anhui. Industrialization was (and still is) almost nonexistent in the province, and sidelines had been severely restricted in the effort to get the peasants to produce more grain. Yet this had not been successful, and many of the people relied on subsidies from the state for their food; failure to reach their quotas was standard experience.

Wan Li encouraged provincial leaders to relax their efforts to foster extreme collectivism, allowing the peasants to undertake specific production quotas by household in both agriculture and sidelines. He stressed that local conditions alter circumstances and that models that work in one part of the country may be unsuitable elsewhere. In fact, some good results had been obtained in Anhui with the job responsibility system during the 1960's before the Dazhai model had been encouraged as central policy. Wan Li also urged that rewards should be calculated according to one's work—more work receiving more pay.

The new leadership aimed to improve local management, preserving the rights of production teams, the basic landholding, residential, and accounting units—a clear mandate to decentralize and thus

diminish the importance of the larger brigades. The Third Plenum of the Eleventh Central Committee established the framework for change in late 1978. By the spring of 1979 these principles were being implemented experimentally, and they were endorsed for the whole country through the action of the Fourth Plenum late that year. By the time of my visit, there seemed to be a new vitality in Anhui, both among the cadres and the rank and file. Furthermore, the slogan, "Learn from Anhui" was beginning to be heard throughout the Yangtze Delta area (though not all areas appreciated or accepted the dictum).

When I arrived in Feng Yang County (Anhui) I was told that I was the first foreigner to visit since the Japanese invasion in 1937. They were eager to entertain me and show me the fruits of their new system, and they were as curious about me as I was about them. I spent 10 days with them, and by the time I left I was almost convinced that a kind of "penny capitalism" at the microlevel was developing, and that it might be a harbinger of more massive change in the future. Repeatedly I was told that the startling improvements in production were due solely to changes in the way in which the work was undertaken. In the most extreme cases work points had been abandoned in favor of cash, which was paid on the spot when individuals brought their produce into the government procurement stations. As part of an explanation of the contract system, I was given one of the small red books that are issued to the peasants and shown how to use the information in the book to draw up a contract with a team leader. I spoke with many individuals, most of them men, who had contracted to produce a certain amount of grain, rapeseed, cotton, tobacco, hemp, or other crop on a given allotment of land. The agreed-upon quotas were determined on the basis of the amount of labor each contractor could muster; most contractors depended on members of their own households for this labor. The land and the larger tools of production (water buffalo, boats, tractors, pumps) remained property of the team, but were contracted to the individual peasants as part of the total plan. The contractors were responsible for providing all other inputs, such as seeds, fertilizer, insecticides, labor, and transportation to market.

Even where the teams still operate in terms of work points instead of cash, the assigning of responsibility for production to smaller units has been widely adopted, and the working out of schemes appropriate to local needs has been a challenge to the ingenuity of local leaders. Instead of the household, the contracting unit may be an individual working alone or with a friend or non-coresidential relative, or with a larger group of team members. The work undertaken may be only one part of the total agricultural task set; for example, transplanting, weeding, or irrigating. One woman may agree to weed a specified number of land units in return for a certain number of work points. Or an irrigation engineer may take over the responsibility for water management for the entire team in return for a much larger lump payment (in cash or work points) at the end of the fiscal year. In one case described to me, three unrelated adults drew up a contract to raise pigs for the team, starting with sows provided by the latter and agreeing to return the same number at the end of the year plus half of the progeny, the other half being their own profit.

The concept of "specialized group" and even "specialized team" is important to an understanding of the system. Ordinarily, production teams consisting of about 75 to 100 workers are thought of as residential units, most of them having their origins in the so-called "natural villages" that covered China at the time the People's Republic of China was established in 1949. At first, when crop production was the primary occupation of most peasants, nearly all members of the team were assigned to the fields, and housework and sidelines were accomplished within families with the assistance of children and the elderly. As the economy became more diversified, some members of the team were assigned as individuals to different tasks, such as schoolteaching, working in a factory, or basketmaking. Thus, members of a single team today may have many different occupations. But, on occasion, an entire team may be assigned permanently to a given type of work. I encountered some brigades in which one team might be assigned to fishing, another to construction, another to noodle manufacturing, and another to mushroom propagation, for example.

In Liaoning, I talked with a 32-year-old woman who worked with her 79 teammates in the prefabricated cement works owned by the brigade. The 80 workers were divided into five functional groups, each of which was responsible for a particular part of the assembly. This woman and a partner bent and cut the metal rods used as frameworks. Others then bound the bent rods together, filled the forms with cement, and transported the finished products to market. Each day the woman and her partner were expected to complete 800 pieces, for which they each received 40 work points. If they produced more than 800 pieces in a given day, they might take off the next day or part of it, so long as they did not jeopardize the work of other groups. Similarly, they were free to choose the hours they worked in any given day. This enabled them to manage other enterprises to enhance the household income.

Such work groups may be residentially based, as was this one, or their members may be drawn from several local units (teams), as was true for a specialized fruit-growing group I also encountered in Liaoning. In this case the commune was the accounting unit and the brigade and team organizations were largely responsible for the regulation of nonproductive matters such as housing, sanitation, family planning, and political education. Since land is ordinarily held by the team, the existence of specialized teams (as opposed to groups) working in nonagricultural occupations suggests the necessity for an organization at a higher level to take over the accounting, the assigning of croplands, and the responsibility for the fulfillment of agricultural quotas.

Table 2. Output values of the three sectors of the economy in Qu Qiao Brigade, Miao Qiao Commune, Cao Zhou County, Jiangsu Province, 1970 to 1980

Year	Agriculture		Industry		Sidelines		Per capita income (yuan)
	Yuan $\times 10^3$	Percentage	Yuan $\times 10^3$	Percentage	Yuan $\times 10^3$	Percentage	
1970	263.7	62.5	144.4	34.0	13.7	3.2	102
1971	287.6	61.9	163.1	35.2	13.2	2.8	106
1972	286.6	44.8	299.1	46.7	54.7	8.5	74
1973	310.3	53.6	198.3	34.3	70.2	12.1	102
1974	310.5	42.7	297.5	40.9	119.1	16.4	113
1975	298.6	37.2	388.0	48.3	116.0	14.5	105
1976	344.3	32.0	615.0	57.1	117.5	10.9	127
1977	282.8	17.2	1,181.4	71.8	180.9	11.0	136
1978	385.1	17.7	1,536.0	70.6	253.3	11.7	201
1979	488.2	14.8	2,307.0	70.0	498.8	15.1	310
1980	532.5	4.6	10,006.0	87.3	919.6	8.0	479

Industrial enterprises may be owned by the commune, by the brigade, or by the team. (In Anhui I also encountered individuals who owned processing mills, having purchased them from their near bankrupt teams.) Although the most common form of payment for rural factory work is work points, some interesting changes are occurring which I believe are also a product of the newer guidelines concerning job responsibility. In the past, as well as today in many places, factory workers earn a specified number of work points per 8-hour day that are calculated on the basis of what the job requires and the physical characteristics of the worker. Bonuses for overquota production are shared equally by all workers, and no accounting of individual productivity is made.

In some types of factory it is impossible to measure individual productivity; for example, in a citric acid processing plant I visited, the workers spent most of their time regulating valves and had little control over production. However, in many of the newer factories a kind of piecework system has been initiated where the nature of the work permits. Individuals are permitted to bargain, or contract, for the number of units they are to produce, receiving bonuses for overproduction and fines when they do not meet their quotas. When the factory belongs to the commune rather than the team or brigade, payment is more likely to be in cash. Sometimes this cash is credited directly to the team account where it is translated into work points so as to include that worker in the general reckoning at the end of the year. More often, however, these workers receive the cash directly. When this occurs, the workers do not share in the division of profits by work points, but they are still considered voting members of the team and receive house and garden plot assignments. Their food grain allowances for personal consumption are also assigned by the collective, though they must pay cash for the grain.

A number of work assignments entail loss of membership in the rural collective, even though the individual continues to live in his or her original home. When a worker is employed directly by the state, whether at the national, provincial or county level, he or she receives a salary, a grain allotment, and often medical, educational, and retirement benefits that are not ordinarily available to commune members. If such persons are married to members of the collective, they may continue living with their spouses, but children follow the mother's classification and, if she is employed by the state, the child will have no future rights in the collective. Most peasants with whom I spoke seemed eager to escape the rural assignment, for this is one way they can achieve higher social status and a more comfortable standard of living; however, since men more often than women are elevated to these positions, relatively little mobility results. Units with considerable industrial development are better off than those that depend mainly on agriculture (see Tables 1 and 2). Thus, even though an industrial worker may accrue no more work points than a teammate who is a field hand, the value of a single work point is likely to be higher in those collectives with a diversified economy. Furthermore, factory work is generally easier and more prestigious, even when it entails monotonous or dangerous conditions. Women, in particular, may earn more in a factory than in agriculture because the number of work points assigned to their jobs may be higher; and, if the work requires manual dexterity, women workers are preferred.

Table 3. Output values of different segments of the economy as percentages of the total in various organizational units within the Yangtze Delta area, 1980 (7).

Unit	Agriculture	Industry	Sidelines
Team (Jiangsu)	39.0	39.0	22.0
Brigade (Jiangsu)	4.6	87.3	8.0
Commune (Shanghai)	9.7	70.8	19.0
County (Wujiang)	30.0	57.0	13.0
Prefecture (Suzhou)	19.6	67.2	13.2

Table 4. Output values (in thousands of yuan), Wujiang County, selected years 1949 to 1980.

Year	Agriculture		Industry		Sidelines		Total
	Amount	Percentage	Amount	Percentage	Amount	Percentage	
1949	31,482	70			13,103	30	44,585
1956	50,068	75			16,716	25	66,784
1966 to 1976	114,177	77	7,720	5	25,709	17	147,607
1979	167,598	44	155,415	41	52,999	14	376,012
1980	138,806	30	265,130	57	58,254	13	462,191

Table 5. Comparison of agriculture, industry, and sidelines in relation to their contribution to the economy, Kai Xian Gong Brigade, Miao Gong Commune, Wujiang County, Jiangsu Province, 1980.

Sector	Workers		Gross output value		Net returns	
	Number	Percentage	Yuan $\times 10^3$	Percentage	Yuan $\times 10^3$	Percentage
Agriculture	819	70	470.1	39	216.5	43
Industry	138	12	463.3	39	117.3	23
Sidelines	201	17	263.2	22	167.3	33

Discussion

It is evident that the communist government in China does not today impose a rigid and uniform set of work patterns on its rural people. Within certain general guidelines the people are encouraged to find ways to achieve both higher agricultural and industrial productivity and a higher income and standard of living for themselves. The job responsibility system, in all its complexity, is only one mechanism of several being advanced in order to achieve the national goal of rapid development.

There is much interest in what the Chinese call "scientific farming," that is, the systematic and knowledgeable use of such techniques as crop rotation, fertilizer application, plant genetics, and modern irrigation. Although I did not hear the term "appropriate technology," the outlook of the Chinese seems quite consistent with the concept, and they freely admit that if crop yields are to improve significantly they need not only conscientious farmers but also technical assistance and capital investment. The level of development varies widely from one part of the country to another, and I was able to observe the highly produc-

tive Yangtze Delta agricultural zone and the industrially advanced area around Shenyang in the province of Liaoning, as well as the more backward areas of Anhui and Guandong.

I found that the job responsibility system has been adopted with the greatest enthusiasm in the poorest and most underdeveloped areas. But the indisputably larger harvests and per capita incomes of the past 3 years in such areas cannot be explained only in terms of the human factor, even though the Chinese themselves tend to emphasize this in their rhetoric. Instead, when I probed their success stories, I found that considerable improvements had been made in the availability of high-quality seed and fertilizers, in irrigation, in the utilization of such techniques as close planting and multiple cropping, and in the availability and type of storage facilities. In many instances new acreage had been added through land reclamation efforts.

New incentives have been introduced into the marketing process. Higher prices for some crops, such as cotton and rapeseed, along with lowered quotas for food grains in some areas, have caused a shift in crop proportions and resulted in larger incomes. The lowered quotas have increased choices and permitted farmers or collectives to make decisions based on local circumstances. Thus, if rapeseed seems suited to their situation, farmers can plant more of this crop and less wheat and still meet their (lowered) wheat quota. Alternatively, they can continue to plant wheat and make more money because prices paid for above-quota produce are higher than for the quota itself.

In less densely populated zones the size of the household garden or private plot has also been increased. These plots, like the sidelines, are managed by the family members and may be used to produce crops that are quite significant in terms of improving diets and income. Although sidelines are more important to individuals than to collectives, they may constitute a substantial part of collective income at all organizational levels (Table 3). Since the job responsibility system gives individuals greater flexibility in time management, people can devote more time to sidelines (*7*) for themselves or on behalf of the collective. In the more prosperous communes, this is seen as the primary advantage of the new system, even when it can be demonstrated that crop yields also increase when people work for themselves or in smaller groups.

In the most advanced communes the job responsibility system has not been adopted and the leaders seem hostile to it in principle. Their discussion of it almost always hinges on ideology, according to which collectivism is a higher form of social organization and a step closer to the ideal communist state. But these leaders also agree that individual or household contracting improves production in the lesser developed parts of the country.

If one examines this observation more closely, one sees evidence of intruding nonideological factors. "Lesser developed" means greater dependence on agriculture and usually less dependence on mechanized agricultural techniques. In such cases, labor is an asset, and higher yields result either from having more field hands or from working longer hours. It is often stated that there are two kinds of situations in China—one in which there is much land and too little labor, and the other in which labor is plentiful but land is scarce. In the latter case, collective sidelines and rural industry have been developed with startling success in some places (Tables 2 and 4).

The resulting redistribution of labor has weakened the effectiveness of the household unit as an agricultural production "team" since some team members are employed in workshops, factories or white-collar positions. A household undertaking responsibility for field production might thus find it difficult to secure enough labor to complete its quotas (*8*). Household sidelines already absorb the after-hours time of factory workers, as well as the energies of the elderly and the very young, but since they are profitable they will probably be continued, expanding or contracting according to households' needs and resources.

Collective sidelines as full-time alternatives to field work seem especially useful in transition periods, when agriculture cannot absorb the available labor and industrialization is not yet providing many employment opportunities.

The specialized team or group may be seen as one adaptation to this situation and, as industrialization proceeds, may either evolve toward collective factory organization similar to that found in cities, or disappear altogether if assignments disperse team members into separate enterprises (Table 5).

Thus, the job responsibility system in China seems to be an appropriate response to differential underdevelopment, and one which will permit, through hard work and the cultivation of new skills, a higher income for many of the poorest people. To the extent that special technical assistance, improved infrastructure, and price supports are simultaneously made available, some progress can be expected. As collective sidelines and then industry become more important locally, the job responsibility system will probably decrease in favor of collective organization, since this remains the ideal to strive for and it serves many of the wealthier communes very well.

References and Notes

1. The China Association for Science and Technology (CAST) invited members of the Board of Directors of AAAS to conduct research of our own choosing for a short period in China. I chose to study anthropological and sociological aspects of agriculture and modernization at the local level. An interpreter was assigned to travel with me, and although the itinerary was prearranged I was able to make minor modifications as I went along and to talk with numerous peasants who had no forewarning of my visit. I thank the AAAS for sponsoring this work.
2. J. Domes [*J. Asian Stud.* **41**, 253 (1982)] describes the new job responsibility system, but few scholars appear to have studied the system firsthand at the local level.
3. The term "state" refers to national, provincial, or county organizational levels. The three collective entities are communes, brigades, and teams.
4. The subject of family organization in modern China has received much attention. See especially H. D. R. Baker, *Chinese Family and Kinship* (Columbia Univ. Press, New York, 1979); E. Croll, *The Politics of Marriage in Contemporary China* (Cambridge Univ. Press, Cambridge, 1981); and W. L. Parish, Jr., and M. K. Whyte, Eds, *Village and Family in Contemporary China* (Univ. of Chicago Press, Chicago, 1978).
5. See S. B. Butler, "Conflict and decision-making in China's rural administration, 1969–1976," thesis, Columbia University (1980).
6. Vice Premier Wan Li gave me an hour-long interview during which he told me many of the things reported here. All of the comments were independently confirmed by further interviews or observations in the field.
7. Figures for sidelines in the tables reflect those managed by the collectives only. Individual sideline activities and income are not systematically recorded, so I have only anecdotal information on them.
8. Some cadres worry that the birthrate will again increase as a result of the job responsibility system. I doubt that this will occur in the more industrialized rural areas, and there was no indication even in the poorer communes that people were thinking of producing more children now to work in the fields later. The one factor that might promote a higher birthrate is the continuing desire to have at least one male child.