The Commune in Chinese Development

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Agricultural collectivization in China took place mainly in the three and one-half years between the summer of 1955 and the end of 1958. Primary-stage agricultural producer cooperatives were formed widely in the second half of 1955, with the proportion of rural households participating increasing from 14% in March to 63% by the end of the year (Walker, 1965: 9-10). These were typically composed of about 30 families which pooled their land and capital assets but retained individual ownership of them. Distribution to members, made from the funds remaining after taxes, costs of production, and so forth were deducted from gross revenues, first provided for their contribution of land and capital (30%-60% of the total), with the residual distributed according to their labor input (Donnithorne, 1967: 38). The following year almost all of these were made into advanced-stage agricultural producer cooperatives, in which the participation of rural households increased from 4% at the end of 1955 to 51% in February

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1956 and 88% in December (Walker, 1965: 12). At first averaging some 340 households, these were reduced in size to about 170 households by the spring of 1958 (Walker, 1965: 16). Besides being larger in size than the primary-stage cooperatives, they differed mainly in eliminating the return to land, which became the property of the collective without compensation.[1]

In the summer of 1958, responding to the same forces which gave rise to the Great Leap Forward, the people's communes, much larger collective units, first appeared. By the end of August, 30.4% of rural households were commune members, with the proportion swelling to 98.2% by the end of September. The communes were formed by amalgamating a group of cooperatives with one or more *xiang* (administrative villages),[2] until then the lowest unit of state authority in the countryside, to form a unique rural institution of some 5,000 households responsible for the economic, political, and social life of the countryside, including agricultural production, rural capital construction, rural industry, repair and maintenance services, trade, local government, public welfare, culture, education, public health, and the militia.

When the land reform was in the main completed in 1952, it had been argued that full collectivization would necessarily be a prolonged process, one that would have to be delayed until the development of industry could make available the material inputs necessary to realize the full advantages of collective agriculture (Walker, 1966). However, the entire collectivization process—and above all the formation of the communes—was based on the contrary assumption that collectivization could in itself be the motive force in bringing about agricultural development. The purpose of this study is to provide some perspectives for assessing the validity of this contrary assumption, and in particular for assessing the role of the commune in Chinese development. This could be done either from the standpoint of China's own objectives or from the standpoint of criteria commonly applied in Western development studies. While I will be considering both perspectives, my major emphasis will be on the latter, because Chinese success in Western terms is less obvious. Some further

discussion of the history and organization of the communes, however, may first be in order.

HISTORY AND ORGANIZATION OF THE COMMUNES

Approximately 26,000 communes were formed by the end of 1958. The primary impetus behind their formation was the desire to mobilize mass energies in the interest of economic development, with the communes perceived as vehicles for innovation, accumulation, and the full utilization of resources, especially labor, as well as for the building of socialism and the gradual transition to communism. They were based on a positive vision of human potential in transforming nature (a harsh environment) and grew directly out of the mass efforts in water conservancy in which tens of millions of people participated in the winter of 1957-1958. They also reflect the new Chinese commitment to decentralization and the mass line as China broke from the Soviet model of development to which it had adhered until 1957; decentralization requires strong local units to assume the responsibilities relinquished by the center, and the communes were meant to take this role.

Many difficulties arose with the communes in the first few years, partly reflecting difficulties specific to the communes themselves, partly reflecting the vicissitudes of the Great Leap Forward and of economic conditions generally. As might be expected, cadres had limited experience in running commune-type institutions, and certain skills, including accounting skills, were in short supply. At the same time, many cadres were carried away by their enthusiasm and tried to institute distribution arrangements based partly on communist principles—according to need. Some food and other necessities were distributed free of charge, limiting the material rewards available to compensate collective labor. Moreover, efforts at rural industrialization and capital construction drew attention from basic agricultural activities. In this context, the harsh weather conditions of 1960 and 1961 had an extremely severe impact, with grain output

falling sharply in 1960 to 160 million tons (compared to 185 million tons in 1957) and remaining at about the same level in 1961 (see Appendix).

In response to these difficulties, several substantive changes were made in the communes. By 1963, their number was increased to approximately 74,000. This did not represent a uniform diminution in size, but a rationalization of commune boundaries according to terrain and traditional marketing patterns; very large communes, often in excess of 50,000 members, were retained in flat areas with dense populations, while communes in mountainous areas tended to be divided. At the same time, the level of ownership and accounting was shifted downward to subordinate units within the communes: to the production brigades in 1959, and to smaller units, the production teams, in 1961. The brigades correspond generally in scope to the advanced-stage cooperatives, and the teams to the primary-stage ones. Either may correspond to the natural village, while the commune itself tends to encompass what was formerly a traditional marketing area, with a group of villages surrounding a market town (Skinner, 1964-1965: 368; Stavis, 1974: 39-42).

The number of communes was reduced at the end of the 1960s: in 1970 there were 51,000, and in 1973 about 50,000 (Crook, 1975: 374). An average commune today has some 3,140 households and 13,800 people[3] divided into 15 production brigades and 100 production teams (Crook, 1975: 375). There are, in all, 750,000 brigades and five million teams in China (Crook, 1975: 366). Despite the tendency for the higher collective levels of the brigade and commune to be strengthened over time, the team at present is the principal unit carrying on everyday farming activities and the level at which income is usually distributed.

An average team has 31 households. The first claim on its income is the agricultural tax, now around 5% of the gross value of agricultural output; to create incentives to increase output, the tax is left fixed for many years. In addition to the tax, the state has the right to purchase 90% of the grain in excess of taxes and subsistence requirements, which include team needs for food, seed, and fodder. The quantity required for sale to the state is

based on the amount of land a team has and a conservatively estimated normal yield calculation; any excess above the amount calculated can be retained or, more usually, sold to the state at a premium price.

Once taxes have been paid and required and surplus sales have been made to the state, the team will have some of its output in grain, some in cash. About 25%-30% of its gross income will repay production costs, 8%-10% goes into an accumulation fund to purchase capital equipment, 2%-3% into a welfare fund, and the remainder, about 55% of output, is distributed among members according to the number of labor points they have earned. During the early 1960s, such points tended to be related to specific jobs, but this system came under attack during the Cultural Revolution (1966-1969) as encouraging a capitalist mentality by making the calculation of personal gain the motive force of collective activity. A wide variety of distribution systems exists today, but almost all are based on assessing the individual's contribution to the collective on the basis of political attitude (essentially one's commitment to the interests of the community and society), physical capacity, experience, skill, and so forth. Each member is assigned a number of work points at periodic meetings of the entire team (these may be monthly, quarterly, or the like) and is credited with that number of points for each day he or she works for the collective, regardless of the task assigned. The sum of the points earned by all team members is divided into the income available for distribution to determine the value of each work point.

The level of organization immediately above the team is the brigade. Brigades may vary in size from a few teams to as many as 20, but the average is seven. The brigade carries out capital construction projects, implement repair, some industrial activities, and in general those activities too big in scale to be handled at the team level. Brigades are responsible for most of the land reclamation, hydroelectric power stations, and granaries built within the communes (Bastid, 1973: 179-180). Brigades may also organize handicraft activities or run small factories making processed foods or other products.

In some cases the brigade has replaced the team as the basic unit of accounting and income distribution. When this happens, the reward for individual members is based more on the economic success of a larger collectivity and is less closely related to individual performance. The income generated by the more prosperous teams within a brigade, for example, must be shared with the less prosperous. While public policy is to encourage such changes in the future, it is felt that the success of the communes depends on the maintenance of the strongest collective material incentives for the present. Therefore, only those brigades whose members have strongly requested the change and displayed the requisite social consciousness are permitted to replace the teams as the basic unit of accounting.

Where projects are beyond the scope of the brigade level, they will be undertaken by the commune. These typically include the large water conservancy projects, factories for the manufacture of simpler farm machines and the repair of others, and more elaborate food-processing and other factories. At the same time, the commune is the lowest level of state authority in the countryside and is responsible for discharging the functions that ordinarily devolve upon local government, including public health, education, and so forth. The commune level is also a key link in planning and in the communications network in the countryside.

In addition to the commune, brigade, and team levels, it is appropriate to consider the family a separate level within the commune; like the other levels, the family is a separate level of economic decision-making and maintains its own accounts and savings (the commune and brigade derive their income from the products they make and the services they provide within and outside the commune). With a few exceptions, communes typically alot each family a private plot, with the total land area involved coming to about 5%-7% of the commune's arable land. Although sometimes subject to public pressures, families are generally free to use the private plots as they wish and to dispose of the produce as they see fit—to sell it or to consume it themselves.[4] This output may account for 15%-20% of family income.

There is both considerable autonomy within and close interaction among the different levels in the commune. Each level has considerable freedom to initiate projects of its own choosing, with the active supervision of higher levels usually limited to cases where one unit's activity impinges upon another unit, or where outside obligations are involved (as in borrowing). At the same time, however, extensive interaction among the different levels is a characteristic of the commune system. For example, large tractors will be kept at the commune tractor station, while smaller ones may be owned by the individual brigades or teams. Minor repairs can be carried out at the brigade level, major ones at the commune level. The most experienced drivers and maintenance personnel will be at the commune level, which will train team members in the necessary skills. Another case of interaction is described by Maxwell (1973a): a production team expanded its arable land by digging a channel to divert a stream and filling in the former stream-bed with soil. The diversion led the stream to a sharp drop, which the brigade would use as a source of hydroelectric power. If in need of technical assistance, the brigade could communicate this to the commune, which would request technical personnel from the county or state. In other cases, a brigade may mobilize all its teams to fight against insect pests or to undertake a water conservancy project.

AGGREGATE PERFORMANCE UNDER THE COMMUNES

The first few years under the commune system can legitimately be considered a period of trial and error. Since 1962, however, despite a number of changes, the communes have by and large maintained their present form. Under the communes, grain output increased from 160 million tons in 1960 to 240 million tons in 1970 and despite five years of generally adverse weather conditions, 260 million tons in 1975 (see Appendix). The 1960 figure represents a depressed level of output, but the performance remains a creditable one nevertheless, with output increasing

faster than population between 1960 and 1975, and an infrastructure created that may be expected to support faster growth in the future.

Grain output alone, about one-half of the gross value of agricultural output (Perkins, 1975a: 351), is not an adequate measure of the success of the communes or the prosperity of their members. Increasing attention has been paid to "industrial" crops that provide raw materials for light industry, as well as to the production of fresh fruits and vegetables, meat, fish, fowl, eggs, and so forth. Moreover, prices paid for agricultural products have risen steadily since 1950, while prices charged for industrial products—especially inputs for agriculture—have fallen steeply since 1960. Between 1950 and 1970, state purchasing prices for grain, cotton, and oil increased about 60%.[5] Between 1957 and 1971 average farm purchase prices for grain increased from .081 to .1082 yuan per catty (1.1 lb.), while those for hogs rose from .38 to .4850 yuan per catty (Perkins, 1975b: 152). Tables 1 and 2 indicate the decline in the prices of agricultural inputs provided by the industrial sector. While this decline must be understood in the context of the priority accorded the agricultural sector since 1961, to some extent the decline also reflects the lower costs associated with higher levels of output.

Measured in terms of constant 1957 yuan, the gross value of farm output is estimated to have risen from 51.5 to 77.7 billion yuan, or 51%, between 1964 and 1974 (Perkins, 1975a: 351). While aggregate data are lacking, the numerous case-reports we have suggest that rising rural prosperity is reflected in the growth of consumption, savings accounts, and reserve stocks of grain, and in the substantial increase in rural house-construction over the past ten years. In the case of consumer goods, we know that rural consumption standards are rising more rapidly than urban ones, and that since 1960 the national output of manufactured consumer goods has been rising at an average rate of 8% per year (Field, 1975: 150), so rural consumption of such goods is likely to be rising somewhat faster than 8% per year (not very much faster, since rural consumers are 80% of the total).

INVESTMENT

Since 1961, China has recognized fully the importance of agricultural development and given priority to the development of the agricultural sector. This priority has influenced the development of the industrial sector, too, where emphasis has been placed on those industries that do the most to support agriculture, especially the chemical fertilizer and farm machinery industries. The production of chemical fertilizers, for example, increased from 1.9 million tons in 1961 to 24.9 million tons in 1974 (Field, 1975: 166), while the output of farm machinery has been growing by over 10% annually (Erisman, 1975: 338). In addition, capital construction is carried out in the countryside on a vast scale, especially in labor-intensive war conservancy projects undertaken during agriculture's slack season. The commune system contributes in varied ways to the high level of rural capital formation.

First, to finance agriculture's industrial inputs, an act of saving must take place somewhere in the economy, and this is forthcoming mainly from agriculture itself. The teams are expected to set aside a certain proportion of their gross income, usually about 8%-10%, for investment purposes, and this claim on output is prior to the distribution to members. In addition, the brigade and commune levels generate their own income through the goods they produce and the services they provide. While some of this income is used for collective consumption—as in education and health care (much of which can properly be regarded as as investment in human capital)—most of it is reinvested in the expansion of existing production activities or the initiation of new ones. Of the 6,229,600 yuan net income of the Evergreen People's Commune, Suzhou municipality, in 1972, for example, 54.0% or 3,362,300 yuan was team income, 18.0% or 1,122,000 yuan was brigade income, and 28.0% or 1,745,300 yuan was commune-level income (Maxwell, 1973b).[6]

The teams of this commune derive their incomes from agriculture, fisheries, and sideline occupations, including the work of members in commune or brigade factories. The Xin Yu (New

Fishery) Brigade, a representative brigade in the same commune, derives its income from a fodder-processing plant, a poultry farm, a sewing group, an insecticide plant (closed in 1973 and to be replaced by a less polluting activity), and a construction team. The commune itself operates a farm machinery manufacturing and repair factory which, expanded from a small workshop through the reinvestment of profits, employs 280 workers (200 in the busy season in farming), a boatyard for repair and some construction of wooden boats, a container and packing material plant (making baskets, boxes, and crates), a brick and tile kiln, a cement plant, a lens factory, and a pig and poultry stud service. Reflecting its suburban location, the Evergreen People's Commune is more industrialized than most, but the tendency for brigade and commune-level income to expand over time relative to team-level income is universal, reflecting the greater reinvestment of the higher-level units and the gradual industrialization and diversification of economic activity in rural areas.

The Jiliying People's Commune in Henan province might be more representative.[7] Its 38 brigades run the same number of small factories, including flour mills, multipurpose mills for processing agricultural and sideline products, and plants for making and repairing farm tools (Chu and Tien, 1974: 80). On the commune level, a former ball bearing workshop was developed into a farm machinery plant with five workshops. The commune also operates a tractor station with repair shops, a phosphate fertilizer factory, a spinning mill, and a transport team with four trucks. Employment of 400 people at the commune level is one-quarter that of the Evergreen People's Commune, but in Jiliying, too, continued expansion focusing on local needs is clearly in store. The structure of the commune, then, not only mandates accumulation from the farming income of the teams, but also directs a growing share of income into accumulation funds at the brigade and commune levels as output increases over time and rural diversification and industrialization proceed apace.

A team putting 8% of its gross income aside for accumulation is saving and investing 10.7% of its net income, if we assume that 25% of gross income goes to cover the costs of production. Since

the higher rates of saving out of brigade and commune income raise the average rate for the countryside above this level, impressive savings rates are attained. But even this perspective grossly undervalues the investment going on in the countryside by excluding the labor-intensive capital construction projects that characterize China's rural development. In each of the six years ending in 1976, more than 100 million people with several hundred thousand to over a million cadres worked in the annual winter-spring capital construction campaigns, mainly in water conservancy work (Daily Report, February 19, 1976: E10; April 12, 1976: E11). The possibility of mobilizing people on such a massive scale is created by China's collective agricultural system.

In the 5 months from October 1975 to February 1976, more than 100 million people built new or improved irrigation facilities on 3.33 million hectares of land, added drainage facilities on 1.66 million hectares, leveled 6 million hectares of fields, terraced 1.26 million hectares, improved 1.53 million hectares of low-yield fields, and reclaimed 0.33 million hectares of land (Daily Report, April 12, 1976: E11). These figures compare to a total arable land area of some 107 million hectares. As of November 1971, 2,600 of the 2,900 hydroelectric stations in Yunnan Province were built at the local level by commune brigade and team members (U.S. Joint Publications Research Service [JPRS], February 22, 1972: 4). Most of these works are of course quite small, but as a consequence of such local efforts electricity is available throughout most of the Chinese countryside, making a major contribution to transforming traditional agriculture.

The accumulation figures for the communes, brigades, and teams also understate the saving provided by agriculture through the rural purchase of industrial consumer goods manufactured in the cities. The profit rates on consumer goods are typically quite high, averaging over 30%, and the profits are remitted via the People's Bank to the state budget, where they are available to finance investment. To the extent that consumer goods are purchased from commune-run enterprises, the profits will be reflected in the income figures for the communes; but to the extent that rural consumers buy urban-made products with high

built-in profit margins, they are making an additional contribution to national saving that will not be reflected in the commune accumulation figures.

The contribution of the commune system to investment can also be grasped from the standpoint of its impact on incentives to produce and invest. The commune as a basic unit in agriculture is large enough and strong enough in terms of labor-power, financial resources, skills, access to specialized knowledge or state aid, and so on to assume primary responsibility for undertaking accumulation (saving and investment) in the countryside. An alternative, of which the Soviet Union provides the most notable example, is to centralize responsibility for agricultural development, with the state taxing away resources (or removing them through control over the urban-rural terms of trade or through other means) and then returning them to the extent that it wishes to assist the agricultural sector. The incentives to produce and invest will be much higher when resources are left in the countryside and the communes, brigades, and teams allowed to assume responsibility for their own development. This can be understood either in terms of the motive force released through the synergistic process of collective transformation of the environment or, in more orthodox terms, as the addition to labor inputs that can be expected when the labor supply curve slopes upward to the right and the burden of taxation is diminished.

TECHNOLOGICAL PROGRESS

The Chinese people speak of three great struggles: class struggle (for the individual, this means especially the development of one's consciousness as a social existence), the struggle for production, and the struggle for scientific experiment, which can be understood more broadly as the struggle for technological progress. The commune as an institution can be understood as furthering this latter struggle in terms of both the institutional support it provides and the impact it has on the skills and attitudes of its members.

All but the very smallest production teams maintain their own experimental plots, typically in the care of an experienced peasant, sometimes in the care of one of the 12 million educated urban youths who have emigrated to the countryside since the start of the Cultural Revolution in 1966 (Daily Report, December 24, 1975: E2). On these plots they try out new seeds passed down from the brigade and commune levels, which maintain more elaborate research facilities under more highly trained personnel and which test and adapt to local conditions seeds received from county and provincial research centers. In addition to this vertical network, communes and their subordinate units learn from one another or from the most advanced units through local conferences, exchanges of visits, and the assistance of specialized personnel. Especially striking about this vertical and horizontal network are its extensiveness, mass participation, the resources it brings to bear on local problems, and the speed and ease of communication within it.

In the Jiliying People's Commune, for example, with 53,200 people, agrotechnical groups in the 38 brigades are organized into six networks with a total of more than a thousand people (Chu and Tien, 1974: 33).[8] In addition to experienced older peasants, locally trained younger ones, and educated urban youths, they include technicians trained at the commune's own agrotechnical school. These groups continually monitor agricultural conditions; by observing an unusually high count of insect-pest eggs in August 1973, for example, they were able to alert the commune officials, who in turn mobilized the entire commune to increase spraying and fight the pests, thereby limiting crop damage. While this example shows the use of science to improve production, technological progress per se can be better grasped in terms of the efforts at seed improvement.

In the Songzhuang brigade within Jiliying commune, low grain yields prompted the brigade's party branch secretary to consult with one of the commune's agricultural technicians, Li Wensheng. He was told that the seed strains had probably become mixed and degenerated. In the same year, 1961, Li helped Songzhuang set up an agrotechnical group and establish an

experimental plot where a dozen strains of wheat were sown to test their suitability for local conditions. Just after they were sown, a hot, dry wind killed all of them except an Albanian "Fumo" strain, which thrived. Pure seeds of this strain were selected for further development, and its extension to the fields in 1963 resulted in a 50% yield gain to 400 jin per mou (2,640 lb. per acre). By 1973, Songzhuang had the highest yields in the commune. Other brigades learned from this and began to cultivate their own improved strains; today there are four high-grade seed farms in the commune.

The head of the largest seed farm in Jiliying is an experienced peasant named Yan Hong-en. After Liberation, he took a short course in agricultural science at a nearby state farm. A keen observer, he noted in 1965 a cotton plant with twin bolls on a short flowering branch. Continuing to observe this plant, he found it had a longer fruit-bearing period than others, produced 20% more bolls, had fewer superfluous branches (required less pruning), and took up less space (permitted closer planting). He took all the seed from this plant and cultivated and multiplied it. In 1973 this strain covered more than 500 mu (more than 83 acres) of the commune's land and was being experimentally planted in five neighboring counties. Changes like this occurring in most of the countryside are responsible for bringing about China's own "green revolution," but one which is on much sounder footing than its Western counterpart due to the greater genetic diversity of the seed strains developed.

Innovation involves not only the development of improved methods of production, but their actual application to production processes as well. In *Transforming Traditional Agriculture,* Schultz (1964) properly puts great emphasis on the importance, in this regard, of the education of the farm labor force and its receptivity to the introduction of modern methods. The commune structure gives especially great support to agricultural development in these respects.

Elementary school education is almost universal in the countryside now, and the fact that the elementary schools—as well as the middle schools, the high schools, and the new peasant

colleges—are under commune or brigade control makes them highly responsive to the needs of agricultural development. At the same time, the receptivity to improved agricultural practices reflects the fact that scientific experiments are being carried out locally with mass participation, that the repair and often the manufacture of equipment for an increasingly mechanized agriculture is mainly undertaken locally, that local people are trained in maintenance and repairs, that there is considerable interaction with more highly trained specialists, that interaction with other teams, brigades, and communes is a constant source of learning, and that Chinese ideology puts great emphasis on the collective power of human beings to overcome the constraints imposed by nature. The reality of a commune must not be defined purely in terms of its formal organization, but in terms of the interaction of individuals and groups and of the interrelation of activities. It is these interactions and interrelations as well as the formal commune structure that enhance receptivity to the modernization of agriculture in the context of a dynamically developing countryside.

It has been observed that decision-making in a Japanese enterprise often requires a rather prolonged period of time, because everyone must be consulted and consensus reached. Once it is reached, however, the decision can be carried out with great rapidity, because everyone is conscious of what is happening and is committed to it. In the Chinese commune, communication is more informal and status less of an impediment, so the reaching of a decision may not require so much time, but the participation of all the members in the decision-making process leads to a comparable awareness of what is involved and, consequently, speed in execution. I believe that this is one explanation of the speed with which innovation is taking place in the countryside.

The close relation between theory and practice and the linking of education to both also help to explain the rapidity with which technical skills are spreading in the countryside and the corresponding spread of scientific agriculture. Among the principal criticisms leveled at agricultural science education and research during the Cultural Revolution was that they tended to be under-

taken at research institutes removed from the countryside and to ignore actual problems; they were not capable of training technicians and cadres who could help spread scientific farming. In response to this criticism, agricultural-technical institutes were set up by brigades, communes, and counties, institutes to which students could come for several months to a year, spending about half their time in theoretical study and a quarter each in farming practice and political study. The students may learn such things as seed selection, pest control, veterinary medicine, and so forth. They receive work points from their teams while receiving such education, an expenditure which becomes quite literally an investment in human capital. When they return to their units, the skills they have developed are not a form of private property but have an immediate impact on the 30-odd families of an average team or the 200-odd families of an average brigade.

After they have had the chance to improve their skills and deepen their knowledge through the practical application of what they have learned, they may receive more specialized training at other institutes. This pattern of developing basic skills and making them relevant by combining theory and practice, and then deepening them through more specialized study, is characteristic of China's development generally, but it is especially evident in the countryside. Another clear example is provided by the barefoot doctors, whose initial training, usually three to six months, is followed by a period of practical experience and then training at a county or provincial medical center for periods ranging from one month to one year. This pattern of a relatively short basic training period followed by practice and supplementary training ensures the wide diffusion of knowledge, skills, and the services based upon them and permits the deepening of specialization as national resources permit and rural needs develop.[9] This pattern of the development of rural skills is intimately linked to China's system of collectivized agriculture, which usually finances the education, provides the institutional framework within which much of it is carried out, and creates conditions for the speedy, extensive dissemination of the knowledge and skills acquired.

The framework the communes create for technical progress can perhaps best be grasped in relation to the import-substitution

pattern of economic development. Rawski's explanation of how this process works for individual enterprises and for the engineering sector as a whole can readily be applied to the development of industry within the communes. Rawski (1975: 206-207) writes:

> The unique significance of import substitution in engineering is the transferability of techniques, skills, and equipment used to service one sector of the economy to equip other trades. Whereas the machinery and methods imported to produce cotton yarn, for example, offer little or no benefit to coal mining or grain milling, the industrial history of many countries shows that the equipment and skills needed to service and manufacture spinning machinery readily lend themselves to the repair and manufacture of a broad range of engineering goods. The accumulation of experience in one type of engineering may be expected to accelerate the pace at which new products and techniques are mastered and costs reduced in other branches of this industry.
>
> These considerations lead to the hypothesis that gradual mastery of casting, forging, machining, design and other engineering operations will push individual firms toward a technological threshold beyond which they can apply their resources of machinery and skill to produce a variety of equipment.

When communes "import" machinery from the industrial sector, there is no impetus created on the "supply" side for further technical change within the communes. After they start to repair machinery by themselves, however, they begin to develop the capability to manufacture simple replacement parts and ultimately more complex equipment. The technological skills acquired in this process, moreover, may pass a threshold beyond which they can be applied to a broad range of technical and mechanization problems in agriculture or in small-scale industry. We have clear evidence that this process of synergistic development is taking place in China today.

In Hunan province, for example, the initial focus of commune industry on repairs has led to a growing manufacturing capability. Many commune repair plants are now able to make electric motors, internal combustion engines, transformers, pumps, threshers, and mechanized harrowing boats (Daily Report, February 24, 1976: H5-H6). Of the more than 3,000 communes in the province, 98% run their own industrial enter-

prises. The commune industry does not substitute for the larger, state-run factories, but supplements them. In 1974, Hunan's commune- and brigade-run enterprises manufactured 660,000 farm machines and spare parts and 10 million farm tools, and repaired 1,950,000 machines and 14 million tools. Besides the farm machinery enterprises, commune industry within the province also focuses on agricultural product processing factories, chemical fertilizer and insecticide factories, cement plants, small hydroelectric power stations, refractory material factories and ceramic mills, as well as small-scale coal and iron mines and lime kilns.

The interaction of agricultural and industrial activity in the countryside provides a spur to development that neither of them alone could provide. The situation is one in which the apparent violation of the conditions of static efficiency, which might call for greater concentration of production in a limited number of units to benefit from comparative advantage and economies of scale, becomes a necessary condition for maximizing dynamic efficiency.[10] Sometimes the primary spur to industrial innovation in the countryside comes from the demand side, as when Lujiang Commune in Hunan added a third crop, one of wheat, to its usual double crop of rice and found itself short of labor at harvest time; to solve the problem, its farm machinery factory began manufacturing wheat threshers (Daily Report, February 24, 1976: H5). Sometimes the primary spur to innovation comes from the supply side, as when Zaijiagang Commune, also in Hunan, used the profits from its new lime plant to help establish a farm machinery repair shop, a brick works, an insecticide factory, and a cement products plant (Daily Report, February 24, 1976: H6). Whether the primary spur to innovation comes from the supply side, the demand side, or both, the development of technical skills provides external economies on the supply side which facilitate further development. In this pattern of development, the earliest stage is always the most difficult; since China has already passed this stage successfully, it is reasonable to expect the pace of rural technological change to accelerate in the future.

THE COMMUNE AND CHINESE DEVELOPMENT OBJECTIVES

In addition to the clearly defined role of the commune in promoting capital formation and technological progress, the commune also furthers a number of specifically Chinese development objectives. Among these are the elimination of the gap between the cities and the countryside, the promotion of equality, and the elevation of socialist consciousness. In this section I would like to note briefly some of the ways in which the communes serve as a vehicle for realizing these features of the Chinese model of development.

One of the principal objectives of Chinese development is to overcome the disparity between the cities and the countryside in living standards, public services, educational attainment, and so forth. This objective has been incorporated into China's development strategy, for China has made the successful development of the countryside a condition for national development. This strategy contrasts strongly with that followed by most of the less developed countries, where the emphasis on industrial development is aided by the cheap labor and other inputs that agriculture can supply, and by the forced saving that can be extracted from the agricultural sector via taxation or the maintenance of urban-rural terms of trade that are adverse to agriculture. In other countries, the poverty and lack of opportunity in rural areas is reflected by mass migrations to urban areas despite widespread urban unemployment and the proliferation of slums.

China, by contrast, is trying to develop by "civilizing" the countryside, by making it a complementary pole of development and one that can assume some of the initiative in the struggle for development. For this purpose it is necessary to have units large enough to provide vehicles for rural enterpreneurship, to take the initiative in establishing new enterprises, to develop new methods, to upgrade skills and mobilize rural talents, to provide the educational and other amenities usually limited to urban areas, and to take the initiative in transforming the local economy while being responsive to national economic planning. The commune is the institution that fulfills these requirements.

According to Elvin (1973), traditional Chinese agriculture was caught in a "high-level equilibrium trap" that made further

progress impossible without exogenous influence. Dernberger (1975: 26) argues that it was caught in such a trap by the end of the nineteenth century, and Perkins (1975b: 120) that it was caught after the middle of the twentieth century. While I have strongly criticized the concept of the trap elsewhere (Lippit, 1976),[11] it is clear that further progress within the confines of a small-scale, fragmented private agriculture would necessarily have been slow and difficult. By contrast, China's commune-based collective agriculture has facilitated the massive effort to complete water conservancy and other rural infrastructure projects, the development of skills and scientific farming, and the self-reliant industrialization projects within the communes, creating a dynamic in the rural areas that makes them capable of self-reliant transformation. External support is of course provided in the form of terms of trade favorable to agriculture (see Tables 1 and 2 and the related discussion), educated urban youths settling in the countryside, where they play a significant role in upgrading skills—more than 12 million have done so since the start of the Cultural Revolution (Daily Report, December 24, 1975: E2)—and the great stress the industrial departments have placed on aiding agriculture through an increase in the production of agricultural inputs and services, but all this support can have its full impact only because it takes place within the dynamic development environment that the communes have created.

The promotion of equality is another principal objective of Chinese development strategy. The principal source of inequality

TABLE 1
Reductions in Prices of Insecticides and Chemical Fertilizers

(1961 = 100)

	1964	1970	1971-73
1059 high-efficiency insecticide	71	26	22
BHC powder	92	71	63
Urea	76	76	68
Ammonium nitrate	81	81	75
Ammonium sulphate	91	91	82

SOURCE: Chu and Tien (1974: 99).

TABLE 2
Reductions in Prices of Tractors and Diesel Engines

(1953 or 1960 = 100)

	1953	1960	1973
Walking tractor ("Worker-Peasant 7")	---	100	48
Tractor ("East is Red-28")	---	100	50
Diesel engine, 20 horse-power	100	---	25

SOURCE: Chu and Tien (1974: 99).

is the disparity between the rural and urban areas, and the effort, discussed above, to eliminate the urban-rural disparity is also the most significant effort to promote equality currently taking place. Within the agricultural sector, however, there are some tendencies toward growing inequality among teams and brigades and among communes. A commune with higher-quality land or other resources or a commune located near a large urban area will have obvious advantages over other communes. Such differences in initial conditions will tend to be reflected in more rapid development and magnified over time by the reinvestment of profits. The commune system is used, however, to keep such disparities in check, and used in typically Chinese fashion by helping the lagging units rather than by knocking down the leading ones.

Such support comes from both inside and outside the communes. As of 1961 one of the poorest brigades in Jiliying Commune, Songzhuang village today has the highest grain yields in this relatively prosperous commune and one of the highest cotton yields. Spurred largely by a dynamic brigade leader who raised the question, "If other brigades can prosper, why can't we?", Songzhuang's development was based largely on self-reliance. As I have noted earlier, however, the brigade also received technical assistance from the commune in developing improved seed strains and in establishing an experimental plot. Moreover, like other lagging units, Songzhuang benefited from the visits arranged for its leaders to Dazhai, where cadres seek to find lessons they might apply to their own brigades, and from the visits arranged for all its members to advanced brigades within

the same commune. The leaders of Songzhuang brigade especially went often to the nearby Liuzhuang brigade, an advanced brigade within Jiliying Commune, to study its experience and receive technical assistance. Every year Liuzhuang has been sending about a dozen of its members to neighboring counties at their invitation to serve as technical advisors in grain and cotton growing. In addition to this type of assistance, units with problems may also receive help from the provincial branches of the Chinese Academy of Agricultural Sciences or from other technical personnel.

In addition to providing technical assistance, communes or counties will send experienced cadres as trouble-shooters to investigate conditions in backward units and to assist them. One theme that is commonly stressed in reports of such investigations is that the central problem was one of political line and consciousness: the villages were not aware that they could transform their environment through intense collective effort (this is precisely the chief lesson of Dazhai, the Shanxi brigade from which all of China is called upon to learn). Backward units may also receive loans or grants from the brigade or commune to increase their capital equipment.

Finally, the Chinese see the communes as institutions necessary for the development of socialist and eventually communist society. Following the thought of Mao Ze-dong, they see the struggle between capitalism and socialism as the central contradiction in China today. Capitalism is identified essentially with "rational," narrowly-defined self-interest as the motive force of economic and social behavior, while socialism is identified with the individual's consciousness of being part of society and behaving accordingly. It is possible, in this view, for public ownership of the means of production to be compatible with the restoration of capitalism, which the Chinese believe has taken place in the Soviet Union. If China had adhered to the initial plan to postpone collectivization until industrial inputs were available in quantity, the calculation of personal gain would have remained the motive force of rural development, and although rural development would probably have languished—because the transformation of the countryside was beyond the scope of individual efforts—the capitalist road would have been strength-

ened in the struggle between the two lines and the development of socialism made vastly more difficult.

SUMMARY AND PROSPECT

Economics does not provide any standard procedure for evaluating the role of an institution in economic development. The approach I have adopted here is to analyze the impact of the communes on some of the principal development variables, including especially capital formation, technological change and several goals that the Chinese themselves view as primary. Additional perspectives could be added, such as the role of the communes in carrying out China's dual economy ("walking on two legs") development strategy, in which modern, capital-intensive techniques are used side-by-side with traditional, labor-intensive ones, or the role of the communes in the realization of self-reliance and self-sufficiency. I have touched upon the first of these indirectly, especially in discussing capital formation, and the second, it seems to me, is basically evident from the overall discussion. Although still others might be discussed, the perspectives I have chosen are, I believe, among the most central in evaluating the role of the commune in Chinese development and especially in considering the assertion that collectivization was a necessary condition for Chinese development.

As must have been evident from the outset, no simple answer can be given to this question because we cannot know for certain what would have happened in the absence of collectivization and the commune system. The evidence concerning the impact of the commune system on several major development variables is sufficiently clear, however, to allow us to make a number of basic assertions with confidence. The commune system has played a key role in helping materialize such Chinese development objectives as equality and the ending of the disparity between rural and urban areas. In addition, the commune system has brought about a much higher level of capital formation in rural China than would be imaginable in its absence. It has also created a framework within which the technical transformation of agriculture is proceeding rapidly in the face of highly unfavorable

initial conditions. It is not going too far to say that China has already created conditions within which technological progress in agriculture has been institutionalized and can be expected routinely. In this sense China can already be classified with the advanced rather than with the less developed countries.

The communes are still a new institutional form, and their possibilities are still being tried and tested. In the last 15 years, however, their form has been basically stable and their merit proved. As inputs from the industrial sector become increasingly available—in the last five years, industrial support for agriculture (irrigation and drainage machinery, chemical fertilizers, and tractors) provided by the state surpassed the level of the previous 15 years (Daily Report, April 12, 1976: E10)—one can expect substantial output gains. The contribution of the commune system to the development of skills, material infrastructure, and an institutional framework conducive to continued development has already created a dynamic potential within Chinese agriculture, the materialization of which is only a matter of time.

NOTES

1. Compensation based on locally prevailing prices was paid for draught animals, large implements, and groups of trees.

2. The administrative village was a pre-Liberation creation which grouped together several natural villages for purposes of state administrative control.

3. The household and population figures for the average commune are based on Crook's (1975: 409) estimate of 4.4 persons per household, Orleans's (1975: 77) estimate of a 1976 population of 863 million, and the figure of 80% that the Chinese commonly cite for the proportion of the population that peasants constitute (see, for example, Chu and Tien, 1974: 3). Basing his estimates on Aird's midyear population estimate for 1974 of 920 million people, Crook (1975: 408-409) comes up with higher estimates than the ones I have cited for the population and number of households per commune. I believe, however, that Aird's estimates, which in essence assume that the Chinese have made no progress at all in population control, are highly unrealistic and are in direct conflict with the limited information that we have. I believe that Orleans's estimates, the rationale for which is argued in his essay "China's Population: Can the Contradictions be Resolved?" (Orleans, 1975: 69-80) are based on much more realistic assumptions and have used them accordingly.

4. Such pressures may take the form of encouraging some particular use for the private plots or of encouraging sales to the state commercial organization in preference to the market (Bastid, 1973: 173).

5. Data cited by economists from Futan University, Shanghai, in conversation with visiting American economists on August 21, 1972.

6. Maxwell cites commune income of 7,481,400 yuan, based on gross team income of 4,614,100 yuan. He also reports, however, team production expenses of 1,251,500, and, since the income figures for the other levels are net figures, I have subtracted this amount from the team income and total commune income figures he cites to obtain net team income and net commune income.

7. Which is not to say that it is "typical." Perhaps the principal function of the newspapers, magazines, and so forth from which most of our accounts of the communes stem is to provide Chinese people with models for correct behavior. Although Jiliying provides such a model, its level of industrial development is much nearer the norm than that of the suburban Evergreen Commune.

8. This arrangement shows the flexibility in rural organization: to make units of optimal size, units were created here between the brigade and commune levels. The information about Jiliying Commune which follows in the text is also from Chu and Tien (1974).

9. A number of American specialists in the agricultural sciences who have visited China have expressed reservations about future difficulties the Chinese may encounter from sacrificing basic theoretical study in the interest of practice and applied science. My own impression is that this might indeed be true if the system were a static one, but it should by no means be assumed that renewed emphasis on theoretical study will not follow the development of production, growing national prosperity, the overall increase in agricultural skills, and the appearance of new types of problems at new stages of development in the future.

10. Donnithorne (1972) argues that efficiency is indeed sacrificed by the Chinese emphasis on self-sufficiency and self-reliance. If otherwise untapped resources are used, however, commune-industry does not necessarily violate static efficiency conditions either; it is likely, to the contrary, to increase efficiency.

11. A revised version of this paper will appear in a forthcoming issue of *Modern China.*

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APPENDIX

Output of Grain in China, 1949-1975 (million metric tons)

Year	*Output estimate*
1949	108
1950	125
1951	135

Appendix (Continued)

1952	154
1953	157
1954	160
1955	175
1956	182
1957	185
1958	200
1959	165
1960	160
1961	160
1962	180
1963	185
1964	195
1965	210
1966	215
1967	230
1968	215
1969	220
1970	240
1971	246
1972	240
1973	250
1974	260[1]
1975	260+[1,2]

SOURCES: 1949-1973: Erisman (1975: 328-329). 1974-1975: U.S. Central Intelligence Agency (1976: 1-3).

NOTES: 1. The figures cited are estimates of the U.S. Central Intelligence Agency. A 1974 figure of 274.9 million tons was reported by Agriculture and Forestry Vice Minister Yang Li-kung at a Food and Agricultural Organization (FAO) meeting in Rome, November 14, 1975 (cited in Current Scene, January 1976, Vol. 14: 20). This higher figure, however, appears to include soybean production while the figures for earlier years do not and so is not comparable with them. On the other hand, it is not clear just when the Chinese began to include soybean output in the grain figures. If they are included for the early 1970s and excluded for 1974 and 1975, then the table will understate the growth rate in grain production for this period, one of generally unfavorable weather conditions. Further discussions of this issue appear in U.S. Central Intelligence Agency (1976), and in Neville Maxwell and R. M. Field, "Recent Chinese Grain Figures" and "Reply," *China Q.*, (December 1976), 817-821.

2. A report in *Peking Review* (October 8, 1976: 47) indicates 1975 grain production was an "all-time high." According to U.S. Central Intelligence Agency (1976), however, most of the increase was concentrated in soybeans, with the output of other grains only marginally above 1974 levels.

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