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FARM OWNERSHIP AND TENANCY IN CHINA

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J. Lossing Buck
University of Nanking

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FARM OWNERSHIP AND TENANCY IN CHINA

Scope of the Study

This study of farm ownership and tenancy in China is an attempt to bring together all the existing information on the subject into as brief a form as is possible in order to give a definite idea of the situation. Very little investigation of tenancy has been made by any individual or any organization in China so far as can be ascertained from published data. Perhaps the Department of Agricultural Economics and Farm Management of the University of Nanking has more first-hand data pertaining to this subject than has any other organization, and for this, special mention must be made of those data obtained by Mr. C. M. Chiao, to whom the writer is greatly indebted for assistance in the preparation of this article. Other sources of material appear under the references, the numbers to which are found throughout the text. In addition to these, the writer has had available a considerable amount of information obtained from students in his classes in agricultural economics. Data were also secured from a number of rural community surveys which have been conducted by various individuals and sent to the department. Information is in hand from Kwangtung in the South to Fengtien in the North and to Szechwan in the West. Further detail of the source material appears with each reference.

The purpose of this study is to ascertain facts and to offer briefly suggested solutions. Deeper than that, however, is a desire to make known more clearly the actual conditions which now control land ownership and tenancy problems in China. The subject of mortgaged land has not been touched on largely for the reason that the mortgagor has the use of the land

rather than the mortgagee and where the mortgagor does not wish to farm it himself he may rent it to an ordinary tenant.

Unless otherwise indicated, weights and measures are given in local units and currency and is in Chinese silver. In terms of local mow reduced to the Peking standard mow, one local mow at Nantung is equivalent to 1.041 Peking standard mow and one local mow at Suhsien is equivalent to 1.1186 Peking standard mow. One Peking standard mow is equivalent to 0.1518 of an acre.

Amount of Tenancy

The extent of tenancy in China is a subject of frequent misstatement because data from exhaustive studies of the topic do not exist. However, a number of studies made in recent years help to give some idea of the situation (table 1). Tenancy varies in different sections of the country all the way from one hundred per cent owners who operate their own land, to one hundred per cent tenants. In general, tenancy is much more prevalent in the Hwai river basin and south to Canton than it is in North China. A number of counties (hsiens) in the southeastern part of Kiangsu Province have as high as 80-90 per cent of the farmers as tenants while in large sections of Chihli, Shantung, and Shansi very few tenants are found. A fairly safe generalization for the whole country could be made by stating that probably at least one half the farmers own the farms they work, one quarter rent some land in addition to that which they own and work, and the other one quarter rent all the land that they work. At least it would be entirely unsafe to estimate a higher percentage of tenants in the light of existing data. Very often part owners (farm operators who rent land in addition to that owned) may be classed with owners or even with a higher group economically than owners, as is revealed in the study of 102 farms near Wuhu (8).

The extent of farm tenancy in China compares very favorably with that of other countries (table 2). It is much less than in England, much more than in Denmark and Canada, but is quite similar to that of Japan and Germany.

Changes in Amount of Tenancy

Changes in the amount of tenancy may be indicated by index numbers calculated from the proportion of farmers who were tenants at different periods. If we take 1905 as the base year (100), then the index numbers for 1914 and 1924 respectively show the following changes in the proportion of farmers who are tenants: Quinsan, Kiangsu, 125, 135; Nantung, Kiangsu, 198, 113; Suhsien, N. Anhwei, 156, 142. The increase of tenancy for Quinsan and Nantung is attributed largely to the increase in population and to owners and part owners becoming tenants. The reasons given for owners changing to tenants are, division of land between members of the family such, for instance, as brothers; higher cost of living; bad habits; crop failures; debts and changes to other types of business. In Nantung where there are very large land holdings it is impossible for even a very industrious tenant to acquire a piece of land during his lifetime.

The large increase in tenancy in Suhsien between 1905 and 1914 was caused by a flood resulting in a severe famine. The owners, because of crop failure and heavy debts, were forced to sell or mortgage* their land and become tenants. The decrease for the years 1914 to 1924 is accounted for largely by the exportation of grains from the county and the accompanying high prices for the same. Many farmers were able to redeem their mortgages during this period of rising prices and in this way become owners again. Land-

*A common method of mortgaging farm land in China is for the mortgagee to loan the mortgagor a sum of money equivalent to about one half the value of the land. The mortgagee then has the use of the land as interest until the debt is repaid.

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lords with a limited amount of land also discontinued their contracts with their tenants and became owner-operators themselves.

Concentration of Land Ownership

Ownership of land by landlords may be divided into that belonging to resident and to absentee landlords.† At Quinsan absentee landlords constitute 66 per cent of all the landlords, and this large proportion is caused by the landlords engaging in business pursuits in Shanghai and other large cities of the lower Yangtze valley. At Nantung the absentee landlords constitute only 16 per cent and at Suhsien 27 per cent of all landlords. The average size of the holdings of landlords (in local mow), classed as small and as large varies for Quinsan from 140 to 370; for Nantung from 240 to 167,000; and for Suhsien from 170 to 550. For absentee landlords the size varies for Quinsan from 230 to 860; for Nantung from 180 to 3,300; and for Suhsien from 480 to 1600. With certain exceptions, such as at Nantung, the data confirm common observation that as a rule absentee holdings are larger than those of resident landlords.

In Sutsien county, N. Kiangsu, the resident landlords remind one of feudal lords in the early history of European countries. These landlords live in large houses fortified with walls, their tenants living about them, but of course in houses much inferior to that of the landlord.

Reasons for Farm Tenancy

An understanding of the reasons for farm tenancy in China does much to help one evaluate the system of

†Resident landlords refer to those who live in the same village as some or all of their tenants. Absentee landlords refer to those who live too far from their land to supervise the farm operations. Usually such landlords live in the county seat or in some other city far removed from their land.

tenancy as such. The two main reasons for tenancy are that many farmers through necessity or preference are willing to rent the use of farm lands from others, and that a comparatively large number of individuals, termed landlords, have land which they themselves do not wish to work and consequently are anxious to rent to others.

The Conditions That Cause Land to be Owned by Landlords

Individuals in China who have savings prefer to invest it in land because of the safety of the investment and often because of the social prestige that comes to the owner of a considerable amount of land. These two incentives account for the degree of concentration of land found in China. This concentration is brought about several ways.

First, it is difficult for farmers to purchase land because of the absence of adequate credit facilities. Second, the custom which forces sellers of land to offer it first to the owners of adjacent fields make it possible for landlords to purchase much more land than the farmer can buy because of the large number of pieces already owned. Third, landlords can outbid the farmer because of their willingness to pay higher prices, often higher than the land is actually worth for farming purposes. Fourth, the farmer can purchase only a small amount of land at one time, regardless of the amount that might be offered him, because of his limited funds. Fifth, after periods of famine, war, and in cases of reclamation, large tracts of land are available for occupation by people with surplus capital. Sixth, increasing land values make it continually more difficult for the farmer to purchase land (table 4). Seventh, unpaid mortgages result in the transfer of land to the money lenders who in most cases are already landlords. Eighth, the development of business and industrial opportunities causes many

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owners to rent their farms and move to the city. Ninth, a certain amount of renting results inevitably from changes to other business, retirement, illness, or death. Such renting seems desirable because it greatly aids individuals in these transitional periods. One cannot always dispose of his land as soon as he changes from farming to another business. Or division of land between brothers may make it desirable for one brother to rent his share to another brother. Heirs of farm land, again, may retain their land for sentimental reasons, such as attachment to an old homestead and to the community, and so prefer to rent rather than to sell.

While these positive factors aid greatly in the concentration of land, still there are others operating in the opposite direction. Along the Shanghai-Nanking Railway, especially in the section below Chinkiang, the landlords are giving up their land in preference to other investments, first, because there are more opportunities to use savings either by depositing in banks or by investing in business and industrial enterprises, and second, because of the extreme difficulty of collecting rents from tenants to an amount which makes the investment in land worth while. It is possible that this trend away from land-owning will increase with the still greater development of industry and banking and there will probably not be an increase in the concentration of land.

Conditions Which Determine That Persons Will Become Tenants

Most tenant farmers in China become and remain tenants because they do not command enough capital or credit to purchase a farm and at the same time provide for adequate operating capital. Some farmers are tenants by preference even though they have capital enough to buy a farm, because they feel it is more profitable to farm a large amount of land, using their capital for operating expenses, than it is to invest

it in a smaller amount of land. Not infrequently owner farmers get into debt to such an extent that they have to give up their land and rather than change into another business in which they have no experience, or for which there may be no opportunity, or perhaps rather than leave the community they know, they become tenant farmers.

Becoming a tenant is often advantageous for the young man just beginning to farm, especially if the system of tenure is that of dividing the crops into a given proportion for each party, because he shares the risks of farming with the landlord and also receives some supervision from the landlord, if the latter be resident.

Types of Tenure in Relation to Size of Farm

Tenant farms are larger than either owner or part-owner farms for the three places where special studies were made (6), because tenants share with the landlord a certain per cent of farm returns. The same conditions holds true for farms in the northern United States. For Quinsan the tenant farms are 67.6 per cent larger than the owner farms, for Nantung 11.7 per cent larger, and for Suhsien 166.3 per cent larger than the owner farms (table 3). Given the same size of farm the tenant would be at a disadvantage compared with the owner because he must pay out a portion of the products for the use of the land, whereas the owner does not have that expense.

Since 1905 all farms have decreased in size at Quinsan, Nantung and Suhsien, but the decrease has been most rapid in the owner farms, and even in the part owner farms the decrease has been more rapid than in the tenant farms. On owner farms this may be accounted for largely by the division of land between brothers and the selling of land for debt.

Renting Systems

Renting systems in China as in other countries, vary from place to place, and vary even in the same

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region, although one system usually predominates at a given place. China has the same types of systems as other countries and has much the same variations within each type. It is beyond the scope of this study to enter into the details of the numerous systems. These systems depend for their effectiveness upon the willingness or the ability of the respective parties to provide supervision, assume risks, and supply capital. Geographical conditions are often a larger factor in determining what each party is willing to do and this is well illustrated by the data given later.

The main classifications of rents are share-tenancy and cash-tenancy. Share-tenancy may be sub-divided into the "half and half," the two-fifths, the three-fifths, and the copper systems. Cash tenancy may be sub-divided into cash, crop, and cash-crop systems.*

At Quinsan 100 per cent of the systems are cash-crop rents; at Nantung 82 per cent are cash rents, 9 per cent share rents, 8 per cent-cash crop rents, and one per cent cropper rents; at Suhsien 91 per cent are share rents, 7 per cent crop rents and 2 per cent cash rents.

**Share rent* is the annual payment of a certain fraction of the crop.

Cash rent is the annual payment of a definite sum of money per mow of land.

Crop rent is the annual payment of a definite amount of one or more crops produced on the farm and is usually paid after the harvest of the crop concerned. In many sections this distributes the payments of rents to twice a year, at the harvesting of the spring and the autumn crops.

Cash-crop rent is the same as crop rent except that the amount of crop is converted into its money equivalent for payment to landlord.

In the *cropper* system the landlord furnishes everything but the labor, which is supplied by the tenant. The landlord therefore receives a correspondingly larger share of the products.

Much of the land at Suhsien is subject to flood or drought with consequent crop failure. Tenants prefer share rent because by the use of this system landlords share with the tenant the risk of loss of crops. The small amount of cash and crop rent found at Suhsien is accounted for by the fact this occurs on high land not subject to floods. The tenant has a much smaller risk on this land and hence prefers to pay a definite rent rather than a share of the produce.

The absentee landlords prefer cash rent because of the little trouble involved, while the resident landlord prefers the cash-crop system because he has storage space for grains and can afford to wait for opportunity for speculation.

Cash-tenancy

The cash-tenancy system typified in Quinsan by cash-crop rent and in Nantung by cash rent as compared with share-tenancy in Suhsien may be explained largely by the fact that farming is safer in most of Kiangsu and by the more intensive type of agriculture there. At Quinsan and other places it may be explained by the large number of absentee landlords who prefer to have rent in cash because of the convenience in management.

The amount of cash rent per mow varies with the quality and location of the land and the kind of crops grown. At Suhsien the average rent for medium land is $1.40, while at Chen Hwa Tsao in Hsiang Shan Hsien. Canton, for medium land it averages $12 per mow. At Nantung the cash rent of good land averages $4.10. The average cash rent per mow of medium land used in grain farming in Ginling Tao, Kiangsu, $2.76, and in Su Chang Tao, Kiangsu, is $4.43, and Hu Hai Tao, Kiangsu, is $3.71.

In the cash tenancy system it is also the custom to have the tenant give a "ya tsu," or deposit which acts as a guarantee of the tenant's good faith in carrying out his contract, and this is returned when the tenant gives up the use of the land. The amount of

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"ya tsu" varies greatly between regions but usually approximates the value of one year's rent. In case the "ya tsu" is unusually large or small the amount of the rent is correspondingly decreased or increased.

Share-tenancy

A very great variation occurs in share-tenancy contracts between landlords and tenants in different parts of the country and smaller variations appear even in the same region. At Suhsien, where the "half and half" system prevails, about two-thirds of the landlords furnish seeds to the tenants in addition to land and buildings. Before the crops are divided on the threshing floor in the presence of the landlord or his representative the equivalent of the amount of seed given the tenant is returned to the landlord. The threshed grain and the stalks of crops not used for feed or fodder, such as part of the barley grain, wheat straw, and sweet potato vines, are then divided equally. However, about one third of the landlords do not require the tenants to return the equivalent of the seeds furnished. About one third of the landlords furnish fertilizers in addition to land, buildings, and seeds, and the cost is divided equally between the two parties, but the tenant is not required to pay his share until harvest time. In exceptional cases a tenant will find a landlord willing to furnish him with labor animals, but most landlords prefer not to do this, for it is a left-over of earlier days when land was plentiful and tenants few. The "half and half" system is probably the most common in North China and varies chiefly in whether or not the landlord furnishes seeds, fertilizers, and, in some cases, buildings.

In the share rent system at Ta Chow Gwan, Hsing Hwa, Kiangsu, the landlord furnishes land, windmill, irrigation pump, one half of the seed and fertilizer, and one half of the labor for irrigation and drainage, in exceptionally wet or dry years. As rent the tenant

gives the landlord (1) one half the grain and straw from wheat and rice land, (2) two fifths of the grain and straw from rice land only, and (3) three tenths of the grain and straw from poor land. It is here, as well as in many other places, that an attempt is made to adjust the proportion of rent to the fertility or type of land and to the kind of crops grown. In all cases the seed used in planting is taken out of the harvest crop and is given to the landlord before dividing. As soon as the grain is threshed the tenant invites the landlord to a feast, after which the grain is divided and the tenant delivers the landlord's share to his home. After it is properly delivered the landlord gives the tenant a feast. If the landlord wishes to dismiss the tenant he does so at this time. If the tenant wishes to leave, he takes the sails from the windmill just before the landlord comes to the tenant's feast as sign to the landlord of his intentions.

In Laian county, or hsien, Anhwei, where the share "half and half" system prevails, the absentee landlords send their agents, or go themselves, to the fields and estimate the yield of the crop and the share given by the tenant is based on this estimate. Such men are very expert in approximating the true yield. It is also quite customary for the landlords to grant the tenants free use of a moderate sized field for the purpose of growing cotton for the use of the tenant's family (6).

In Wutai, Shansi, and in other parts of Shansi (north), the cropper system prevails. The landlord furnishes everything but labor and routine management, and in return receives from the tenant eight-tenths of the products of the farm (2).

The two-fifths and three-fifths systems differ from the "half and half" systems in that a smaller or larger share of the products are given the landlord. The amount depends upon the crops requiring different amounts of labor and capital, upon the varying degrees

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of productivity of the land, and upon the dissimilar amounts of capital supplied by the landlord. However, while there is often some adjustment attempted to these factors, it is not often wholly successful because in many cases the systems were adopted hundreds of years ago and have not been altered to meet changing conditions.

Whether these cash and share tenancy rents are too high or too low depends largely on the proportion of the total expenditures of the farm paid by the tenant and by the landlord. Some indication of the fairness of these rents may be judged from the percentage return the rent is on the value of the land. For cash rent on medium land these percentages are as follows: Nantung, 4.6, Suhsien, 7.0 (6); Ginling Tao, 7.7, Su Chang Tao, 7.5, and Hu Hai Tao, 5.9 (5). For cash crop rent the percentages are as follows: Quinsan, 12.6, Nantung, 11.5, and Suhsien, 11.2. For share rent on medium land the percentages are 11.3 for Nantung and 12.5 for Suhsien (6). Actually the landlord does not receive as large a return on his investment in these regions as the percentages indicate, because he has certain expenses to pay, such as taxes, and in the case of share rent often a proportion of the cost of seeds and fertilizers.

The actual return on the landlord's investment has been computed for 486 tenant farms in seven regions of six provinces by subtracting the landlord's expenses from the value of rent received (3). The average interest on the landlord's investment for these farms is 10 per cent per annum. The weighted average of the interest on the landlord's investment for the farms mentioned, plus 50 farms for eight other regions (3), but numbering less than 20 for any given region, was obtained by dividing the landlord's net receipts by the total capital investment. Such interest amounted to 12 per cent per annum which is 0.5 per cent less than the weighted average of interest received by tenant

and owner farm operators themselves on their investment (3).

Comparing the interest rates obtained by the farm operators with that of the landlords and judging from the usual rates of interest in China where 24 per cent annual return is considered a low rate, these figures do not tend to prove that the landlord is obtaining exorbitant profits from his land.

Just as in the cash-tenancy system the tenant tries to cheat the landlord by reporting a crop yield lower than it is in order to obtain a reduction in rent, so in share-tenancy the tenant very commonly cheats the landlord by skilfully hiding some of the threshed grain before division takes place and also by giving the landlord inferior crops. He may also make away with some of the fertilizer furnished by the landlord, and because of such danger landlords personally supervise the application of fertilizer to the tenants' fields.

Reduction of Rents

It is significant that in the cash-tenancy system, especially in the cash-crop, or crop, form, the custom in years of low yields is to reduce the amount of rent. Such reduction is usually determined by asking the landlord or his representative to come just before the crop is harvested and estimate the probable yield in consultation with the tenant.

In Quinsan, as well as in other regions, the percentage of reduction in years of less than normal yield is a little less than the percentage of reduction in taxes by the government to the landlord. In extremely bad years if the landlord refuses too reduce the rent to an amount the tenant is willing to pay, either after looking at the crops or after refusing to look at them, the tenant often does not harvest the crop at all. This by custom prevents the landlord from collecting any rent at all, because the tenant has had no harvest

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from the land. The landlord loses money to the extent of his taxes paid on the land and the tenant loses his income for his labor. However, if the tenant does harvest the crop then he must pay rent according to the fixed amount, without regard to the yield.

At Soochow where the conditions of farm tenancy are quite similar to those in Quinsan, the landlords have organized into an association for the express purpose of controlling the tenants from whom it is difficult to collect rents. This landlords' association has special privileges from the magistrate's office and the latter will put tenants into prison upon recommendation from the association. The amount of rents per mow are indefinite but are decided upon by representatives of the association in the presence of a representative from the magistrate's office, either after or sometimes without field inspection. Almost invariably the landlords estimate the yields higher than they actually are. The tenants seem partly to blame for this situation because every year many of them try to cheat the landlords by reporting the crops worse than they really are and demanding a reduced rent.

The landlords' association issues a certificate to each member indicating the amount of rent to be demanded of the tenants on the basis of the estimates and the seal of the magistrate's office is also affixed. The certificate includes (1) the names of the landlord and tenant, (2) the number of mow of crops, (3) the percentage of the estimated yield, (4) the amount of rent that should be paid.

In passing it should be mentioned that the association has a president and a vice-president elected by the landlords, whose duties are to help the landlords collect rents and obtain the assistance of the magistrate's office in this regard.

The stipulated amount for rents in the forms already mentioned takes the form of payment in money

or in products from the farm. Another requirement of the tenant made by the landlord, however, is that he should act as a servant to the landlord on special occasions, such as at New Year holidays, and at weddings and funerals which occur in the landlord's household. The amount of service required is not stipulated and varies from year to year and in different regions. It is a system evil in its effect, because it is indefinite in requirement, and may work real loss to the tenant in keeping him away from his work, and worse than that, perhaps, is that it makes deeper the feeling of inferiority that the tenant has, and definitely classes him as the landlord's servant.

Considerations Affecting the Type of Renting Adopted by the Landlord and Tenant

Landlord's considerations	Tenant's considerations
Share-tenancy	
1. Freedom to supervise the tenant in the management of the farm.	1. Assistance from the landlord in the management of the farm.
2. Greater risk because of possible crop failure or incompetent tenants.	2. Less risk, because in years of poor crops the landlord shares the loss. He also shares the risk from the inexperience of a tenant.
3. Profits usually increase with the amount of supervision and capital supplied by the landlord.	3. Less capital required because the landlord often furnishes seeds, fertilizers and sometimes other things in advance, or gives credit for other farm or living expenses.
4. Ease with which supervision can be given.	4. Less freedom in kind of crops that can be grown (in some regions).

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5. Landlord gives a share of increased production due to any additional effort on the part of the tenant.

Cash-tenancy

1. Little supervision required.
2. More competent tenants can often be obtained.
3. Less trouble to collect rent than in the case of share-rents.
4. The tenant cannot cheat in the amount of rent given as easily as he can in the share-rent.

1. Freedom in the management of the farm.
2. All products above the value of the stipulated amount go to the tenant.

No statement can be made as to which type of tenancy is the better because they vary with both the human and physical factors. In general, cash-tenancy prevails in the Yangtze valley and south, and share-tenancy in the north. The precariousness of farming and the large number of resident landlords in the north of China as compared with southern China explains in part, at least, these wide differences.

Length of Tenure

The majority of the farm tenants in China cultivate the same land for a lifetime as compared with 3.8 years for the cash renter and 2.6 years for the share renter in the United States. For Quinsan, Nantung and Suhsien almost all the tenant farmers remain on the same land throughout their life (6). In Kiangsu, for Ginling Tao, 55 per cent; for Su Chang Tao, 91 per cent: and for Hu Hai Tao, 90 per cent of the tenant

farmers remain on the same land for life (1). This long tenure in China may be accounted for in a number of ways. The dense population in many sections results in few pieces of land being offered for sale. Farm are so small that accumulation of enough savings to purchase land is very difficult. Adequate credit facilities are entirely absent. All this means that there is no agricultural ladder in the sense often referred to in the United States where a person may begin farming as a hired man, accumulate savings enough to rent a farm later on and eventually to purchase one. Also the patriarchal family system in China helps to prevent such a ladder in that the land of one family is worked in common rather than by renting it to one member and the other members being employed to help work it.

On the other hand, there are regions where the tenants do change frequently. In Hsinghwa, Kiangsu, this situation is revealed in a common proverb of the region, to the effect that "Every time a tenant moves, three are made poor, the tenant, the landlord and land" (換田叁家窮). However, even though the tenants change infrequently or operate the same land for life, it is common to find the tenant having the same attitude toward the farm as that of the tenant in the United States, who moves so frequently. He feels the land is not his own, but belongs to the landlord and he knows that there is always the possibility of his being dismissed and hence he is not interested in improvements. Share-renters do not attempt to obtain the largest crops economically possible, because they feel the landlord receives such a large share of the additional effort. In some regions the landlords do not have the power to dismiss the tenant and in such cases the tenant takes a more vital interest in the land.

Trends in Land Values, Prices of Crops, and Costs of Rents

In Japan there is much trouble between the landland and the tenants because the price of rice is rising

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more quickly than the increase in the value of the land and rents are paid in form of cash crop rents and the crop used is chiefly rice. It is because of this situation that the tenants feel justified in demanding a reduction of rents.

A comparison of changes in land values, prices of crops and rents paid landlord (table 4) in Quinsan, Nantung and Suhsien foor the years 1905, 1914 and 1924, taking the year 1905 as the base year, indicates that rents are rising a little faster than crop values but that land values are lagging behind crop values. More data are needed before drawing conclusions for the whole of China, but from that presented from a limited number of places in China it would appear that the landlord is getting the benefit from the relative changes in prices of land, crop and rents.

The Compradore System as a Corollary of Tenant Farming on Large Estates

Much of the evil in farm tenancy arises from the use of a third party to take care of the landlord's business dealings with the tenant. Probably the majority of the resident landlords and a portion of the absentee landlord with small holdings supervise all business dealings with the tenant, personally or through a relative. Some landlords collect rent through their regular servants. Landlords with large holdings and especially absentee landlords use a third party to supervise all relations with the tenants. This system is very highly developed in southern Kiangsu in such districts as Quinsan, Soochow and Wukiang. It is in these places that the landlords maintain a special office known as "chang fang" (賬房) to look after the landlord's interests. Actually it is the compradore system applied to agriculture. The large landlords here, as is also true of many others having even medium sized holdings, do not even know the boundaries of their own land or the location of many of the

fields. It is the fashion in some places for the landlord to know as little as possible about his business, and any landlord who takes an interest in his holdings loses social status.

The "chang fang" as found in Quinsan are mostly in large market towns. Their principal task is the collection of rents, although they also decide upon dismissal or acceptance of tenants and assist the landlord in all his dealings with the tenant. Usually a number of landlords group together and organize a "chang fang". Two persons, a manager and a sub-manager, are employed. In Quinsan the salaries of these managers are approximately $200 and $100 a year respectively, in addition to fees from registration of new tenants and from other sources. The manager has charge of all business in the office, such as accounting, receiving of rents, and general management, while the sub-manager takes charge of collecting rent from all of the tenants who have been delinquent in paying.

Rent Collection Under the Compradore System at Quinsan, Kiangsu

Payments of rents are required immediately after harvest and the good and reliable tenants pay at this time unless unusual circumstances occur to prevent them. Tenants who fail to pay on time are notified and are given three periods of grace in which to pay the rent. The dates set for payment are usually the 1st, 10th and 20th of the Tenth Moon. Failure to pay after the third period sends the sub-manager of the "chang fang" to the home of the tenant in person to collect the rent. If the tenant does not pay, the sub-manager will inform the local constable (ti-pao), who will assist by demanding that the rent be paid. Further failure to pay will cause the manager of the "chang fang" to send a "tsui gia" (摧甲), or servant of the "chang fang" to collect. Another refusal on the part of the tenant results in the servant's informing

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the "ti pao", who by previous arrangement then sends a servant from the magistrate's office to the tenant's home. The magistrate's servant takes with him a "warrant of arrest," and if the tenant still fails to pay he is put into prison.

The Committee on Rent Collection (摧租委員會) begins to function at this point and is a committee given legal standing by the magistrate at the request of the landlords who manage and finance it. It is a method the landlords have of facilitating rent collections.

The Committee on Rent Collections treats the tenant in the same manner that criminals were treated in the Ching dynasty when they appeared before the magistrate. The tenant is asked why he does not pay the rent and if his answer is not as desired, the Committee has the servant beat him with a bamboo stick. The servant is paid at the time of beating and according to the number of blows. It is reported that this method of treatment is decreasing in comparison with former times not only in Quinsan, but in other parts of southern Kiangsu. The Committee has the power of putting the tenant in prison without further recourse to he magistrate and this is known to hold true not only in Quinsan, but also in the region of Chentseh, Wukiang county, Kiangsu, where the landlords' association of that place has the same power.

Tenants' Prisons

A number of the members of the Department of Agricultural Economics and Farm Management of the College of Agriculture and Forestry of the University of Nanking have personally visited tenants' prisons either in Quinsan or in Chentseh. A prison visited in Quinsan by one of the members of the department had 15 inmates, 10 male tenant farmers, and 5 females, wives of farmers who had run away.

In each prison there are many attendants to oversee the tenants and these cheat the tenants and treat

them very badly. The attendants make the tenant prisoners pay for their food in advance, charge them a double price, and prevent their friends from giving them any food. If the tenants do not pay the doorkeeper a tip they will be ill-treated and even beaten. Rich tenants when imprisoned are required to furnish food for the poor tenants.

Evils of the Compradore (Chang Fang) System

The compradore cheats both the tenant and the landlord. The landlord is easily cheated because he pays little attention to the details of his business. He only requires substantial returns from the compradore, who may cheat him in the following ways. Most honest tenants pay their rents punctually, but the manager does not enter the amount in the books, and the money is used either by the manager or the submanager. If the landlord makes any inquiries he is met with the reply that the tenants have not paid their rents. In order that the managers do not have to pay the landlord eventually all of the rents paid by honest tenants, their names are listed with the less honest ones who pay only partial rents later on. The landlord is then told by the manager that these tenants are in such poor and wretched circumstances that there is no way of forcing them to pay, and the landlord is helpless.

The "chang fang" has charge also of buying land for the lanlord. Themanager will often take the money given by the landlord to buy good land and buy poor land with it and use the unexpended portion to buy good land for himself. Later he will sell this good land to the landlord at a still higher prices and will use a forged name as owner of the property.

The "chang fang" cheat the tenant by demanding more rent than that stipulated by the landlord, and by forcing the tenant to bribe him to put down a good name for him in the records.

Tenants themselves cheat the landlords when the former seriously object to the raising of rents. The method used is to sub-let the land too bad tenants without the knowledge of the landlord, and this means the landlord cannot collect full rent. A frequent way of cheating the landlord, also, is to give a poor quality of grain for rent.

Double Ownership of the Land by the Landlord and the Tenant

Good land at Quinsan is divided into the soil 田底), and the surface (田面). The possessor of the soil is held liable for the payment of taxes on the soil. The possessor of the surface is called a tenant, (佃戶) and has the exclusive right of leasing the surface for cultivation. The soil is commonly worth from two to four times as much as the surface; if they belong to two different proprietors, neither has the right to build a house or make a tomb on the land. The possessor of the soil cannot cultivate the land, but is required to lease it to the one who possesses the surface, and who has the right, unlimited in time, of leasing the soil, nor can he expel the lessee at his own will, except in a case where the tenant owes him for rent to amount equal to the value of the surface. Under such circumstances the surface becomes the property of the owner of the soil, and may be leased to another tenant together with the soil.

When the owner of the soil sells it to another, besides the deed of sale he usually signs another deed)會租契) which is shown to the tenant through the "ti pao" so that the tenant may be informed of the change in ownership, and may sign a new lease. The same process takes place to inform the landlord when the tenant sells the surface, but the former tenant may be required by the landlord to guarantee the rent of his successor.

If the owner of the surface leases it to another the lessee pays rent for the soil to the owner of the soil, and for the surface to the owner of the surface.

The landlords have devised this system of ownership for the purpose of preventing struggle among the tenants for obtaining the privilege of renting land and to facilitate the collection of rents on time and of good quality. This is accomplished through the permanency of tenure of the owners of the surface in that they cannot be ejected except for failure to pay rents when such equal the value of the surface. The fact, however, that they can be expelled at this point has a wholesome influence on payments of rent which are satisfactory to the landlord from the standpoints of punctuality and quality.

A Form of Serfdom

The definition of serf as given in Webster's Collegiate Dictionary is, "a serf, strictly, is one bound to a certain estate, and thus attached to the soil, and only sold with it."

At Chentseh in Wukiang county, Kiangsu, the money lenders, who are usually also landlords, make loans to the farmers at high rates of interest and endeavor in every way possible to get the land away from the owner farmers. After the debt equals the value of the land the owner is forced to give up his title deed to his creditor, but at the same time he is forced to sign a contract that he and his descendants will farm the land for the new landlord and his descendants will farm the land for the new landlord and his descendants forever. One of the members of the Department of Agricultural Economics at the University of Nanking has personally met and talked with one of these "serfs," whose father had signed such a contract. It is in this region that tenants very often run away and it may be that the serfs form a

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large majority of such persons. It is not known how many farmers in Wukiang are serfs, but it is not at all uncommon at Chentseh.

Attitude of Landlords and Tenants Towards Each Other

The larger the landlord's holdings, the further removed he is from the tenant, and the more he deals with the tenant through a third party, such for instance, as the compradore, the more pronounced are the class distinctioons and ill feelings between landlord and tenant. Often the relationship between the small resident landlord, who personally supervises his holdings, and his tenant, is very good. In southern Kiangsu, however, where there are many tenants of absentee landlords and of large resident landlords, the landlord looks upon his tenant as of the lowest order of humanity. In the words of a Chinese reporting upon this situation for Nanchoa, near Shanghai, in Fenshe hsien, Kiangsu. "The landlords consider the tenants simply as slaves. But the tenant also thinks of himself as the lowest person in society, and he calls his landlord (老爺), being the term used to address high officials before the time of the republic. When the tenant meets the landlord the tenant acts like a criminal before a cruel officer. When together, the tenant cannot sit down without permission from the landlord."

It is quite universal for both parties to suspect the other and to take advantage of each other in any way possible. So long as the tenant feels that the landlord is getting more than his share of the rent he is going to try to cheat the landlord, and if he is a dishonest man, he will, of course, try to cheat under any circumstances. On the other hand the landlord will drive as hard a contract as possible because he knows that many tenants do try to cheat him.

Better relationships between the tenant and the landlord must depend upon honest dealing between the

two parties according to contract arrangements, and this can never come about in the present atmosphere of mutual suspicion.

General Conditions Relating to Tenancy

With certain exceptions, the living conditions of the tenant appear to be inferior to that of the owner farmers, who as a rule inherit their residences. The homes of the tenants are usually smaller, less well built, less hygienic, and made of a poorer quality of materials. It also appears that they, or their children, are not so well educated. Just to what degree this holds true needs further study. Such conditions do not imply that the tenant is a man of inferior character to the owner. Report after report brings out the fact that the owner is usually a man of less substantial character than the tenant. The owner inherits his land and therefore has not had to work so hard for a living and this results in his using more money, in many cases, for bad habits than the tenant does. This larger percentage of owners than tenants with bad characters is an important fact to be noted by those who are interested in social welfare in rural districts.

Conclusions

Probably no one fully acquainted with the problem of land tenure in any country would advocate the elimination of that form of tenure called tenancy, because there are too many situations where the owner of a small amount of land finds it expedient to rent it to someone else, and where a person without land desires to rent rather than own land. The problem, essentially, is one rather of eliminating the evils existing in the landlord-tenant system. While much can be done through the slow process of education of landlords and tenants, still education in itself and of itself does not change character, and for more rapid results it would appear that an enlightened government could do much through governmental regulations, well-enforced, to bring about the elimination of the main evils.

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The fundamental trouble back of so many of the land tenure problems is that of the large holdings where the landlords do not personally supervise their dealings with the tenants. Probably a law should be passed and enforced looking forward to the elimination of all large land holdings. European history is full of instances of the breaking up of large estates, and it seems that China must do likewise. This is perhaps the most practical way of solving many of the tenant problems. Otherwise much detailed legislation must be passed and a large number of governmental officials employed to carry it out. Simultaneously with an act to reduce large landholdings there should be another making it impossible for individuals or groups of individuals to acquire large amounts of land.

Adequate credit facilities for industrious farmers to purchase land is another function of the government which, if provided, would do much to make it possible for farmers to become owners of the land they work.

What constitutes a fair rent is not easy to decide even when both parties are honest and desirous of making a contract in which an equitable rent is to be paid. Probably the best method of determining a fair rent is on the basis of the landlord and tenant taking receipts in the same proportion as they assume expenditures, whether such expenses be in the form of cash, such as seeds, fertilizers, hired labor, and the like for the tenant, and taxes for the landlord, or in the form of non-cash expenditures, such as the tenant's own labor or the landlord's possible interest on the money value of his land. Great care needs to be taken in giving as nearly correct values for the non-cash items as is humanly possible. This method of dividing receipts in the same proportion as expenses are incurred is a fundamentally correct one because it reduces all the variable factors, such as amount of labor expended on the crops, amount of fertilizer ap-

plied, and other intensive methods as well as the value of the land, which varies according to productiveness, to a comparable basis between the two parties.

While the assistance of the government would be invaluable in the establishment of fair rents, still a great deal of educational work among the farmers and landlords would need to be done. It is here that the Christian church could well function in promoting such a Christian virtue as justice, having always in mind that other ideal of a true unselfishness which is the surest foundation for happy relations among men. Such unselfishness, however, comes as the fruit of an educated conscience, and our problem as a Christian group is concerned with the question of how we can produce this fruit from this essentially human relation of landlord and tenant.

References to Numbers in Parenthesis in the Text

(1) The Statistical Report of the Ministry of Agriculture and Commerce of Peking for the year 1919 which gives land tenure by provinces.

(2) The unweighted average of data collected by J. Lossing Buck from 37 widely separated regions in China (1917).

(3) From farm management studies (1921-1924) made by the Department of Agricultural Economics and Farm Management of the College of Agriculture and Forestry, University of Nanking of 2866 farms located in seven provinces.

(4) The average of inquiries made by middle school students in their home villages under the direction of A. L. Carson of the American Presbyterian Mission at Weihsien, Shantung (1924).

(5) An Agricultural Survey of Kiangsu Province by C. C. Yuen of Southeastern University. The data are recorded by each inquiry made and six to eight

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estimates were obtained for each county (district). The averages were compiled by the Department of Agricultural Economics and Farm Management, University of Nanking.

(6) A Study of Farm Tenancy in the Counties of Quinsan and Nantung of Kiangsu and of Suhsien, Anhwei, China (1924), by C. M. Chiao, Department of Agricultural Economics and Farm Management, College of Agriculture and Forestry, University of Nanking. The method used in this study was to visit different sections of the counties mentioned and obtain estimates from groups of individuals thoroughly acquainted with conditions. In Quinsan all the eleven hsiang (townships) were visited and estimates from 77 people were obtained. At Nantung all of the twenty chu (large townships) were visited and estimates were obtained from 140 individuals. At Suhsien twenty-one scattered places throughout the county were visited and estimates from a total of 147 people were obtained.

(7) A Study of Chinese Rural Economy by C. B. Malone and J. B. Tayler, published by the Chinese Social and Political Science Review (October 1923 and April 1924).

(8) An Economic and Social Survey of 102 Farms near Wuhu, Anhwei, China (1924) by J. Lossing Buck. Published by the College of Agriculture and Forestry, University of Nanking.

(9) From data furnished by advanced students in the Department of Agricultural Economics and Farm Management, College of Agriculture and Forestry, University of Nanking.

Table 1. *Amount of farm tenancy in China.*

Region	Percentage of farmers who are		
	Owners	Part owners	Tenants
China (1)	59	18	23
China, 17 regions (2)*	64	17	19
China, 37 regions (3)	40	23	37
Shantung, 30 regions (4)	77	12	11
Kiangsu:			
Kiangling Tao (5)	50	23	27
Hu Hai Tao (5)	29	28	43
Soo Chang Tao (5)	22	28	50
Nantung County (6)	13	23	64
Quinsan Cnunty (6)	8	14	78
Anhwei:			
Suhsien County (6)	44	31	25
	Percentage of land cultivated by Owners:		by Tenants (including that rented to part owners)
Kiangsu villages (7)†	33		67
Chihli villages (7)†	89		11

*Separating these regions into North and East Central China the percentages are as follows: North China; owners, 73, part owners, 14, and tenants 13. East Central China; owners, 53, part owners, 21, and tenants 26 per cent.

†The number of local mow for the Kiangsu villages is 19,433 and for the Chihli villages 69,949.

Table 2. *Percentage of farmers who are owners, part owners, and tenants for selected countries.*

Country	Owners	Part owners	Tenants
China, 1919 (1)	59	18	23
England, 1914	11	?	89
Argentina, 1914	61	?	39
United States, 1920	53	9	38
Ireland, 1916	64	?	36
Japan, 1927	31	41	28
Germany, 1907	75	?	25
Denmark, 1918	92	?	8
Canada, 1921	86	6	8

Table 3. *Relation of types of tenure to size of farm for the counties of Quinsan and Nantung of Kiangsu, and Suhsien, Anhwei, China (1924).*

County	Size of farm in local mow		
	Owners	Part owners	Tenants
Quinsan	9.4	16.9	23.2
Nantung	10.0	11.0	11.8
Suhsien	33.9	47.9	90.3

Table 4. *Indices of prices of land, crops and rents for a number of places in China.*

ITEM	Indices for the indicated localities and years (1905 = 100)									
	Quinsan		Nantung		Suhsien		Nanchoa, Fenshe hsien, Kiangsu		Laian hsien Anhwei	
	1914	1924	1914	1924	1914	1924	1914	1924	1914	1924
Land values*	200	394	146	249	123	220	129	200	133	200
Crop values	162	288	155	272	158	246	—	256	—	—
Cash rent	—	—	207	316	81	153	145	261	150	250
Cash crop rent†	157	296	155	272	—	—	—	—	—	—
Share rent†	—	—	155	272	158	246	—	—	—	—

*The actual values per local mow in Chinese silver were $62 for Quinsan, $72 for Nantung, and $23 for Suhsien.

†Cash crop rent and share rent increase with the same rapidity as the value of the crops used in paying the rent, unless the quantity of the crops for rent changes.

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The Building Of A Rural Church

ORGANIZATION AND PROGRAM IN CHINA

J. LOSSING BUCK

IT is generally recognized among those familiar with the development of the church of China that the rural church presents problems peculiar to itself and as yet unsolved. To take only one instance, how frequently do missionaries and Chinese complain of the inadequate results obtained from the present very prevalent policy of placing in out-stations resident evangelists employed by a church organization other than the local one, and yet such evangelists continue to be employed, more because other methods have not sufficiently commended themselves than because the present one is satisfactory. This problem is but one of many in the development of a rural church whose purpose is to produce a consciousness of God and to exemplify the life of Christ in a community.

The rural church may be defined as a church located in a rural environment, as opposed to a church located in a city type of environment, which may be a city or a large market town. This definition may bring forth the query in some readers' minds: "Are there any rural churches in China?" To this question the answer is affirmative, although there is no information as to how many such rural churches exist. Certainly the number altogether self-supporting and with a resident pastor and self-governing must be surprisingly small.

The successful establishment of such a rural church cannot be accomplished without some attention to principles which may aid in successful church organization. For several centuries science has discovered laws which control many phases of physical phenomena. We are just now emerging into an era of discovery of laws which control individuals and the relationship between individuals. In other words, we are finding certain great principles which are classed under the name of sociology and psychology. These laws cannot be disregarded if one desires success in any undertaking having to do with human beings. That success has been occasional where there is no conscious knowledge of the underlying principles which produced it, is due to a chance use of the principles, and a thorough investigation would undoubtedly show that the waste from ignorance, where chance has not worked so happily is enormous.

Now a church organization is a group of human beings, a social group, bonded around the religious interest. No matter how saintly a religious leader may feel himself or his fellows to be, or may desire himself or his fellows to be, he cannot escape the fact that so long as spirits are clad in human flesh, people behave according to the laws of psychology and sociology.

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The purpose of this discussion, therefore, is to outline in a very elementary way a few simple principles which have been found essential in the experience of various rural leaders in the development of rural organizations in the United States, with the thought that what has proved constructive and useful among other human beings may prove helpful here as well. These principles briefly enunciated are as follows:—

1. The self-help principle.

2. Development of organization around a keenly felt need or interest and sponsored for the most part by the people themselves.

3. Activities which will keep the members loyal to the organization.

4. A unit of organization large enough to accomplish its aims, such, for instance, as the employing of an expert to assist the members in any way in which they need and desire such aid.

Application of these principles to the organization of the rural church.

1. *That the self-help principle is essential* to the healthy development of religious organizations has been ignored almost completely except in a purely theoretical sense, in the history of the Christian church in China. Church-workers have held as their goal the "self-supporting, self-governing, and self-propagating church," and then in the ardent desire to push the work forward to win souls, and to make some sort of a visible church organization, they have proceeded with methods which have delayed immeasurably the attainment of this goal.

Perhaps the greatest mistake in this respect has been the placing in a community a resident evangelist paid, and in most cases controlled, by some central church organization located miles away in a hsien city. Distance and the lack of well-directed supervision has resulted in very ineffective accomplishment and many evangelists have been kept in employment long after they have demonstrated their incapability to the local people whom they were supposed to serve. Such a policy as this delays and injures incalculably the Christian movement in a community. People in North China have nicknamed these men "making a groove in the bed" people (溝的炕) This situation is fully recognized by many church-workers, and yet it is allowed to continue with the hope that self-support will soon come about in some way or another, and solve the difficulty. But it is just this method of non-observance of the self-help principle which delays self-support—and so we go on indefinitely with the false hope that something will happen to bring a better day.

Fortunately, we have examples of mission work in China where the self-help principle has been more nearly followed.

In general terms, the self-help principle as used in mission work should mean, first, the winning of a few to the Christian faith in a given community, and second the nurture of this little group and the winning through their aid of additional souls. The little group may be encouraged to have its own Sunday services. As it grows it may eventually have its own church building, funds for which are raised locally. A pastor supported by the local group is often the goal although some church leaders do not consider a resident pastor essential or even advisable. In this method of evangelist work, which utilizes the self-help principle, outside stimulus is given, but buildings and a resident pastor must wait until the local group is large enough and anxious enough to finance and manage them.

The self-help principle is not concerned only with matters of finance and the routine of self-government. It must also be applied to the programme of activities of the organization. An agricultural extension worker in the United States tells of a home bureau where the home bureau agent did most of the planning for the monthly program of the bureau. The agent wondered why it was that the members of the bureau were not more interested in the work and why they did not turn out in larger numbers for the meetings. It occurred to the agent that perhaps it was because she had arranged the program by herself. Thereafter she left the entire program of meetings to the members and although they may not have seemed to the agent so good and helpful as were the programs arranged by herself, still the members turned out in much greater numbers than formerly and showed a far greater interest.

Some church-workers have found this to hold true for the church. There has been too much fostering of a stereotyped program of action and form of worship in the churches to develop the maximum amount of interest on the part of the members. This may be illustrated in one instance by the almost widespread use of foreign music and forms of worship in the churches throughout the country. If the self-help principle had been carried out all such affairs of the organization would of course have been controlled by the members.

Like most rules, however, this one of self-help has also its limitations. Organizations such as the struggling church do pass through a period when the need for development is strong but the ability to provide for the means of development is still lacking. The only answer to this is that such an organization may be subsidized temporarily with money, or preferably personnel, by a larger and central sister church as a home mission function. Such money subsidy should be limited in amount and length of time granted and the same applies to any personnel subsidy.

One requirement is essential in the subsidizing of organizations, if it is not to be harmful rather than helpful. First, the use of such temporary aid should not take from the new church any of its own

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independence. The way in which the money is to be used should be decided by the local group. It should from the first realize that the aid is only temporary and that therefore any activities which are begun with the aid of the subsidy should be such as it can manage financially within a given time. This subsidy may be given with various suitable conditions attached to it, and if the local church does not wish to fulfil these limitations, it need not accept the grant.

It is almost impossible to over-emphasize the importance of this point that the church should have power to decide how funds given it should be spent. Any other policy pauperizes and robs the local group of the very power to develop. At the same time the central organization has the final authority over its funds, for at any time that these funds are not being efficiently spent and agreements are violated, the money may be withdrawn.

The subsidy method is being used by a number of large organizations. The subsidy to the Farm Bureaus in the United States by the United States Department of Agriculture and by the State Colleges is a very good example of the efficient working of this method without any impairment of the local self-government of the Bureau by the farmers themselves.

The master key to successful rural church organization is that of self-help and this key when properly used will also make it much easier to utilize the other principles of organization.

2. **Development of an organization around a keenly felt need, or interest and sponsored for the most part by the people themselves.**

A local organization developed by a central organization without a real feeling of need for it on the part of the local people is in most cases a failure. In other words, one must begin from the bottom if one is to build a lasting institution such, for instance, as the rural church. It cannot be accomplished by any overhead method which for the moment seems to insure more rapid progress. The rural church must be a growth out of the feeling on the part of the Christians themselves of a real need for being banded together. The success of the Farm Bureau in the United States is quite largely due to the development of Bureaus by the farmers themselves. The farmers felt the need of improving their methods of farming and they believed that organization for the employment of an expert, the county agent, was the method by which it could be accomplished. As a result, we have many strong farm bureaus which could never have been formed except by this method of beginning from the bottom—from the farmers themselves.

Why do Christians organize themselves together into a church? In China where Christianity is only just beginning to obtain a foothold it seems to be quite largely because the representatives of the central church organizations have urged and even required Christians to organize themselves. A careful study would probably show that many churches have been organized before the Christians themselves felt any real need for it. What is the keenly felt need that the average Christian has that makes him want to organize himself with others? The Christian is told that he should become a member of a church for the purpose of publicly worshipping God. Perhaps the newly converted Christian is not conscious of this desire for public worship; perhaps he feels more keenly the need for getting alone for private worship with God. In a densely populated country like China it is not easy to be alone with God. It is pretty hard to close one's closet door and still be away from the hubbub of the family, village or street life. Christ made religion a part of everyday life. Perhaps the newly converted Christian would do the same thing if he had half a chance. Perhaps he would organize himself with the other Christians of the community into a church which had as its chief aim the worship of God not by word of mouth alone but by actually rendering needed assistance to other Christian or non-Christian members of the community. The important thing to remember is, that if we must have a church organization, and without doubt some form of organization sooner or later is desirable, let us not make the local Christians organize before they are ready of themselves to band together for some definite purpose or keenly felt need, and let us not decide arbitrarily on the form of that organization. The result then will be a local church which will live in the community, which will serve the community, and one in which the chief motive is not only "a duty to perform" in routine church and prayer meeting attendance.

3. **Activities which will keep the members loyal to the organization.**

It is an axiom that an organization without activities to hold the interest of its members is a dead organization. There is much talk these days about the decline of the church. The root of the difficulty lies in the fact that the activities of the church do not hold the interest of the members or are not sufficiently attractive to the Christian or non-Christian outside of the church walls. A successful organization must accomplish something very definite if it is to continue to exist and it cannot do this unless most of its members are actively participating.

The rural church has, perhaps, a more unique opportunity for including activities which will help to keep the members loyal than has the city church. The test of a Christian in the past has been largely attendance at church meetings and services, the daily reading of the Bible, daily prayer, the saying of grace at meals, the living of a moral life, and the conversion of other souls by word of mouth. Christ taught by example and deed that true religion includes the helping of others. The rural church can express religion more effectively by making constructive community service a part of the test rather than

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having its members confine their help to an occasional kind word or deed to the sick and the bereaved, important as these things are.

The rural church might, for instance, promote better agriculture and rural community improvement as a definite Christian act in itself. Agricultural missions, like educational and medical work began, in the minds of many, as an adjunct to the evangelistic work, with its chief function to make a point of contact for presenting the Gospel; in other minds it began as a method by which the economic level of the church members could be raised so that the church might become self-supporting. Those of us who are engaged in agricultural mission work feel that our work is as directly evangelistic as is that of the person who presents the gospel by word of mouth. We feel that helping the farmer to help himself by improving farming methods is a very definite Christian act. It is the Christian spirit of helping others which was so well exemplified in the everyday life of Christ and which He taught so clearly was the duty of his followers.

To the question, How can the rural church serve? the answer is, the rural church may be an active organization commanding the respect of the community and the loyalty of its members and it may be a truly evangelizing force when, in addition to its present traditional functions, it performs such Christian acts as:—

(1) Introducing improved seeds and encouraging its members to pass them on to a neighbour.

(2) Introducing into the community methods of controlling plant insects and diseases and encouraging its members to show their neighbours how to control their pests also. This will at the same time be a very great factor in overcoming superstition because the farmers universally believe that the gods send diseases and insects, and since fate has so willed it, there is no human remedy.

(3) Promoting the idea of rural co-operative credit and savings societies and encouraging its members to organize such a society and to include in it other reliable members of the community who may not be Christians.

(4) Teaching the correct relations between tenants and landlords to such an extent that the church members may put them into practice as a method of living one's religion in everyday life.

(5) Introducing to the community improved silkworm eggs and methods of rearing silkworms.

(6) Teaching the method of keeping accounts with the farm business which will enable the farmer to know why he lost or failed in some one or more of his enterprises and encouraging its members to help their neighbours to keep such books.

(7) Introducing wholesome forms of amusement and recreation, both for the community and for the home. We hear much talk about anti-gambling propaganda. The church is "anti" this and "anti" that but offers little in the way of a substitute. It is an axiom that to replace evil one must substitute good. If the church hopes to be a moral force in the community it must be the leader in various forms of amusement and recreation. No amount of anti-gambling literature laying bare the evils of the practice by itself will accomplish the desired end.

(8) Promoting public health and sanitation. The control of flies and malaria is a comparatively simple matter. A very large number of country churches and even chapels in the cities have privies which are every bit as unsanitary as those of the community. There is a saying, "Cleanliness is next to Godliness," and a strictly scientific investigation would probably find a very close correlation between the two.

(9) Promoting and even participating in the building of good roads. Church members can do a real Christian act by putting enough earth in the middle of the road so that water will run off the road rather than into it.

(10) Organizing flower clubs among girls and women for the beautification of the home. Again a careful study would undoubtedly reveal a very close relationship between beauty and true religion.

(11) Organizing schools for adult education and urging its church members to participate as teachers in such schools.

(12) Requiring of its members a truly Christ-like spirit, not as exemplified by word of mouth alone but chiefly by a life lived.

(13) Conducting rural community surveys for the purpose of finding out what problems the church should attack. The voluntary participation of every church member in helping to make such a study is again a definite Christian act in itself.

(14) Solving the various problems pertaining particularly to the country women, such for instance, as better rearing of children, better homemaking in all its phases, more leisure, labour-saving devices and the rudiments of education.

Not all of these things will be easy to do; perhaps not all should be undertaken by one church. If the church can get other organizations to help, well and good. But the church is responsible to its members and to the community to render these services. Many similar activities might be added to this list. When the church demands of its members Christian activities of the kind mentioned, one does not need to fear that the church will not be a living and active organization in the community and one commanding the loyal support of all its members and winning others to Christ.

5. A unit of organization large enough to accomplish its aim such, for instance, as the employing of an expert to assist the members in any way they need and desire.

Some church leaders are questioning the effectiveness in any country of the pastor served church of the West and feel it most unsuitable for the rural groups in China. However, all will agree that some kind of paid religious leadership is necessary. We must have religious experts whether they be pastors of local groups of Christians or religious leaders of an area comprising many local groups. We may consider then, two types of religious experts; the pastor of the local group of Christians, or the itinerating and possibly superintending pastor who serves several local groups.

The church which desires to have a church building and the aid of an expert, in the form of a pastor, immediately commits itself to a considerable expenditure of funds. The extent of the geographical area and the number of Christians within that area and their wealth will determine first whether or not it is possible to employ a pastor and construct a building and, if this is found feasible, the next consideration is the degree of training and experience that can be paid for in a pastor, and the kind of building that may be constructed. Since a group of Christians can probably get along better without a building than it can without a religious expert our discussion will be confined to the problems of getting the right pastor. It is of course evident that the more the training and experience of the pastor the greater the salary it is necessary to pay. Therefore, if the proportion of Christians and their wealth is the same, one has to decide between a small unit area of organization with a poorly trained, poorly paid pastor and a larger unit of area with a well-trained, well-paid pastor.

The size of the unit for the local group will, in most cases, have to be small enough so that meetings can be held as often as once a week at some common, logical meeting-place. This group cannot employ a pastor or construct a church building on the self-help principle until it is large enough to command sufficient resources. While awaiting such a time it may be best for it to unite, if possible, with other groups in employing an itinerating pastor until the group becomes large enough to employ its own pastor. Even the small churches that have pastors may desire to organize into a central organization with a highly trained person to advise with the local pastors and churches. If the Church of China is established and denominations do not function as such a hsien unit of religious organization, as the next unit higher than the local church may prove desirable.

The mapping of the rural community interests showing the extent and location of the existing religious, social, educational and political interests aid greatly in the determination of the extent of area that should be included in the local church organization and in pointing out the logical center for a meeting place. A study of the Yao Hwa Men market town trade area in Kiangling Hsien reveals eight worship areas (the temple and the villages from which people go to the temple to worship) within the trade area. In addition to this each hamlet or village has its own local shrine (土地廟). In no case do any of the villagers go to the market town for worship. This is significant in the light of the general practice of selecting the market town as the centre of Christian worship. The apparent failure of this market town centre as a logical one is brought out in an Evangelist Survey made by Presbyterians (North) in South China. An excerpt is as follows:—

"The conflict of policies between the market town chapel programme and the proposed village evangelization programme.

The market town chapel was designed to function in such a way that the village work would from the first be self-supporting. But the method of subsidizing the work of the chapel created a tendency adverse to the development of village work on that basis.

Christians developed the attitude of looking towards the market place for the expression of their Christian life instead of becoming members of the Church. Such religious life and activity as they had prior to becoming Christians were connected with their villages. There the temples and ancestral halls are located. On becoming Christians, the tendency was to draw them away from the village for the expression of their religious life.

In the future the village must be brought into the centre of thought. It has been proven pretty conclusively that the market town program alone or as the main part of the evangelistic effort has failed to meet the needs of the situation. Neither this Mission, nor any other Mission, nor any independent Chinese society have had solid success with the small market town chapel but only where there is a relatively large resident population. Where the town has few people and the main dependence is on the surrounding villages as feeders to the growing church there has been no marked success. Where Christian groups exist in and for a single village they are often strong, comparatively speaking. The church must go where the people actually live—where they have their homes and largest community interests."

The decision of extent of area must also rest on a number of factors, but assuming that a pastor is desired who will carry out the principles herein enunciated then Christians must employ much better trained men than are now available in most rural churches. This training requires more time or a different content than at present. Not all pastors can be or should be highly trained men. Expressing it in another way, men of different degrees of training are needed and a greater amount of work can be accomplished than if all experts have the same training. However, no matter what degree of training, every rural religious expert, to be successful, *must have an experience of country life and must have sympathy with and understanding of the farmer and his problems and attitudes.*

In addition to the religious expert's training in the knowledge of the Bible and his religious experience, he must have training in

methods of presentation. Since he is to work with farmers he must know enough of farming practices and of plant and animal life processes to enable him to advise the farmers and to bring to the community the assistance of experts for the solution of the particular problems found.

If our religious experts have not the requisite training for the carrying out of a Christ-like program of Christian service in the country, there is little excuse for steps not being taken at once to give such men the needed knowledge. The local Christian group desiring a pastor might better go without one than employ an inefficient person no matter how low his salary. It is probably possible to find men qualified to give the required preparation for country pastors and Bible women at already existing training centres; or at new ones which might be developed. It would not even be necessary to have additional funds. A readjustment of policy which would provide for fewer evangelists and those few better trained, for fewer buildings, and for no more expensive buildings, which often cannot even be maintained by the local church, would at once release funds sufficient to train adequately pastors and men and women evangelists. In some cases merely a re-organization of curricula in existing training schools and the elimination of some material now given to make room for subjects more practical for the rural worker, would solve the problem. Teachers could in many instances adapt themselves to this program; others would have to be replaced by better qualified persons.

In order to get the necessary knowledge and viewpoint the pastor does not have to have a four-year course in agriculture. A year's training should prove fairly adequate. Particularly important are courses in rural social and economic problems, general agriculture, recreation and amusement, first aid, public health and sanitation and one or two more technical courses in agriculture. A qualified man added to each seminary and Bible school could do much toward bringing about the training necessary, provided the rest of the faculty is in sympathy and places a reasonable emphasis upon rural work. Special attention should be given in Women's Bible Schools for the training of women evangelists in a knowledge of how to serve country women. Summer school courses, such as are given by the College of Agriculture and Forestry at the University of Nanking, are especially adapted for persons already in positions and for seminary and Bible school students. An increasing amount of printed matter is also becoming available.

If qualified religious leaders are provided who understand the self-help principle, who realize that a church, like any other organization, must be centered around a deeply felt need and must have activities which will keep the members loyal, and who perceive that the unit of organization must be large enough to command sufficient resources to accomplish its aims, there need be no doubt that a successful indigenous church will result.

Christian Missions in China may be severely criticized for their non-observance of these fundamental principles. Most organizations that are seeking the development of local units have experienced the same difficulties. Moreover, national agencies such as the Y.M.C.A., the Y.W.C.A., the Boy Scouts and the Camp Fire Girls in the United States have found that the small rural communities consider them as "alien" to the community. If this occurs within a country, one can understand the more readily how the Christian Church in China is thought of as "foreign." In speaking of the problems of such national agencies as mentioned above, Dr. Douglass* says:

"But communities frequently do not understand the efforts of the national agencies to secure standardized results by enforcing specific requirements, and feel that they are dealing with rigid overhead organizations rather than with adaptable and sympathetically helpful ones.

Again, while very generally absolving the local executive on the ground that he cannot help himself, communities suspect the national agencies of offering service in the promotional spirit and for the sake of laying a foundation on which they may carry on financial solicitation. Back of both of these attitudes is frequently the sense, already mentioned, of the externality of the national agencies. Personal contacts are inadequate with the bulk of supporting constituencies; and communities, especially the remoter ones, never get over feeling that they are dealing with alien and unfamiliar forces.

On the first point, there is grave doubt whether communities, on the whole, are convinced that the agencies are offering them their services on reasonable, equitable and generous terms.

The factual chapters of the report have presented what was called the problem of the naturalization in the rural community of organized work for boys and girls. As outlined in the Preface and as presented directly to the agencies, it was hoped to help them to see the seriousness of their problem as relatively alien forces with other major tasks, approaching rural civilization from without. The crux of the problem as formulated is how to get on the inside, so as to become an accepted and permanent part of the situation.

At this point the agencies most definitely revealed the assumptions explored in the previous chapter. They are acutely conscious that they are bringing an important contribution to rural life, both of vision and of technique. These gifts they are under the necessity of promoting by some version of deliberate organization, since, in the main, the work has not enjoyed the contagious spread of a spontaneous and self-propagating movement.

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* Douglass, H. Paul, How Shall Country Youth Be Served?
George H. Doran Co., 1926.

The facts as presented raised the essential issue of how such national agencies can enter into partnership with actual rural communities and their indigenous agencies on terms of actual mutual contribution to a common end, so that the communities become actually participants in the service of youth and no longer mere exponents and agents of values imported from without.

The outcome of the discussion may fairly be said to have identified the problem of naturalization as presenting a genuine, essential and serious issue. Its outstanding characteristics are the frequent tendency of the agencies to be so inflexible as to aggravate the sense of their alien origin; and, on the other hand, the tendency of communities to be so self-complacent and intractable as to make partnership difficult. The essential difficulties of the issue are great enough without further complication by competition among agencies within a given community."

As long as our local rural church is controlled by some central church organization there is no hope of its being considered anything but "foreign." Just the other day I was talking with a pastor about this problem. In effect he said that one could talk himself "blue in the face" about the Church not being foreign, but so long as he was paid by an outside organization the people could not be made to believe that there was no ulterior motive behind it all. With such an attitude on the part of the local people there is little hope for a prosperous rural church. The honest evangelist realizes this, too, and he would be only too glad to adopt the self-help principle if he knew how. The self-supporting church will come quickly when the religious leader is trained in such a way that he will really help his flock so much that his services will be willingly paid for. Few pastors can get self-support in return for words, words, words. None will fail to build a self-supporting church when they have made themselves indispensable to the community.

Yet some may feel that all this has little to do with the Christian message; but Christ never enunciated a simpler or truer or more effective principle than when He said: "Let your light so shine before men that they may see it and glorify your Father which is in heaven."

This does not mean at all that bug-a-boo of some church workers, "a gospel of good works which is not unto salvation." It does mean that if we have any light within, either as individuals or as a church, we should obey Christ and shine forth into activities which will make men believe in and glorify God. There has not been a great deal of the glorifying of God in communities where Christian churches have been established, and the essence of all the reasons for it is summed up just here, that men have not seen any light shining forth, and therefore have not been aware of any necessity for glorifying God. However "saved" we may feel, and however full of personal belief in Jesus as our Savior and however we may spend ourselves to preach the cross, it avails little, if we do not practice the cross, and really do something whereby men may see God.

And in order to follow this injunction of His, which Jesus Christ gave us as a prime method of leading men to believe in the gospel, it is necessary to discover what the man in the rural community needs, before we can help him. In the past missionaries and Chinese evangelists have been assigned to country fields almost entirely regardless of whether their previous experience was in city or country and with little consideration as to whether or not they were suited for country work. The religious worker in the country should have nothing less than the best training, which is specialized training, and until this is provided we shall continue to wonder why the rural church does not prosper more abundantly and bear the fruit of a good tree.

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[*From "The Chinese Recorder," June, 1920.*]

Agricultural Work of the American Presbyterian Mission at Nanhsuchow, Anhwei, China 1919

J. LOSSING BUCK

A YEAR ago this November (1919) the first agricultural class in over four thousand years of the history of Nanhsuchow was held for some of the more interested landowners of this place. Twelve men registered in the class, and there was an average attendance of nine throughout the course, which was given for two months one hour a day. A fee of one dollar was charged. Mr. Shao, who has had work in the Nanking College of Agriculture, did most of the lecturing, and both he and I took part in the practical discussions. The men kept up their interest throughout the course, in spite of the fact that most of them were taking it in addition to other duties. That they valued the knowledge received can be seen from the fact that some of them wanted us to start another short course for farmers. This was not possible on account of Mr. Shao's having taken a position with the government school and there being no other available Christian man trained in agriculture, who could handle the work. The class showed its appreciation of our efforts by giving us a feast. Perhaps one of the greatest drawbacks to the course was the lack of any available books in Chinese on general agriculture. The class even wanted us to get out a book so that they might purchase it.

The class undoubtedly precipitated the formation of an agricultural society, the idea for which had occurred to some of the members even before the class had started. Some of these men were responsible for getting the society started, but unfortunately they wanted to start something "big" and invited the officials of the town to participate also. After over one hundred members had been secured they held their meeting for election of officers. At this gathering the magistrate himself appointed a military man, who resides at Pengpu, as president of the organization, and some other military man as vice-president. This military president, having his hands full

with other things, as well as having little interest in the real improvement of agriculture, naturally was not the man to make the organization amount to anything. Beyond renting a building and hanging out a sign the only thing evident that was done by the society was the putting up of notices last spring saying that they would help to protect the farmers' crops from thieves and urging everyone to plant more trees. Upon inquiry, it seems that the society has accomplished nothing of importance and has made no serious effort to do so.

Three weeks ago the former members of last year's class, at our suggestion, decided to form an agricultural club with the idea of meeting to discuss together agricultural topics as related to local agriculture, with the idea of trying to work out some of the more up-to-date methods on their own farms. We are discussing such subjects as "The Improving of the Fruit Industry"; "The Improving and Enlarging of the Poultry Industry" (this topic was discussed owing to the great demand there is for eggs by the egg factories of this and other places); and "What can a Farmer do during the Winter Months besides idling away his time and gambling away his money." The Club has great possibilities and we hope it will be a large factor in the dissemination of new ideas and practices among the farmers as well as a means of keeping hold of these men themselves.

We are planning to give an agricultural short course in January for farmers who can read. There are not many farmers who can read, but owing largely to the recommendations of the members of last year's class, we already have ten men who want to take the course.

We have set twenty as the maximum number for this course. These men are coming in from widely separated districts of this region and have quite large holdings of land themselves and it is hoped that some of them will be influential in bringing about desirable changes in the agriculture of their immediate locality. Mr. Lei, a graduate of the Paotingfu Government Agricultural School will assist in giving the course.

Perhaps one of the most promising things of the year is the fact that Mr. Hwang, a young man who was in last year's class and who owns a considerable amount of land, has taken some of his land back from his tenants and is farming it himself. A year and a half ago, Mr. Hwang when asked:

"What is your business?" replied, "To get up in the morning, eat, and go to bed again at night." In other words, he was one of the many who are loafing and who have no interest in life. Mr. Hwang is a member of the church at Nanhsuchow and we have all been interested in seeing him make something of himself. It seems now as though farming would be the factor to bring this about. He has spent considerable time with me, getting advice about the use of a foreign harrow, and would probably buy one if we had one that we could demonstrate to him and if we or some agent in Shanghai had one on hand for sale.

Mr. Hwang is now conducting, on our suggestion, a co-operative fertilizer experiment with wheat. He has over half an acre devoted to this experiment with eighteen different kinds of fertilizer tests. It is the same experiment we are conducting on our own land and the two will help to check up results. Mr. Hwang's neighbors have little faith that he will make a success of farming. When preparing the ground for the fertilizer experiment, some one of his neighbors asked, "What are you doing, getting ready to plant melons this time of the year?" (Melons are planted in small patches and considerable care is taken in applying a good deal of fertilizer.) Most of Mr. Hwang's neighbors are laughing at him now, though some of them admit that making a fertilizer test is a good thing. We are looking forward to a few years hence, when these same farmers will probably be copying some of Mr. Hwang's farming.

Mr. Wang and Mr. Gwoh, also members of last year's class, who have been interested in the improvement of agriculture for some time, are trying out some of the things they have learned. Both planted a considerable quantity of locust seed this past spring for the purpose of starting a farm woodlot this coming year. Mr. Gwoh has already started part of his woodlot with other trees this past spring. Mr. Wang has been also co-operating in the testing out of new grains and grasses for this region.

This type of extension work with the farmer will only be productive of the best and largest results, first, when it is possible to secure properly trained Chinese assistants; second, when enough experiment work has been carried out on our own farm to know what are the best farm practices to advocate for this region and what seeds, both new and selected, are best

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adapted to local conditions. And Nanhsuchow is not the only place where the lack of trained agricultural assistants is felt. All mission stations wishing to try out the type of work that is now being advocated and carried on by the Church and Country Life Movement of the Presbyterian Board of Home Missions in the U.S.A., find themselves absolutely prevented in doing so by this same lack of trained men.

The experiment work for the year has consisted largely of the following. The results are not given in most cases because nothing definite can be decided until the experiment has been carried on for several years.

A variety test (rod row method) with sixty-three varieties of different lots of wheat obtained from widely separated regions in China and from America and Japan.

A variety test (plat test) with eight varieties of American wheat and two local varieties.

The difference between the lowest and highest yielding wheat was eighteen bushels per acre. The American wheat is practically the equal of local wheat in yield and it has the additional advantage of having a stiffer straw and also more of it. However, it seems to be more easily affected by rust and hot dry winds than the local varieties.

A variety test (rod row method) with twenty-six varieties or lots of barley secured from different places in China.

Seed selections of local wheat and barley were also made in the spring.

A variety test (plat method) with twenty varieties or lots of beans secured from different places in China.

A variety test (rod row method) with eighteen different lots of sesame secured from different places in China.

Seed selection work with one hundred selected sesame plants planted by the plant to row method.

Mass seed selection work in the sesame fields this fall.

A fertilizer test is being made with wheat for this coming year for the purpose of finding out which elements or combination of elements are most lacking and to determine which of the local fertilizers are best adapted for use in this region. Eighteen plats of 1/26 acre each are being used for this test.

A cultural experiment with four plats of wheat has been started.

A cultural experiment with five plats of local cotton was also carried on this past year.

The following crops were also tried:

Eight varieties of American cotton (in co-operation with the Nanking College of Agriculture) with the result that the Trice

variety is by far the most promising and will probably outyield the local varieties.

Five varieties of American corn, all of which are promising.

Australian salt bush and a leguminous plant from Tsingkiangpu, Ku., for the purpose of growing in alkali soils which are quite frequent in this region.

American sweet potatoes which proved to be much sweeter and better eating than any of the local varieties.

Various foreign vegetables.

Eight varieties of grapes.

Alfalfa from native seed. Alfalfa will grow well in this region but for some reason the farmers have never planted it. The probability is that the farmers will have to plant it in the near future, owing to the scarcity of the wild grass which is commonly used. One farmer who planted some alfalfa in co-operation with me is quite enthusiastic about it.

Gatami and Smyrna varieties of spring barley gave good yields and are promising for low land which is too wet to be plowed in the fall and which is usually dry long enough in the spring and early summer to produce a crop.

Oats for soiling or for hay is also a crop which could be grown on such land to advantage.

The amount of agricultural work done this past year was seriously limited by the necessity of building the agricultural residence (farm house in other words). Building in China is an entirely different proposition than it is in America owing to the fact that there are no reliable Chinese contractors and to the fact that most of them have to be told how to do a great deal of their work.

The fact that no trained Chinese agriculturist could be secured to help between the months of February and September also seriously handicapped the work.

However, the outlook for the future is very bright and we are more encouraged than ever with the opportunities offered the agricultural missionary in China. The greatest drawback is the matter of funds, which for the present must come from the United States. The Chinese will have to be shown first before they will be willing to offer any pecuniary assistance and this doubly so in a locality of such "good for nothing" officials as we have here.

One might ask, "Why don't we secure funds for the Department by growing crops and produce for sale and in this way be a little easier on the pocketbooks of others?" This might be all right if earning money was all that is expected of

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us. It is pretty hard to earn money to run a department financially and at the same time accomplish much in the way of education among the farmers. It is undoubtedly a great deal easier for many at home to earn this money and in much larger amounts than it is for us out here in a strange land.

As one looks forward to this year's work, it is with the hope that everyone concerned will realize that the results to be obtained from the agricultural work are directly in proportion to the amount of support given. Just now we are in the position of the poor Chinese farmer agriculturally, who can never get ahead because he has too limited an amount of land and capital with which to work, or like the American farmer who has such a small amount of land and capital that his income is proportionally small. The reason for this is apparent for one must have sufficient land if one is to make farming profitable. If this amount is too small the farmer cannot use his animals, labor, or tools to good advantage.

In our own case, if we have too little land we cannot work to advantage either. For instance, if we only have enough land to carry on seed selection work with wheat and sesame, we cannot do any improvement work with the other important crops of the region. Neither can the Chinese assistants work to advantage. The assistant who does the selection work with wheat and sesame could also do the selection work with some of the other crops since most crops have different ripening seasons, and thereby use what might otherwise be idle time. Take another instance. At present we have not enough land to warrant the purchase of labor animals. On the other hand, if we rely on hiring animals it is difficult to get them at the time the work should be done and then it is hard to get the work done well because any one whom we hire with the animals is not interested in doing other people's work well.

There is also the question of securing farm implements and tools and machinery for demonstration to the farmers. As yet it has been impossible to get any of the Shanghai agencies for American machinery to loan this Department samples of the more simple and more likely to be used implements. Unless the companies themselves will loan samples for demonstration work as an advertisement for possible future sales, it will be necessary to purchase them outright and this cannot be done with present funds. Just at present there is considerable interest in the matter of irrigation in this region because of the

crops suffering from the drought of the past three years. We would like to purchase an irrigating pump that is used considerably in Shantung, and also a windmill pump that is in common use in Kiangsu near Yencheng. Each of these costs about $75 in addition to the expense of getting them here, so that it is out of the question to secure them with present funds. These instances of where this Department could be of help to these people can be multiplied by the dozen. Another important question is that of the purchasing of a bone mill for grinding bone fertilizer for this region. There is, of course, a limit to what the Department should undertake, but on the other hand, it is important to do something besides talk to these people if we expect much in the way of results. They must be "shown" before they will take up a new idea. One can talk a whole week to a class of farmers about the importance of using a horse cultivator, but all this talk would not be worth near as much as five minutes spent demonstrating an actual cultivator working in a near-by field.

If the government would carry on good experiment work in this region we could then use all our time and money on extension and educational work. However, since that is not the case, nor is it likely to be the case, and in view of the fact that farming conditions are similar for a large region about us, anything we do here in experiment work will be of wide service. Such work is also necessary for the proper carrying on of extension work among the farmers.

We have the opportunity! If to this we can add the necessary funds and personnel, results can be secured which will enable many of these people to live a better and more contented life. Moreover, new opportunities will be presented for the winning of these same farmers to a faith in our Saviour Jesus Christ.

Is the work worth while? If so, then it is worth putting on an efficient basis.

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INVESTIGATION OF THE ECONOMIC AND SOCIAL CONDITIONS OF 150 FARM WORKERS IN HYEN SHAN HSIEN, HOPEH

See bulletin in English #13

河北鹽山縣一百五十農家之經濟及社會調查

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河北鹽山縣一百五十農家之經濟及社會調查

農業經濟　卜凱著
農場管理系
鄉村社會　孫文郁譯

第一章　緒言

第一節　調查之意義及範圍

著者作此調查，其目的在就普通農區，普通年成，而攷察各農家成功與失敗之各種主要因素。此種因素，如能悉心研究，該農區內多數農家之農場週年出入狀況，皆可得其梗概。本調查着手之初，即採用本科編製之農家週年出入調查表，由本科三年級生崔君毓俊，在其本鄉河北鹽山縣之三個農莊，親自查填一百五十份之調查表。所調查之時期，自民國十一年四月一日起，至十二年三月三十一日止。表內所有問題，皆通俗易解，毫不予農人以疑難。各問題之間，猶能彼此對證。如有錯誤，極易發見。又調查問題之範圍，除直接關於農場者外，尚有間接影響於農業成敗之問題，舉凡人口，教育，道德，嗜好等等，亦皆在研究之列。

本調查內之農場，無例外畸大畸小者，而所調查之家數復多，確足以代表該地之農業情

形，茲將所調查之村莊，及其家數等，列表於次：

第一表　調查之來源

村名	村內共有之農家數目	村內所調查之農家數目	距鹽山縣城之方向及距離
吳家莊	九二	八五	東　二里
郭家莊	一二七	五六	東北五里
楊帽莊	一八	九	南十八里

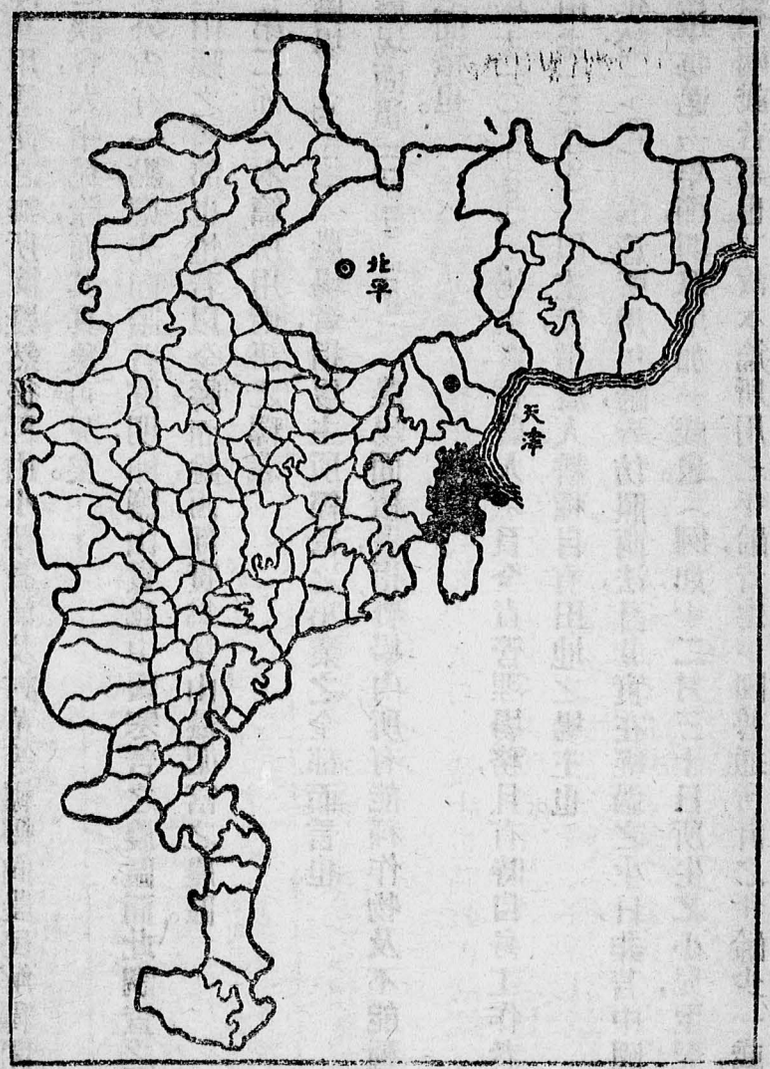
當調查時，確曾經過種種困難。最顯著者，爲一般農民，懷疑本調查之用意，懷疑之點，大約有以下諸端：

一、此調查爲將來增加稅捐之根據；

二、此調查爲將來辦賑之預備；（前華洋義賑會賑災之初，曾經調查一次。）

三、此調查爲將來曹錕被選總統後收買土地之根據。（因當時民間，有曹錕舉爲總統後，將收買河北全省之土地，使農民皆爲其佃戶之謠。）

因有以上種種誤會，故調查者，不得不變更方法，先與較開通之小學教員及村董等，詳細



第一圖（甲）　河北省分縣詳圖（黑色地域即鹽山縣治）

解釋其用意，使之無所懷疑。然後再由小學教員及村董等，輾轉向農民解釋開導，如是則農民之誤會，大半免除，而其真象可見矣。

此外尚有一點，應先向讀者聲明，卽鹽山實爲中國寒苦之農區，而此調查之範圍，復僅限於鹽山縣之西部也。惟若以全縣而論，西部實爲鹽山最肥富之農區。

第二節　本篇所用術語之釋義

「農場」(Farm)　農場者，指場主所經營之事業之全部而言也。

「農場面積」(Farm area)　農場面積者，指農場內所有能種作物及不能種作物共有之土地面積也。

「場主」(Operator)　場主者，指農人之負全責管理場務，且有時自身工作者也。

「田主」(Owner)　田主者，指農人耕種自有田地之場主也。

「年齡」(Age)　本篇所用年齡，皆仿照西法，計其實在經過之生日，非若中國習慣上，以年爲標準，每遇一年節，卽算增加一歲也。（例如十二月三十日所生之小兒，至翌日正月初一，卽稱爲兩歲者是也。）故本篇所用之年齡，皆比中國普通所計之年齡少一歲，中國年齡有稱周歲者，其意義卽與西法相等。至年齡之小於一歲者，卽以月計之。

注：譯者按著者之採用西法年齡也，因人口問題，爲現代各國社會學家最注意研究之問題，而所用年齡，皆以西法計算，故本篇之採用西法，純爲便於比較及印證耳。

「成年男子單位」(Adult-male unit)　成年男子單位者，不以人口數目計算，乃將男女老幼，皆化爲成年男子之標準，而用以測量各家人口之多少也。此種方法，爲愛特華特爾氏（Atwater）所發明，故名曰愛特華特爾標準。其標準如下第二表：

第二表　各組年齡各類性別之人稱化爲成年男子單位之計算標準表

年齡		兩歲以下	兩歲至五歲	六歲至九歲	十歲至十一歲	十二歲	十三至十四歲	十五至十六歲	十六歲以上
等於成年男子單位之數目	男	○·三	○·四	○·五	○·六	○·七	○·八	○·九	一·○
	女	○·三	○·四	○·五	○·六	○·六	○·七	○·八	○·八

「工人等數」(Man equivalent)　工人等數者，乃一標準單位，用以測計農場內工人之多寡也。每一工人等數，卽指一年十二月中常在農場工作之一人也，

2000
3429
0325

「人工單位」(Man-work unit)　人工單位者，乃指每一工人，在一日十小時內所能成就之工作量也。此單位乃用以測量工人在農場內對於生產工作效率之高低者。

「家畜單位」(Animal uuit)　家畜單位者，乃以黃牛爲一種標準單位，其他各種家畜，皆按其食量及所產糞量，化爲一家畜單位之倍數或分數，如大猪五口，小猪七口，馬一匹，騾一頭，驢兩頭，及水牛一頭之三分之二，現皆認爲一個家畜單位。

「畜工單位」(Animal-work unit)　畜工單位者，乃指一役畜單位，在一日十小時內所能成就之工作量也。此單位乃用以測量役畜在農場內對於生產工作效率之高低者。

「牛」(Oxen)　牛皆指黃牛而言，不分公母。所有母牛，亦非爲產乳之用。蓋中國普通農人無專營乳酪事業者，鹽山亦猶是也。

「第一季作物」(First crop)　第一季作物者，卽在一年之植物生長期內，第一次生長在田地中之作物，且在同年內第一次在該田地中收穫之作物也。例如小麥雖種於上年之秋季，但爲翌年該地中第一次收穫之作物，故爲第一季作物。又如高粱種於春季，穫於秋季，且爲該地一年內僅有之作物，故高粱亦爲第一季作物也。(可參看第二季作物之解釋。)

「第二季作物」(Second crop)　第二季作物者，指第一季作物收穫後，再在同年同地所種植且收穫之第二次作物也。譬如黃豆常種於小麥之後，黃豆卽第二季作物之一例也。

「作物面積」(Crop area)　作物面積者，指農場內能種作物之實在畝數也。

「作物畝」(Crop mow)　作物畝者，指農場內各季所有共種作物之總畝數也。普通多數土地，每年皆可種兩季作物，則此能種兩季作物之作物畝數，當二倍於實在之作物面積。按本調查一作物畝，祇合到六分五厘七毫之作物面積也。

「家」或「家庭」(Family and household)　家或家庭，係指同居共食，且共同生活所包括之人稱之總名詞也。多數農家，除場主夫妻子女以外，尙有場主之弟兄叔姪及傭工等，亦得包括在內。

「家庭進款」(Family income)　家庭進款，乃指一年內全農場之現款收入，(家用農產物品不計值)減去一年內全農場之現款支出，再加他項收入之總進款也。此項進款，純係現金，可作家庭用費及儲蓄等用途。

「家庭賺款」(Family earnings)　家庭賺款者，乃指一年內全農場之收入，(家用農產

物之價值亦算入）減去全農場內除家工折款外之支出，（即現款支出）然後再加他項收入之總款也。

「農場賺款」(Farm earnings)　農場賺款者，乃由一年內全農場之收入減去一年內全農場之支出，再加家用產品之價值也。換言之，卽農場進款（按美國常用此名稱，卽場主之資本，及人工所得到之進款也。）加家用產品之價值也。

「場主工價」(Labor earnings)　場主工價者，乃指農場收入除去農場支出（卽用費）及所投資本應得之利息外之所餘者，卽爲場主之工作及管理，在一年內應得到之報酬也。於計算資本應得之利息時，所用之利率，爲年利八厘。按八厘爲銀行界普通所用之利率，農人如售其所有，存入銀行，亦能得到此種利息。至鹽山當地所用之利率，常高於此數，是不可據爲定律也。

普通資本，包有以下各項，如田地，房屋，農具，牲畜等皆是也。除場主外，不費現款之家工，亦估計其值，算在支出項內。家庭自用之農產物品，亦算在收入項內。

場主工價之用途，似較場主工作進款爲適當。在美國場主之工作進款，乃指場主之躬自操作及由其管理能力所得到之進款也。至家用產品之價值，並不算爲收入之一項。在中國則不然，農家人口較多，而家用產品之數量亦甚大，若不計算家用產品之價值，殊難代表場主之工作，及管理所得到之進款，故本篇多用場主工價，以代場主工作進款。

「場主工作進款」(Labor income)　場主工作進款，如上所述，其與場主工價不同之點，卽不計家用產品之價值爲收入也。

「工作報酬」(Labor returns)　工作報酬之性質，與場主工價同。惟工作用費，皆不計算，且以全農場之工人等數計算，不僅場主個人也。

「平均數」(Average)　平均數者，指所列各數中之均數，或稱爲數學平均數者是也。故所列各數之變更，皆能直接影響於此平均數。「單平均數」(Weighted average)（或稱爲較量平均數）之數目，皆於本篇內特別標明。其計算法，係由總數量中平均而得，並非各數平均後之總數也。「複平均數」(Average of averages)則僅係各平均數之平均，例如每農場每畝之贏利，係由各農場每畝平均之贏利相加後，再以農場之數目除得者也。（參看本篇第

四十一表，即可見出單平均及複平均之差異。

「均數」(Mean) 均數者，與數學平均數之意義相同，惟名稱不同耳。

「中位數」(Median) 中位數者，乃一組數目，依大小次序排列，居乎當中之一數也。

「密集數」(Mode) 密集數者，乃一組數目中佔最多數相同之數目之值也。

「混合相互關係」(Multiple correlation(R)) 此乃表明一種因數與其他各種因素二者間之相互關係程度也。

「部分相互關係」(Net, or Partial correlation) 此乃表明三因素以上，一因素或數因素消除後，所餘兩因素間之相互關係也。

「或差」(Probable error) 或差者，乃一種數目，用以表明所得結果之眞確程度也。普通常有正負兩種符號，附於該數目之前。設若四倍或差之數目，再在所得結果數目內，分別加入之，減去之，而成爲大小兩極限數目，凡與此同類之他種調查數目之任何數目，能出此大小兩極限數目範圍之外者，蓋百不得一焉。

「相互關係之函數」(Correlation coefficient or gross correlation (r)) 相互關係之函數者，乃一種數目，用以表明兩種因素，或兩組數目互相關係程度之高低也。此函數不得高於正一，(十一)或低於負號一。(一一)函數之數目愈近於正一或負一者，表明其正面或反面之互相關係愈高。若此種函數高過百分之三十時，(0.30)即可認爲關係重要。

「變量之函數」(Coefficient of Variability (C)) 變量之函數者，乃一種數目，用以表明一因素，或一組數目，高下相差之大小也。此函數可作各種因素相互比較之用，且爲測算各種數目變量之最好單位。

「標準變量」(Standard deviatiou) 標準變量，係一種數目，用以測計一組數目中各數大小相差之限度也。於均數內加入標準變量，再於均數內減去標準變量，成爲大小兩數，而此大小兩數間，至少須包容該組數目中百分之八十也。

「度量衡制度及幣制」(Weights, measures and currency) 鹽山所用之度量衡之比較如下表：

鹽山度量衡標準	與以下各標準制之比較			
	部定標準	美國權度制	萬國權度制	

一畝	一・三一四〇五畝	英畝	○・一九九五一	英畝
一石	一・八一四九九石	英斗	五・三三三三三	英斗
一斤	一・〇一三三三斤	英磅（常衡）	一・三三三三三	英磅（常衡）
一兩	一・〇〇〇〇〇兩	英兩（常衡）	一・三三三三三	英兩（常衡）
一里	一・〇〇〇〇〇里	英里	○・三五七九〇	英里
			○・〇八〇七四	公頃
			一八七・九三六四三	公升
			○・六〇四七七	公斤
			三七・三三三二四	公分
			○・五七五九	公里

一斤活猪等於二十八兩。

一斤普通農產物，皆等於十六兩。

一石小麥等於二百四十斤，蓋石爲容量之石，非一百斤爲一担也。十斗爲一石。

一英畝等於五・〇一〇二二鹽山畝。

所有價值，統以銀洋計算。例外者皆隨時特別標明，該年平均兌換市價，金洋一元，約合銀洋一・八四七九元。

第三節　鹽山地方上之自然狀況

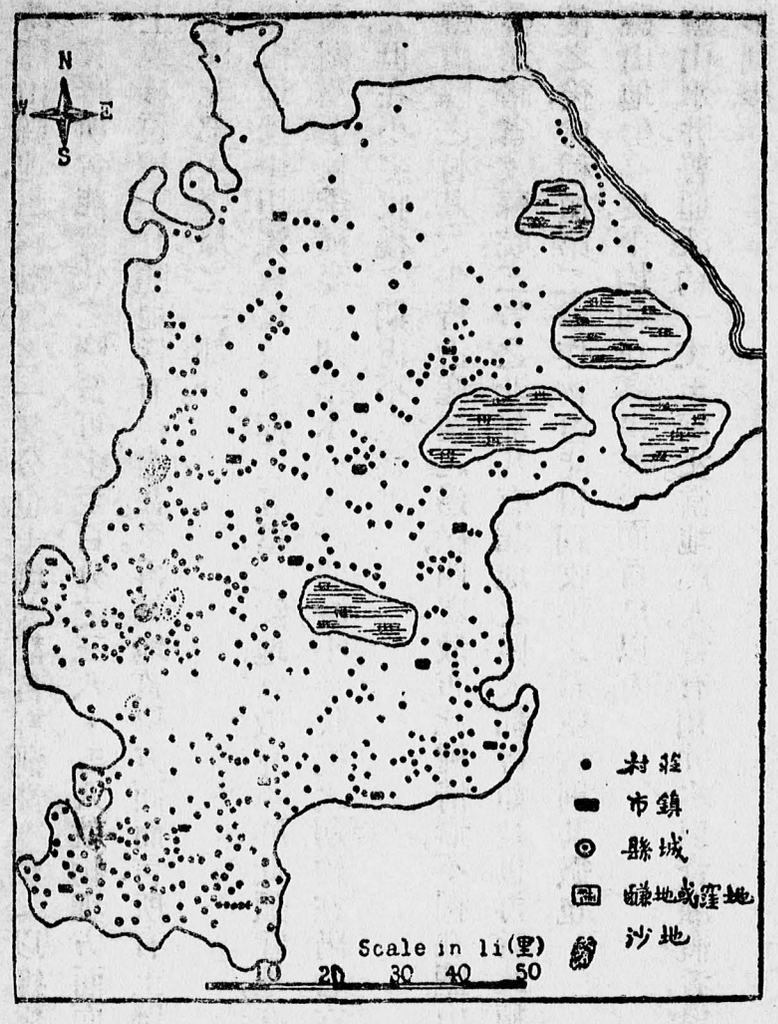
鹽山縣居河北省之東南，當北緯三十八度，及東經一百一十九度之間。東北接連渤海，蓋昔時鹽山縣地，實爲渤海之一部分也。土壤大都含有硝性鹽類，（以綠化硝及硫酸硝爲最多，）有時所含能溶化之鹽質，可多至百分之三八・五八。就物理方面而言，土壤大抵屬細砂土，或砂質壤土，且隨地皆有鹹灘甚多。再就地質學方面而言，所有土壤，皆係冲積土，且同屬中國北部大平原之一部分。

鹽山地勢平坦，深數尺及直徑三五里之窪地，常數見不鮮。此類窪地，在夏季收儲雨水，則變爲湖沼，至秋季種麥之期，積水亦逐漸涸減。小麥收穫之期，約在陽曆六月中旬，夏季雨水雖大，但在小麥收穫之期，尚不至爲害。

鹽山縣之村莊，大半皆沿窪地之邊緣，四處散布。此種情形，不獨在鹽山爲然，且足以代表冀魯豫諸省及蘇皖二省之北部，凡有窪地之區，大都皆如是也。再者此類窪地，雖常於小麥收穫之後，尚種植第二季作物，但能得到收穫之希望者，則甚微也。

鹽山地勢高度，平均約在高出海平面百尺以內。

鹽山水井，普通深約一丈至兩丈。當地農人，嘗有用井水以資灌溉者，但因水內含有鹹質，害多利少。



第一圖（乙）

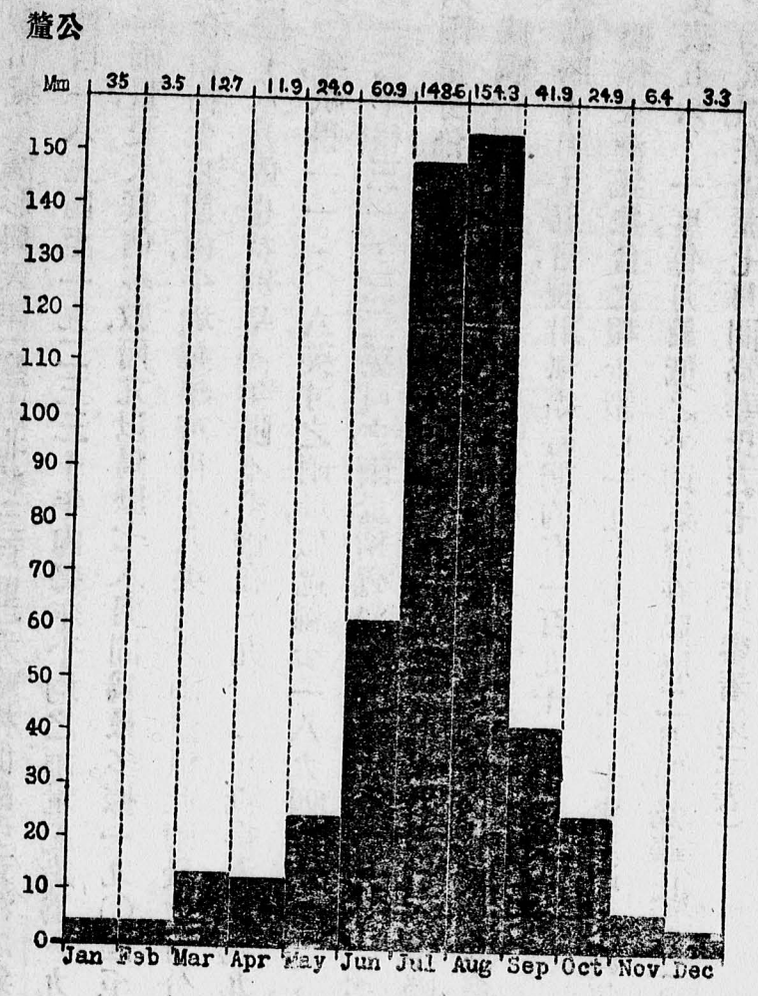
鹽山縣全圖

本調查之一百五十農家，卽在圖中有黑點圈成之三村中。其餘各村，因本縣鹹地甚多，故其分佈之疏密，恆不一定。各村中之聯絡，概係土路，石路並不多見云。

鹽山氣象情形，與天津（鹽山北，約三百里。）大略相似。故引天津之氣象報告以示一斑，據天津自一八九四至一九二三三十年內每年平均之雨量紀錄，爲一九・三五英吋。一年內所降雨量，夏天實佔多數，而尤以陽歷七八月間爲最多。據一九〇四至一九一〇年之紀錄，謂在作物生長期內，平均每年可得十八英吋之雨量。但此雨量之百分之六十一，則係降在陽歷七八月內也。特別旱澇年限不多，惟在一九〇二年，祇得九・九九英寸之雨量，在一九二〇年，祇得一一・〇六英寸之雨量，似過稀少；一八九四年得三〇・五英寸之雨量，與一九一二年得三一・三二英吋之雨量，稍覺過多而已。惟每年雨量之多少，既不一定，而一年內雨量分佈之時期，又未能適合其度，故在鹽山境內，亦仍不免有旱澇之患也。

據調查，鹽山境內每年最晚之停霜時期，約在陽歷四月五日，而每年下霜最早之時期，約在陽曆十月十五日，統計無霜時期約有一百九十三天。

據徐家滙氣象台之報告，謂自一九〇七至一九一七年期中，天津每年之平均氣溫，爲華氏表五六・一度。每月最低之平均氣溫，在陽曆二月間，爲華氏表二八・八度。每月最高之平均氣溫，在陽歷七月間爲華氏表七九度。（參看第三表）



第二圖　自民國三年至九年間天津每月之平均雨量（單位公釐）

第三表　天津一九〇四至一九二〇年期內每月之平均最高及最低氣溫

（攝氏表）

月份（陽歷）	平均度數	平均最高	平均最低
一月	負四・一	一〇・八	負一八・七
二月	負一・八	一四・二	負一八・六
三月	四・七	一四・三	負一〇・三
四月	一二・七	三二・七	負二・五
五月	一九・五	四一・二	四・九
六月	二三・七	四一・九	九・四
七月	二六・一	四〇・四	一六・四
八月	二五・九	三九・四	一三・七
九月	二〇・八	三二・八	九・一
十月	一四・二	三一・三	〇・四
十一月	四・五	二一・七	負一二・一

	十二月	負二・四	一一・三	負一五・八
	全年	一二・〇	四一・九	負一八・七

據測計所得，在陽歷七八月內，可以得到百分之九十的强度之日光照射者。祇有日數之百分之二十至四十。但在其餘十個月中，則可得到百分之九十的强度之日光照射者，約爲日數之百分之八十。

鹽山之蒸發量甚高，因由大陸吹向西北之風甚大，且一年內之乾季，亦甚長也。

第二章　農場之組織

第一節　農場之佈置

吳家莊位於車道之旁，交通尙稱便利，農家皆在農村中，而田地則散在村外，各處距離亦不甚遠。卜列第三圖，爲一標準農場之布置式樣。至普通農家之出入門戶，則可見之第五圖中。

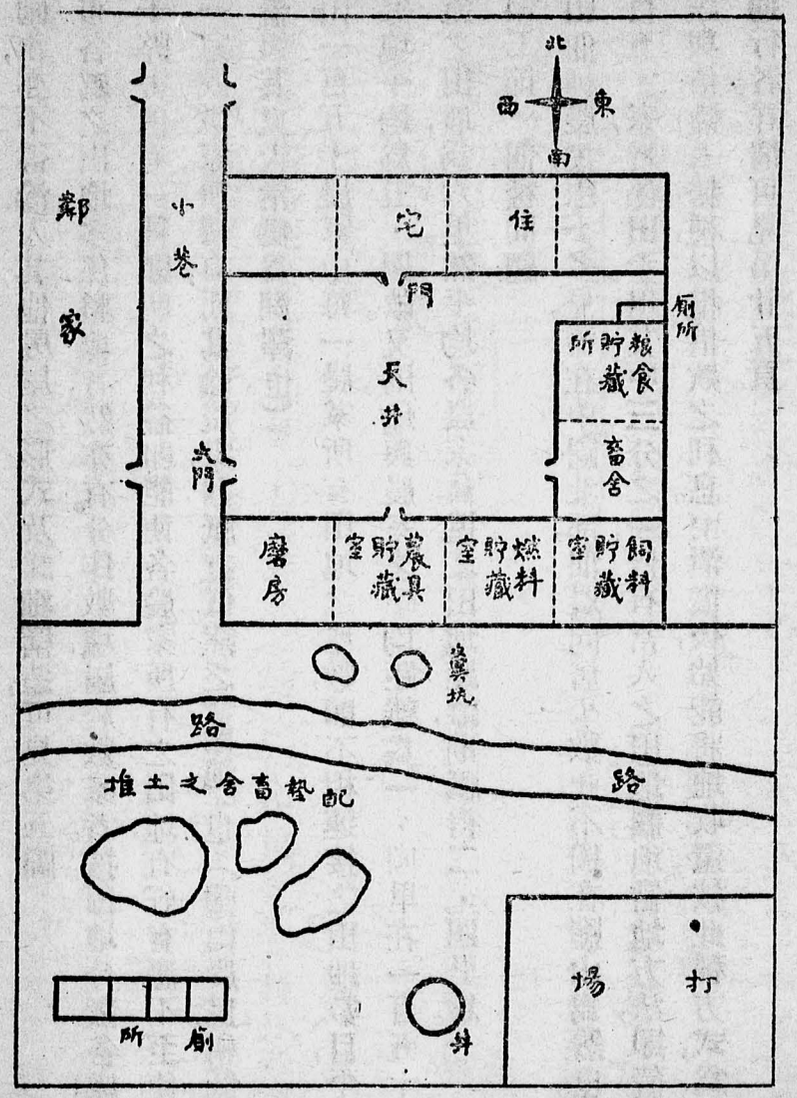
普通農家房居之建築，大致與第五圖中吳家莊之房屋相類。牆基多用磚築成，其上則用和有麥稭之土坯壘砌之。屋頂係用未加細斲之木椽，其上鋪以高粱稭，再其上則施以灰泥，雖有雨水，亦不得滲入。其他房屋之形式及詳細構造，可見第五圖。

散布各處之田地，多係整塊者，然亦有分作數塊，屬於數家者。按田地分散各處，對於農場，有若干弊害。但有一種顯明之利益，即能使各農家所有之田地，有好有惡，不至使最好之地，畀爲一家或數家所據有，而其餘農家，則祇有低窪之「湖地」也。（鹽山農民，稱低窪之地曰湖地。蓋因其夏天常變爲湖澤也。）

鹽山一百五十農家中，每一農家所有田地之塊數，即不相連接之田地數目，平均爲四・三塊。每塊平均爲五・四畝。又田地與農家之平均距離爲一・四里。在一百五十家中，距農家最遠之田地，爲六里。然平均各農家最遠之田地距離，則祇得二・四里焉。

第二節　佃種問題

鹽山佃種農民，殊不多見。蓋在中國北部，佃農向居少數，此不獨在鹽山爲然也。本篇所調查之百五十家，皆係田主。但其中三分之一，皆有當入之田地。該地當地方法，即債務人將其田地讓與債權人耕種，以抵借欵之利息。至清償後，始能將地收還。按此種方式，爲當地方法中最通行者。詳情可見第廿五頁。



第二圖　模範農家之平面圖

第四表　按農場面積之大小（畝數）以表明一百五十農家地權之分佈

按農場面積大小分組	佔全農場面積之百分數			佔所有場主之百分數		
	自有地	當入地	田主	自有地	當入地	田主兼有當地者
十畝以內	九二・八	七・二	八七・九	一二・一	一・一	八七・九
十一至二十畝	九四・八	五・二	八一・二	一八・八	一・一	八一・二
二十一至三十畝	九四・五	五・五	七三・五	二六・五	一・一	七三・五
三十畝以上	八七・二	一二・八	四〇・〇	六〇・〇	一・一	四〇・〇
平均	九〇・八	九・二	七一・三	二八・七	一・一	七一・三

第三節　農場企業之大小

（一）農場之大小作物之面積以及一年兩季作物之面積

關於農場之大小，作物之面積，以及一年兩季作物之面積等，皆按農場面積之大小，分組列入第五表中，以醒眉目。總計百五十農家之面積，共佔地三六七一畝。平均每家農場面積，爲二四・五畝。最小之農場爲三畝，最大爲一七三畝。再者，在此一百五十農家中，祇有三家

農場之面積，特別較高。（一七三畝，一七一畝，及一一六畝。）其餘農場面積，皆無超過七十二畝者。下列一表，即表明在各組不同面積之農場中，關於農場面積之中位數及密集數者也：

按農場面積大小分組	中位數	密集數
十畝以內	八	九
十一至二十畝	一五	一五
二十一至三十畝	二四	二二
三十一畝以上	四二	三五
一百五十家農場	一九	一五

在此百五十農家中，各農場面積大小之相差數，（C＝95.06±6.20）實較各作物面積大小之相差數（C＝88.77±5.55）爲大。蓋因農場面積中，包括有不種作物之荒地及廢地等在內，故其差數較巨也。又各農場之作物畝數，其大小相差，較前二者爲尤小，（C＝85.99±5.27）此蓋由大多數之田地，每年皆種兩季作物也。

第五表　按農場面積大小分組以表明農場面積作物面積及作物畝數表

按農場面積大小分組	各組所包括之農場		各種面積（畝數）			每農場之面積（畝數）			作物面積所佔農場面積之百分數	作物面積之種兩季作物者所佔之夏數
	家數	百分數	農場面積	作物面積	作物畝	農場面積	作物面積	作物畝		
十畝以內	三三	二二・〇	二五〇・〇	二五〇・〇	四〇二・〇	七・六	七・六	一二・二	一〇〇・〇	六〇・八
十一至二十畝	四八	三二・〇	七四七・〇	七一七・〇	一〇九四・〇	一五・六	一四・九	二二・八	九六・〇	五二・六
二十一至三十畝	三四	二二・七	八三五・〇	八〇三・五	一二四一・五	二四・六	二三・六	三六・五	九六・二	五四・五
三十一畝以上	三五	二三・三	一八三九・〇	一六五一・五	一四九八・五	五二・五	四七・二	七一・四	八九・八	五一・三
總計	一五〇	一〇〇・〇	三六七一・〇	三四二二・〇	五二三六・〇	…	…	…	九三・二	五三・〇
平均	…	…	…	…	…	二四・五	二三・八	三四・九	…	…

在百五十農家中，作物面種，佔農場面積百分之九三・二，而每農場之平均爲二二・八畝。普通十畝以內之小農場，其農場面積完全種植作物。而三十畝以上之大農場，其種作物者，祇佔全農場畝數百分之九十。換言之，即農場之面積增多，作物之面積，亦因之增多。惟不能按一定之比例而增加。（r＝0.575±0.037）蓋因較大之農場，其不事生產之土地，常較小農場爲多也。

如上所言，佔全農場面積百分之六・八之不種作物之面積，其重要用途，不外以下諸端，如路徑，墳墓，溝渠，晒場，以及鹹土灘等皆是。至鹹土灘一種，並非完全不能生產者，有時亦能生長抵抗鹹性力較强之野生植物，於經濟方面，亦不無補益。若鹹性過多，尙可出產滷鹽，蓋不可全以廢地目之也。

鹽山一年兩穫之土地，素較鄰近之區爲多，每年可種兩季作物之面積，約佔全作物面積之百分之五十三。又平均每家之作物畝爲三四・九畝。在本調查中，除去三家特別大農場，其餘百四十七家，每家作物畝數多少之變量，（C = 61.01±3.19）猶較美國伊利諾省麥克亨利地方每家平均作物英畝之變量，（C = 42.5±0.9）爲高也。

農場之面積愈大，一年兩穫之田地反較少。（見弟五表）故大農場組中之作物重種指數，較小農場組中之作物重種指數反小百分之十。（百四十七家之農場面積與作物重種指數之相互關係，（r = −0.289±0.051）惟此種表現，並非直接因農場面積大小之關係，蓋因較小之農場，土地高而且好，土地高好，則作物之面積亦愈多，而作物重種指數亦愈高矣。

每家作物畝數與作物面積之關係，甚爲密切，（r = 0.977±0.003）而與農場面積之關係

比較尤爲密切也。（r = 0.989±0.001）

（二）資本與資本之多少支配及效率

鹽山平均每家資本之總計及支配等等，可見之第六表中，表中所舉典當之地，與租進之地相類，惟性質不同耳。攷當地之方法，卽地主以其地作抵押品，而向放債者借欵。其借款價格，大致與地價相等，約成後，土地卽歸債權人使用。而債務人亦不另付利息。至借款償還後，土地卽仍歸地主，按此種當地方法，在中國甚爲普通，惟普通之當地價值，祇約合地價之半數耳。又當地之期限，最通行者爲三年，但三年後，常有不能償還債務者，則當地年限，亦可因之延長也。

於買賣土地之時，地上之樹木，常分別賣買，與地不作一體，鹽山平均地與樹木之價值，約佔全資本之三分之二弱。房屋建築之價值，亦幾近全資本之四分之一。故資本中之土地樹木房屋三種總值，幾共佔全資本百分之八十六，是卽所謂不動產者是也。鹽山投資於房屋之百分率，常較他處所調查者爲高。其原因大概不外以下兩種：（一）房屋所佔之土地，亦算入房屋價值內。（二）地價較一般地方爲低。鹽山有多數晒場，屬村人公有，且所有晒場，多係

利用荒廢鹻也，先洒以水，然後碾平壓堅，方爲適用。

燃料常與其他供給品合計。因燃料一項，本係家庭用費之一種，似不應列入資本項下也。此處燃料之價值，約爲三二·一九元之半數。（參看第六表）

鹽山每家之平均資本，爲七百六十二元。

第六表　每農家平均資本之總計及其支配

項目	有此項目之農家百分率	共有資本	平均資本	
			有此項目農家之平均數	百五十農家之平均數
自有地	一〇〇·〇	六〇、三四三·〇〇元	四〇二·二九元	四〇二·二九元
當入地	二八·七	六、〇四五·〇〇	一四〇·五八	四〇·三〇
房屋及其他建築	九八·〇	二七、七三一·〇〇	一八八·六五	一八四·八七
家畜	九四·七	五、二三二·五八	三六·八五	三四·八八
樹木	八二·七	四、八七六·五〇	三九·三三	三二·五一
燃料及其他供給	一〇〇·〇	四、二七·五〇	三二·一九	三二·一九

種子及飼料等	一〇〇·〇	二、六五七·〇〇	一七·七一	一七·七一
農具	九七·三	二、六四四·五〇	一八·一一	一七·六三
總計	…	一一四、三五七·〇八	…	…
平均	…	…	…	七六二·三八

下列第七表，係依農場面積之大小分組，所得之資本支配百分表。大概農場之面積增大時，則投資於土地之百分率，亦逐漸增高。而投資於建築之百分率，反逐漸減少。據分析所得，大農場組中投資於建築之百分率，較小農場組中減少百分之十三，此蓋因農場之面積增大時，農場之建築物，未必即照其增加比例而擴充也。此種現象，撥諸實際，亦頗近情。

農場之面積增大時，投資於農具之百分率，亦因之增高。此蓋因小農場常須借用大農場之農具，而結果適與美國之通常情形相反。

對於家畜之投資，平均每家爲三十五元，農場面積愈大者，其投資百分率亦愈高。此不僅因大農場之工畜等，應多於小農場，且因小農場每向其借用工畜也。

第七表　按農場面積大小分組以示各項資本百分率之支配

項目	按農場面積大小分組				百五十家總計
	十畝以內	十一至二十畝	廿一至卅畝	三十一畝以上	
自有地及當入地	五二・六	五四・八	五九・三	五九・九	五八・一
農場建築	三四・〇	二七・七	二四・〇	二一・〇	二四・二
家畜	一・〇	四・〇	四・三	五・七	四・六
樹木	三・九	四・〇	四・一	四・五	四・三
燃料及他種供給	五・七	五・四	三・九	三・六	四・二
種子及貯粮	一・六	二・三	二・二	二・五	二・三
農具	一・二	一・八	二・二	二・八	二・三
總計	一〇〇・〇	一〇〇・〇	一〇〇・〇	一〇〇・〇	一〇〇・〇

關於資本支配最明顯之表現，莫若依據每畝農場面積之比較。（見第八表）在大農場組中，因有比例較多之窪地，於是農田之平均價值，亦因之較低。按鹽山平均每畝農場面積之價值，爲一八・〇八元，而最低之價爲二・七五元，最高之價爲三七・〇五元。

大農場平均每畝投資於房屋之價值，較小農場少七元。同時小農場平均每畝投資於農具之價值，亦較大農場少三角四分。此蓋因小農場常有借用農具之情形，否則其價值亦應較大農場爲高也。

一百五十農家平均每畝之投資爲三十一元。

第八表　根據農場面積大小分組平均每畝資本之價值

使用之項目	按農場面積大小分組（畝）				百五十農家平均農場面積每畝之價值
	十畝以下	十一至二十畝	二十一至卅畝	三十一畝以上	
自有地及當入地	二〇・四四元	一七・九一元	一九・六三元	一七・一四元	一八・〇八元
農場建築	一三・二三	九・〇四	七・九六	六・〇〇	七・五五
家畜	・四〇	一・三一	一・四二	一・六一	一・四三
樹木	一・五一	一・三一	一・三七	一・二九	一・三三
供給及燃料	二・二三	一・七六	一・二八	一・〇三	一・三二
種子及儲粮	・六一	・七六	・七三	・七二	・七二

農具		●四七		●五九	
每畝總值	三八・八九		三二・六八		
每畝百分之八的利息	三・一一	●七一	二・六一	●八一	●七二
每一農家所使用資本之總值	二九四、六六	三三・一〇	五〇八、六一	二八・六〇	三一・一五
		二・六四		二●二八	⋮
		八一二、六六		一・五〇二・五六	⋮

第九表　資本大小與場主工價之關係

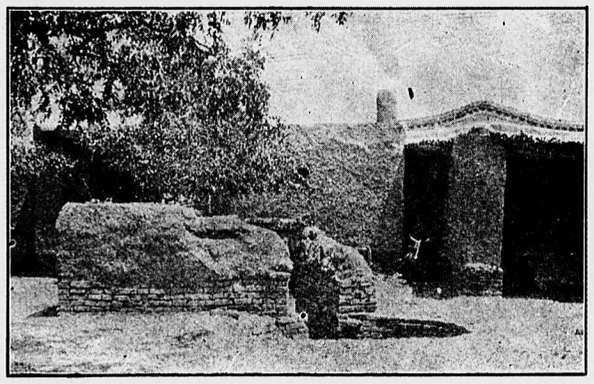
資本	有此資本農家之		場主工價(平均數)	場主工價超過五十元以上之農家在本組中所佔之百分數
	數目	百分率		
四百元以下	四一	二七・三	二二・九九元	七・三
四〇一至七〇〇元	四〇	二六・七	四二・九一	三五・〇
七〇一至一〇〇〇元	三六	二四・〇	四〇・二〇	四一・七
一〇〇一元以上	三三	二二・〇	五五・九四	五七●六
總數	一五〇	一〇〇・〇	⋮	三四・〇
平均	⋮	⋮	三九・六七	⋮

2000
3424
0338



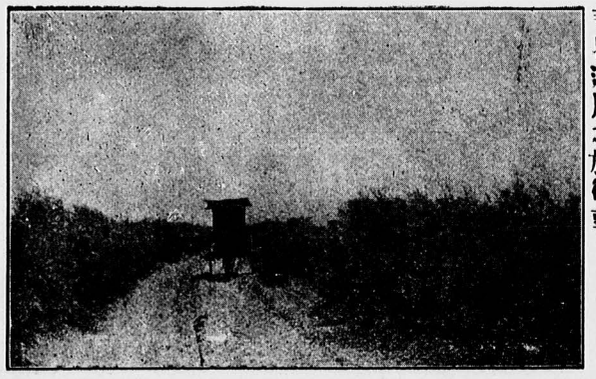
第四圖

吳家莊村外風景之一斑：左邊之一叢植物卽馬蘭，可用以製草繩及草鞋等。



第五圖

離開大道之農房：大門在左邊大樹下。前面有低圍牆者爲圓形之糞坑，深約一丈，有階級直通到底。右邊之房屋係放大車之用。



第六圖

大道兩邊之植物爲檉柳，可用以製筐篇及作燃料。正中之騾車，爲華北通用之旅行車。



第七圖　此最通行之鋤地式也。鋤時，身體必須作傴僂狀，將鋤向後拉動，非若美國農夫之鋤地，須直上直下也。此種鋤法，常不易去莠草之根，故尚須改良。後面之作物，爲高粱。



第八圖

此圖卽表明鹹土中野生之臭蒿。當中之人卽崔君。臭蒿之子，貧農常用以爲食物。前邊左邊之地，卽除去臭蒿後所種之黃豆也。



第九圖

圖中人前之担，係割就之青草及莠稗，用以飼家畜者，左旁之隙地係雜地。

各家對於農具之投資，平均每畝農場面積爲七角二分，每畝作物面積爲七角七分三厘，每作物畝爲五角零五厘。

各種農具之式樣，可見第十一圖中。

由第九表資本大小與場主工價之關係中，得見資本較大之農場，其平均之場主工價，較資本較小之農場，約高兩倍半。又在資本較小之農場組中，祇有百分之七之農家，得到五十元以上之工價，在大資本農場組中，則得到五十元以上工價之家數，竟佔百分之五十八，於此可見資本大者，其設施較易爲力，而贏利亦較高也。

(三)農場進欵及其支配

觀下列第十表，可知農場現錢進欵之來源，由於作物方面者，佔百分之九十一。較之前蕪湖一百零二家調查之結果爲尤高。現錢進款作物中，以小麥爲主體。因百五十農家中，售賣小麥者，卽有一百四十八家。故其結果，小麥售值，在各作物之進款中，佔百分之八十七，而在全進欵中，亦佔百分之四十二。其次爲穀子，售賣之家數，約佔三分之一，惟其值僅佔總進欵中百分之二。總計農產物爲農家自用者，約佔百分之四十二。

第十表　農場進款之數目及其支配

類別	單位	有此項進款家數所佔之百分率	農產量 總計	農產量 有此種產物農家之平均數	農產量 百五十農家之平均數	進款價值 總計	進款價值 有此種進款農家之平均數	進款價值 百五十農家之平均數	進款價值 佔總進款價值的百分率
現款收入 作物 小麥	石	九八·七	一,〇二八·六五	六·九五	六·八六	一〇,六一四·〇九元	七一·七二元	七〇·七六元	四二·二
穀子	石	三五·三	八八·五〇	一·六七	·五九	五一四·九〇	九·七二	三·四三	二·〇
高粱	石	二九·三	八三·九〇	一·九一	·五六	四七八·八〇	一〇·八八	三·一九	一·九
棗子	石	五·三	九五·五〇	一一·九四	·六四	三二一·〇〇	四〇·一三	二·一四	一·三
玉米	石	九·三	二一·〇〇	一·五〇	·一四	一三一·六〇	九·四〇	·八八	〇·五
黃豆	石	一八·〇	一六·九五	·六三	·一一	一〇一·九〇	三·七七	·六八	〇·四
蔬菜	…	一·三	…	…	…	五一·〇〇	二五·五〇	·三四	〇·二
綠豆	石	四·七	一·六〇	·二三	·〇一	一一·七〇	一·六七	·〇八	〇·一
家畜 雞蛋	個	八五·三	三〇,〇五〇·〇〇	二三四·七七	二〇〇·三三	二四九·三六	一·九五	一·六六	一·〇
豬	個	六·〇	一一·〇〇	一·二二	·〇七	二三五·〇〇	二六·一一	一·五七	〇·九
及其副產品 驢	個	·七	二·〇〇	二·〇〇	·〇一	九〇·〇〇	九〇·〇〇	·六〇	〇·四
雞	個	三七·三	一五八·〇〇	二·八二	一·〇五	二一·九三	·三九	·一五	〇·一
皮	…	·七	…	…	…	八·〇〇	八·〇〇	·〇五	…
廐肥	…	·七	…	…	…	五·〇〇	五·〇〇	·〇三	…
雜入	…	四〇·〇	…	…	…	三一七·五〇	五·二九	二·一二	一·三
非現款收入 家庭自用產品	…	一〇〇·〇	…	…	…	一〇,五二二·四九	七〇·一五	七〇·一五	四一·八
資本增加	…	五五·三	…	…	…	一,四九六·〇五	一八·〇二	九·九七	五·九
總數	…	…	…	…	…	二五,一七〇·三二	…	…	一〇〇·〇
平均	…	…	…	…	…	…	…	一六七·八〇	…

若比較大小農場每畝進款之數目，以及各種進欵之百分率，除小農場每畝小麥之產量較高，進款較大外，其餘大小農場中，殊無顯明之不同點。

（四）農場費用及其支配

農場費用中最鉅之項目，即爲工資。約佔總費用百分之三六·五。其他任何費用，即具此

數之半者亦無之。(見第十一表)統計工作費用中，家工(場主不在內)卽居四分之三，是較燕湖調查工作費用佔總費用之百分之七六·三者，尙低一倍多。鹽山工價較爲低廉，蓋亦爲其中主要原因之一。在調查時期中，平均每一農工之工飯值，每年祇約三十餘元，與現在之人工費用，已不可同日而語矣。

按鹽山習俗，農工之草帽，手巾，煙，酒等，皆須由場主供給，因此等皆係現錢費用，故均算入僱工費用中。各農場每家中平均之草帽手巾費爲一元二角五分，煙酒費爲九角七分。

其次爲肥料費，平均約佔總費用百分之十五。

國稅及地保費，各家皆所不免。房屋之建築或修理費，亦幾各家皆有之。五分之四之農場，有肥料及農具之購買，或修理費。幾近半數之農場，有家工在農場工作。此外有百分之五十九之農場，有飼料費，飼料之大宗爲穀子與苜蓿。

本調查有家庭工業之農場，僅有五家。其費用已算入農場費用中，其收入亦已併入農場進款中矣。

第十一表　農場費用之數目及支配

項目	有此項費用之農家所佔之百分率	費用數目 總數	費用數目 佔總費用之百分數	費用數目 有此項費用之農家之平均數	費用數目 百五十農家之平均數
家工	四四·七	二，八七〇·五〇元	二八·五	四二·八四	一九·一四元
肥料	八二·七	一，五一三·五〇	一五·〇	一二·二一	一〇·〇九
建築及修理	九五·三	一，二八九·九〇	一二·八	九·〇二	八·六〇
飼料	五九·三	一，〇〇六·〇〇	一〇·〇	一一·三〇	六·七一
僱工	一〇〇·〇	八〇一·三五	八·〇	五·三四	五·三四
購買家畜	六六·〇	五〇二·七九	五·〇	五·〇八	三·三五
購買或修理農具	八四·七	四五八·七〇	四·六	三·六一	三·〇六
種子	七九·三	四三八·二〇	四·三	三·六八	二·九二
國稅	一〇〇·〇	三二六·〇〇	三·二	二·一七	二·一七
木料及車油	二六·〇	二三〇·八〇	二·三	五·九二	一·五四
資本減少	二六·〇	二二〇·六〇	二·二	五·六六	一·四七

家庭工業	二・七	一四二・〇〇	一・四	三五・五〇		・九五
地保費	一〇〇・〇	一一六・八〇	一・二	・七八		・七八
樹木（樹秧）	四八・七	八二・四〇	〇・八	一・一三		・五五
貿易	四・七	六四・〇〇	〇・六	九・一四		・四三
獸醫	六・〇	六・〇〇	〇・一	・六七		・〇四
總計	…	一〇，〇六九・五四	一〇〇・〇	…		六七・一四

按農場面積大小分組後各項費用之支配，以及每作物畝之平均費用，皆可詳見第十二表中。在大農場組中，家工費用所佔之百分率，較小農場組中者，約高兩倍之多。同時每作物畝之平均家工費用，在大農場中者，亦幾較小農場高出三倍。此蓋因農場大則人口多，人口多則家工自較多也。但因小農場中家工甚少，故其僱工費用之百分率，反較大農場多出兩倍。而同時每作物畝之雇工費用，亦反較大農場爲高也。

關於肥料之費用，每作物畝之平均數，在大小農場間，所差甚微，然其百分率，則小農場實較大農場爲低。

大農場之經濟情形，較小農場爲寬裕，故關於建築修葺等費亦較多。又大農場對於農具家畜之設備飼養，常較小農場爲多，故其費用方面，亦較小農場爲高。

國稅僅佔總費用之百分之三，每畝平均爲八分八厘。

肥料佔全費用百分之十五，平均每畝爲四角四分二厘。

各家平均每作物畝之總費用爲一元九角二分，觀第十二表可知，惟因場主工作之工值，尚未算在費用之內，而小農場多數之工作，又皆爲場主所自做，故大農場之總費用，比小農場高出百分之四十也。

第十二表　根據農場面積分組每作物畝所需各項費用之數目及支配

項目	根據農場面積大小分組各項費用所佔之百分率				各項費用在總費用中所佔之百分率（全數農家）	根據農場面積大小分組每作物畝之用費				每作物畝之平均費用
	十畝以下	十一至二十畝	廿一至三十畝	十三畝以上		十畝以下	十一至二十畝	廿一至三十畝	三十畝以上	
家工	一五・一	二八・〇	二九・一	三〇・〇	二八・五	〇・二三元	〇・四二元	〇・五四元	〇・六六元	〇・五五元
肥料	九・二	一五・三	一四・五	一四・七	一五・〇	・三〇	・二三	・二七	・三二	・二九

建築及修理	七·〇	一一·〇	一三·五	一三·八	一三·八	
飼料	八·四	七·七	一一·八	一〇·一	一〇·〇	
僱工	一四·五	一〇·七	五·五	七·四	八·〇	
購買家畜	〇·四	三·七	四·三	六·二	五·〇	
購買及修理農具	三·四	四·六	四·九	四·五	四·六	
種子	六·一	五·〇	四·三	四·〇	四·三	
國稅	五·二	四·〇	三·一	二·八	三·二	
木料及車油	〇·六	一·〇	三·〇	二·六	二·三	
資本減少	·九	三·四	二·三	一·九	二·二	
家庭工業	一六·四	一·八	···	·二	一·四	
地保費	一·四	一·六	一·一	一·〇	一·二	
樹木（樹苗）	·四	一·五	·八	·七	·八	
貿易	一·〇	·六	一·七	·二	·六	
獸醫	···	·二	·二	···	·二	
	·二	·二	·二	·二	·二	
	·二	·二	·二	·二	·二	
	·二	·二	·二	·二

二十一至三十畝	三四	三六・五	四一・二	三八・七二	四〇・二七
三十一畝以上	三五	七一・四	六〇・〇	五八・五四	四七・九〇
總計	一五〇	…	三四・〇	…	…
平均	…	三四・九	…	三九・六七	四二・三八

每家場主工價，與每家作物畝數之相互關係，其函數並不十分高，但亦有顯明之關係。(r=0.441±0.044)

場主之工價，乃用以測算場主個人進款之單位。每人工作之報酬，則係測計全場農工收入之標準。如以農業全體言，則後者之用途尤較前者爲廣大準確。觀第十三表，大農場每人工作之報酬較小農場者高出三分一而有餘。故若以場主工價與工作報酬論，則大農場確較優於小農場也。

二十一至三十畝之農家，其場主工價與每人工作報酬，較之十一至二十畝之農家，無甚差別。此蓋因十一至二十畝之農家，每畝之投資額，較十畝以內之農家，竟減少六元二角一分。資本既減少，則每畝可減少五角之資本利息，同時每作物畝之平均費用，亦較省一分。如是十一至二十畝之農家，可較十畝以內之農家每家平均儉省八元零三分。再觀二十一至三十畝之農家，每畝之投資利息，較十一至二十畝組中之農家平均多三分，同時每作物畝之費用，亦較多三角三分。由以上種種之比較，即可見二十一至三十畝組中之農家，自不能比十一至二十畝組中之農家，得較多之贏利也。

農場愈大者，場主之工價亦愈高。惟場主工價增高之原因，並非直接因農場增大而然，蓋因農場愈大者，則人工畜工農具建築等之使用效率，亦即增高，因之可以減低生產費，而使贏利自然增高也。

由以上各節，吾人可下一斷語。即最大之農場，其發展之機會亦愈多。(參看第十圖)最大之農場組中，每家平均之作物面積，爲四七・二畝，或七十一作物畝。然若除去三家最大之農場，則每家平均之作物面積，爲三九・七畝，每家平均之場主工價，爲三六・四四也。若欲於此決定最適宜之農場面積爲若干，是非得進而研究其他主要因素不可也。

(乙)每作物畝之進款費用及贏利　每作物畝之進款及費用，詳見第十四表中。鹽山因小農場組中小麥之產量較大農場爲稍高，(因土地較好之故)故每作物

畝之進款，小農場竟高出大農場六角九分。惟因小農場之贏餘，每作物畝終較大農場爲多，故由進款內減去工價費用之結果，即小農場少三角四分。最大農場組與次小農場組每作物畝之贏利，皆較最小農場組高三倍有半，至於第二組內，有如是特高之贏利者，其原因至少或與場主工價之情形相同。

第十四表　農場之大小與每畝之進款費用工作用費及贏利之關係

根據農場面積大小分組	每作物畝之平均進款	每作物畝之平均工作用費（註一）	每作物畝之進款及工作用費之差數	每作物畝之平均他項用費及利息	每作物畝之贏利（註二）
十畝以下	五●三八元	二●二二元	三●一六元	三●〇三元	●一三
十一至二十畝	四●九八	一●七九	三●一九	二●七二	●四七
二十一至三十畝	四●七〇	一●四〇	三●三〇	三●〇〇	●三〇
三十一畝以上	四●六九	一●一九	三●五〇	三●〇五	●四五
平均	四●八一	一●四四	三●三七	二●九七	●四〇

（註一）此費用包括場主之工值。場主之工值，平均每全年爲二五●八八元。

（註二）每作物畝之贏利，若用共有之作物畝數相乘後，再加場主之工值，即得每家之場主工價。

在人烟稠密之區，農人耕作之土地，不能達到其所需要時，則每作物畝之贏利，爲測算農業經營利益時較善之單位。若同時以每人之進款與每畝之進款相比較，則在場主所得，未達到普通農工代價時，即無贏利之可言。一旦達到此點後，則因較精密之經營，額外收入超過支出之數，是即場主除工資外所得額外之報酬也。

鹽山平均每作物畝之贏利爲四角，即所以表明農人，除農場費用及投資利息外，尚可得到應得工資以外之利益也。此種情形，與以前在蕪湖之調查，適成反比。因蕪湖每畝尚虧損二●一四元也。故吾人若在農業經營上立論，蕪湖農人，所得實不償所失。（一部分因田地佔價太高所致）鹽山農人，表面上雖較貧苦，然實際上反可得到較佳之結果。再者凡管理適當之農場，其所得除去一切費用及資本之利息外，其贏餘尚應較長工所得之工資爲高也。

（丙）人工之效率　人工之效率，詳見第十五表中。本調查平均每家之工人等數，

爲一・五一人。大農場中之工人等數，較小農場者約高三倍。大農場中每人耕作之作物畝，較小農場約高兩倍有零。但各農場經營之集約程度，既各有不同，故最精密之測驗標準，莫若用每人之人工單位爲準確。惟大農場每人之人工單位，亦較小農場高兩倍，於此可見大小農場間，其經營精密之程度，大致相等也。且於此吾人可以下一斷語：卽大農場中人工之效率，殆二倍於小農場中也。

大小農場經營精密程度之相似，又可於每作物畝之人工單位中證明之。（r＝0.110±0.0534）

平均每人耕作之作物畝爲二二・九畝，約合燕湖之兩倍。平均每人每年工作單位爲九二・六，其變量尙在大小之間。（c＝48.5±2.30）至每作物畝之人工單位，則甚低。（c＝10.12±0.43）此外場主工價與每人人工單位之相互關係，（r＝0.532±0.40）亦較與每家作物畝數之關係爲高。

第十五表　農場大小與人工效率之關係

農場面積之大小	工人等數總計	每人平均所有之作物畝	平均每農家所有之工人等數	平均人工單位數		
				每一農家	每一作物畝	每　人
十畝以下	二九・四九	一三・六	・八九	四九・八	四・〇九	五五・八
十一至二十畝	六一・一五	一七・九	一・二七	九三・三	四・〇九	七三・二
二十一至三十畝	五二・五二	二三・六	一・五四	一四六・八	四・〇二	九五・一
三十一畝以上	八五・四二	二九・二	二・四四	二八七・五	四・〇三	一一七・八
總計	二二八・五八	⋮	⋮	⋮	⋮	⋮
平均	⋮	二二・九	一・五二	一四一・二	四・〇五	九二・六

（丁）畜工之效率　畜工之效率，其統計詳在第十六表中。此百五十家中，有役畜者，祇有一百零八家。十畝以下之農家，無役畜者，佔百分之八十八。十一至二十畝之農場組中，無役畜者，亦佔百分之二十七。普通小農場，常可借用鄰居大農場之役畜。平均每家借用役畜之次數爲六・四次，而平均每家出借役畜之次數爲十二次。至此二數之所以有差者，因尙有借用役畜之小農場，不在此調查之範圍內也。此外借用及出借之畜工單位數，因調

查不完全，故從缺。

在大農場中，每役畜可耕種之作物畝數，較小農場者約多三分之一。同時每役畜之畜工單位數，亦爲測驗畜工效率最善之標準。但結果大農場亦祇較小農場多三分之一。於此可知役畜在大農場，比在小農場，僅可多作三分之一以上之工作也。

平均每作物畝之畜工單位，在各組中大約均相等，是可表明該處使用役畜耕種之精密程度，各家大抵皆相等也。

第十六表　農場大小與有役畜農家畜工效率之關係

根據農場面積大小分組	在各組中所有之家數	在各組中有此役畜之家數	百分率	平均每農家所有役畜數	平均每一役畜單位所有作物畝數	平均畜工單位 每農家每作物畝	平均畜工單位 每役畜單位
十畝以下	三三	四	一二・一	・四四	三七・一	二〇・四	四六・六
十一至二十畝	四八	三五	七二・九	・五八	四〇・九	三〇・〇	五一・八
二十一至卅畝	三四	三四	一〇〇・〇	・六五	五六・四	四六・〇	七一・一
三十一畝以上	三五	三五	一〇〇・〇	一・四五	四九・一	九〇・九	六二・五

（戊）農具之使用效率　農具之使用效率，詳情見第十七表中。每作物畝對於農具之投資，在大農場組中者，較在小農場組中約多兩倍。但在其他調查中，則較大之農場，每作物畝之投資，必較小於小農場，與此處適成反比。蓋此處小農場，如前文所言，常向大農場借用農具也。

第十七表　農場大小與農具使用效率之關係

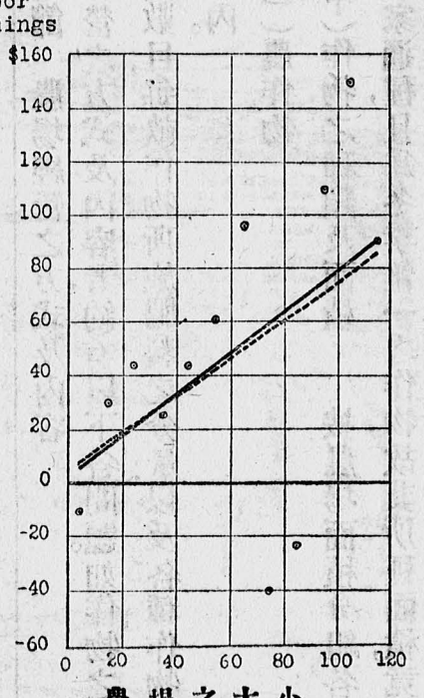
根據農場面積大小分組	每作物畝平均農具之使用費	每農場平均農具之價值
十畝以內	〇・二九元	三・五六元
十一至二十畝	〇・四一	九・二五
二十一至三十畝	〇・四八	一七・四七
三十一畝以上	〇・六〇	四二・五四
總計	〇・五一	一七・六三

總計	一五〇	一〇八	七二・〇	…	…	…	…
平均	…	…	…	・八八	四八・八	五四・四	一・三	六一・九

(己)建築資本之使用效率　關於建築上所用資本之使用效率，已詳見第七表中。小農場投資於建築之百分率，較大農場約高百分之十三。此蓋因農場增大時，關於建築之百分率，未必亦按此例而增加也。

總上各端，吾人可得一結論如下：即凡中等之農家，如有二成年之男工及一役畜時，其最適合之作物面積，爲四十畝。蓋此種面積，足以提高農家之生活程度，而使之較一般農家爲優也。有少數幹練之場主，若有一成年男工爲之助，至少可以經營作物面積五十畝。至大於四十或五十畝之作物面積之農場，从大體觀之，似已超過中等農家之所需要。故其經營效力，亦自降低，而所得贏利，亦不能按以前之比例而增加矣。

(六)人工單位之數目　人工單位爲測驗農藝經營最精密之標準。因人工單位，即所以表明全場所成就之工作量也。例如一畝玉蜀黍需要一畝小麥之人工單位之四倍，其所欲比較之點，最精確而顯者。人工單位之數目，與場主工價高低之關係，可見下列第十八表。其最著者，如有一百五十一或以上之人工單位之農場，其場主工價，較有九十以內之人工單位之農場，高出兩倍有零，月得到五十元以上之場主工價家數之百分率，前者亦竟較後者高出六倍之多云。



第十圖　作物畝數與場主工價之關係

作物畝數每增加十畝，場主工價即增加七元五角九分。換言之，即每作物畝增加七角六分也。◉爲各組之平均數，—爲直線，…爲對數線。

第十八表　人工單位與場主工價之關係

人工單位	有此項人工單位之家數百分率	百五十家平均之人工單位	平均作物畝	平均每農家之場主工價	有場主工價五十元以上之場主百分率

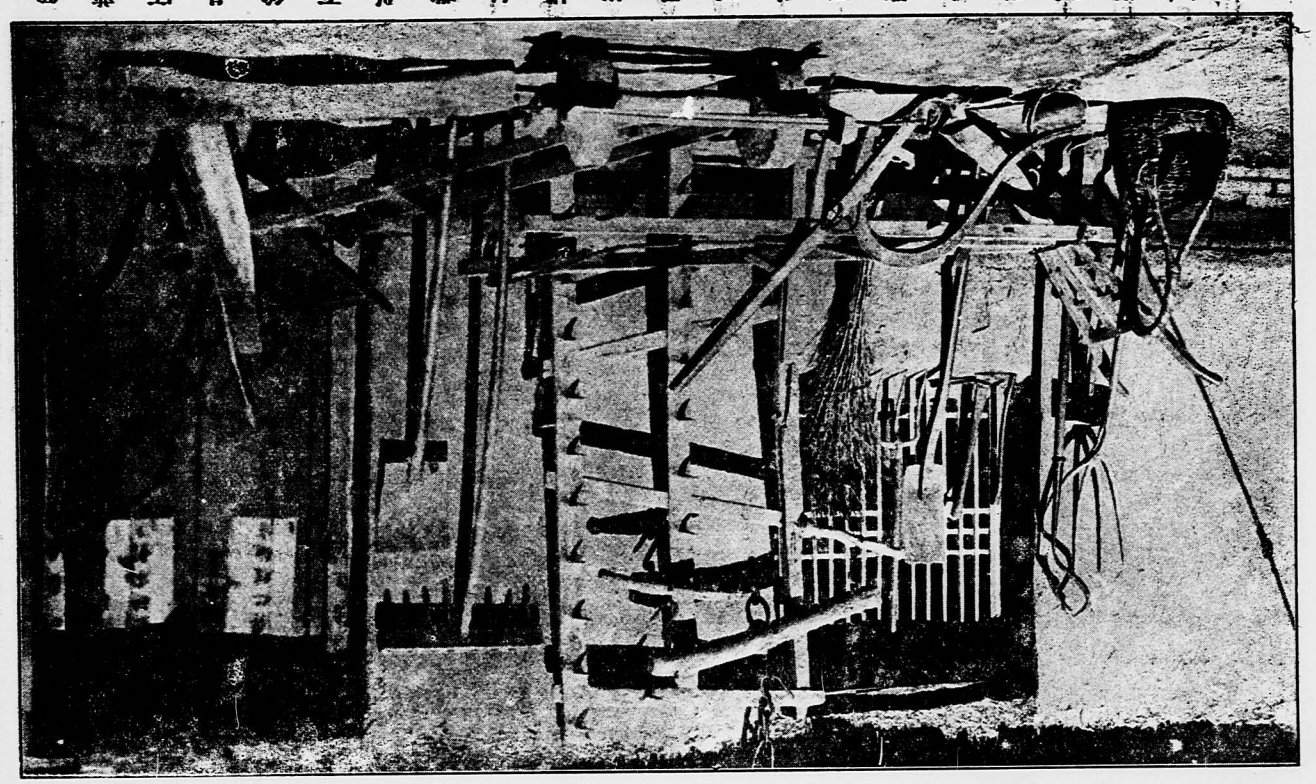
九十以下	五三	三五・三	六一・四	一四・八	二六・一二元	九・四		
九十一至百五十	四八	三二・〇	一一四・六	二八・四	三七・二二	三三・三		
一百五十一以上	四九	三二・七	二五三・八	六三・〇	五六・七六	六一・二		
總計	一五〇	一〇〇・〇	…	…	…	…		
平均	…	…	一四一・二	三四・九	三九・六七	三四・〇		

第四節　農場經營之方式及內容

所謂經營之方式及內容者，約有以下各問題。如作物之種類，面積，支配，及輪種方法；家畜之種類及數目；每畝作物所施肥料之分量；以及各種作物所需人工畜工之數量及分配等，皆包括在內。

（一）農作物

（甲）作物之種類及面積　按農場面積分組各農作物之畝數，詳見第十九表中。小麥爲各家通種，且爲冬季惟一之作物，故其所種面積，竟佔全作物面積百分之五四・八，或佔全作物畝百分之三五・九。百分之九十六之小麥地，尙可種第二季作物，於表中可見



第十一圖　普渡廣場臨用之鳥

人　後行由左至右爲木工用具

前行由左至右爲泥工用具

一、泥工用具

1. 下槓後用以壓土者。
2. 碌石碌，一端爲柄，一端爲碌石之滾筒，中貫木柄，可左右推動。
3. 鏝子，一端爲柄，一端爲鏝子之鏝面。
4. 抹子，一端爲柄，一端爲抹子之抹面。
5. 鏟子，一端爲柄，一端爲鏟子之鏟面。
6. 鐵鍬，一端爲柄，一端爲鍬之鍬面。
7. 鋤頭，一端爲柄，一端爲鋤頭之鋤面。
8. 鐵耙，一端爲柄，一端爲耙之耙面。
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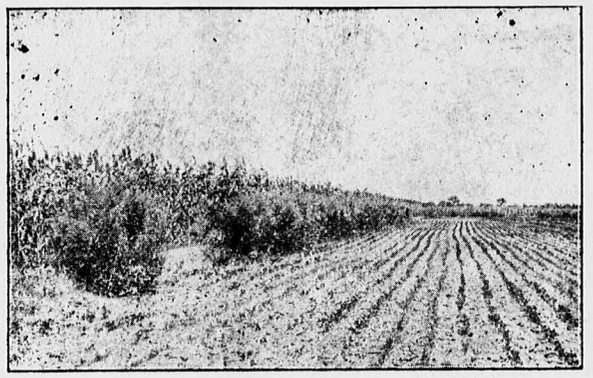
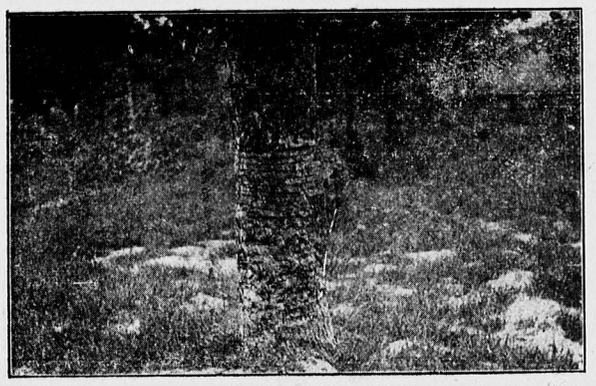
200. 鐵鍬，一端爲柄，一端爲鍬之鍬面。



第十二圖（甲）　左邊之高者，爲高粱。右邊之低者，爲黃豆及穀子。（兩行穀子間四行黃豆。）兩者中之叢物，卽名檉柳，俗亦謂之金條。



（乙）　低小之麥稭堆，是卽該年（民國十二年）小麥因旱歉收之顯示也。堆底及堆頂，皆用泥封固，俾當雨季時，不致有雨水滲入之慮。



（丙）　鹽山農民，常將棗樹樹幹之下部，用力割成圓圈，意謂如是卽可減少木質之增長，激刺葉芽之發達也。

之。至於其餘作物面積百分之三八·七，在本調查內，皆種春種夏收或秋收之作物。統言之，第一季作物，如小麥高粱等，其種植面積，即佔共作物畝數之三分之二，而第二季作物，則祇有全作物畝之三分之一也。此外各家一年兩獲之作物面積之百分率，其變量函數，在各家中亦甚低。（C＝9.47±0.25）

第十九表　各農作物之畝數及其百分率

作物名稱	種此項作物之田地的百分率	種此項作物之農場面積（畝）	第幾季作物	根據農場面積大小分組中所佔之百分率 十畝以下	十一至二十畝	廿一至卅畝	卅一畝以上	各項作物在總作物畝中所佔之百分率
小麥	九九·三	一八七八	第一季	三八·八	三六·〇	三五·六	三五·九	三五·九
高粱	八八·〇	一〇三四·五	第一季	一五·七	一九·六	一九·八	一九·八	一九·八
玉米及黃豆	七〇·七	六四一	第二季	二八·八	一三·三	八·九	一二·二	一二·二
黃豆	五四·七	五七三	第二季	三·〇	一〇·九	一一·四	一〇·九	一〇·九
穀子	六七·三	四七〇	第一季	四·〇	八·五	一〇·六	九·〇	九·〇
玉米	五二·〇	四〇七	第二季	四·五	六·七	九·二	七·八	七·八

黃豆及穀子	一二・七	一〇八	第二季	一・五	二・七	〇・六	二・六	二・一				
綠　豆	一〇・〇	三一	同	…	〇・三	〇・五	〇・九	〇・六				
高粱及穀子	三・三	二四	第一季	三・二	〇・五	〇・五	…	〇・五				
水　菓（棗）	五・三	一八	同	〇・五	〇・五	…	〇・四	〇・三				
黃豆及綠豆	二・〇	一五	第二季	…	〇・三	一・〇	…	〇・三				
黑　豆	二・〇	一三	同	…	一・二	…	…	〇・二				
玉米及黑豆	〇・七	一二	同	…	…	…	〇・五	〇・二				
蔬　菜	五・三	五・五	第一季	…	〇・二	〇・二	〇・一	〇・一				
玉米及綠豆	〇・七	四	第二季	…	〇・三	…	…	〇・一				
甘　薯	〇・七	二	同	…	〇・二	…	…	…				
總　計	…	五二三六	…	一〇〇	一〇〇	一〇〇	一〇〇	一〇〇				

高粱爲佔面積次多之作物，農家百分之八十八，皆種植之。

甘薯爲新有之作物，在八年以前，鮮有種之者。然至今仍不能廣爲栽種，嘗考其故，蓋其最大原因，卽成熟時每易被人偸竊也。按甘薯每畝所出之產量，遠較他種作物爲多，且爲較集約之農作物。以目下鹽山人口稠密之情形觀之，似乎當地農民，應改變方針，種植較多之甘薯，以解決當地之食糧問題也。

若按農場大小而比較各農作物之種植百分率，則較大之農場，常種較多之黃豆，穀子及玉蜀黍。惟玉蜀黍及黃豆之合種畝數，則比較甚爲稀少。據一般小農場場主多年之經驗，謂在高地中，倘將黃豆同玉蜀黍合種，其結果皆較他種作物爲有利。但在本調查中，其結果適成相反，因該年夏秋間，高地苦於亢旱，故其產量，反較通常爲低也。

餘第十九表中所列舉之各種作物外，尚有雜灘中數種野生之植物，（見第八圖）亦具有經濟之價值，茲特條舉於下：

名稱（註一）	用　途	生長之土壤經燃燒後所含鹼質之百分率（大部分除硫化物外皆爲綠化物）（註二）
臭　蒿 Artemisia annua L (comp) 俗名蒿子	枝幹可作燃料，煨燒之並可驅蚊。子可榨油，油渣可爲肥料，卽俗稱爲麻生者是也。	一・二五

馬蘭 Iris ensata thumb (Irid)	蘭草之一種，其葉可作草繩及草鞋。	一・二五
黃蒿 Artemisia scoparia w and K (Comp.)	其嫩葉可食，秋天割取後，可作燃料，其子亦可食，冬季貧農多食之。	四・五一
檉柳 Tamarix chinensis Lour (Tamaric) 俗名金條	幹可作燃料，其枝條可用以編製柳筐。	四・五一
鹵蓬 Salsola Soisola (Chen)	植物之全部，可用以製鹼，洗衣帽及麵食恆用之。	三八・五八

（註一）表內各科學名詞，皆爲金陵大學史德蔚教授（A. N. Steward）所鑑定。

（註二）表內各成分，皆係金陵大學李查理教授（Charles C. Lee）所分析。

檉柳常自生長於道旁及田地之四周，有時亦由人工栽植之，（見第六圖及第十二圖甲）不能生長作物之鹹灘中，亦爲檉柳之生長繁殖區。

（乙）作物輪種制　最通行之作物輪種制，有下列之四種。總計四分之一之農家，採用第一制；四分之一之農家，採用第二制；三分之一之農家，採用第四種之混合制，殊難一一區分之也。

第二十表　農作物輪種制

輪種制別	年數	當年第一季作物	當年第二季作物
第一種	第一年	小麥	黃豆及玉蜀黍
	第二年	高粱或穀子	...
第二種	第一年	小麥	玉蜀黍
	第二年	小麥	玉蜀黍及黃豆
	第三年	高粱或穀子	...
第三種	第一年	小麥	黃豆及穀子
	第二年	高粱或穀子	...
	第三年	小麥	玉蜀黍

第四種	第一年	小麥	…	…
	第二年	小麥		

關於輪種制應注意之各要點，在乎認識何者爲淺根之作物，何者爲深根之作物，何者爲中耕之作物及豆科作物是也。

如第二年後，小麥出產成績仍佳時，卽可仍種植小麥，倘成績仍佳，亦可再繼續種植之。

第二十一表　輪種制之百分率支配

輪種制別	選此項輪種制農家所佔之百分率
第一及第二種	三四・〇
第二種	二六・六
第一種	二四・〇
第一及第三種	五・三
第二及第三種	四・〇
第二及第四種	一・三
第一二三及第四種	一・三
第三種	〇・七
第四種	〇・七
第二三及第四種	〇・七
第一及第四種	〇・七
第一二及第三種	〇・七

（丙）農作物食用之支配　農作物總值百分之三十七，爲農家所自用，（見第二十二表）玉蜀黍，黃豆，綠豆，高粱，穀子，黑豆，甘薯等之爲農家所自用者，皆約在四分之三以上。惟小麥自用者，僅佔總量百分之五，家畜之出產概全係出售，惟雞約有四分之一，係農家所自用。

普通穀類農產物，除銷售者外，皆作農家之食料。稈稭等副產品，則多作燃料，飼料，及家庭工業原料之用。穀稭及高粱葉（綠時摘下者）爲飼畜最佳之食料，高粱稈，玉蜀黍稭，豆稭等，大都係作燃料之用。

小麥雖爲僅有之重要售錢作物，但其經濟用途，遠不若高粮之廣。高粱之用途，若概括言之，除供人食外，並可作燃料，飼料，及家庭工業之原料焉。

（註）高粱爲中國重要作物之一。用途甚廣。穀粒，可供人畜食料，並可造酒。葉可作飼料，桿可作燃料及各種工業之原料，如建築時可以做牆裏，可以作屋頂，可以做藩籬，又可以編筐籃玩具，及其他家庭用具等。此外農家日用之掃帚，亦多有以去實之高粮穗爲之者。

第二十二表　農產物銷售者及自用者之比較

項目	一百五十農家之平均價值		價值百分率	
	出售（或備售）	自用	出售	自用
作物				
玉蜀黍	○・八八元	一○・七○元	七・六	九二・四
小麥	七○・七六	三・八九	九四・八	五・二
黃豆	・六八	六・○八	一○・○	九○・○
綠豆	○・八	○・二七	二二・九	七七・一

項目	一百五十農家之平均價值		價值百分率	
	出售（或備售）	自用	出售	自用
作物				
高粱	三・一九	一四・○五	一八・五	八一・五
穀子	三・四三	一二・三三	二一・八	七八・二
棗	二・一四	○・二二	九○・七	九・三
菜蔬	○・三四	○・五一	四○・○	六○・○
黑豆	...	○・一四	...	一○○・○
甘薯	...	○・○一	...	一○○・○
總計	八一・五○	四八・一九	六二・八	三七・二
家畜及其副產品				
鷄	○・一五	・○八	六五・二	三四・八
鷄蛋	一・六六	・四八	七七・六	二二・四
猪	一・五七	...	一○○・○	...
騾	○・六○	...	一○○・○	...
皮	○・○五	...	一○○・○	...
糞	○・○三	...	一○○・○	...
總計	四・○六	○・五六	八七・九	一二・一

雜項	二・一二	二一・四〇	九・〇	九一・〇
共計	八七・六八	七〇・一五	五五・六	四四・四

（二）家畜

（甲）家畜之多少及支配　第二十三表，係按農場面積大小分組，以表明各組中各種家畜之數目者，第二十四及二十五表，係表明家畜之數量及其支配者。吾人觀此三表，對於鹽山畜牧之事業亦可以窺得其大概矣。

第二十三表　按農場面積大小分組各組中共有家畜之數目

按農場面積大小分組	馬	牛	驢	騾	大豬	小豬	鷄	鴨
十畝以下	…	…	三・五	…	…	…	一二三・五	三・〇
十一至二十畝	…	四・五	二七・五	二・〇	〇・五	一・〇	二五六・五	二・〇
二十一至三十畝	一・〇	五・五	三一・〇	…	…	〇・五	二一七・〇	一・〇
三十一畝以上	一・五	二五・五	三五・七五	六・〇	一〇・〇	一六・五	二五〇・五	二・〇
總計	二・五	三五・五	九七・一五	八・〇	一〇・五	一八・〇	八四七・五	八・〇

第二十四表　家畜之數目及支配

家畜種類	有此種家畜之農家之數目	有此種家畜之農家之百分率	百五十農家中平均每家之家畜單位	有此種家畜之農家每家所有之家畜數目	家畜單位總計	在總家畜單位中所佔之百分率
驢	九六	六四・〇	・三三	一・〇二	四八・八八	四五・五
牛	三七	二四・七	・二四	・九六	三五・五〇	三三・一
鷄	一四一	九四・〇	・〇六	六・〇一	八・四八	七・九
騾	七	四・七	・〇五	一・一四	八・〇〇	七・四
馬	三	二・〇	・〇二	・八三	二・五〇	二・三
大豬	一三	八・七	・〇一	・八一	二・一〇	二・〇
小豬	二〇	一三・三	・〇一	・九〇	一・八〇	一・七
鴨	八	五・三	・〇一	・〇〇	・〇八	・一
總計	…	…	…	…	一〇七・六二	一〇〇・〇
平均	…	…	・七二	…	…	…

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多數之家畜，皆爲役畜。純爲生產之家畜，祇佔全家畜中百分之一一·七。馬牛（黃牛）驢騾等爲役畜，猪豚鷄鴨等爲生產之家畜。其畜產或係自用，或作售品，殊不一定。役畜中驢子一項，幾佔全家畜單位中之半數，黃牛則佔三分之一。有驢之農家，約佔全農家三分之二。而養鷄之家，竟達全農家百分之九十四。所養鷄之隻數，每家平均約爲六隻。賣去鷄蛋之款，常作主婦針線之需用焉。

距城周圍十里之鄉間，其農民備受軍事時間差徭之苦，故通常鮮有畜養騾馬者。惟本調查中，農家所養之驢，仍有如是之多者，又別有故，蓋因驢除能耕作於田場外，且兼有負重，推磨，拉縴等用途也。

有若干農家，常有兩家共養一家畜者，或爲馬，或爲牛，或爲驢，則各家不等。據調查所得，尙有一農家祇有四分之一之黃牛，其餘之四分之三，則屬諸隔鄰他家也。

百五十家共有家畜單位爲一百零一家畜單位）每家平均之單位爲〇·九五，而平均每家之役畜單位，則爲〇·六三。又平均每家畜單位所經營之作物面積，爲三一·八畝，而平均每家畜之作物畝則爲四八·七畝。

第二十五表　農場之面積與家畜之數目

根據農場面積大小分組	每一家畜單位之作物面積	每一家畜單位之作物畝	役畜單位總計	生產家畜單位總計	家畜單位總計
十畝以下	八二·〇	一三一·八	一·七五	一·三〇	三·〇五
十一至二十畝	三一·〇	四七·三	二〇·二五	二·八九	二三·一四
二十一至卅畝	三三·一	五一·一	二二·〇〇	二·二九	二四·二九
三十一畝以上	二八·九	四三·七	五〇·八八	六·二六	五七·一四
總計	…	…	九四·八八	一二·七四	一〇七·六二
平均	三一·八	四八·七	…	…	…

（三）土地肥力之保護

由上節所言，可知鹽山各家之家畜，皆失之太少。換言之，即家畜每年所出之糞肥，實不足供給所有土地營養之需要也。觀每作物畝每年平均由家畜方面所得之糞肥，祇有〇·一

六五噸，（每英畝合〇・八二七噸）卽可知之。丹麥每英畝（合六華畝）卽平均有一家畜單位。美國康乃爾大學華倫博士常言每一家畜單位，平均在六英畝以上者，（約合華畝三十六畝零）此處之家畜單位，卽失之太少。若平均在一英畝及三英畝之間者，（約合六至十八華畝）又似覺太多。（註一）燕湖之調查，每家畜單位，約合五英畝，尙稱適中。鹽山每一家畜單位，在前文已言之，約合九英畝有半。若僅就此而論，其家畜單位，似誠太少也。惟人糞在中國，皆作肥料之用，與歐美各國，其情形略有不同。按鹽山農民，對於糞甚注意，而對於尿，則忽視之。人糞常與畜糞摻合而用，且所用之糞，俱係半腐化，並打碎之糞麵。以上所述，足以代表華北之情形。至中部如燕湖者，則糞與尿，同時皆被利用，不若鹽山之專知用糞也。設鹽山三分之二之人糞，可以利用，則依統計，每作物畝每年可多得七七・五磅之肥料。（註二）鹽山之人糞，雖祇佔全場糞肥之四分之一，但在研究中國土地肥力時，人糞畜糞，實居同等之重要，且鹽山除施用自產人糞及畜糞外，尙有購買豆餅芝蔴餅，和糞用之者。此項價值，半時每作物畝，約合二角九分。如以購買之肥料與自產者合計時，（註三）則每作物畝每年所施之糞肥，約近五分之二噸。（註四）在美國紐約省平均每年每英畝（六華畝）祇施二噸之肥

料，若與鹽山相比，似乎大致相等焉。

每畝肥料費增加時，地價及農場面積，亦同時增高。但產量指數九十四與一百另九兩數之差，爲數甚小。似難斷定卽爲肥料之影響。因同時地價較高者，產量之指數亦較高也。（見第三十一表）故多施肥料之有利與無利，尙待精確之實驗。

（註一）見G. F. warren 著 Farm Management 第二一一頁。

（註二）係根據 Heiden 氏之估計，每人每年可產糞一千磅。

（註三）每噸之估價，爲一元五角。

（註四）每家畜單位，每年估計，約可產糞八噸。

（四）農工

農場愈大者，人工畜工之效率亦愈高，此點已詳見以前農場大小一章中。鹽山普通農場之面積既較小，故家工在農場作工者，尙有餘暇之時，無再僱農工之必要。據調查所得，在此百五十農家中，祇有五家，每家雇一長工，卽可想見。因人工之需要太低，故同時農工之工價，亦遠較他處爲少。平均長工每年之工價，約僅爲十元左右，飯值亦僅二十元。（註一）惟現在

工價，較本調查年間，已漲二三倍，因大部分農民，皆有赴滿洲作工之機會，人工需要較多也。

各種作物每作物畝之人工及畜工單位，詳見第二十六表。按鹽山生產每畝小麥所需人工之數量，與美國紐約省相較約多四倍半云。

每畝所需畜工之數目，較美國紐約省稍高。此亦因紐約畜工之數目，較人工之數目多三分之一，而中國人工之數目，則較畜工之數目約大兩倍之故也。觀此種中美主要之不同點，吾人可以斷言，即美國使用畜力之機器，較中國爲多；中國雖有可以代替人工之役畜，然大抵閒而不用也。

第二十六表　各種作物所需人工及畜工之單位

作物名稱	每作物畝之工作單位		
	工	人	工 畜
小麥	一·七		一·〇
玉蜀黍	五·五		一·三
黃豆	三·三		〇·六
高粱	六·五		一·九
穀子	五·三		一·九
玉蜀黍及黃豆	五·五		一·三（註二）
黃豆及穀子	五·三		一·〇（註二）
黃豆及綠豆	五·四		一·〇（註二）
甜薯	八·五		一·三（註二）
蔬菜	一八·〇		……（註二）

（註一）鹽山長工，僅與場主共食而不同居，與他處情形稍異。

（註二）作物之面積甚小，故所有人工畜工之單位數目，皆係由調查者照經驗所及，比較而估計得之。

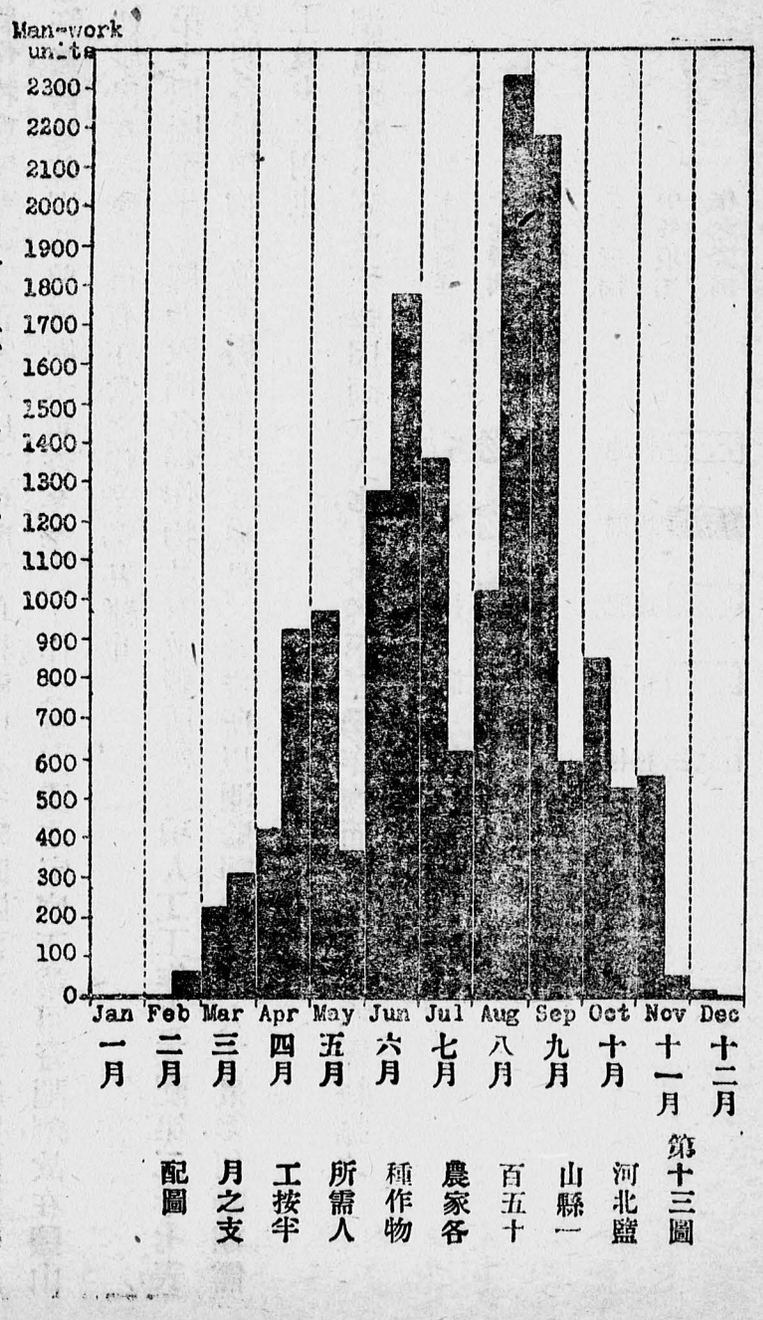
（甲）人工數目及按半月之支配　百五十家共有作物工作之支配，詳見第十三圖中。按此圖而言，農家冬季，即無工可做，即在作物生長期各季中，其工作多寡之差，亦殊甚鉅。雖然，在冬季時，亦非無工作可做，如仕道上拾取遺糞，以作肥料，是即冬季工作中最有利

益之一種。此項工作所需之時間，亦不爲少，若算入作物工作總量中，卽可使其大增。徒以缺乏精確統計，不能決定其所費時間，究有多少，故祇得暫付缺如耳。

在作物生長期中，五月七月及十月之各下半月，人工工作量皆甚低少。第一次工作最多之時期，爲收穫及打落第一季作物卽小麥之時。（見第十四圖）第二次工作最多之時期，爲八月下半月及十月上半月，則係因收穫高粱及預備種小麥之故云。

觀第十三圖，吾人第一種感想，卽關於作物人工之支配，頗覺其有在一時期，則失之工作過多，而在另一時期，復失之工作過少之弊。若以百五十家共有之工人等數二二八・五，除其工作最多時期人工單位之總數，吾人可得每十五天中，平均有十足天之工作。若再除去陰雨不能耕作之時，則農人此時，似難有休暇之時間矣。

平均每家共有人工單位數爲一四一・二，是可表明農場工作量，並不得謂之多。雖陰雨及節日，可佔去若干天，但一年三百六十五日中，每人之工作單位數，亦不過祇有九三・二。攷工作單位所以如此之少者，大約因農場面積過小，與耕作太粗放所致。申言之，卽多種穀



第十三圖　河北鹽山縣一百五十農家各種作物所需人工按半月之支配圖

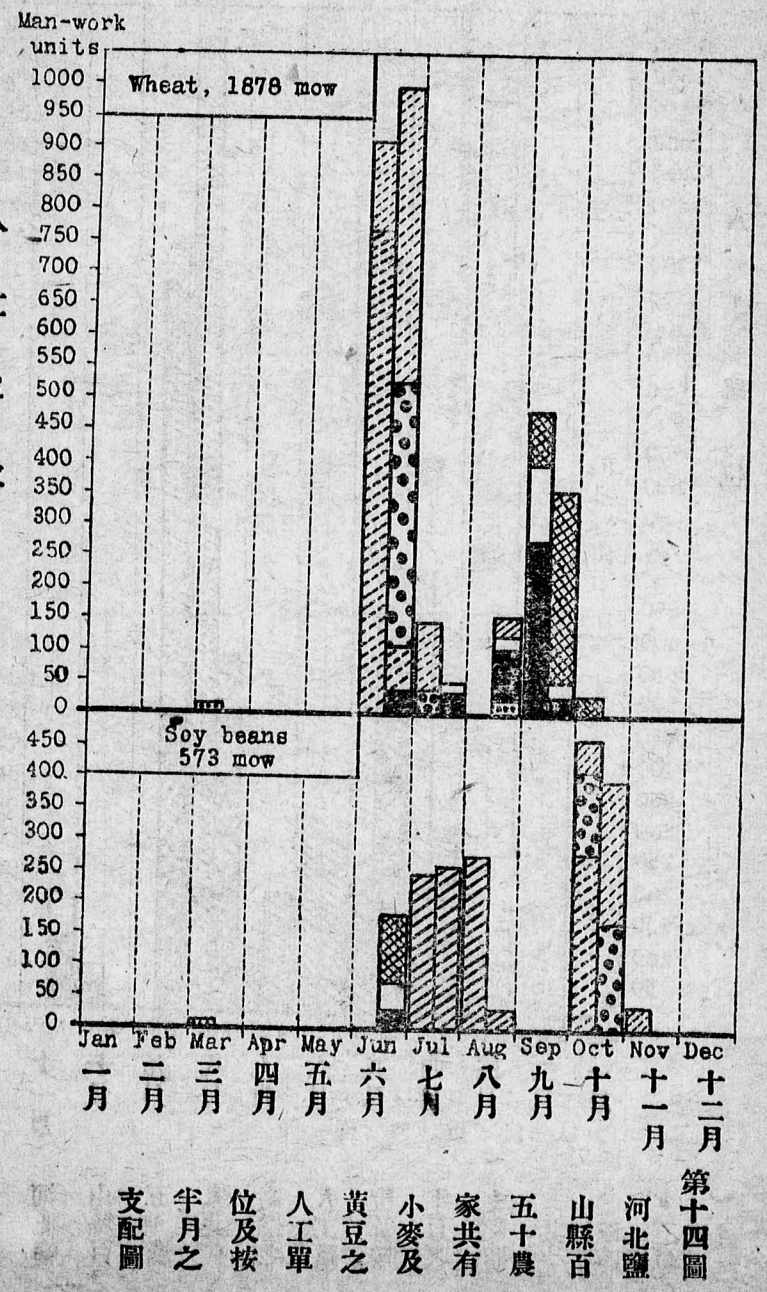
類農作物，與冬季缺乏正當農場工作所致也。按鹽山在冬季時，雖已有少數農民出外營生，但既無畜牧，菓樹，及普通樹木，可資冬季之工作，又無發達之家庭工業，可資調劑，故在鹽山欲使農民在冬季時，得有正當之作業，蓋甚難也。

第十四圖至十七圖，乃表明各種作物共有畝數所需各項人工工作之支配。第二十七表，則表明各種作物每畝所需人工之支配。是二者，皆所以測驗何時期需人工最多，何時期需人工最少之用也。

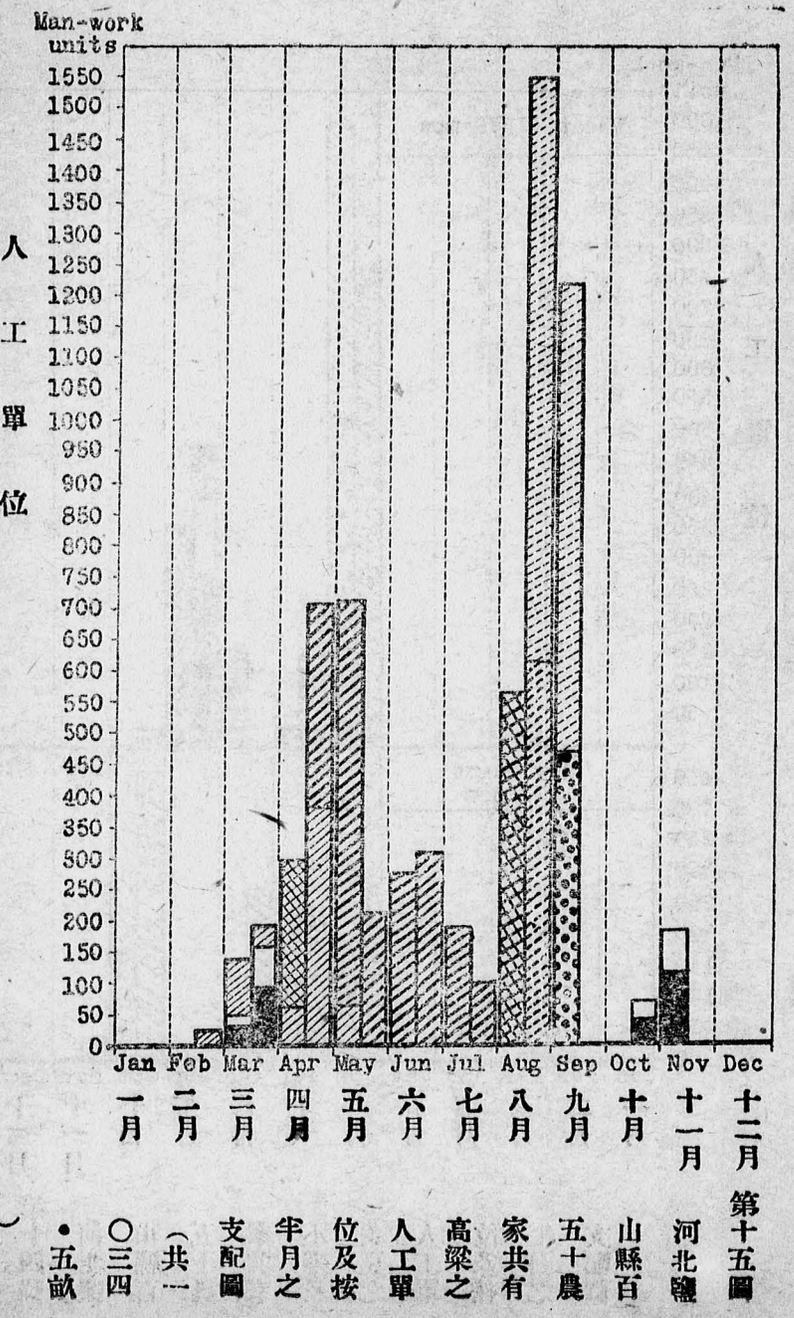
湖地雖於小麥收穫後，因雨水太多，不再種第二季作物，而於初夏時亦需耕掘之。

第十四圖至十七圖與十九圖至二十三圖中各項工作之圖例

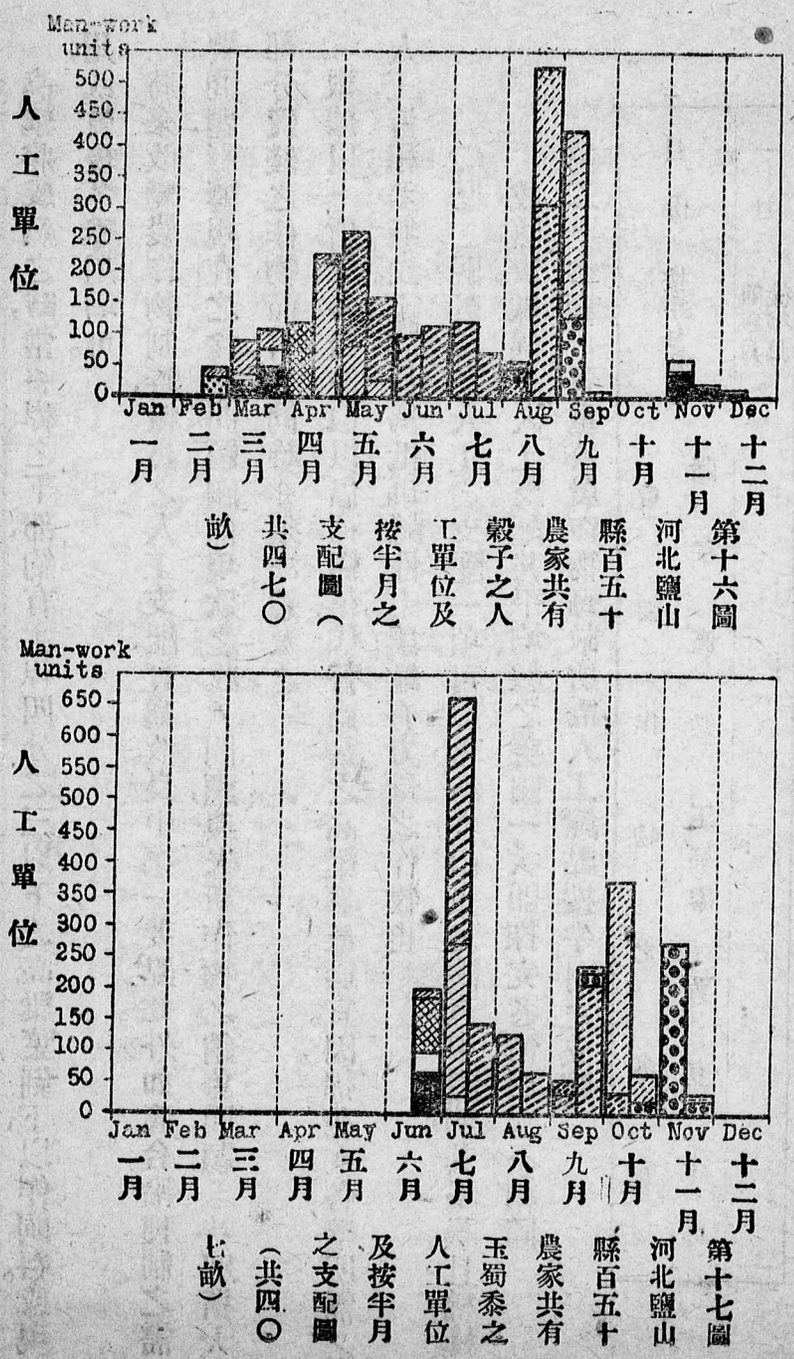
整地　除草
耕掘　收穫
施肥　打落
耙平　摘葉
種植　雜項



第十四圖　河北鹽山縣一百五十農家之經濟及社會調查　人工單位及按半月之支配圖



第十五圖　河北鹽山縣百五十農家共有高粱之人工單位及按半月之支配圖（共一三四•五畝）



第十六圖　河北鹽山縣百五十農家共有穀子之人工單位及按半月之支配圖（共四七〇畝）

第十七圖　河北鹽山縣百五十農家共有玉蜀黍之人工單位及按半月之支配圖（共四〇七畝）

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高粱將成熟之時，常將稈之下部，約有主稈四分之三以下之高粱葉剝下，以作飼料。或現用，或乾後冬季用均可。

將來改變農作物制時，較良之人工支配，實爲改良中第一要點。此外如適合輪種制之需要問題，影響現在之食糧問題，關係現欵之收入問題，與夫新作物之銷售問題，（特別指大部分賣錢之作物而言。）同時亦須注意及之。

根據以上所舉各條件，似以倡種棉花，代替過量之高粱爲最適宜。因棉花在各季所需之人工，皆相差無幾。（註）且爲抵抗鹼性土壤，最有力量之作物也。

（註）關於棉花人工之支配一項，可以著者在山東諸調查中證明其不誤。且棉桃成熟後，採棉之人工，支配甚平均，較之美國一次卽採完者，情形大不相同。

第二十七表　各重要農作物每畝所需人工鐘點按半月之支配

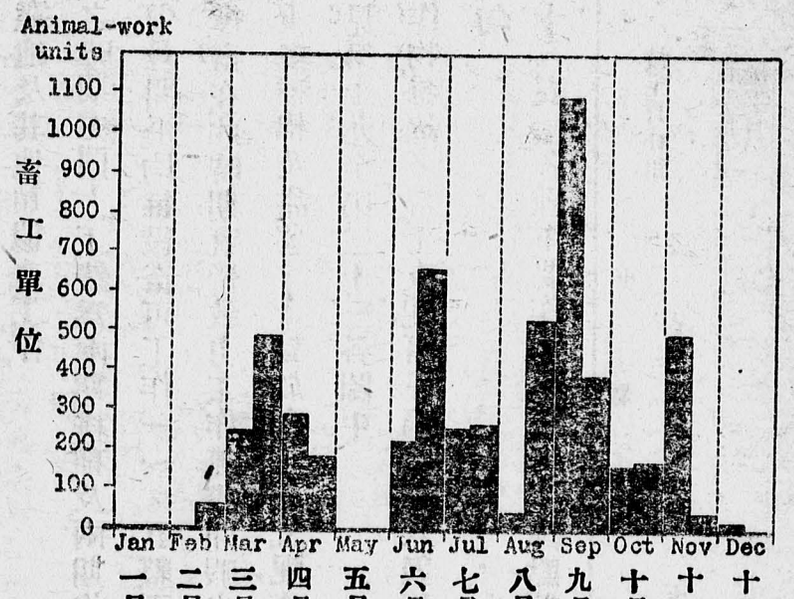
月份	按半月分組	重要作物之名稱					
		穀子	高粱	玉蜀黍	黃豆	小麥	
一月	前半月	…	…	…	…	…	…
	後半月	…	…	…	…	…	…

月份	按半月分組	重要作物之名稱					
		穀子	高粱	玉蜀黍	黃豆	小麥	
二月	前半月	…	〇・九	…	…	…	…
	後半月	…	〇・二	…	…	…	…
三月	前半月	…	一一・三	…	〇・一	…	…
	後半月	…	一一・八	…	…	…	…
四月	前半月	…	二二・九	…	…	…	…
	後半月	…	六六・九	…	…	…	…
五月	前半月	…	五六・六	…	…	…	…
	後半月	…	二三・〇	…	…	…	…
六月	前半月	…	一一・九	…	…	…	…
	後半月	…	二三・〇	…	…	…	…
七月	前半月	…	二七・六	…	…	…	…
	後半月	…	一一・九	…	…	…	…
八月	前半月	…	一一・三	…	…	…	…
	後半月	…	一五・〇	…	…	…	…
九月	前半月	…	九・二	…	…	…	…
	後半月	…	一一・八	…	…	…	…
十月	前半月	…	…	…	…	…	…
	後半月	…	〇・七	…	…	…	…
十一月	前半月	…	一・三	…	…	…	…
	後半月	…	一・八	…	…	…	…
十二月	前半月	…	…	…	…	…	…
	後半月	…	…	…	…	…	…
總計	…	五三・三	六五・一	五四・四	三二・八	一六・七	…

如謂引種棉花，易使食糧減少，則可同時多栽植甘薯，以彌補之。因甘薯產量豐，有時或不僅可以彌補減少，而反能使食糧大形增加也。再就工作支配方面言之，甘薯需要工作最多之時期，爲十月後半月及十一月，而該季農場，祇有少量之工作，並無衝突之點也。

按鹽山情形，農民於高地中，應試種白甘薯。此外甜菜亦似乎相宜。因甜菜亦爲抵抗鹹土最有力之作物也。惟因目下銷售甜菜之市場，尚形缺乏，雖在中國他處，有時農民且直接用之爲食物，但其銷費量究屬不多，故就現在而言，甜菜尚不應廣爲種植也。

（乙）畜工數目及按半月之支配　鹽山役畜重要之工作，爲耕地，耙地，下種，（用耧）中耕，（用中耕器）及拉車等。驢並可用以載重及磨麵粉等。觀第十八圖，吾人可知該地工畜，不僅在冬季四月中無工可做，即在作物生長期內之兩月中，亦無甚充足之工作。平均每一役畜單位所作之畜工單位，僅爲六一・九，即可見其工作之太少矣。又每一役畜單位平均之作物畝爲四八・七畝。按鹽山情形，大可利用役畜耕種及中耕。如第七圖所示鋤地之人工，正可利用役畜及中耕器以代替之。冬季大車之用途較少，故役畜於土壤未凍時，祇可用



第十八圖　河北鹽山縣百五十農家共有作物之畜工單位及按半月之支配圖

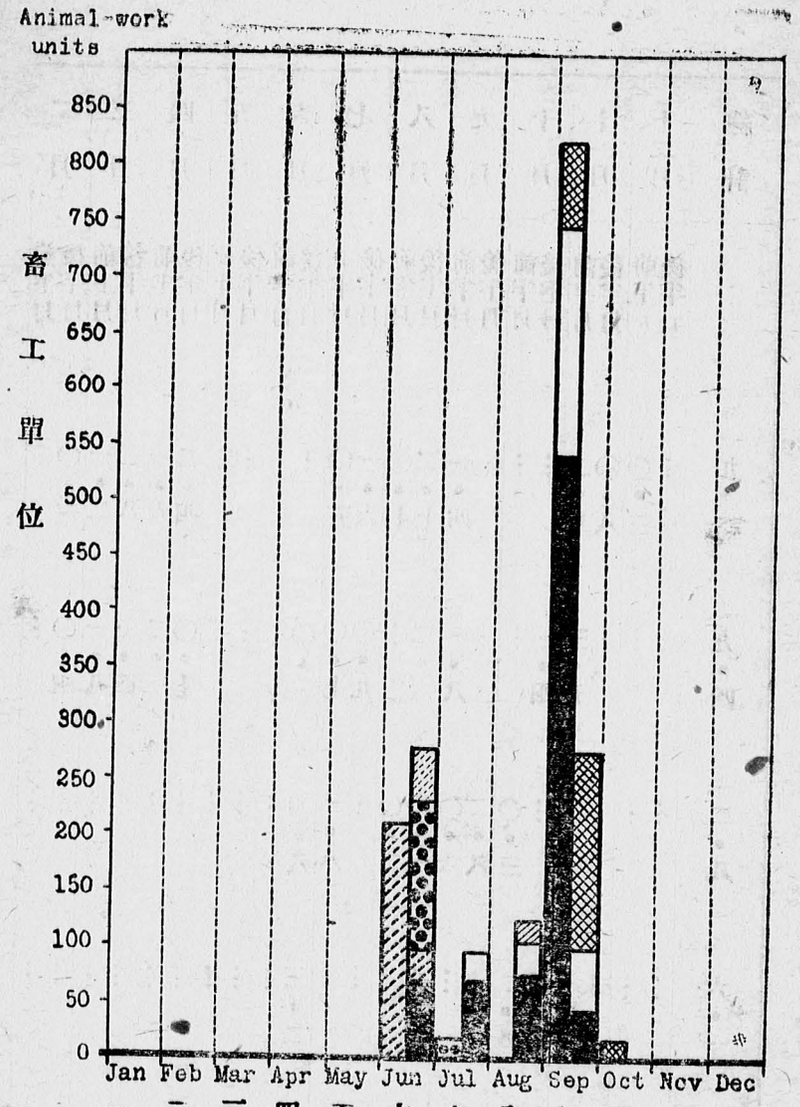
以除鹻土，墳窪地，及其他類似之工作。

役畜最忙之時期，亦同人工，然爲兩期耕種及兩期收穫作物之時期。九月上半月，爲畜工最忙之時期，半月間平均每役畜可工作一一·五整天。（每天十點鐘）在此十五天中，尙須除去陰雨，故役畜在此時期，實皆致力工作，無或閒暇也。在前節人工支配問題中所假定改變之作物，——多種棉及甜薯——對於畜工之支配，亦較現在者爲佳。至各種作物畜工之詳細支配，可見第十九至第二十三各圖中。

各種主要作物每畝之畜工支配，可見第二十八表。根據此表，卽可以研究畜工問題，使之支配較爲均勻。

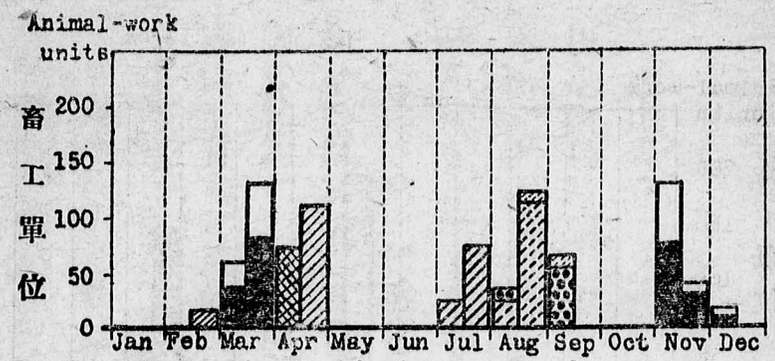
第二十八表　各種主要作物每畝畜工鐘點按半月之支配

月份	按半月分組	重要作物之名稱					
		穀子	高粱	玉蜀黍	黃豆	小麥	
一月	前半月	…	…	…	…	…	…
	後半月	…	…	…	…	…	…
二月	前半月	…	…	…	…	…	…
	後半月	〇·三	〇·四	…	…	…	…
三月	前半月	一·二	一·八	…	…	…	…
	後半月	二·八	三·四	…	…	…	…
四月	前半月	一·六	二·一	…	…	…	…
	後半月	二·四	〇·七	…	…	…	…
五月	前半月	…	…	…	…	…	…
	後半月	…	…	…	…	…	…
六月	前半月	…	…	…	…	…	…
	後半月	…	〇·一	四·八	…	…	…
七月	前半月	〇·五	〇·七	三·八	…	…	…
	後半月	一·六	〇·九	…	…	…	…
八月	前半月	〇·七	…	〇·二	…	…	…
	後半月	二·七	二·六	〇·三	…	…	…
九月	前半月	一·四	一·八	…	…	…	…
	後半月	…	…	…	…	…	…
十月	前半月	…	…	…	…	…	…
	後半月	…	一·四	…	…	…	…
十一月	前半月	二·九	三·五	…	…	…	…
	後半月	〇·八	…	…	…	…	…
十二月	前半月	…	…	…	…	…	…
	後半月	〇·三	…	…	…	…	…
總計	…	一九·二	一九·四	一二·八	六·一	九·九	…



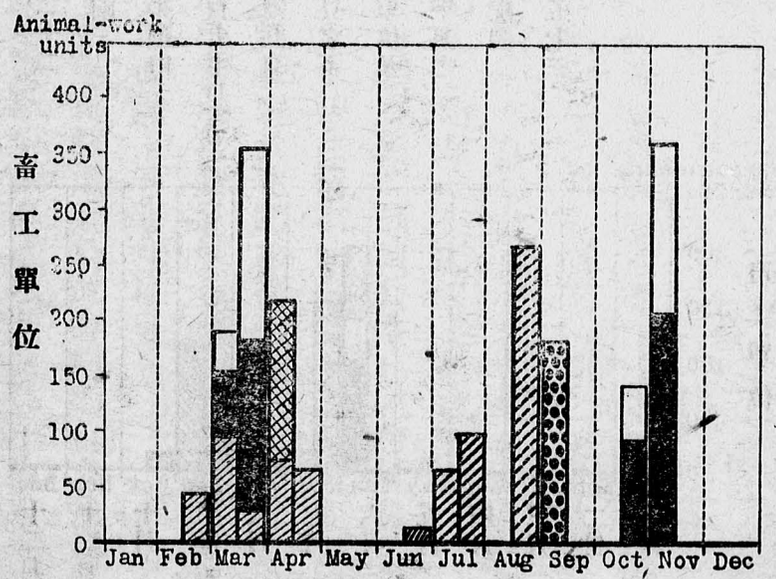
第十九圖

河北鹽山縣一百五十農家小麥之畜工單位及按半月之支配圖（共一八七八畝）



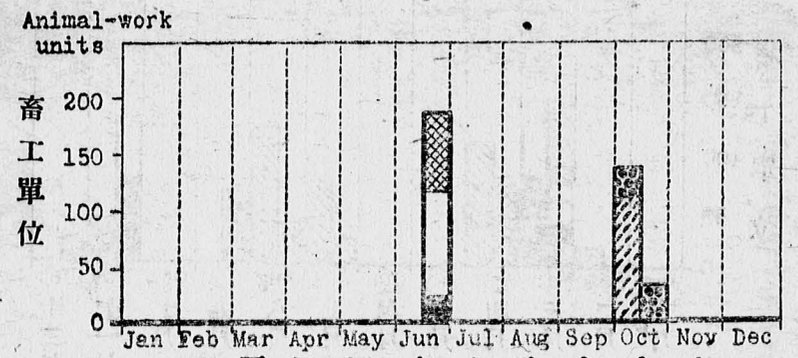
第二十圖

河北鹽山縣一百五十農家共有穀子之畜工單位及按半月之支配圖（共四七〇畝）

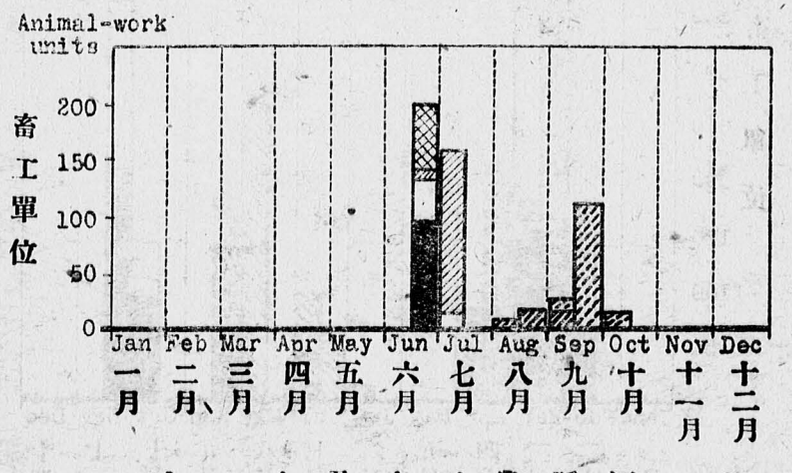


第二十一圖

河北鹽山縣一百五十農家共有高粱之畜工單位及按半月之支配圖（共一〇三四・五畝）



第二十二圖　河北鹽山縣百五十農家共有畜工單位及按半月之支配圖（共五七三畝）



第二十三圖　河北鹽山縣百五十農家共有畜工單位及按半月之支配圖（共四〇七畝）

第五節　農場經營之情況

（一）作物之產量及價值

鹽山農藝之方式爲穀類農藝，故作物產量指數，卽各種作物產量混合之指數，爲測驗全場事業最精確之標準。惟河北全省各種作物之產量，既乏精確之統計，故鹽山一縣之產量，亦無從與各地比較。雖然，觀第二十九表中各作物之產量，似皆較低。此蓋因當地之土壤生產力既較他處爲低，而作物在生長期內其雨量之支配，又不甚適宜也。

鹽山之耕作，似應再加以精密。著者曾親到田間，周圍觀察，見田間所長之莠草，在兩禮拜之前，卽應鋤去之者（見第七圖）尙未除去。按此情形，鹽山目下似頗需要利用役畜中耕之方法，使鋤耘之工作，得以增快。惜鹽山農民，對於此點之不措意，一與他處農民相同，雖或因不了解除去莠草、保持水分，以及消除地面鹼土等等利益也。

小麥及穀子之產量最高。蓋因該年期氣候較適宜於此等作物也。其他諸作物，則因晚夏太乾旱，皆較標準產量爲低。紅棗爲農場進款中最高之項，其次爲小麥，黃豆最低。詳見第二

十九表。

第二十九表　作物之產量與其價值

作物名稱	產量		作物之價值	
	每畝斗數	每英畝英斗數	每斗(中幣)	每畝(中幣)	每英斗(美金)	每英畝(美金)
小麥	五・八	一五・五	一・〇三元	五・九七元	一・〇四元	一六・一八元
黃豆	一・五	四・〇	・六〇	・九〇	・六二	二・四六
高粱	四・四	一一・八	・五二	二・二九	・五三	六・二一
穀子	八・一	二一・六	・五四	四・三七	・五四	一一・八二
玉蜀黍	三・七	九・九	・六一	二・二六	・六二	六・一一
粟子	六〇・〇	一六〇・一	・三三	一九・八〇	・三三	五三・六一
黃豆及穀子(註)	一・〇 一・八	二・六 四・八	・六〇 ・五四	・六〇 ・九七	・六二 ・五四	一・六二 二・六一
玉蜀黍(註)	二・〇	五・三	・六一	一・二二	・六二	三・三一

及黃豆(	一・一	二・九	・六〇
			・六六	・六二	一・八〇

註:兩種作物同種一地者

(二)作物產量之指數

以所調查一百五十農家各種作物平均之產量，假定爲一百，於是卽可比較各組農場之作物產量指數矣。(見第三十表)作物產量之指數，大小相差甚低。(C = 20.27+0.82) 作物產量指數之關係，可於每作物畝之贏利中見之。卽屬最低指數一組之農場，其平均贏利，爲貳七角三分，而屬最高指數一組之農場，其平均贏利，則爲九角五分也。

作物產量指數最高如一二五以上之農場，平均每家場主之工價，較作物產量指數最低如七五以下之農場，約多六倍。但在一〇〇至一二四作物產量指數組中之農場，其平均作物畝數，雖較作物產量指數次小組中農家之作物畝，尙少一四・六畝，然其每家平均之場主工價則獨高。

第三十表　作物產量指數與場主工價及每作物畝之贏利之關係

根據作物產量指數之佔有此種產量指數之每家平均之有場主工價五十元以上之家數在每作物畝之贏

量指數分組	家數	百分率	之作物畝	場主工價	本組總家數中所佔之百分率	利
七五以下	九	六•〇	二五•七	六•七四元	…	負〇•七三元
七六至七九	六五	四三•三	四四•二	三七•五六	三五•四	•二二
八〇至一二四	五五	三六•七	二九•六	四七•二九	三六•四	•六九
一二五以上	二一	一四•〇	二四•二	四〇•四三	三八•一	•九五
總計	一五〇	一〇〇	…	…	三四•〇	…
平均	…	…	三四•九	三九•六七	…	•四〇

若在大小不同之農場面積各組中，詳細比較各種作物之產量，小麥之結果，似覺最爲明顯。因小麥爲當地主要農作物，故一般小農家，常將小麥種植於最好之田中，以期得最高之產量。而結果，小農場之平均產量，確較大農場高出百分之一五•八。惟小麥收後之玉蜀黍及黃豆等，因天旱關係，其產量反不若大農場之種於低地者爲高耳。

作物產量混合之指數，在小農場中，較大農場中者，高百分之七。

在一百四十七農家中，如以作物產量指數爲固定數，則場主工價及作物畝二者間之部分相互關係函數爲 $+0.469\pm0.043$，較其簡單相互關係之函數稍高。於此亦可証明小農場中作物之產量，較大農場中者爲高也。

(三)地價與作物產量之指數

鹽山土地出產既不豐，故地價亦不高。平均每畝（農場面積）僅值一八•〇八元。且各家地價高下相差之數亦甚低。（$C=30.03\pm1.27$）地價高低與其他因素之關係，可見第三十一表中。大概每畝農場面積地價不足二十元之農場，其作物產量指數爲九五。而每畝農場面積地價在二十元以上時（平均二三•五一元）則其作物產量之指數爲一一〇。又地價較高之地，複種之指數亦較高。至地價較低之農場，每有較高之場主工價，及每作物畝之贏利者，大部分因地價較低之農場，即農場面積較大之農場，每有較高之場主工價，及每作物畝之贏利等之故也。

第三十一表　地價與作物產量指數複種指數場主工價及每作物畝之贏利等之關係

根據田地價值分組	佔有此項田地價值之家數百分率	每畝平均作物產量指數	田地複種百分率	每農家平均之場主工價	每作物畝之贏利

一九・九九元以下	七五	五〇・〇	一四・四四元	四一・〇	九五	五一・九
二十元以上	七五	五〇・〇	二三・五一元	二八・八	一一〇	五四・六
總計	一五〇	一〇〇・〇	…	…	…	五三・〇
平均	…	…	一八・〇八	三四・九	一〇〇	…

	四六・四六	〇・四八				
	三二・八九	〇・二八				
	…	…				
	三九・六七	〇・四〇				

第六節　農場週年經營之總結

鹽山百五十家農場平均週年經營之結果，見第三十二表。在本調查年期內，全場土地之價值，每家平均增多四〇・四六元。但並未計入資本增加項內，此蓋因鹽山地價之漲落，常視收成之豐歉爲轉移。本調查年期之前一年，較通常爲歉收，而調查年期，適較爲豐收，故在調查年期之初，地價甚低，而一至年期之終，地價忽增也。

平均場主之工價，爲三九・六七元，較普通長工之工資，多九・四七元。五分之四以上之場主，其工價皆屬零至九十九元之一組中，（見第三十三表）而其高下相差之鉅，爲自負二一九元至三八九元。（C＝138.29±11.83）再場主工價之中位數爲三十八元，密集數爲二十五元。

平均每家之家庭進款爲五六・四八元，其中三三・九〇元爲現款，而其餘二二・五八元，尙爲存貯備售之小麥之估值。因本調查年期之收成較高，故農家之貯存小麥，亦較他年爲多也。再此三三・九〇元之現款收入，與家庭現款費用二四・二八元相比較，前後亦甚相符。

平均每家之家庭賺款爲一三五・一三元，此數之百分之五十二，卽係家用農產物之估值。農場多數之進款，既係非現款，而爲家中之農產物，故於測算場主之工作及管理之價值時，場主工價似較場主工作進款爲準確也。觀平均場主工作進款爲負三〇・四八元，若據此以繩，是予讀者以極謬誤之印象矣。

倘以鹽山與蕪湖相較，則兩處人口相等之家庭，其賺款，蕪湖較鹽山約多二倍有半。鹽山每人之家庭賺款，平均爲二五・二四元，每一成年男子單位之平均賺款，則爲三三・三一元。上數若再加農場供給房屋之租值，卽可與中外各處之家庭賺款調查相比較矣。至全房租之價值，約合全房價之十分之一。而房屋之爲家庭用者，又祇佔全租值之半。若依此計算，則鹽山家庭所用房屋之租值，爲九・二四元。

僱工之費用，指包括草帽手巾費一·二五元，及烟酒費〇·九七元而言。

農場以外他項進款之總額，約佔全家庭賺款之百分之十一，是表明家庭賺款之總額，由他項進款中來者，僅佔十之一以上。至他項進款之來源，大部分係由旅外家屬由外寄回者。（見第四十表）

第三十二表　農場週年經營之總結（以一農家爲單位）

	元（平均）
農場收入	八一·五〇
農作物售價	四·〇六
牲畜及其副產品售價	二·一二
他種現款收入	七〇·一五
家庭自用產品估值	九·九七
資本增加	一六七·八〇
總計	
農場費用	
雇工（包括膳宿費）	五·三四
家工（包括膳宿非現款）	一九·一四
現款費用（雇工除外）	四一·一九
資本減少	一·四七
總計	六七·一四
農場賺款（農場收入減去農場費用）	一〇〇·六六
資本利息（資本七六一·三八元利率八厘）	六〇·九九
場主工價（農場賺款減去資本利息）	三九·六七
場主工作進款（場主工價減去家庭自用產品估值）	負三〇·四八
場主他項進款	一五·三三
家庭進款（現款收入減去現款支出再加他項收入之總進款）	五六·四八
家庭賺款（農場收入加入他項進款再減去全農場除家工折款外之費用）	一三五·一三

投資報酬的百分率（農場賺款減去場主本身工值再以資本除之）　九·八

第三十三表　場主工價之大小

場主工價之大小	佔有此種場主工價之家數	百分率
三〇〇至　三九九元	一	〇·七
二〇〇至　二九九元	…	…
一〇〇至　一九九元	一二	八·〇
〇　至　九九元	一二三	八二·〇
〇　至負九九元	一一	七·三
負一〇〇至負一九九元	二	一·三
負二〇〇至負二九九元	一	〇·七
總計	一五〇	一〇〇

鹽山投資所得之報酬，約合百分之九·八之利率。其利息所以如此之高者，舉其要約有三點：即地價廉，人工賤，與小麥之產量高也。

第三十四表，乃全場主要因素之平均統計也。此統計可用以與其他各處之調查相比較。作物畝，每人之人工單位，及作物產量之指數三者，足以影響場主工價百分之三十四。（見附錄第四表）而三者之中，尤以人工之影響爲最顯著。觀人工單位之影響率爲二十二，作物畝之影響率爲十可知矣。

場主工價與作物畝，每人人工單位，及作物產量指數三者之混合相互關係函數爲〇·五七八（R 1.243 = 0.578°）並該三因素即佔影響場主工價全因數之百分之三十四也。

綜觀農場週年經營之總計，吾人可以斷言，身充場主者，較傭工爲佳。此外農人經營自己完全獨立之事業，其興趣亦非傭工所可同日而語也。

第三十四表　主要農場組織因素之總計

企業之大小		
一、每農場之人工單位		一四一·二
二、每農場之畜工單位（百五十農家平均）		三九·二

三、每農場之作物面積(畝) 二二·八
四、每農場之作物畝 三四·九
五、作物面積複種的百分率 五三·〇
六、每農場之工人等數 一·五二
七、每農場之資本總數(元) 七六二·三八
八、每農場之家畜單位(百五十農家平均) 〇·七二
九、每作物畝之人工單位 四·〇五
十、每作物畝之畜工單位 一·一
企業之方式及其內容
十一、種植售現歉作物(小麥)畝數佔全作物畝數之百分率 三八·四
十二、資本支配之百分率如下： 八六·六
(甲)不動產如田地房屋等 四·六
(乙)家畜
(丙)設備及他種供給 八·八
十三、每一家畜單位(包括役畜)所有之作物畝 四八·七
十四、每一家畜單位(包括役畜)所有之作物面積 三一·八
十五、每作物畝所用之糞肥(以噸爲單位) 〇·一六五
十六、每作物畝所購用之肥料價值(元) 〇·二九
十七、工作支配 不適當
工作效率
十八、每人之工作單位 九二·六
十九、每人所有之作物畝 二二·九
二十、每人之作物面積(畝) 一五·〇
廿一、每一役畜單位之畜工單位 六一·九
廿二、每一役畜單位之作物畝 四八·八
廿三、每一工人等數之工作報酬(元) 四二·三八

廿四、每一人工單位之工作報酬(元)	一〇〇
廿五、人工費用在全數農場費用中所佔之百分率(場主工作費用在外)	〇·四五
廿六、每作物畝之工作費用(元)	三六·五
資本效率	一·四四
廿七、農場面積每畝之價值(元)	一八·〇八
廿八、每一農家建築之價值(元)	一八四·八七
廿九、建築投資佔全數資本之百分率	二四·二
三十、田地樹木等投資佔全資本之百分率	六二·四
卅一、每作物畝之農具及設備價值(元)	〇·五一
卅二、每畝農場面積之稅率(元)	〇·〇九
利益	
卅三、場主工價(元)	三九·六七
卅四、場主工作進款(元)	貳三〇·四八
卅五、家庭進款(元)	五六·四八
卅六、家庭賺款(元)	一三五·一三

第三章　農家與人口

第一節　農家

研究農場管理各種問題時，同時對於農人之本身，亦得有相當之研究。此種情形，在中國尤爲顯著。蓋中國農家之社會及經濟兩方面之關係，比之美國農家，較爲密切。試閱本篇由農場面積之大小，以測計農家人口之多少一點，即可證明此點之不誤。再者，農業本爲農家之事業，然普通各國關於農場管理之調查及研究等，對於此種關係，則鮮有論及者。此或由中西農家之情形有不同者歟。

(一)場主及其家屬之世籍

關於場主及其家屬之世籍，亦多由調查各農家時所得，在此調查中，所調查得之一百二十九個場主之內，有一百二十五個場主，或佔全場主之百分之九十七，皆係生長於該村之

內。其餘百分之三，則係由他處遷入者。

又調查得一百一十七個場主之父親籍貫內，有一百一十人，或百分之九十四，皆係生長土著，且在各場主之父親中，除一人爲軍官外，餘均世襲業農。

此外又調查得一百二十個場主之妻室，則祇有八人或百分之六・六，係與場主生長同村。其餘一百一十二人，則皆生長在隣近之七十三村內，且其中更有三人，不屬鹽山縣境者，八人生長在鹽山縣城內者。場主之岳父，大都與場主之妻室，幼時同居一地。且除一人爲教員，一人爲勞工外，其餘亦皆係業農。

關於以上調查，讀者幸勿等閒視之。觀於此可以表明農人之職業，多係世代相傳，而此兩代之中，竟無一經營商業者在焉。此外猶有重要之一點，卽在通姻媾之範圍甚廣，於血統關係之研究上，亦大有貢獻者也。

（二）農家人口之多少及其內容

中國常有大家庭之名稱，其內容大約不外乎下列第三十五表中諸人稱。觀表內若干場主之母親，皆與場主同居，而場主之若子若媳，亦大都與場主同居。此蓋由中國家庭之制度如此，禮教使然，非若西國盛行小家庭制，兒子婚後，卽與父母分居，而農家之人稱，亦少見場主之父母及成婚之子媳也。又觀表內之人稱，場主之女，恆較子爲少，蓋女子出嫁後，卽不在場主家庭範圍以內也。

平均百五十家之人口，每家有五・三五人，此數似乎較普通想像中之家庭爲小。至各農家人口多少之變量則甚大。（其數爲 54.39±2.66）

第三十五表　農家之內容

農家之人稱（除場主外其餘皆指與場主之關係）	有此人稱之家數	百分率
男場主	一四八	九八・七
女場主	二	一・三
妻	一一九	七九・三
子	一〇六	七〇・七
女	六七	四四・七

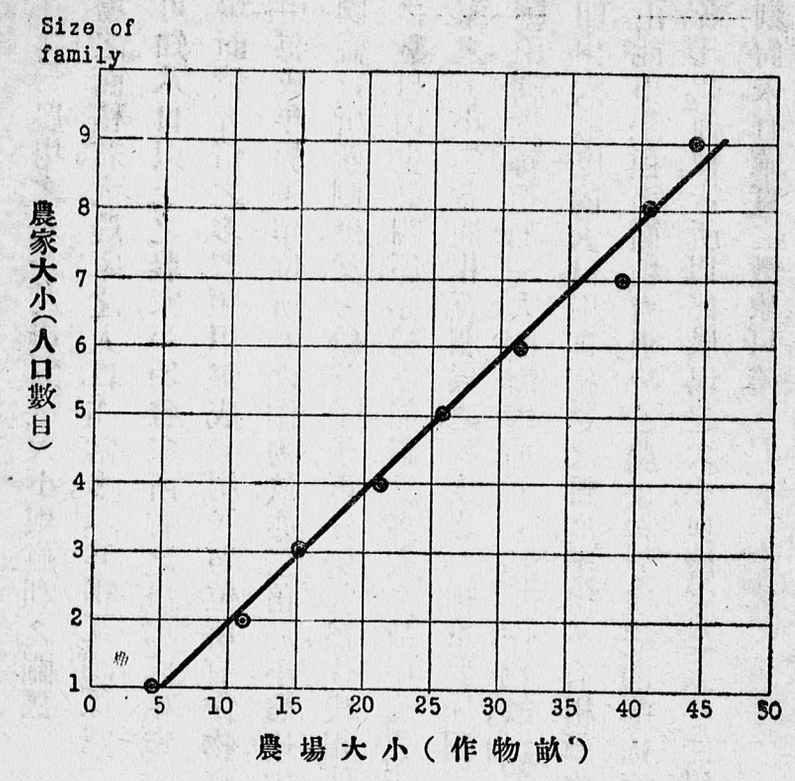
母親	四四	二九・三		
子媳	四〇	二六・七		
孫	二六	一七・三		
孫女	二三	一五・三		
兄弟媳	一八	一二・七		
兄弟	一七	一一・三		
父親	一三	八・七		
姪子	八	五・三		
姪女	七	四・七		
姊妹	四	二・七		
祖母	三	二・〇		
孫媳	二	一・三		
重孫	一	〇・七		

(三)農場之大小及農家之大小與贏利之關係

農場之面積若大，農家之人口亦常多。（其相互關係爲 0.735+0.023）試觀以下第三十六表，可知八口以上之農家，平均每家所有之農場面積，竟達三口以下之農家，平均每家所有農場面積五倍之多。若更用每成年男子單位所有作物畝之方法測計之，則可見最大之農場中。每成年男子單位所有之作物畝，亦二倍於小農場中也。

中國盛行析產制度，父分給其子，子再分給其孫。代代相傳，於是農場之面積愈小，而農家人口之數目，因生計關係，亦勢不能容納多人矣。故中國之析產制度，實爲增高農場之大小與農家之大小二者間相互關係之程度之一種重要原因。

按鹽山調查，每增加一人，則需增加九・〇一作物畝。（即三・一七畝作物面積）此種現象，亦即由大家庭內人口增到相當之限度，不得不有析產之舉所演進。（參觀第二十四圖）惟鹽山能事墾種之面積有限，於是農民有分居後，即遷徙至他處謀生者。有因窮苦而減少壽命者，凡此種種，皆所以使農場之大小，與農家之大小，能維持現狀者也。至對於生育上之節制，刻尙未有確實之徵象可稽。



第二十四圖 農場大小與農家大小之關係 每增一人即須增加五、〇一作物畝或三、二七畝作物面積

農家大小與場主工價之關係甚微，(r = 0.128±0.054)，但與家庭賺欵之關係，則甚爲顯著。(見第三十八表)蓋家庭賺欵中，兼有農場以外之他項進款，且同以家爲單位，故其關係較爲密切也。試觀大農家之家庭賺款，較小農家之家庭賺欵，約多三倍。而二者間之相互關係，竟達 +0.644±0.032 之高也。又此種關係，亦可用每成年男子單位之平均家庭賺欵以測驗之，結果大農家中每成年男子單位之家庭賺款，似較小農家中者畧高。此外家庭賺欵，常較場主工價，與其他各種生產要素相互間之關係爲少爲低。且各農場中家庭賺欵之變量亦甚小。(C = 72.92±4.08.)

第三十六表 農場之大小與農家大小之關係

農場按農場面積大小分組	共有之人數	平均每家之人數	共有之成年男子單位數	平均每家之成年男子單位數	每成年男子單位之作物面積	每成年男子單位之作物畝
十畝以內	九二	二・七九	七五・〇	二・三	三・三	五・四
十一至二十畝	二二六	四・七一	一六九・五	三・五	四・二	六・五
二十一至三十畝	一九五	五・七四	一四六・四	四・三	五・五	八・五

第三十七表　農場面積大小與農場面積變遷之關係

農場按農場面積大小分組	農場平均面積（畝）		較原有面積增減之百分數
	初當場主時	現在	
十畝以內	一六・二	七・六	減五三・一
十一畝至二十畝	二二・六	一五・六	減三一・〇
二十一至三十畝	二七・六	二四・六	減一〇・九
三十畝以上	四九・七	五二・五	增五・六
平均	二八・六	二四・五	減一四・三

第三十八表　農場面積大小與農家他項進款及家庭賺款之關係

農場按農場面積大小分組	共有之農家		平均每家之他項進款		平均家庭賺款	
	家數	百分數	實有家數之平均	百五十家之平均	每農場之平均	每成年男子單位之平均
十畝以內	一四	四二・四	六六・五〇元	二八・二一元	七七・七〇	三四・一九
十一至二十畝	一二	二五・〇	四二・〇〇	一〇・五〇	九八・九六	二八・〇二
廿一至三十畝	四	一一・八	八四・五〇	九・九四	一三三・四〇	三〇・九八
三十畝以上	六	一七・一	八七・八三	一五・〇六	二四〇・六一	三八・七〇
總計	三六	…	…	…	…	…
平均	二四・〇	六三・八九	一五・三三	三・七八	一三五・一三	三三・三一

（四）農家之他項進款

農場之大小，既與農家之大小，有如前述之密切關係。且每成年男子單位平均所得之作物畝，亦祇有八・六畝。（或五・六畝作物面積）於是若干農家欲多營收入，不得不賴他項進款以資調劑。按本調查所得，若以成年男子單位作標準時，則小農家實較大農家之他項

進款爲多。試觀第三十八表每成年男子單位之他項進款平均祇有三元七角八分，但在大農場組中，則減少一元三角六分，而在小農場組中者，反增多八元六角三分，即其明證也。

又在小農場組中有他項進款之農家，居百分之三十九，而在大農場組中有他項進款之農家，則祇佔百分之十七。（見三十九表）亦可爲前說之證。在百五十農家中有他項進款之農家居百分之二十三。而此種進款之來源，由旅外家人賺得者，幾佔全數之半焉。又觀以下第四十表有他項進款之家，每家平均爲六十四元。但以百五十家計之，則每家祇平均得十五元而已。

第三十九表　農場之大小與場主之兼營他種職業者及祇經營農業者之關係

農場按農場面積大小分組	場主兼營他種職業者		場主祇經營農業者	
	人數	百分數	人數	百分數
十畝以內	一三	三九・四	二〇	六〇・六
十一至二十畝	一二	二五・〇	三六	七五・〇
廿一至三十畝	四	一一・八	三〇	八八・二
三十畝以上	六	一七・一	二九	八二・九
總計	三五	二三・三	一一五	七六・七

第四十表　農家他咱進款收入之來源

進款之來源	所有之家數	進款總計	佔各來源總進款中之百分數	每家平均之進款	所有家數之平均	百五十家之平均
旅外家人之寄款	一一	一一〇七元	四八・一	一〇〇・六四元	七・三八元	
貸款之息金	四	三四一	一四・九	八五・五〇	二・二八	
經營商業	七	三二八	一四・二	四六・八六	二・一九	
做瓦匠	九	三〇一	一三・一	三三・四四	二・〇一	
家庭工業	二	一四二	六・二	七一・〇〇	〇・九五	
幫工	四	八〇	三・五	二〇・〇〇	〇・五三	
總計	三六（註）	二三〇〇	一〇〇・〇	六三・八九	一五・三三	
平均	…	…	…	…	…	

（註）此數並非以前各數相加之總數，因有同一場主兼有數種來源之進款者也。

（五）場主之品行與農場面積之大小及贏利之關係

場主之品行不好者，係指嗜賭酗酒者而言也。此類場主，在本調查中，約居全場主之四分之一。普通賭博多在新年過節時舉行。雖有若干農人，未曾加入，然亦終日偷閑，無所事事。統計農人之曾賭博者，約佔全數百分之六十三。而飲酒者，約佔全數百分之三十一，蓋較賭博者少約一倍云。

品行端正之場主，其起初所承繼得來之田地，平均爲二十四畝八分。而品行不好之場主，其起初所承繼得來之田地，平均竟達三十五畝七分。見第四十一表。較品行好者爲多。既爲場主以後，其田地即有增減之分。統計一百一十三家品行端正之場主，平均每家祇減少田地二畝一分。而三十七家品行不好之場主，則平均每家減少田地五畝八分，較品行好者約多一倍半。其所以致此之由，賭博或亦爲其一大原因。試觀各家之賭債，有兩家高至二十元，有若干家，亦高至十元以外。此種賭債高積，未始非變賣田地之一種原因。舉一反三，則品行不好之場主，其田地所以逐漸減少之原因，亦可豁然矣。

再者承繼田地較多之場主，其爲較富之農家，可以斷言。而較富之農家，對於嗜賭酗酒之機會，實較貧窮之農家爲多。於此可見富足之足以使人墮落，與兒孫以家財，同時實不能不與兒孫以良好之教育也。

第四十一表　場主之品行與農場之大小田地之價值及作物指數之關係

品行	場主之有此品行者	農場之面積		平均作物價	平均每畝地作物價	作物產量指數
	家數	百分數	現有畝數	承繼時所有畝數		
好品行	一一三	七五・三	二二・七	二四・八	三二・五	一八・九二元	一〇三・〇
壞品行	三七	二四・七	二九・九	三五・七	四二・三	一九・一五	一〇〇・〇
總計	一五〇	一〇〇・〇	…	…	…	…	…
平均	…	…	二四・五	二七・五	三四・九	一八・〇八	一〇二・五

（註）好品行者之作物產量指數之或有差量爲+1.395

壞品行者之作物產量指數之或有差量爲+2.393

壞品行之農人，雖較好品行之農人之農場，約大百分之三十，但其平均之場主工價，反較

好品行之農人爲低。而同時好品行者，能得到五十元以上場主工價之家數，亦較壞品行者爲多。（見第四十二表）又小農場組中之農人有好品行者，較大農場組中之農人有好品行者，多佔百分之十。故若大農場組中之農人，皆係品行優良時，則其農場報酬，尤當較現在所得到者爲高也。

在本調查中，賭博與場主工價之相互函數爲負・二一二。換言之，即場主之嗜賭博者，其工價亦較低也。好品行場主之地，其價値雖略較壞品行者高出百分之三。據研究所得，好品行場主所以有較高之場主工價者，其主要原因，因好品行場主每作物畝之用費（投資之利息亦計算在內）較省三角九分。更進言之，好品行場主每作物畝之純利，較壞品行之場主多四角四分（總平均數）或九角八分（複平均數）。

第四十二表　品行與場主工價家庭賸款每畝費用及每畝純利之關係

品行	平均家庭賸款	每家之場主工價	場主工價在五十元以上者所佔之百分率	每作物畝之費用（註一）	每作物畝之純利	
					總平均數	複平均數
好	一三六・〇二元	四三・四四元	三五・四	一・八一元	〇・五三元	正〇・五二（註二）
壞	一三二・四七	二八・一九	二七・〇	二・二〇	〇・〇九	負〇・四六（註三）
總計	…	…	三四・〇	…	…	…
平均	一三五・一三	三九・六七	…	一・九二	〇・四〇	〇・三〇

註一——資本之利息及場主之工價統計算在內

二——或有之差數爲十〇・〇八八

三——或有之差數爲十〇・三四

由以上各節觀之，吾人可以斷言，即酗酒嗜賭之農人，對於其農場事業，決不能克勤克儉，努力經營，直一不良之經理而已。再好品行之農人，其農場以外之他項進款，較壞品行農人之所有者，二倍尤多（見四十三表）於此更可見在鹽山境內品行不良之農家，雖有較廣之農場面積，但就其企業或資產而言，猶不若品行端正之農家所有者爲大也。

第四十三表　品行與農場以外之家庭他項進款之關係

品行	每家平均之他項進款	
	百五十家之平均	有他項進款各家之平均
好 二八	一七•九〇元	七二•二五元（註一）
不好 八	七•四九	三四•六三（註二）
總計 三六	…	…
平均 …	一五•三三	六三•八九

註（一）或有之差數爲±9.971

（二）或有之差數爲±9.692

（六）場主之教育與農場之大小及贏利之關係

就調查結果而言，在本調查中有五分之一之場主，曾受教育，平均爲五·九年。在曾受教育之全數場主中，除一人外，餘皆受過舊式的通年的私塾教育。

受過教育之場主比未受過教育之場主，其所得之場主工價，約多兩倍。且受過教育之場主，能得到五十元以上之場主工價者，其百分率亦較未受過教育者爲高。（見第四十四表）

再教育與場主工價之關係，亦可用相關函數以表明之。就分析所得，爲＋0.292。又場主工價之大小，雖因受教育與否而有所區別，但一部分亦由地畝多少之不同，遂使此種關係更爲顯著。雖然如此，若依第十圖中每增加一作物畝，即增加七角六分場主工價之比例，而計算之，則可證明凡受過教育之場主，每增加一作物畝，因而增加之場主工價，一次較一次增多。而未受過教育之場主，每增加一作物畝，因而增加之場主工價，每次僅大約相等。綜上各點，受過教育之場主，似較未受過教育者爲優。然仍難據此即下一斷語，因同時受過教育之場主中，其品行壞者之百分率，反較未曾受教育者爲多也。

受教育者及未曾受教育者，其作物產量之指數比較，相差僅爲一。

在班吳鎮中，計有新式小學十六所，共有男生百五十七名，女生二十名。並有私塾四處，共學生二十四名。若據此數推算，則入學人數，僅佔全人口之百分之二。就表面言之，該處學校設備，固不足饜人民之需求，但就實際言之，有多數農人，皆喜願其子女留在家中，或助理農務，即有好學校，亦仍不能使其子弟入學也。

第四十四表　教育與贏利之關係

受教育與否	場主受教育之數目	場主受教育之百分率	平均總面積(畝) 農場面積	平均總面積(畝) 作物畝	平均祖遺之農場面積	作物產量指數	平均每家之家庭賺款	平均每家之場主工價	得有場主工價五十元以上者之場主百分率
未受教育者	一一九	七九・三	二二・四	三一・九	二四・七	一〇三	一一九・六二元	三三・八〇元(註一)	三一・一
已受教育者	三一	二〇・七	三二・五	四六・五	三八・〇	一〇二	一九四・七四	六二・二六元(註二)	四五・二
總計	一五〇	一〇〇	…	…	…	…	…	…	三四・〇
平均	…	…	二四・五	三四・九	二七・五	一〇二・五	一三五・一三	三九・六七	…

註(一)或有之差數爲 ±2.914

(二)或有之差數爲 ±8.890

品行好者，與教育之關係，可見第四十五表。總計未受教育之一百一十九家，品行優良之場主，却佔四分之三以上，而曾受教育之三十一場主，平均受五・九年之教育)品行優良者，反僅有三分之二以上。此種未受教育，而品行優良者，反居多數之趨向，亦可於連帶關係函數中(Coefficient of association) 見之。其數爲 +0.237。按普通情形而論，凡受教育之兒童，皆係出自富有供給能力之農家，而所學者，大都爲四書五經，以故此類之場主，在現在爲少數。且此種結果，可表明教育不但不能使品行優良，且因家長昧於家庭教育，或缺乏需要教育之識見，以致兒童習成不良之習慣或嗜好也。此外中國向以學做分爲兩事，知行每不能合而爲一，或亦有以促成之。

第四十五表　好品行與教育之關係

是否曾受教育	場主 人數	場主 百分率	好品行之場主 人數	好品行之場主 百分率
未受教育者	一一九	七九・三	九二	七七・三
曾受教育者	三一	二〇・七	二一	六七・七
總計	一五〇	一〇〇	一一三	七五・三

(七)家用農產品之價值及支配

第四十六表中農家所消費各項物品之價值及支配，乃係合併第四十八表家用農產品之價值，及第四十九表購買家用品之價值後，再加住房之租值也。(租值按房屋價值十分

之一計算，而家庭及農場應各負租額之半數。若詳察此表，吾人可得到三點最關重要之結論。第一，三分之二以上之家庭消費，係出自自己之農場中；第二，食料費用，佔衣食住燃料四項必需費用之首；第三，以上四項必需之費用，即佔去總費用百分之八十七。其餘費用，爲數既屬微小，對於生活上之需求，自屬不能滿足，而生活程度，自亦不能提高矣。

第四十七表，乃將鹽山農民之生活費，與北平及其他各國人民之生活費，互爲比較。觀此表中，鹽山人民之生活費，除必需費用外，其他各費用總計之百分率，尙較歐洲十八九世紀之人民爲高，但與美國二十世紀之人民相比，則實甚低矣。(註一)又觀鹽山燃料費用如是之高，即足表明鹽山燃料問題之亟需解決。惟此不獨在鹽山爲然，即在中國其他各處，亦莫不如是。惟以在中國北部爲尤重要。因大部分之燃燒物，皆仰給於農業也。清華調查中燃料費用若是之低者，亦非無因。因該區農民，有自行採拾燃料之習慣，不懼燃料之無着也。再觀鹽山農民比清華調查中人民之食料費用爲低者，蓋因鹽山較貧之農民，在冬季多有食糞子者，而糞子之價值，則甚低。故在食物費用項內，並未列入。更有一點，普通食料中之最貴者。在該處厥惟小麥，而農民自食小麥之量，其爲數又甚有限也。

(註)一 Kirkpatrick, E. L., "The standard of Living in a Typical Section of Diversified Farming," Bulletin 423, Agricultural Experiment Station, Cornell university. P. 39.

第四十六表　農家費用之數目及支配

項目	價值			各項費用所佔之百分率
	田場供給者	市場購買者	總計	
食料	四八・七五元	一三・四六元	六二・二一元	五四・七
房租	九・二四	...	九・二四	八・一
衣服	...	六・六八	六・六八	五・九
燃料	二〇・五二	...	二〇・五二	一八・一
其他各項費用	...	...	一五・〇二	一三・二
衞生費用	...	...	〇・四〇	〇・三
生活改進費	...	...	一〇・三四	九・一

嗜好費	…	三・四〇	三・四〇	三・〇	…
雜項	…	…	〇・八八	〇・八	…
總計	七九・三九	三四・二八	一一三・六七	一〇〇・〇	…
自用及購買所佔之百分率	六九・八	三〇・二	…	…	…

在第四十六表中其他各項費用一項，係指第四十九表中未列入以上四項之各項而言也。關於衛生費用一項，係指醫藥等費而言。關於生活改進費一項，係包括教育，宗教及新年應酬等費用而言。關於嗜好一項，係包括烟酒賭博等費用而言。

第四十七表　中外各處各類生活費用之百分率比較

費用之分類	食料	房租	衣料	燃料與燈燭	其他各項費用
英國愛登氏(Eden)七三家之統計(一七九六)	七三・〇	一二・〇	七・〇	五・〇	三・〇
比國英及爾氏(Engel)之統計(一八五三)	六六・九	七・六	一四・九	五・六	五・〇
法國蕾潑萊氏(Leplay)一〇〇家之統計(一八二九—一八八八)	五六・八	六・八	一六・五	四・三	一五・六
美國工人部(U.S. Dept. Labor)二五六二家之統計(一八九〇—九一)	四一・一	一五・一	一五・三	五・九	二二・七
美國工人部一二〇九六家之統計(一九一八至一九一九)	三八・二	一三・四	一六・六	五・三	二六・四
美國紐約省格羅登(Groton N.Y.)九二家之統計(一九一九)	四一・七	一三・一	一一・三	六・八	二七・一
美國紐約省北利峯斯東 North Livingston County)四〇二家之統計(一九二〇至二一)	三九・二	一二・〇	一三・八	七・四	二七・七
中國北平清華迪特摩氏(Dittmer)一九三家之統計(一九一六)	七三・九	八・二	六・七	六・五	四・七
中國河北鹽山一五〇家之統計(一九二二)	五四・七	八・一	五・九	一八・一	一三・二

(八)家用農產品之支配

家用農產品之支配，可見第四十八表中。大約有百分之九十以上之農家，皆用農場之小麥，黃豆，高粱，及玉蜀黍等爲食糧，與高果稈及玉蜀黍稈等爲燃料。有百分之七十以上之農家，皆用農場之穀子爲食糧，與麥稭爲燃料。再食用雞蛋之農家，約居半數以上。

百五十農家中栽植自用蔬菜之農家，祇有八家，此足表明中國北方各省之人民，對於家庭園藝之不大措意也。在中國北部地方，普通蔬菜，大都皆由專門種菜園者，从事種植之。普通農人，皆以爲缺乏經驗，視若難事。惟鹽山則又不然，蔬菜缺少之原因，由於水土含鹼性，不宜於種植者，實居大半。故鹽山城西一帶，鹼性較少，而園藝之農家，亦即較多也。再甜薯雖較

其他作物每畝所出產之食糧價值一熟量一爲多，但食用甜薯者，祇有一家。種紅棗者，在該處共有八家，紅棗雖可售得較高之市價，但農民食用之數量仍甚高。

鹽山農民生活既如是之苦，而當地農人，毫未知設法多種較爲集約之作物，如蔬菜及根類作物等以供日下之需求，殊滋疑向。惟關於此點，實有相當之解釋，即水中鹼質太多，殊不宜用以灌溉作物也。雖然，甜薯爲不需灌溉之作物，而種植者似不應如是之少也。

農家費用中，概無食鹽之一項，蓋因鹽山農民，自己皆可由鹼灘提製食鹽也。

據有經驗之農夫所言，三十畝田地之收入，即可供六口之家之用，但無盈儲之機會耳。本調查所得每人平均之作物面積，爲四畝二分，似較所估計者約少百分之十六。惟此項不足，似可由農場之外之他項進款彌補之。

第四十八表　家用農產品之分配

作物種類	單位	用此作物之家數之百分率	所用總量 所用家數平均	所用總量 百五十家總量	所用價值 所用家數平均	所用價值 百十家總計	佔總值中之百分率
小麥	石	九九·三	〇·三八	五七·〇〇	三·九二元	五八三·二元	五·六
高粱	石	九〇·七	三·〇五	四四四·六〇	一五·二五	二二〇七·九〇	二一·〇
稈（高粱玉蜀黍）	担	九七·三	三八·九五	五六七·〇〇	一九·二八	二八四八·三五	二七·一
穀子	石	七二·七	三·三三	三五〇·〇〇	一一·九九	一六五五·二〇	一五·二
玉蜀黍	石	九〇·〇	一·九六	二四一·三〇	一·七六	一六四·八〇	一·六
稭（大半小麥）	担	七八·八	二〇·四三	六六〇·七〇	一四·〇〇	一四二一·〇〇	一三·六
黃豆	石	九六·〇	一·〇五	一五一·二〇	一·〇一	一五一·二〇	一·四
家庭工業	：	五·三	：	：	：	：	：
蔬菜	斤	五·三	二〇六二·五〇	一〇·〇〇	一六五〇·〇〇	一六五〇·〇〇	一五·八
蛋	個	五六·〇	七二·〇〇	四〇·三二	六〇四八·〇〇	六〇四八·〇〇	五八·五
樹木（木料）	：	一〇·〇	：	：	：	：	：
綠豆	石	一二·七	〇·三二	〇·四〇	五·八五	七三·一〇	〇·七
棗	石	五·三	一·五六	〇·八〇	一二·〇五	六〇·二五	〇·六
黑豆	石	二·七	〇·〇八	〇·〇三	一·一〇	三·三〇	〇·〇三
隻雞	二四·七	二·三五	〇·五八	八七·〇〇	二·〇四	三一·四〇	〇·三

甜薯	斤	〇•七	二〇〇•〇〇	一•三三	二〇〇•〇〇	二•〇〇	•〇一	二•〇〇	…
總計	…	…	…	…	…	…	七〇•一五	一〇五三一•四九	一〇〇

（九）家庭現欵費用之數量價值及支配

家庭現欵費用，詳見第四十九表中。各費用之中，食料佔三分之一以上，衣服費尚不足三分之一。

蔬菜佔食料費用中百分之一二・八。讀者於此須注意每家之蔬菜費用，平均爲四・三七元。而農場自產之蔬菜價值，則僅值五角一分。關於此點，前節已言及之，卽當地農人，似應自種蔬菜，以塞此項漏危也。又百五十家中買肉食者，祇有一十五家。

第四十九表　農家現欵費用之支配

費用項目	單位	有此項費用家數之百分率	所買作物 總量	所買作物 所買家數平均	所買作物 百五十家平均	所費價值 總量	所費價值 所佔之百分率	所買家數 平均價值	百五十家 平均價值
食物									
雜項	…	一八•〇	…	…	…	八四四•〇〇元	一六•四	三一•二六元	五•六三元
蔬菜	…	九三•三	…	…	…	六五五•五〇	一二•八	四•六八	四•三七
高粱	石	一八•〇	三七•七	一•四〇	〇•二五	二〇五•一〇	四•〇	七•六〇	一•三七
黃豆	石	一六•〇	一七•三	〇•七二	〇•一二	一〇七•六〇	二•一	四•四八	〇•七二
穀子	石	一四•七	一九•〇	〇•八六	〇•一三	一〇二•三〇	二•〇	四•六五	〇•六八
肉(猪)	…	一〇•〇	…	…	…	四六•五〇	〇•九	三•一〇	〇•三一
玉米	石	四•〇	五•一	〇•八五	〇•〇三	三〇•八〇	〇•六	五•一三	〇•二一
青豆	石	五•三	二•三	〇•二九	〇•〇二	九•七五	〇•二	一•二二	〇•〇七
甘薯	斤	四•〇	九二〇•〇	一五三•三〇	六•一〇	五•三〇	〇•一	•八八	〇•〇四
黑豆	石	一•三	〇•八	〇•四〇	〇•〇一	五•二〇	〇•一	二•六〇	〇•〇三
棗	石	一•三	三•〇	一•五〇	〇•〇二	二•〇〇	〇•一	一•〇〇	〇•〇一
大麥	石	〇•七	〇•二	〇•二〇	…	一•六〇	…	一•六〇	〇•〇一
鹽	…	〇•七	…	…	…	一•〇〇	…	一•〇〇	〇•〇一
總計	…	…	…	…	…	二〇一六•六五	三九•三	…	一三•四六
其他									

衣服	…	九八·七	…	…	…	…	…	…	…	…	…	…	…
新年	…	一〇〇·〇	…	…	…	…	…	…	…	…	…	…	…
社交費	…	九五·〇	…	…	…	…	…	…	…	…	…	…	…
教育	…	三三·〇	…	…	…	…	…	…	…	…	…	…	…
烟酒	…	九四·七	…	…	…	…	…	…	…	…	…	…	…
賭博	…	四一·三	…	…	…	…	…	…	…	…	…	…	…
迷信	…	八九·三	…	…	…	…	…	…	…	…	…	…	…
醫藥	…	三〇·〇	…	…	…	…	…	…	…	…	…	…	…
總計	…	…	…	…	…	…	…	…	…	…	…	…	…
合計	…	…	…	…	…	…	…	…	…	…	…	…	…
	…	…	…	…	…	…	…	…	…	…	…	…	…
	…	…	…	…	…	…	…	…	…	…	…	…	…

黃瓜	一四	七六	五	一五・二
白菜	一二	六六	六	一一・〇
南瓜	一二	六六	三	二二・〇
葱	一〇	五五	一二	四・六
茄子	八	四四	二	二二・〇
韭菜	六	三三	一二	二・八
芹菜	四	二二	三	七・三
總計	一〇〇	五四七	…	…

若按陰歷之月份排之，則該處農民所食之蔬菜種類，有如下表：

月份	該月所食用之蔬菜種類						
正月	蘿蔔	葱	韭菜	胡蘿蔔	白菜		
二月	,,	,,	,,	白菜			
三月	,,	,,	,,	,,			
四月	,,	,,	,,	黃瓜	黃菜		
五月	,,	,,	,,	,,	,,		
六月	,,	,,	,,	,,	,,	南瓜	
七月	,,	,,	,,	,,	,,	,,	胡蘿蔔
八月	,,	,,	,,	,,	,,	,,	,,
九月	,,	,,	,,	胡蘿蔔	白萃		
十月	,,	,,	,,	,,	,,		
十一月	,,	,,	,,	,,	,,		
十二月	,,	,,	,,	,,	,,		

在以下第五十二表中，所有各種蔬菜供給之食物熱量，（加羅里 Colories）皆未計入，蓋蔬菜之功用，不在乎發熱量，而在供給人以生命素也。

鹽山農民生活之優劣，大部份視小麥收成之豐歉爲轉移。故鹽山農民，常謂小麥一年收，即足三年用也。

第五十表　農家每家一年中消費各種物品之數量（註一）

作物名稱	單位	田場供給者	市場購買者	消費總量	除廢棄者外每家實際消費之總量（單位公斤）（註二）
小麥	石	〇・三八	…	〇・三八	四五・九
高粱	石	二・七二	〇・二五	二・九七	三四四・七
穀子	石	二・三一	〇・一三	二・四四	二八三・二
玉蜀黍	石	一・六四	〇・〇三	一・六七	二二六・一
黃豆	石	〇・八六	〇・一二	〇・九八	一三五・一
鷄蛋	個	四〇・三二	…	四〇・三二	二・四
菉豆	石	〇・〇三	…	〇・〇三	四・一
粟	石	〇・〇八	〇・〇二	〇・一〇	七・三
雞	隻	〇・五八	…	〇・五八	〇・七
甜薯	斤	〇・八三	六・一〇	六・九三	四・二
綠豌豆	石	…	〇・〇二	〇・〇二	二・八
猪肉	斤	…	一・五	一・五	一・〇

（註）一、黃菜之菜子及菜葉與每家每天平均一斤半之蔬菜消費額，皆未計算在內。

二、每英斗糧食，除不能食用一部分外，其純淨之重量如次：小麥爲五十磅，高粱四十八磅，小米四十八磅，玉蜀黍五十六磅，黃豆五十七磅，紅粟三十磅，蔬菜及甜薯不能食用者，約佔百分之五。

欲測算農人食物之適量與否，就本調查所有之材料中，莫若根據每歲年男子單位所食物品發生之熱量爲最善。第五十表即依此法合併第四十八表中家用農產食品之數量，及第四十九表中購買食品之總數而計算得之。以下第五十三表各種食物化得之熱量，係由第五十一表各種食物之化學成分，與第五十二表各種作物每公斤之熱量而計算得之。至所有之數量，皆係純淨能食之數量，如米殼等類之廢物，皆已除去。

鹽山農民食物，究竟適量與否，按本調查所得，尚不敢下一斷語，須待有更精密之調查。其

中猶以食物中所含之生命素爲最要。此外如黃菜所能發生之熱量，每成年男子單位之體格，及其用去之熱力等，亦須有較精詳之研究。惟目下就調查者之大體估計，鹽山農民之工作，似在不勤不惰之間，如是卽可按查伯林氏（見 Chamberlain, W. O., Organic Agricultural Chemistry. Chap. XVII）之測計，每人每日須熱量三千加羅里（Calories）。

本調查中人口之總計，爲八百〇八人（僱傭五人亦在內）成年男子單位爲六一三・五人，每家平均成年男子單位爲四・一人。總計每成年男子單位，每天除每家每天一・五斤之蔬菜及黃菜之菜子及菜葉等不計外，平均消費二一五九八加羅里。以上之數目，若按當地實在之情形，平均每人每年須消費二・五石穀糧而計算，則失之太低矣。按第五十表，每人每年祇消費穀糧一・六石，而一・六石與二・五石之差數，卽由蔬菜黃菜之子葉等補充之也。

按以下第五十三表，卽可証明鹽山農民食物熱量之百分之九八・七，皆由穀糧，如高粱，小米，玉蜀黍，黃豆，及冬季食用之黃菜子等而來。又按中國之北部，肉食並非不足，不過農民之食用甚少。於此可知鹽山農民之生活，幾完全依賴穀糧也。

第五十四表，乃將鹽山每成年男子單位每天食物中所含之蛋白質，炭水化合物，及脂肪等之分量，與卜來費爾氏（Playfair）每一中等工作之成年男子，每天食物中所應含之標準分量，互爲比較。結果鹽山農民之食物中，對於脂肪及蛋白質兩項，均較卜氏之標準爲低，至少理由，或因黃菜子之分量，尙未計入所致。

觀以上各節所云，鹽山農民之食物中，似已達有適當之熱量矣。惟對於生命素之供給，似仍嫌不足，而猶以冬季缺乏蔬菜之時期爲甚。是故若僅依據農民食物及農場管理等調查，雖有較精密之研究，亦仍難以決定何種爲最適宜之食物，可供農民之食用；何種爲最適當之作物，可供農民之種植也。申言之，卽在一社會中，欲作一確實而有利益之建議，必得先有精確完備之調查而後可。

第五十一表　食用物品之化學成分

作物名稱	蛋白質所佔之百分率	炭水化合物所佔之百分率	脂肪所佔之百分率
小麥（註一）	一二・一	七五・二	一・八
高粱（註二）	一一・九	六四・八	五・〇

穀子(註四)	八•二	七〇•六	四•二
玉蜀黍(註一)	一〇•七	七八•七	五•〇
黃豆(註二)	三九•二	二五•四	一七•四
雞蛋(註一)	一二•四	…	一〇•七
菜豆(註二)	二二•一	五八•八	〇•八
紅棗(註六)	一•一	二九•三	…
雞(註五)	二一•六	…	二一•五
甘薯(註三)	一•八	二七•四	〇•七
綠豌豆(註四)	四•〇	一六•〇	〇•五
猪肉(註四)	三一•六	…	一九•七

註一、The Principles of Human Nutrition, W. H. Jordan.

註二、Contributions from The Peking Union Medical College, Yol. I. 1921

註三、Food Products, Henry C. Sherman.

註四、Food and Dietatics, Robert Hutchison.

註五、Chemistry of food and Nutrition, Henry C. Sherman.

註六、The Chinese Jujube, U.S.D.A., Bul.1215, April, 1924

第五十二表　每公斤食物之熱量(註二)

作物種類	每公斤食物之熱量（加羅里）			
	蛋白質	炭水化合物	脂肪	總計
小麥	四八四	三〇〇八	一六一	三六五四
高粱	四七六	二五九二	四五〇	三五一八
穀子	三一八	二八二四	三七八	三五三〇
玉蜀黍	四二八	三一四八	四五〇	四〇二六
黃豆	一五六八	一〇一六	一五六六	四一五〇
蛋	四九六	…	九六三	一四五九
菜豆	八八四	二三五二	七二	三三〇八

棗	四四	一一七二	…	…	…
雞	八六四	…	二二五	一〇八九	…
甘薯	七二	一〇九六	六三	一二三一	…
綠豌豆	一六〇	六四〇	四五	八四五	…
猪肉	一三一四	…	一七七三	三〇七七	…

（註）本表係根據第五十一表各物品之化學成分與以下之百分率而計算得之：

每公分炭水化合物經食用後，可發生四・〇加羅里，（熱量）或四・一加羅里之百分之九十八。

每公分脂肪經食用後，可發生九加羅里，或九・四五加羅里之百分之九十五。

每公分蛋白質，經食用後，可發生四加羅里，或四・三五加羅里之百分之九十二。

第五十三表　平均每家每年各項食物所有之熱量總數（加羅里）

作物種類	蛋白質（加羅里）	炭水化合物（加羅里）	脂肪（加羅里）	每種作物之總熱量（加羅里）	佔總熱量中之百分率
小麥	二二一五	一三八〇六七	七四三六	一六七七一八	四・三
高粱	一六四〇七七	八九三四六二	一五五一一五	一二一二六五四	三一・二
穀子	九二八九〇	七九九七五七	一〇一〇五〇	九九九六九七	二五・七
玉蜀黍	九六七七一	七一一七六三	一〇一七四五	九一〇二七九	二三・四
黃豆	二一一八三七	一三七二六二	二一一五六七	五六〇六六六	一四・四
蛋	一一九〇	…	二三一一	三五〇一	一・〇
菜豆	三六二四	九六四三	二九五	一三五六二	〇・四
棗	三二一	八五五六	…	八八七七	…
雞	六〇五	…	一五八	七六三	…
甘薯	三〇二	四六〇三	二六五	五一七〇	〇・一
綠豌豆	四四八	一七九二	一二六	二三六六	〇・一
猪肉	一三〇四	…	一七七三	三〇七七	〇・一
總計	五九五五八四	二七〇四九〇五	五八七八四一	三八八三三〇	一〇〇・〇

每成年男子單位每日之消費熱量爲二五八九加羅里

第五十四表　鹽山每成年男子單位每日所享用蛋白質炭水化合物及脂肪之數量與英國卜來費爾氏之標準消費量（Playfair' S Standard）之比較（註）

食物之成分	數量（單位公分）			
	鹽山	卜來費爾氏之標準量	鹽山農民之消費量較卜來費爾氏之標準量所少之百分率	
蛋白質	九九	一一九	一六・八	
脂肪	四四	五六	二一・四	
炭水化合物	四五二	五三一	一四・九	

（註）本表中關於蔬菜及黃菜之菜子菜葉等，皆未計入。

第二節　人口

（一）人口之密度

本調查所及之三村，皆屬班吳鎭，全鎭共計有一三一四家，七九〇七人，耕地共有二五五二七畝。按此數目平均，每家有六・二人，每平方英里有九九二人。

本調查百五十家中，每平方英里之作物面積有七百五十一人。

（二）人口之歷史

鹽山在元末明初時，燕王棣曾與元順帝大戰於此，人民殺戮殆盡。及順帝北去，燕王南歸就位，社會之秩序方復。永樂二年，遷都北京，天下大定，晉魯諸省及鹽山以北之本省人民，源源移聚於此，故鹽山之現在人民，其有史可稽者，咸自明永樂始，時當西歷一四〇五年也。

本調查開始時，鹽山居民，百分之九十九，皆係土著，由南方遷入者，僅及百分之一耳。五十年前，人民多在二十三四歲以後，始行結婚，較目下爲晚。現在則不然，據本調查所得，其結婚之平均年齡，男爲十八，女爲十七。約較前差三之一。其早婚原因，一爲男子父母，咸願早日含飴弄孫。女子父母，或因境遇欠佳，不願多加担負，偶有機緣，即將女子出嫁之故。

鹽山人口增加之速，甚爲顯著。據當地居民所言，吳莊六十年前，祇有人口二百名，今則除旅外七十人外，尚有人口四百四十八名。且自該時以迄現在，並無外來寄寓者，於此可見該地人口自然增加之速矣。再者每家農場面積，較前減少百分之一四・三，亦可爲人口增加之明證。

(三)人口之移殖

鹽山人口增加，既若是之速，於是多有赴東三省及天津等處以謀生者，在一千八百九十九年，俄人建築南滿鐵道時，鹽山人民趨之者甚夥。一千九百九十九年以後，滿州之發展更速，鹽山人民之向彼移殖者更多。

旅外人民，大約可分爲三種，一爲全家從去者，但爲數甚少。二爲無業之青年男子，在外工作，一方謀自存，一方亦可以補助家庭之偶有不足。此類旅外人民，每於新年時，歸家團聚，然亦有數年一歸者。三爲單身男子，於無業時期，即出外工作。通常咸於秋收之後，赴天津或附近各處，尋覓短期工作。至其工作，大多數爲造磚瓦等事。至翌年農事方興時，復回家從事農業。第四十表中所述，即可與此對照。

關於移民赴滿之情形，可參看民國十三年四月十二日英文華北明星報（North China Herald）之新聞紀載。下列所述，即該報之一段。

「當陰歷新年以後，山東直隸兩省，常有大批工人，赴東三省工作。因該地工作既易於尋覓，而同時工價亦復較內地爲高也。屆時京奉鐵路當局，常特備減價專車，以資鼓勵結隊出發時，亦常有携帶家小者。」

旅外人民之夥，大可令人注意。吳家一莊，旅外者共有七十人，佔全村人口百分之一三·五。所去之地，大都爲東三省。全班吳鎮中，除單人不計外，旅外者共有一百二十家，佔全居民百分之九。其移殖地，大都爲東三省及天津。

下列第五十五表，乃本調查中旅外四十九人職業之統計。作勞工者，約佔全數之半以上。至其與家庭之關係，百分之四十九爲場主之子，百分之二十九爲場主之弟或兄。

第五十五表　旅外人民之數目職業及與場主之關係

職業類別	此項職業之家數	旅外人民之數目及其與場主之關係						
	數目	百分率	父	親	母	親	兄弟	兄弟媳	子	孫	子	子媳
兵士	七	一四·三	…		…		一	…	…	…	…	…
勞工	二八	五七·二	…		…		一〇	…	六	…	…	…
官吏	二	四·一	一		…		…	…	一三	五	…	…
商業	五	一〇·二	…		…		一	…	三	…	…	一

| | | |

一五至一九歲	七八	九•七	三四	四四	七七•三
二〇至二四歲	五〇	六•二	二四	二六	九二•三
二五至二九歲	六一	七•六	二〇	四一	四八•八
三〇至三四歲	六三	七•八	四〇	二三	一七二•六
三五至三九歲	七〇	八•七	三二	二六	八四•二
四〇至四四歲	四六	五•七	二五	二一	一一九•〇
四五至四九歲	三二	四•〇	一七	一五	一一三•三
五〇至五四歲	二八	三•五	一六	一二	一三三•三
五五至五九歲	三〇	三•八	一四	一六	八七•五
六〇至六四歲	一九	二•四	八	一一	七二•七
六五至六九歲	二三	二•九	一一	一二	九一•七
七〇至七四歲	八	一•〇	三	五	六〇•〇※
七五至七九歲	四	〇•五	二	二	一〇〇•〇※
八〇至八四歲	五	〇•六	一	四	二五•〇※

八五至八九歲	一	〇•一	…	一	…
總計	八〇三	一〇〇	三九〇	四一三	九四•四

（註一）見北京華洋義賑會所出版之 Taylar, J.B. aud Malove, C.B., "A Study of Chinese Rural Economy".

※每組人數太少，似難代表實地情形，故从疑。

第五十七表　旅外人口年齡與性別之支配

平齡（按五年分組）	男女性人口總數		
	男性	女性	
一〇至一四歲	二	…	一四七
一五至一九歲	一二	…	
二〇至二四歲	八	…	
二五至二九歲	六	三	
三〇至三四歲	六	…	

三五至三九歲	一〇	…
四五至四九歲	一	一
總計	四五	四

第五十八表　五歲以下之人口年齡與性別之支配

年齡	男女性人口總數		男女性個別人數		
	數目	佔全體人口數中之百分率	男	女	
〇—一	九	一・一二	五	四	
一	一六	一・九九	九	七	
二	一八	二・二四	八	一〇	
三	三三	四・一〇	一八	一五	…
四	三	・三七	…	三	
總數	七九	九・八四	四〇	三九	

未滿五歲之農家子女之分配，見上表。三歲以下之小孩數目，似乎太少。或者調查員一時忽畧，未曾一一填入，亦未可知。再表中有一可注意之點，即百五十家中，何以竟無四歲之男孩也。豈死亡太多歟？吾聞民國九年十年之時，鹽山大荒，曾有出賣子女者，豈其所賣皆男孩歟？果也，則年成豐歉之足以影響一世中之人口支配，固已有精確之明證矣。

（五）鹽山人口與他處人口情形之比較

研究人口問題之人，每將瑞典國之人口分配，爲各國之標準。若以鹽山人口與之相比，即可證明鹽山調查中，必有若干嬰孩任調查時缺漏，未曾填入也。（見第五十九表）

第五十九表　鹽山百五十家之人口與瑞典標準人口支配之比較

年齡之分配	鹽山人口		瑞典人口在各組中所佔之百分率
	數目	百分率	
〇至一歲	九	一・一二	二・五五
一至一九歲	三五四	四四・〇八	三九・八〇
二〇至三九歲	二四四	三〇・三九	二六・九六
四〇至五九歲	一三六	一六・九四	一九・二三

六〇歲以上		六〇	七·四七	一一·四六
總計	八〇三	一〇〇·〇〇	一〇〇·〇〇	

鹽山人口由各方面證明，皆係逐漸增加，故鹽山人民，應屬遞加式。（見第六十表）本調查雖缺人口生產率及死亡率二者，然在本調查之後，於相距二十里之地方，另有一百三十三家，共六百八十七人之調查，結果每千人中，生產率爲五八·四人，死亡率爲三七·一人，二者相比，每年可增加原人數百分之二·一三。亦未始不可爲本調查人口方面之旁證。所可惜者，人口日較前增加，而農事方面，未能日較前集約，以致多數人民，咸不能安居鄉里，不得不旅外謀生也。

第六十表　鹽山百五十家之人口支配與人口標準式之比較（註一）

人口在各種標準式中所佔之百分率				鹽山之人口支配	
年齡之分配	遞加式	中和式	遞減式	數目	百分率
零至一四歲	四〇	三三	二〇	二八五	三五·四九
一五至四九歲	五〇	五〇	五〇	四〇〇	四九·八一
五〇歲以上	一〇	一七	三〇	一一八	一四·七〇
總計	一〇〇	一〇〇	一〇〇	八〇三	一〇〇·〇〇

（註一）見 Whipple, G.C., Vital statistics, P.189

（六）人口問題之解決方法

鹽山之人口過剩，成爲目下普通之農業及社會問題，與中國內地之其他各處，初無二致。此種問題，解決最難，以下之各種方法，或可稍解一時之慮乎？

（甲）臨時解決方法

（一）增加生產

（子）種植較集約之作物，使每畝出產之食糧增多。

（丑）改良品種及耕作方法，使每畝之產量增高。一部分增加之產量，可由利用暇時多加工作而得。如深耕排水改良鹼土等等皆是。其次多施肥料，亦可使產量增加。惟多施肥料時，須注意是否尚有贏利。而同時購買肥料之款項等，亦須顧及。是又問題中之問題矣。

(二)移殖人民於人口較稀之區，如東三省是。

(三)發展社會及家庭工業，以吸收過剩之人口。

(四)農暇之時，多從事他種工作，如冬季可赴城市做短期工作等皆是。

(乙)根本解決方法

(一)根據食糧之數量，節制人口生殖：

(子)增多入學年限，俾男女從晚結婚。

(丑)普及教育，使人民明了人口及生活需要等問題。

(寅)破除不孝有三，無後爲大之古話，使人民不至渴望子嗣。

(卯)自然限制生育。

以上臨時方法，祇能救濟解決於一時。現鹽山人口之增加，確有如馬爾薩氏所論者。據現狀而言，當地出產已不足供給當地人口之需要。一旦水旱歉收，即不能維持其生計。簡言之，即當地人口已超過當地出產所能供給之限度。故臨時解決方法，祇可收一時之效，決非永久之謀。縱使行之而效，一代或可維持，而數代之後，以人口增加如是之速，仍當有供不應求之日。屆時人口過剩問題，又從而發生矣。綜觀以上所述，可知社會中凡百改進事業，無論其爲農業爲工業，爲交通事業，若對人口蕃殖，無相當之限制，則雖有利益，亦難永久，一旦人口增加，以前之種種改進，亦自然失其效益矣。

第四章　鹽山其他之社會經濟等問題

第一節　娛樂

普通娛樂，可以分爲二類，即家庭娛樂，與公衆娛樂是也。各種娛樂之次數，可見第六十一表中。通常家庭娛樂，祇有一種，即賭博是。表中所指之次數，每次至少爲半天，至多爲一天。至看戲趕會等，亦是每次爲兩三天者。看戲之人，幾佔全數；在外賭博者，亦居半數。飲酒賭博最多之時期，恆爲新年。賭博一項，多屬娛樂性質，賭額亦甚微小。且其中連觀場之時間，亦已計算在內也。

其次之娛樂爲搖會，俗稱請會，此係借貸團體，同時亦含有社會之性質者也。集會爲公衆娛樂之最通行者，詳見後節。

第六十一表　娛樂之種類

娛樂之種類	場主娛樂之人數	場主娛樂之百分率	每場主每年娛樂之次數
家庭娛樂			
賭博	一〇	六・七	一四・九
公衆娛樂			
看戲	一四〇	九三・三	五・八
賭博	八七	五八・〇	二九・八
露天游玩	四三	二八・七	一四・〇
集會	一一	八・七	五・〇
飲酒	四五	三〇・〇	一二・一

第二節　集會

集會者，乃指人民之聚合於一定之地點，而有宗教，或娛樂，或交易，或兼有任何二者或三者之意義者也。

鹽山有二次大集會，一爲夏季之集會，於收穫高粱之前舉行之。時期約在八月後半月。爲冬季之集會，常於十二月內舉行之。（陰十一月後半月）大集會咸在鹽山城內舉行，爲期約有十天。距城較遠之地，亦舉行小規模之集會，以免長途跋涉焉。其他中國各處，亦常有在四五月間，收穫小麥之前，舉行集會者。

在夏季集會時，人民可以藉此購置各種農具，新舊衣服，蔬菜，及其他食物等。此外如前所言，此種集會，兼有社交及娛樂之性質，因農民終歲勤勞，藉此亦可稍事快樂也。其次尚有宗教式之集會，俗名廟會。農民對於此會之主要目的，即在看戲及其他娛樂而已。

第三節　市集

農家出產物品之預備售賣者，於收穫後，普通即將全體之四分之三，概行售出。其餘之一小部分，在年內需錢時，始臨時出售。（見第六十二表）小麥爲本縣出口糧食之大宗，高粱及玉蜀黍次之。有市集之村莊，每隔五天，即舉行售糧一次，城中則隔日一次。

鹽山距滄州車站，約有百里。有土道可通，運輸皆用騾車。粮食運至滄州後，即可由火車直運天津，其距離約有二百二三十里。鹽山農人粮食，多半先由本地販子收買，轉售於外來之

商販，然後轉運出口，由鹽山而滄州，由滄州而天津。當地小資本家，亦有先行屯積，以待善價而估者。大約當小麥剛收之後，麥價較低，而農民於此時期，又適欲售出是產之大部。故一般投機者，每於此時買進大批小麥。及至冬季或翌春時，麥價必形高漲，乃始行出售。中國小麥一年內市價之漲落，其差度猶較美國爲高。故投機者咸趨之若鶩。至農民之應否貯存粮食，以待善價，其得失相比，當待更精細之研究。

第六十二表　收穫後即銷售之物產與銷售物產總數之比例

作物種類	百分率
玉蜀黍	一〇〇・〇
小麥	八七・五
菜豆	八七・五
高粱	八〇・三
穀子	七五・七
黃豆	七一・七

第四節　借貸

農民借錢，大都作婚喪用費。借錢之方法，或賣地，或當地，或用其他方法不等。其他方法有兩種，一爲定期借欵，爲期十月，年利三分。一爲搖會，由入會會員組織之。其法先由欲借錢之人，設備酒飯，邀請其隣居戚友，共同聚餐，然後發表其借欵之意思，及此會之組織內容。如是即可有多數之會員加入。若有十人加入，則該會共有十次聚會。會員每會皆貸出同數欵額，而每次皆有一人輪流得會，其數皆與首次得會之欵額相等，不過或先或後耳。（註）

（註）見 Dr. Arthur H. Smith 所著 Village life in China 第十四章合作借貸之組織該篇於各種會社之組織及性質，描寫甚爲詳細。

第五節　合作

農人合作之種類甚多。諺云「沒有不求人的時候」，於此可見合作之普通矣。窮苦之家，受隣人自動之救助者，亦常有之。役畜農工，皆可借貸，並無所謂租費。富有之家，因恐貧民對於其住宅或作物有所加害，故對於貧農之借用工畜農具者，特別容易，以表好

感。人工於耕種收穫時，亦可互相借用，以示互助。至借用人工畜工農具等之家數及次數，可見第六十三表。大約鹽山農民借貸驢子，耬，犁，及大車者，約有一半之多。

第六十三表　工作及農具之交換

人工役畜及農具	農人交換之數目	總次數百分率	借出貸進	平均次數	借出貸進
農具					
耬	一〇九	七二·七	⋮	⋮	⋮
犁	九八	六五·三	⋮	⋮	⋮
大車	八二	五四·七	⋮	⋮	⋮
耙	三二	二一·三	⋮	⋮	⋮
鋤	四	二·七	⋮	⋮	⋮
石輥	一	·七	⋮	⋮	⋮
共計	⋮	五七二	五〇九	五·一	七·七
役畜					
驢子	一一三	七五·三	⋮	⋮	⋮
牛	六七	四四·七	⋮	⋮	⋮
馬	三	二	⋮	⋮	⋮
共計	⋮	⋮	六六九	八四九	八
人工	一	·七	一〇	六·四	一二·〇
				一〇	八

第六節　物價

無論何處，長時期之物價紀錄，確可為該處社會經濟狀況之寫眞。鹽山八種物產價格升降之指數，見第六十四表。表中數目，每隔十年，即有一年之調查。自一八六四至一九一四年六十一年中之物價指數，祇增加百分之一百八十六。惟自一九一四至一九二三之短時期中，其指數竟增加至百分之一百八十。

按一九二〇年，因荒年之故，致小麥價格之指數，與大車價格之指數，有顯然不同之表現。吾人觀是年小麥價格指數，竟增至一九一四年小麥價格指數之百分之二百二十五，而

同時大車之價格指數，非但不增，且祇合一九一四年大車價格指數之百分之五十三，卽可知荒年食糧價格之增加甚速，而農具價格，則反較平時爲低落也。

第六十四表　鹽山八種物產價格（以銅元計）及大洋兌錢市價之指數（以一九一四年物價爲基數）

貨品	一八六四	一八七四	一八八四	一八九四	一九〇四	一九一四	一九一九	一九二〇	一九二一	一九二二
車	三七	三三	四七	五三	六七	一〇〇	一三〇	一五三	一六七	一三三
稗	三七	三七	五〇	六三	七五	一〇〇	一三五	一六八	一三五	一三〇
耙	四四	四四	五〇	六〇	七〇	一〇〇	一三〇	一六〇	一三〇	一三〇
玉蜀黍	三五	三七	三三	四三	七三	一〇〇	一四〇	一八〇	一三〇	一三七
高粱	三三	三五	三一	四一	七五	一〇〇	一三六	一七五	一八	一三〇
小麥	三五	三三	三五	四五	八五	一〇〇	一六五	一六〇	一三〇	一三〇
黃豆	三三	三三	四三	五三	九三	一〇〇	一八三	一六三	一三七	一三〇
工價	七五	七五	八〇	九〇	一〇〇	一〇〇	一三〇	一三〇	一三〇	一三〇
平均指數	三五	三八	四六	五四	七八	一〇〇	一四五	一五九	一八七	一三五
每元大洋換錢數	…	…	…	九五	七四	一〇〇	一〇四	一一九	一四一	一三三

荒年之影響於物值者，有如以下各端：

（一）食糧及燃料之價格高漲。（作物稈稭，尤爲顯著。）

（二）非食用物品之價格如常，或竟減低。

（甲）因售賣農具而購買食物。

（乙）因荒年鄉人多出售其山地木材，以換食物。故本材之價格，常形低落，而且市面上建築之舊木材，及舊器具，亦每因此而反形充斥。此外如衣服等類，亦多有售賣者。

（丙）荒年市上之役畜，每較在農場中者爲多。一因農民願售去工畜以購食料，二因售去工畜，卽可節省飼料，以充別用也。

（丁）地價降落因農民多願售出產業以買食糧。

（戊）荒年因食糧缺乏，甚至有售賣妻小者。

(三)當荒年時，富者每乘機買地以謀厚利，故經一度之荒歉，而富者愈富，貧者愈貧，社會間之階級，每每因是而益形明顯。然此種情形，亦未可厚非。因荒年倘無富者之調節，則貧者將何以售地得錢，藉以維持其生計？吾常見雖有產業而無人購買者，倘竟如此，社會間豈不因此而騷亂耶？

在本調查中，近十年來，物價增長如是之速者，約有以下之原因：

(一)大洋兌錢之市價，較一九一四年，增加百分之五十二。亦爲物價增漲原因之一。至大洋兌錢市價之增漲，係屬普通性質，其原因如左：

(甲)銅價較銀價低落

(乙)發行之銅元增多

(丙)銅元銅質減少

(丁)商店發行紙幣，以致銀價漲高。

(二)其次係因外地需要食糧，以致影響此出產地之價格。蓋外地需要食糧時，出產地之價格，常較外地爲低也。再因鐵道通行，外地食糧之需要，亦因之而愈廣。結果鹽山內地之食糧，其價格之增加亦愈速矣。

按上海貨價調查處，一九二三年一百四十七種物品價格之指數爲一五六・四，而大洋兌錢之指數則爲一八四。

觀此種指數，即可証明通商地方物價增漲之速率，實較內地爲慢。上海之物價指數，如以一九一三年二月之價格爲基數，則一九二〇年至一九二四年期中物價指數之漲落，爲自一四一・六至一五九・九，而鹽山則在一九二〇至一九二三年期中，物價指數之漲落爲自一五九至二八〇。

第七節　普通情形

在百五十農家中，其場主承繼先人之產業者，共有一百四十九家。

各場主平均定婚之年齡爲一八・四歲。場主之妻之結婚年齡，平均爲十七歲。場主現在之年齡，平均爲四一・八歲，農人起首成爲場主之年齡，平均爲二八・七歲。

關於農人之宗教信仰，約可計之如下：信佛教者一三三人，信天主教者九人，信耶穌教

者四人。

農家有爭鬧情事者，共計八家。因賭博而起釁者五，因鬧言或小孩爭鬧及爭地界而發生者三。

關於衞生方面，鹽山殊應大加改良。因鹽山夏季熱且多潮，冬季則乾燥多灰塵，飲水皆含鹼質，殊不解渴也。且水料多從井中取得，井深僅十尺，復常與厠所同在道路之一旁，且其距離復甚相近。厠所皆係地下窖坑，故飲水中難免有不潔之物，雜其中。燃料既貴，農民且貧，故飲茶方面，亦遠不若他處人民之多也。

第五章　結論

以下數端，僅本調查結果中之少數重要問題而已。辭意難免有與前文重複者，幸讀者諒之。

本調查共有一百五十農家，農場面積，共計三六七一畝，（七三四英畝）資本共計一一四三五七元。（六一八八五元美金）人口密度，每方英里作物面積，有七百五十一人。人民生活費用，百分之八十九係出自農場，其餘則依賴在外地工作之收入。

農家賺款，（進款減去現款費用）平均爲一三五・一三元。（七三・一三元美金）每人約合二五・二四元。（合一七・七一元美金）每成年男子單位爲三三・三一元，（合一八・〇三元美金）按調查所得，每人每年之食糧費用，（黃菜因無市價，故未計入）爲一一・六三元，其餘之一三・六一元，則包括其他各項費用。

鹽山農民之進款既少，故農民僅可維持其勉强之生活。在冬季或閑暇之時，普通農民，更爲窘苦。每日祇有兩餐，每餐之所食者，又概屬粗糲，且其分量亦少，其節省限度，可謂已至極點。惟在夏季農忙之時，每日方有三餐，且食料亦較爲良好。如將食物化爲熱量而平均之，每成年男子單位，每天約有二六〇〇加羅里。

鹽山農民，因食糧之不足，及現款收入太少之故，致不能購買食物及其他生活上之必需品。於是有百分之十之人民，不得不向天津及東三省移殖，藉以解決其生計問題。人口向外移殖以及食物營養不足因而致命者，與農家之大小，（即人口多少）有極密切之關係。（r＝+0.735±0.025）再農家每加一人，平均即須有三・二七畝之作物面積之增加，故同時農場之面積，亦足影響大家庭之實現或存在。

鹽山每方英里作物面積，平均有七百五十一人。與中國其他人口稠密之區相較，雖尚覺不及，然以土壤瘦瘠，水旱頻仍，致作物產量甚微之地域，而能有如許人民，似不能不承認其已達最高之密度。其人民時時向外移殖，卽人口過剩顯明之特徵。惟僅恃移民，究非根本之解決方策。蓋因解決人口問題，不僅恃增加生產而已。同時亦須有適當之方法，以節制生育而後可。

中國農人之消費，大都依賴其自己之出產品。斯點也，固早爲一般人所公認。而鹽山售出之產品，仍佔全產額百分之五十六者，蓋因農民有若干消費物品，須用現欵購買，觀農家消費表，卽可知之。再中國之農業情形，雖不若丹麥及美國之企業化，然因交通漸漸發達，而出口之物產亦日見其增多矣。

百五十家場主中，有百四十九家，皆係在本地生長。場主之父，亦然。如是可証明已有兩世爲土著矣。再場主之妻及其岳父，亦大都生長本地。

場主之妻，除八人係與場主同村外，餘皆娶自外村。又三人係娶自外縣，其餘則皆娶自鹽山縣境中。

農場面積，平均爲二四・五畝。（合四・九英畝）依其大小分爲四組。最小之組，平均每家爲七・六畝（合一・五英畝畝）最大之組（除去三家特別大農場而言）平均每家爲三九・七畝。（合七・九英畝）

最大農場組中得到五十元以上場主工價之家數，較在小農場組中之家數，約多六倍。其平均每家之場主工價，約較小農場多兩倍有奇。

大農場每人之工作，較小農場多兩倍。役畜之工作亦如之。

普通大農場中平均每畝農具之投資，較小農場爲少。蓋因大農場中農具之使用效率較高也。然在鹽山，則其情形適與之相反。蓋因小農場常向大農場借用農具，而如大車等物，亦惟大農場方有購備之能力也。

大農場中對於房屋之投資，較小農場中少百分之十三。是亦因大農場中房屋之使用效率較高也。

普通人民，皆以爲耕作勤勞之小農場，爲最善之農場。是蓋就小農場較大農場每畝之總收入爲高而言也。（因小農場常種植較多之售錢作物）然一比較其每畝之收入及其費用

而言，則大農場之餘利，終較小農場爲高。本調查中大農場每畝之贏利，較小農場高三分之二，卽足證大農場之投資，終較小農場爲可靠也。

每增加作物面積一畝，場主工價，卽增加一·一六元。按本調查四組農場之比較而言，尙未能決定最有利之農場面積，究爲何若？換言之，卽對於報酬遞減之定率，尙未有所證明也。鹽山之小農場，每人每年祇工作九十三天，而所有工作，大都屬手工式。若與美國紐約農人種植每畝小麥之工作相較，則多四倍又半也。

農場營業大小，影響于農民幸福者甚鉅，故可用下法增大之：(一)增加農場面積，(二)種植較集約之作物，(三)施行較精密之耕作方法。

若按農場面積大小與農家人口多少而言，則農場面積，可以下列兩法增大之：一卽殖民，一卽節制生育也。農民向開闢未竟之地方移殖，或改事他種職業，固皆可使留居家中農民之土地增多。發展實業，固亦可使過剩之人民，得以圖謀生活。然亦有一定之限度，若一旦超過土地所能供給之分量，於事實亦仍無補。觀鹽山近五十年來，人口增加一倍之多，而結果常有飢荒之現象，安得不使人憬悟耶？

若當地實業可以漸次發展，人民教育程度，漸次增高，人口之蕃殖，亦有適當之限度，則人民之生活程度，始可提高，人民之社會經濟狀況，始有一線之希望焉。

普通是兩種簡易之方法，可以使農場之營業增大，一卽種植較多之集約式作物，一卽致力於較精密之工作也。由輪種法一點而言，農人似應增高作物複種之指數。因按目下言，複種之地畝，祇有百分之五十三也。惟關於此點之是否有利，尙難斷言。

本調查之農區，因荒歉頻仍，大部農民頗難自給，雖間有賑災救荒等義舉，然僅可救濟一時，而自身之日漸貧窮，仍屬無可諱言之事。政府如能實行一種預防荒災方法，對於人民，當有大益。例如防止水災，卽爲當地改良農業上之第一要務也。故吾人以爲最善之方法，在使農家自給，惟欲增加每人之生產量，係一最難解決之問題，非於社會經濟各方面，皆有詳細精密之考慮者，又安能定一具體解決之方法乎？

附錄

第一表　十五重要因素之平均數標準變量及相互關係之函數

因素名稱	平均數	標準變量	相互關係之函數

X_1 場主工價	39.67±3.02	54.86±2.14	138.29± 11.83
X_2 作物畝	34.90±1.65	30.00±1.17	85.96± 5.27
X_3 作物面積	22.80±1.11	20.24±0.79	88.77± 5.55
X_4 每人之人工單位	90.50±2.42	44.03±1.72	48.65± 2.30
X_5 每畝田地$\left(\frac{\text{農場面積}}{\text{農場面積}}\right)$之值價	18.98±0.31	5.70±0.22	30.03± 1.27
X_6 作物指數(註一)	100.00±1.17	21.07±0.83	21.07± 0.61
X_7 農家大小	5.35±0.16	2.91±0.11	54.39± 2.66
X_8 每工人等數之作物畝	26.00±1.40	25.50±0.99	98.08± 6.53
X_9 農場面積	24.50±1.28	23.29±0.91	95.06± 6.20
X_{10} 家庭賸款	135.13±5.43	98.54±3.84	72.92± 4.08
X_{11} 每作物畝之人工單位	4.05±0.02	0.41±0.02	10.12± 0.43
X_{12} 每作物畝之淨利	0.30±0.11	2.03±0.08	676.67±253.34
X_{13} 男子成年單位	4.10±0.11	2.01±0.03	49.02± 2.32
X_{14} 人工費用	50.51±1.61	29.24±1.14	57.90± 2.91
X_{15} 複種指數(註一)	154.84±0.82	14.66±0.53	9.47± 0.25

(註一)　係除去最大之三農場所平均求得之數

第二二表　重要因素之相互關係函數

(因數之解釋見第一表)

r_{12} = +0.441±0.044	r_{29} = +0.989±0.001
r_{13} = +0.433±0.045	$r_{2,11}$ = −0.110±0.054
r_{14} = +0.532±0.040	$r_{2,12}$ = +0.066±0.055
r_{15} = −0.055±0.055	$r_{2,13}$ = +0.728±0.026
	$r_{2,15}$ = −0.289±0.051
r_{16} = +0.128±0.054	r_{39} = +0.575±0.037
r_{71} = +0.128±0.054	r_{46} = −0.064±0.055
r_{23} = +0.977±0.003	r_{56} = +0.531±0.040
r_{24} = +0.641±0.032	$r_{7,10}$ = +0.644±0.032
r_{25} = −0.139±0.054	$r_{7,14}$ = +0.706±0.028

r_{26} = −0.151±0.054	$r_{8,12}$ = +0.247±0.052
r_{27} = +0.735±0.025	$r_{10,13}$ = +0.638±0.033

第三表　重要因數之部分相互關係之函數
（因數之解釋見第一表）

甲。　第一級	乙。　第二級
$r_{12.4}$ = +0.152±0.054	$r_{12.46}$ = +0.186±0.053
$r_{12.6}$ = +0 469±0.043	$r_{14.26}$ = +0.363±0.048
$r_{14.2}$ = +0.363±0.048	$r_{16.24}$ = +0.220±0.052
$r_{14.6}$ = +0.517±0.039	$r_{24.16}$ = +0.519±0.040
$r_{16.2}$ = +0.220±0.052	$r_{26.14}$ = −0.179±0.053
$r_{16.4}$ = +0.193±0.053	$r_{46.12}$ = −0.039±0.055
$r_{24.1}$ = +0.535±0,039	
$r_{24.6}$ = +0.640±0.033	
$r_{26.1}$ = −0.233±0.052	
$r_{26.4}$ = −0.144±0.054	
$r_{46.1}$ = −0.157±0.054	
$r_{46.2}$ = +0.043±0.055	

第四表　四種重要因素之混合相互關係及其關係之百分率

X 1 場主工價，
X 2 作物畝數，
X 4 每人之人工單位，
X 6 作物產量指數。

r	相互關係函數	部分相互關係函數	關係百分率
r_{12}	+0.441	+0.224	0.0988
r_{14}	+0.532	+0.414	0.2202
r_{16}	+0.128	+0.186	0.0238

混合相互關係

R 1.246 = 0.578

第五表　人口數目及性別按年紀之支配

年紀	零歲	十歲	二十歲	三十歲	四十歲	五十歲	六十歲	七十歲	八十歲
男	五	四	一	四	三	二	一	二	一
女	九	七	二二	六	九	六	八	七	四
男	四	四	一	四	三	一	二	一	四
女	八	一〇	七	三	一	一	三	⋮	⋮
男	一八	一四	一四	五	五	五	三	二	⋮
女	⋮	三	一	四	八	一〇	七	一〇	五
男	八	七	一五	一二	⋮	五	⋮	⋮	二
女	一八	一五	六	八	一	一	七	四	三
男	一九	七	一八	六	一六	六	八	七	四
女	一八	一九	五	一三	一一	一八	九	一五	四
男	五	三	六	二	三	六	三	四	三
女	七	九	二	九	四	一六	八	一一	二
男	八	五	三	六	二	三	六	四	三
女	九	七	九	二	三	六	三	二	三
男	一	六	三	一	⋮	一	三	一	六
女	一	一	一	⋮	一	⋮	⋮	⋮	四
男	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
女	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮

人口總數八〇三人

第六表　農家週年調查表舉例

調查人　崔毓俊

第二十五家　河北省鹽山縣吳莊

時間自一九二二年四月一日起至一九二三年三月三十一日止

（一）產業調查

種類	己有產			別種產	
等數	畝數	每畝值	總值	畝數	總值
上等	一二	二八元	三三六元		
中等	⋮	⋮	⋮		

	以錢租入的
分租的	⋮
當入產	一二	三〇三元

下等	八	八	六四元	總數	三一三元
總數	二〇	…	四〇〇元	總計（包括己有及當入）	三二	七一三元

表內所列各產，如有左列之叁項空地時，須註明各佔若干畝。

（一）道路，水溝，曬場，及其他小事生產之土地山共有若干畝。

（二）墳墓，堤壩，及其他廢地荒山共有若干畝。

（三）牧場，森林區域……等，共有若干畝。

（二）資本（總計）

項目	己有產	當入產	樹木	已有	農用器具及設備	種子飼料及燃料	牲畜	資本總計
上半年價值	四〇〇·〇〇元	三三·〇〇	一〇·〇〇	三〇〇·〇〇	一〇·〇〇	五·〇〇	八二·二〇	二八〇·八〇
下半年價值	四〇〇·〇〇	三三·〇〇	一〇·〇〇	三〇〇·〇〇	一〇·〇〇	五·〇〇	六五·八〇	二六五·八〇

資本平均一一七二·二〇元

資本增加……

資本減少一七·二〇元

（三）農作物調查

作物種類	畝數	作物生產之每畝產量	總收穫數量	已售或備售價值總數	場主自用數量價值
小麥	一八	五斗	九石	五石 一〇元	四石 四〇元
玉米（種在小麥後）	八	四斗	三·二石	… …	三·二石 一九·二〇元
穀子及黃豆（種在小麥後）	五	一斗 一斗	五斗 五斗	… 四斗	… 一斗 三·七五元
黃豆（種在小麥後）	五	一斗	五斗	… …	五斗 三元
高粱	九	五斗	四·五石	二石 六元	一·二石 一五元
穀子	五	一·二石	六石	一石 六元	五石 三〇元
甜薯	…	…	…	… …	… …
蔬菜	…	…	…	… …	… …
水果	…	…	…	… …	… …

其他：							
總記	五〇	…	…	…	七〇•六〇元	…	二一〇•八五

本場爲第一及第三類輪種法

(附註)(一)以上各種，須註明何類植於何類之後。例如黃豆種於麥後，稻種於蠶豆後。

(二)如兩種以上作物同時植於一處者，須將其收穫量分別註明。

(三)單位務須駐明。如每畝所收，或以重量數計算，或以斗量數計算，皆須明白塡出。茲爲簡明計，一一表明如下：

P＝擔　D＝石　T＝斗　C＝斤

P與C爲重量數　D與T爲斗量數

(四)每斗小麥重二四斤

(四)牲畜調查

種類	上半年 頭數	上半年 每頭值	上半年 總值	下半年 頭數	下半年 每頭值	下半年 總值	賣出 頭數	賣出 每頭值	賣出 總值	買進 頭數	買進 每頭值	買進 總值	死亡
馬	…	…	…	…	…	…	…	…	…	…	…	…	…
牛	一	三五元	三五元	一	三五元	三五元	…	…	…	…	…	…	…
驢	一	二五	二五	一	二五	二五	…	…	…	…	…	…	…
騾	…	…	…	…	…	…	…	…	…	…	…	…	…
大豬	一	二二	二二	…	…	…	一	三〇元	三〇元	…	…	…	…
小豬	…	…	…	一	五	五	…	…	…	二	二•五元	五元	一
鷄	四	•二〇	•八〇	三	•二〇	•六〇	…	…	…	…	…	…	…
鴨	…	…	…	…	…	…	…	…	…	…	…	…	…
鵝	…	…	…	…	…	…	…	…	…	…	…	…	…
其他：													
總計	…	…	八二•八〇	…	…	六五•六〇	…	…	三〇	…	…	五	…

場主自用者鷄一，價值二角，總價二角。

(五)牲畜副產調查

副產	賣出 數量	賣出 價值	賣出 總值	場主自用 數量	場主自用 價值
蛋	二〇〇個	…	一•六〇元	…	…
糞	…	…	…	…	…
總計	…	…	一•六〇元	…	…

(六)雜入調查

項目	賣出 數量	賣出 價值	賣出 總值	自用 數量	自用 價值
稭稈(小麥，穀子，豆等)	…	…	…	…	一二•〇〇元
柴火(茅草)	…	…	…	…	二五•〇〇元
家庭工業(註)	…	…	…	…	…

其他進款	…	…	…	…	…
總計	…	…	…	…	三七•〇〇元

(註)如此項工業，與本農業經營無關者，可用第三十號表調查，並須指明其名稱。

(七)農用出款調查

項目	出款
總計	六四•五〇
其他	…
家庭工業費(註)	…
獸醫費	…
地保及看守費	一•〇〇
國稅	二•〇〇
木料費	…
肥料費	…
飼料費	八•〇〇
苗木費	〇•五〇
種子費	二•〇〇
修農具費	一•五〇
置農具費	…
修造房屋費	二•〇〇
建築房屋費	…
工用烟酒費	二•〇〇
工用雜費	三•〇〇
家工飯費一人	三〇•〇〇
家工折款一人	一二•五〇
日工飯費	…
日工工資	…
年工飯費	…
年工工資	…

(註)如在雜入項中，有此種家庭工業之進款時，則其費用可列入本項。

(八)出入款項總計

甲、入款

賣出作物	七〇・六〇元	
賣出牲畜	三〇・〇〇	
牲畜副產	一・六〇	
雜　　入	：	
資本增加	：	
自用產品	一四八・〇五元	
總　計	：	二五〇・二五元

乙、出款

買進牲畜	五・〇〇元	
農用出款	六四・五〇元	
資本減少	一七・二〇元	
總　計	：	八六・七元
	：	
	：	

(九)家庭淨利調查

場主的盈餘	一六三・五五元
百分之八利息	九三・七八元
場主工價	六九・七七元
場主的盈餘	一六三・五五元
家工折款	四二・五〇元
他項進款	：
總數	二〇六・〇五元
減去場主的家用產品	一四八・〇五元
場主的家庭淨利	五八・〇〇元

(十)普通調查

甲、地之大小遠近及速售之作物

地共分幾處　(五)　其最遠者相距幾里　(三里)

平均相距幾里（一里）　平均大小幾何（六畝）

有多少粮食，收穫後即行售出（小麥五石，高粱二石，穀子一・四石。）

乙、家庭

傭僕幾名（　），年歲（　），作何工（　）。

場主道德好否（好）

場主屬於何種宗教在何會爲會員會加入何種團體組織（佛教……）

會與他家人爭鬧過否（　）爲何故（　）

家庭費用方面若干：

供佛或他種費用	一・五〇元
社交費用	二・〇〇
賭博	……
吸烟	二・〇〇
新年	……
教育	……
醫藥	……
買進食物（菜）	四・〇〇
衣服	……
已成	七・〇〇
衣料	……
其他	
娛樂方面	
看戲	三次
賭博	十次
飲酒	五次
其他	……

（丙）互助方面

一年中同左右隣人互換人工幾次

牲畜及農具曾借進借出幾次

（十一）場主之家族調查

場主及其家屬	年齡	入過何校讀書幾年	何項職業工作多少時間	其他職業種類	淨利
場主	五九	...	農（十二月）	...	...
妻	五八	...	...	...	...
子	三〇	...	農（十二月）	...	...
子媳	三〇	...	...	...	...
孫子	四	...	...	...	...
孫女	一四	...	...	...	...

（十二）場主及其近親之籍貫並職業調查

	何處生（省縣村）	職業
場主	河北鹽山	田主，佃戶，半田主，抑傭工
場主之父	河北鹽山	農
場主之妻	河北鹽山	又
場主之岳父	河北鹽山	農

（十三）場主之親屬調查（析居之子，及已嫁之女，均包括在內。若女已嫁，其丈夫之姓名及職業，亦須填明。兄弟姊妹及姊妹夫之年在十八歲以上者，亦可填入此項之內。）

姓名	年齡	場主何人	職業	何省何縣何村人

（十四）場主之歷史調查

何年	幾歲	職業	畝數			
			買進	賣出	祖遺	租出	典進	總數
一九〇五	四一	農	…	…	一二	…	七	一九
一九一〇	四六	〃	八	…	…	…	…	二七
一九二〇	五六	〃	…	…	…	…	五	三二
一九二三	五九	〃	…	…	…	…	…	三二

場主定親年紀（一二）

成親年紀（一八）

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An Economic and Social Survey of 102 Farms Near Wuhu, Anhwei, China

J. LOSSING BUCK

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An Economic and Social Survey of 102 Farms near Wuhu, China

INTRODUCTION

What would you think of an investment which only gave you 2.5% interest per year? Or of working a whole year on a farm and paying out $1.25 a month for the privilege? And having the tenant on your farm make by comparison $105 a year? That is what is happening in Wuhu, where the landlords are only making 2.5% interest on their investment. One is startled into the realization that perhaps the landlords of China have a "case" as well as the "poor" tenants! Moreover the tenant's profits per year were $105 as compared with minus $15 for the farmers who own and work their own farms, and this group of farmers, who were losing money at the rate of $15 a year, constituted 55% of all the farmers. Those farmers who drank liquor to excess and gambled, made an income of $89 less than those who lived a straightforward life. Education evidently hindered a man in his struggle for existence. Those having education had profits amounting to $49.11 per year, while those without schooling of any kind received profits of $60.57 per year. But before going into further detail regarding the results of this study, let us consider briefly the method and purpose of the survey.

IMPORTANCE OF SOCIAL AND ECONOMIC SURVEYS

The importance of social and economic surveys in the understanding of the problems of a community is so well known to the reader that it is not necessary to emphasize that phase of the subject here. It is becoming more and more recognized that no one engaged in evangelistic, educational or other types of community work can perform his duties efficiently or satisfactorily without a knowledge of the

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social and economic situations in which he finds himself. Particularly is this true of famine areas, where a definite knowledge of actual facts is absolutely essential before recommendations can be made looking forward to a change in the conditions which at present time operate against the population especially in times of food shortages. It is because of this self evident need that the writer has undertaken the task of finding out facts regarding farming conditions in some of the rural districts of China. The study presented here represents only a beginning and is but one of a half dozen surveys to be completed shortly.

IMPROVED AGRICULTURE, A COMMUNITY FUNCTION

It must be remembered that **Improved Agriculture has for its purpose the solution of all Phases of Rural Life,** not only in its more material aspects, but in so bettering the general social and economic conditions of the farmer that he may become a more efficient, intelligent and moral human being. It is quite a fallacious idea that one must improve the farmer's economic condition before his social and spiritual potentialities can be developed. A large income will not help the family of a farmer who drinks and gambles, for he will only waste his profits in further profligacy. His mind and his will have not been developed sufficiently to enable him to spend his income wisely. In order to be of the greatest help to the farmer, we must attack all his problems at once. In other words, there is a strong social or community function in the work of scientific agriculture, as well as the more technical one of improved crop and animal production.

HOW FACTS ARE OBTAINED

Now the only practical way of getting at these facts is through surveys, carefully prepared and used by men trained to get the information needed in a first hand way. There

are many such surveys, of course, but perhaps the most satisfactory one to use in studying farming conditions is the farm management survey. In studying farm management principles the farmer's own farm is the very best experiment farm in the world. Through years of experience many farmers have worked out a very successful farm organization. This being true our problem is to find the farmers who are successful or unsuccessful and then to determine the reasons for success or failure. To accomplish this, data must be secured from many farms of a given region where each farmer is engaged in the same general type of farming.

METHOD OF SECURING THE DATA

During the summer of 1922, such a survey was made of 102 farms near Wuhu, Anhwei, by Tao Yuen-chiao, one of the students in the Department of Agricultural Economics and Farm Management of the University of Nanking. He secured the data from about one-half of the farms of three villages six miles south of Wuhu, taking care to visit small farms as well as large ones. Ordinarily it would have been difficult for him to secure this information, for had he been a complete stranger the people would have feared that he was trying to get the information for further taxes or the like. But he happened to have family connections in this district, and it was thus easier for him to get what was wanted.

Table I gives a sample record from one of the representative farms of the region, and gives an idea of the kind of data collected. All the questions are separate and distinct from each other, and are so arranged as to intercheck with each other; this is done so as to make it comparatively easy to avoid unreliable results.

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Record of a Year's Business on a Farm Situated in a Village of 120 Families Near Wuhu, Anhwei, for the Year May 1, 1921-April 30, 1922

Capital

	Beginning of year	End of year	
Land (17 mow)	$1,600	$1,600	Average $1,892.99
Buildings	180	180	
Farm tools and equipment..	70	66	Decrease $2.38
Seed, grain, etc.	4	4	
Livestock	40.18	41.80	
	$1,894.18	$1,891.80	

Livestock

	Beginning of year			End of year			
	Number	Value each	Total value	Number	Value each	Total value	Died
Yellow cow	1	$40	$40	1	$40	$40	
Chickens	9	2 cts.	.18	6	30 cts.	1.80	1
			$40.18			$41.80	

Farm Crops

	Mow	Yield per mow	Total yield (piculs)	Crops sold or to be sold Amount	Value
Rice	15	4	60	20	$60
Rape seed (winter crop)...	13	1	13	13	65
					$125

Two mow were flooded

Produce Used by the Family from the Farm

	Amount	Value
Eggs	150	$3.00
Straw, stalks	70 piculs	24.00
Chickens	2	.60
Rice	40 piculs	120.00
		$147.60

Farm Expenses

Family (labor unpaid) ...	$50.00
Value of board to unpaid labor	50.00
Buildings, repairs	4.00
Farm tools, new	4.00
Farm tools, repairs ...	1.00
Feed for animals	2.00
Taxes...	5.00
Miscelleanous	.10
	$116.10

Table I.

Summary

Receipts

Crops	$125.00
Use of produce by family	147.60
Total Receipts	$272.60

Expenses

Farm expenses	$116.10
Decrease of capital ...	2.38
Total expenses	$118.48
Income from capital and operator's labor ...	154.12
Interest at 8%	151.44
Labor Income	2.68
Income from capital and operator's labor ...	$154.12
Family labor	100.00
	$254.12
Products used by family	147.60
Family Income	106.52

General Information

There were **six separate pieces of land** averaging about three mow apiece and all were very near the farmer's residence.

The family has a **feud** with another family over the selling of products.

This family is **cleaner** than the average for the region.

Implements and animals were **loaned** and **borrowed** for a **period** of ten days.

The Operator and his Household

Age	*Marital condition*	*Relation to operator*	*Occupation*
60	widower	operator	farming
24	married	son	farming
26	married	son's wife	
20	single	son	farming

Operator's Nativity and Occupation

The operator was born in the village he is now living in.

The operator's father was born in the same village and was an owner-farmer.

The operator's wife was born in the same village as was also her father.

Operator's History

Age	*Occupation*	*Bought*	*Mow Sold*	*Inherited*	*Rented*	*Total operated*
10-15	farming as a boy					
15-24	hired man					
24-32	farming under his father					
33	farming			5	17	22
50	farming	10			15	30
55	farming	2				17
60	farming					17

The operator was married at the age of 24.

The operator had a debt of $400 when he began as an owner.

The operator is of the gentry.

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VARIATION IN LABOR INCOMES

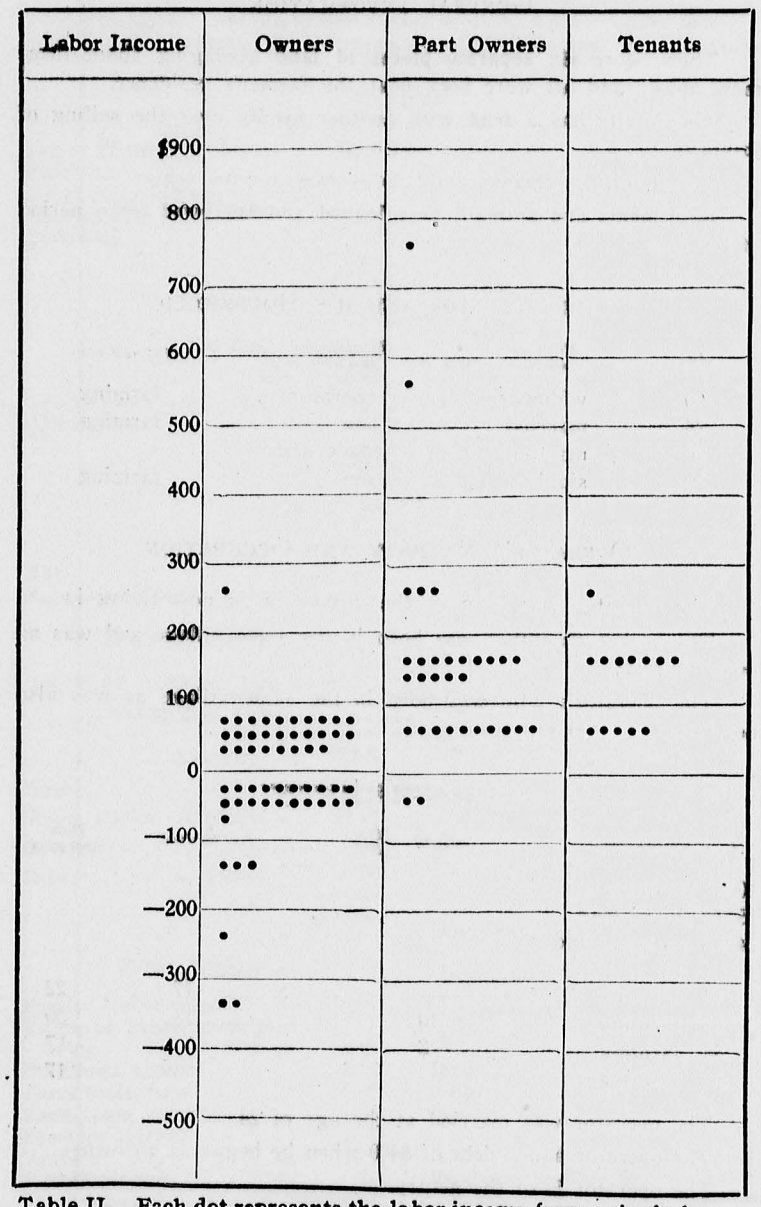

Table II. Each dot represents the labor income from a single farm

After these records were examined and analysed, many interesting and significant facts were revealed. Perhaps the grouping of the information under topics will render it a little more available and striking.

LABOR INCOME EXPLAINED

The clearest and most concise way to make the final comparison of different farms is to compare the amount of labor income and to study its relation to other factors. Labor income is the amount of money left for the operator[1] as the profits for his labor and managing ability, after deducting farm expenses and the interest on the capital invested. The interest is here taken at eight per cent., although the interest rate of the Wuhu district averages about 35%. The unpaid labor of the family outside of the operator's own labor is counted as an expense. The produce from the farm used by the family is counted as a receipt.

The term farm labor income, is used to indicate that the landlord's income and expenses are included with those of the operator thus counting the whole farm business as a unit.

LAND TENURE

The actual tilling of the land is divided among three groups of farmers; namely, the owner who works his own land; the part owner who works some of his land and rents the rest; and the tenant who rents all his land from others. Of the 102 farms surveyed, 55% were owners, 32% part owners, and 13% tenants.

LABOR INCOME[2]

The very surprising fact revealed by these surveys was that owners made no money and, in fact, really managed

[1] Operator refers to the farmer who manages and usually works the farm.

[2] All values are given in Mexican dollars. One dollar equals approximately fifty cents Gold.

their farms at a loss. The labor income of the owners was minus $15.00; of the part owners, $156; and of the tenants $105 (see Table II). Of course, actually, the owner and part owner groups had more money than this to use for the interest on their capital invested was available.

The particular question which strikes one at first sight, however, is, why did the part owner make so much more money than the other two groups? This will be answered as we proceed.

It may be interesting to note that the average of 2,090 farms in the United States shows a labor income of Gold $439.

FAMILY INCOME

While we are chiefly concerned with the income of the farmer when placed on a strictly business basis, we are also interested in the actual amount of money the family has to spend as a result of the year's work. Family income may be defined as the actual amount of money the family has available at the end of the year in addition to any produce used from the farm and also to house rent.

We found that the average size of the family, including every body that lived in the operator's household, was 4.9 persons for owners, 6.2 persons for part owners, and 5.3 persons for tenants, the average of all three groups was 5.4 persons.

The family income and the value of the produce used by the family are shown in Figures one and two.

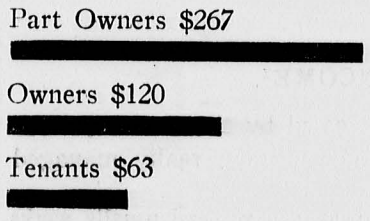

Figure 1. Distribution of Family Income.

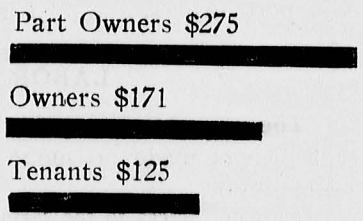

Figure 2. Distribution of produce used from the farm.

Combining the family income in money and in produce, we have the amounts shown in Figure three.

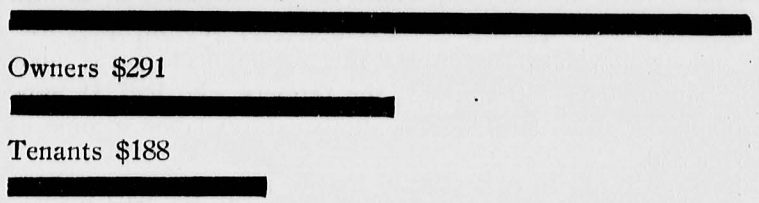

Figure 3. Distribution of total family income by including value of produce used from the farm.

The average family income for the 102 farmers is $160; the average value of produce used by the family from the farm, $199; and the average of these two incomes combined is $359. House rent should also be added to this last amount when making a comparison with city incomes.

It is interesting to compare this scale of living with those of Dittmer in his publication, **An Estimate of the Standard of Living in China**[1]; keeping in mind, however, that a dollar buys more in North China than in Central, and that Dittmer's study began in 1914 when the cost of living was lower. Dittmer writes as follows:

"From the study of a large number of cases, it appears that a family of five can live in comparative comfort (according to local standards) on $100 a year. This means that they can have enough food, though simple and poor, live in a house that will at least shelter them from the elements, have at least two suits of clothes, have enough fuel so that they do not have to go out and gather it, and have five dollars left over for the miscellaneous expenses, which will give them meat on feast days and tea quite often, almost every week; while, if there is no sickness, they may even make a trip to the temple fair back in the mountains."

[1] See Readings in Economics by C. F. Remer, Commercial Press.

SIZE OF FARMS

From these surveys it became evident that the size of a man's farm was very important, for the size has a great deal to do with the profits. For instance, of the farmers who had ten mow[1] or less, only 7% were making a farm labor income of over $50 while of the farmers who had 31 mow of land or over, 50% were making a farm labor income of over $50.

The owners averaged 20 mow per farm, the part owners 38 mow (14 mow rented in addition to that owned) and the tenants 15 mow. When a farmer is a part owner, it is an advantage for him to rent additional land and thus increase his area under cultivation.

It was also found that efficiency in the use of man labor, animal labor, tools and equipment bore a very definite relation to the size of the farm, and again the large farms make the best showing.

Man labor was **twice as efficient** on the large farms as on the small ones. In the group of 10 mow or less, one man farmed 5 mow while in the group of 31 mow and over he farmed 10 mow.

Animal labor was almost **three times as efficient** on the large farms as on the small ones. In the group of 10 mow or less, one animal farmed 10.6 mow while in the group of 31 mow and over, one animal worked 28.8 mow.

Equipment was nearly **twice as efficient** on the large farms. In the group of 10 mow or less, $20 worth of tools and equipment farmed four mow while in the group of 31 mow and over the same amount of equipment farmed 7.1 mow.

The reason for the greater efficiency of labor and equipment on the larger farms is due to the fact that men,

[1]One mow equals approximately one-sixth of an acre.

animals and equipment are not idle so much of the time on large farms as on small ones and also to the fact that larger units can be worked to better advantage and with less loss of time in going from one job to another.

Man labor constituted 75% of all the farm expenses. This means that the large farms saved one-third of their expenses on man labor alone as compared with the smaller farms.

Just here it is significant to note that of the three kinds of farmers, the part owners were the ones who had the largest farms, an average of 38 mow, and received the largest labor incomes, an average of $156.

DISTRIBUTION OF LABOR

One of the farmer's greatest problems is how to distribute his work over the year so that he is never idle and yet never overwhelmed with more work than he can accomplish. From these surveys it was found that the farmers of the region had certainly not been able to find a solution to the difficulty, for their labor distribution was very bad. Figure 4 shows what it is. One can readily see that at some times in the year there is a great deal of work to do, and at other times none at all. Probably what should be done is to vary the kind of crops grown, or supplement the farm work with home industries or with an outside occupation during the slack season. Since the land about Wuhu is so low, a change from the principal crop of rice to something else would be very difficult, and perhaps another occupation in addition to farming would be the solution to the problem of labor distribution in this particular district.

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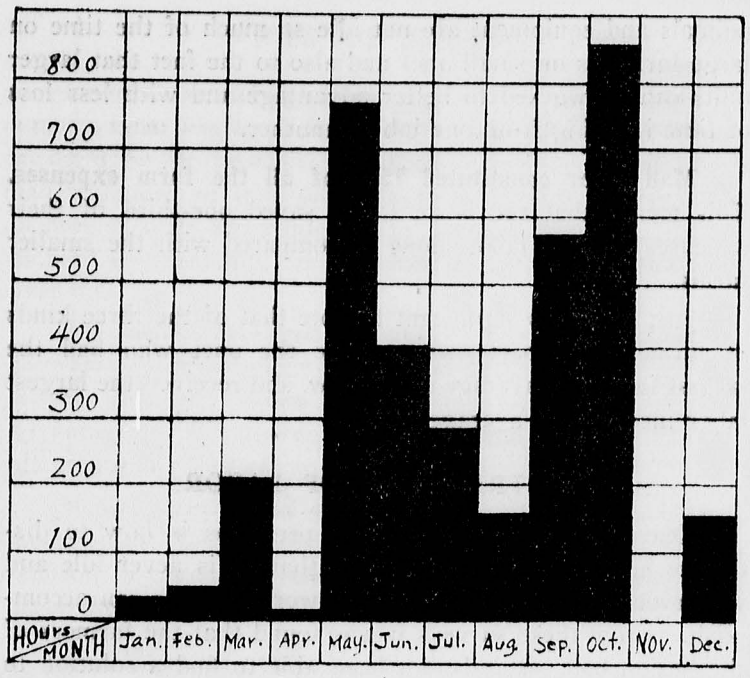

Figure 4. DISTRIBUTION OF MAN LABOR ON A 32 MOW FARM. The crops grown during the winter and early spring were 20 mow of rape, 5 mow of wheat and 2 mow of barley and during the summer, 32 mow of rice.

PRODUCTIVE WORK UNITS

Efficiency of labor may be measured by the number of productive work units. A productive work unit is the amount of work the average farmer can accomplish in a ten hour day. In this district it took 6.3 days per mow to raise a crop of rice and 6.1 days per mow to raise a crop of rapeseed. If we multiply the number of mow devoted to each crop on a farm by the number of productive units required to produce one mow of that crop, we have the total number of productive work units for the farm.

In compiling these figures, it was found that the proportion of productive work units per man was in about the same

ratio as the size of the farms themselves, which was the result to be expected; that is, 76 units for the owners, 99 for the part owners and 71 for the tenants. Grouping the farms again according to productive work units, it was found that the farms with the fewest work units were also making the smallest income; that is, of farms of 125 or less units, only 6% were making a farm labor income of over $50, while in the group of 30 units and over, 42% were making a farm labour income of over $50.

CAPITAL

Capital is just as important to the farmer as to any other business man, and the amount of capital the farmer has affects very materially his chances of success. Take again for instance, the part owners. Those who had a capital of $1,500 or less, were making a farm labor income of $18, while the ones who had a capital of $5,501 and over, made $112, or nearly six times as much; an agricultural version of "to him that hath shall more be given."

In the case of the owners, the labor income in the capital group of $1,500 or less, is $9, and in the group of $1,501-$2,500, it is $16. Those having capital above $2,500 had a minus labor income which may be accounted for in two ways; first, because of the small number of farmers represented, thus making the possibility very great that these farmers were inefficient, and second and more probably, the richer the owner the less he works. This latter reason is the one given by the student securing the data.

VALUE OF FARM LAND

Again the profits of these farms were very definitely linked up with the value of land per mow. One's first impression of farming might be that the better the land, i.e., the more high priced, the better the farm. The surveys showed something quite different. The farm labor income from farms with land valued at $100 or less per mow was

$45; from those with land valued at $101-$125, the labor income was minus $6; and from those with land valued at $126 or over, the income was actually minus $13. From which the natural deduction is that farmers about Wuhu cannot afford to invest their capital in land that costs more than $100 a mow!

CHARACTER

One of the most interesting parts of the whole survey was the relation shown between the character of the farmer and his labor income. Here as usual, good character was an actual financial asset. That is, 66% of the farmers reported as having good character were making an average farm labor income of $86, while the 34% of farmers with bad character (drinking and gambling) were making a labor income of minus $3. Seventy-two per cent. of those reported as bad were in the owner class. This may explain to some extent the low labor income of the owners.

It is also significant to note that the amount of land owned by those having good character increased by 87.5 mow, while the land owned by those of bad character decreased by 77.5 mow.

It was to be expected that the records would show just what they did in regard to the labor capacity of these two groups; that is, the farmers of good character worked harder than the others. The better ones had an average of 88 productive work units per man, while the others had only 71 units per man.

As to the percentage of good men in the three groups, again the part owners win out. Of the owners, 55% were classed as having good character; of the part owners, 85% and of the tenants, 61%.

EDUCATION

The 102 farmers were divided into two groups as regards education. The first having no education comprised 56%

of the farmers, and the second group having some education, the average number of years being about four and a half comprised 44%. Now comes an interesting correlation. Those having no education had a labor income of $60.57 while those with education had a labor income of only $49.11. Comparing the family income of these two groups, we find that those having no education had $9 more to spend each year than those with education. As a matter of fact, this result is not very surprising when we consider that the education was of the old type and therefore not only made no contribution toward better farming but, on the other hand, had the tendency to make less efficient farmers because these men had secured just enough education to make them too proud to work hard with their own hands.

Of the owners, 50% had some education; of the part owners, 39.3%; and of the tenants, 30.8%. Here, again, it is interesting to note that the owners, in spite of having the most education, had the lowest labor incomes and the lowest family incomes.

In comparing the figures for education and character, it was found that in the illiterate group there were 2.3% more farmers with good character than in the group of those having education. This is another argument for the fact that education alone does not produce good character.

THE LANDLORD'S PROFIT

Here in China much is heard about the landlord's profit and the poor oppressed tenants. The results from this survey show a surprisingly different state of affairs. Since the landlord invests chiefly money, we must figure his profits by the interest received on his investment. For the thirteen tenant farms covered by this survey, the landlords made the insignificant interest of 2.5% on their investments. One reason why the landlord makes so little is because he receives only one-fourth of the crop. The large share the tenant receives helps to make his income greater in comparison with the income of the owner.

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DISTRIBUTION OF FARM EXPENSES

In examining any budget of expenses with an eye to higher profits, we think first of where to save money. The farm expenses as revealed by the survey were as follows; family labor, 53%; hired labor, 18%; feed, 19%; buildings and repairs, 12%; farm tools and repairs, 5%; hired animals, 2%; taxes, 5%; decrease of capital, 4%. Now it is easily seen that the most considerable item here is that of labor, which amounts to 71% altogether. Hired labor is always to be economically used but where farm labor can be supplemented with other work family labor should be used sparingly too. **In brief, labor seems to be the item upon which the farmer needs to economise.**

DISTRIBUTION OF POPULATION

The ratio between male and female children under 10, is like so many other things in China, quite opposite to the same ratio in the West; that is, there is a greater proportion of males. This ratio continues up to the age of twenty. There are two well-known reasons for this; first, in childhood boy babies are more valued than girl babies, and hence receive more care; second, that a proportion of the girl babies are thrown away. A third possible reason is that the person questioned might neglect to count any girl baby under two years of age.

Between the ages of 16 and 20 many girls are married off as early as possible for economic reasons and go to live in other villages. Of those who are brought into the village as brides, a percentage die in childbirth, and the rate of death in childbirth in early marriages is greater than in the later marriages.

Between the ages of 21 and 30, the proportion of men and women evens up, and the reason is that by this time all the men are married, and the unmarried women of the village have left before reaching this age. The percentage

of later age groups are about equally divided between male and female.

GENERAL

The **average age** at which the operator when a boy **began helping** his father was 12.7 years, and the average age at which he ceased was 22.8 years.

The **average age of the operator** was 43 years. The average age of his marriage was 21.7, the youngest being 17 years and the oldest 26. The average age of his wife at marriage was 19.5, the youngest being 14 years and the oldest 25.

Seventy-nine per cent. of the land was **double cropped,** that is, there was a crop of rapeseed, wheat or barley during the winter and rice during the summer. **One hundred per cent.** of the land was devoted to **rice** during the summer.

The amount of land devoted to **wheat is decreasing** and that devoted to **rapeseed is increasing** owing to the export demand and better price of rapeseed.

Tools and equipment averaged **$2.42 per mow** in value. The 1910 census of United States gives the value of implements and machinery as Gold $199 per farm. This is equivalent to Mexican $0.90 per mow.

The **investment of capital** was distributed as follows: land, 87.9%; buildings, 7.3%; farm tools and equipment, 2.8%; livestock, 1.7%; pond products, .1%; seed and fuel and supplies, .2%.

The average number of **separate pieces of land** per farm was seven and the average number of mow per piece was 3.5. The average distance of these pieces of land from the operator's home was one tenth of a mile, the farthest piece being 2 2/3 miles away.

Of those owning their **property** 73% reported that it was **inherited,** 22% that it was both **inherited and purchased,** and 5% that it was **purchased.**

Forty-eight farms **exchanged labor** on an average of 10 days per farm. Forty-nine farms exchanged animals and implements for an average period of 11 days.

All the **operators were born** in the same village they are now living in. This is also true of all the **operators' fathers.**

Of the **operators' wives,** 38% of them came from the same village as that of the operator, and 38% of the **operators' wives' fathers** were also born in the same village. The three villages had a total of 254 families.

The largest of the three villages had a population of 120 families. The fact that so many of the **marriages** take place between people of the **same village** raises the question of how much inbreeding one might find in village life.

Twenty-four per cent. of the farms kept **hired men** on the farm, these men being members of the operator's household. Of the farms having hired men, there were **1.7 per farm.**

Of the **produce used by the family** from the farm, 73% was from rice, 18% from straw, 4% from wheat and 2% from eggs.

CONCLUSIONS

Briefly summarizing, then, the surveys of these 102 farms, it is quite evident that the part owners are the most successful. This is due to

1. A large farm which enables them:
   - *a.* To use both man and animal labor to the best advantage.
   - *b.* To use tools and equipment efficiently.
   - *c.* To make the business large enough to bring in good returns. It is impossible to make a good living in too small a business.
2. Investment in land that is not too high priced, $100 is about the highest price one can afford to pay for a mow of land in this region.
3. Good character, for little time was spent in drinking or gambling.
4. Hard work, the part owner hired much less labor than the owners.

5. An all around progressiveness. This is best evidenced in the fact that while the part owner owned on the average two mow more than the owner himself, he rented, in addition to this, 14 mow more.

We may conclude, then, that it was the hard working, wide awake man trying to live the best kind of life he knew who was getting into the part owner class. The part owners were successful not primarily because they were part owners, but because they were conscientious men endeavoring to do their utmost, and in so doing, they found that it paid to rent additional land and thereby become a part owner.

A RURAL SURVEY BLANK FOR USE IN CHINA

The writer recognizes that a survey of the nature outlined would be too detailed for the inexperienced to undertake. However, the Department of Agricultural Economics and Farm Management of the College of Agriculture and Forestry has a survey blank known as "A Rural Survey" which is designed to be an inventory of the economic and social conditions of a community and which can be used by any one. It is adapted for a village, several villages or for a whole county or several counties, depending on the extent of the knowledge of the one answering the questions. In almost every county, or community within a county, there are several local people who are well acquainted with the general conditions and who could fill in the blank in a day or two of time. One who has lived in a community a long time would be able to answer most of the questions, and the others could be answered after more careful attention to those particular problems involved. Such a survey would give an understanding of the conditions among which one is working and would enable one to plan out better programs for the church or the school. For instance, if it were found that the relations between the landlords and tenants were of a selfish and dishonest nature on the part of either or both parties, as is so often the case, the Church could well apply the

teachings of Jesus as a solution of the difficulty and to the betterment of both the tenant and the landlord.

If this brief outline of the results of the survey of these 102 farms and farm families interests other people into making a clear and more careful study of the conditions of their own community, it will have been worth while.

Note: A more technical bulletin giving complete table and fuller discussion of the results will be issued soon.

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An Economic and Social Survey of 102 Farms Near Wuhu, Anhwei, China

Part Two

J. LOSSING BUCK



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An Economic and Social Survey of 102 Farms near Wuhu, Anhwei

Part II

INTRODUCTION

It has seemed advisable to present this survey in two parts. The first part has already been published as College of Agriculture and Forestry Series Bulletin, Vol. 1, No. 7, presenting the information in popular form. The present second part contains the complete details upon which the brief summaries contained in the first part were made. There is also some new data not referred to in the previous publication. The definitions given in the first bulletin are for convenience given again, including definitions of certain additional terms.

Two facts should be borne in mind in considering the accuracy of the information presented in this bulletin. First, the data were secured by a native of the area investigated, thus insuring more reliable information because of the acquaintance between the investigator and the informants. Second, the method used, that of the record of a year's business on the farm, of which a sample record was printed on page four of Part I of this survey, insures sufficient accuracy to establish principles which make for successful farming.

In studying these data, the reader should keep in mind that the area surveyed is equivalent only to a 424 English acre farm, but with a total capital investment of $314,724 Mexican and a population of 102 families (588 persons) securing subsistence from the land only.

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DEFINITIONS

Labor income is the amount of money the farm operator has at the end of the year for his labor and managing ability, after deducting farm expenses and the interest on his capital investment.

The interest rate used is 8% which is much lower than the usual local rate. Capital includes investment in land as well as livestock, tools, equipment and farm buildings.

The unpaid labor of the family, except that of the operator, is counted as an expense. The produce from the farm used by the family is counted as a receipt since a large portion of the crops raised is used by the family.

Farm labor income, in the case of tenant and part owner farms, is used to indicate that the landlord's investment, income and expenses are included with those of the operator when computing the labor income, thus considering the whole farm business as a unit, i.e., as if it were actually owned by the operator.

Family income may be defined as the actual amount of money the family has available at the end of the year in addition to any produce used from the farm and also house rent.

It differs from the labor income in that interest on capital investment has not been subtracted, the value of unpaid family labor has been charged and the value of produce used from the farm has not been counted as a receipt and it includes any income from sources other than the farm.

Operator refers to the farmer who manages and usually works the farm.

The **owner** is an operator who works his own land.

A **part owner** is an operator who works his own land and rents additional land from another person.

A **tenant** is an operator who rents all his land from others.

A productive work unit is the amount of work the average farmer can accomplish in a ten hour day and is used to measure the efficiency of labor.

An **animal unit** is estimated by taking the cow as a unit. Other animals are reduced to animal units by considering an equal amount of feed eaten and manure produced as being equivalent to one unit. Thus five hogs, seven goats, two-thirds of a water buffalo, or 100 chickens equal an animal unit.

Mow farmed, or **mow in farms,** is the total amount of land in the farm regardless of whether or not it is all growing crops.

Mow in crops represents the actual area devoted to crops raised in one year on the same piece of land, thus often making one mow in crops equivalent to two or more crop mow.

A **farm** is the area of land controlled by one operator.

The terms **"family"** and **"household"** are used synonomously and refer to all the people living and eating together. In most cases this includes near relatives of the operator and his wife, such as operator's brothers, brothers' wives and children, operator's parents, employes, etc.

Expenses, receipts and capital include all such items for **both** the operator and the landlord, thus considering the farm as if owned by the operator.

Weights, measures and currency. A **picul** ("tan" 擔) is eqivalent to 100 catties or 133 1/3 English pounds.

A **"tan"** (石) is the unit of cubic contents for grain and, at Wuhu, one "tan" of wheat equals 136 catties and a "tan" of hulled rice 138 catties.

Mow is the unit of area for land measurement and is equal approximately to one-sixth of an acre at Wuhu. Size of farms is given in mow in every case.

All **values** are given in Chinese currency (Mexican). One dollar is equivalent to approximately fifty cents gold.

Abbreviations are used in the tables as follows: "av" for average; "%" for per cent; "no." for number; "am't" for amount. Amounts of money are sometimes given by omitting the cents.

SIZE OF FARMS RELATED TO VARIOUS FACTORS

Table I shows the relation of size of farms to various factors. Under the item of labor (line 10) giving the average number of **labor animals per farm** it should be noted that only one farm in the group of ten mow or less had labor animals. These farmers not having animals, hired their animal labor at a cost of $6.27 per farm, or $0.80 per mow. In the group of 11 to 20 mow, forty-two out of fifty-one farms had labor animals and the cost of animal labor for the farmers in this group not having animals was $10.33 per farm, or $0.74 per mow. Two of the farms in the larger groups hired animal labor at a cost of $10.00 per farm. Those farmers having small sized farms realized that labor animals cannot be kept and used efficiently on such small areas, so they very wisely depend on hiring the animal labor needed.

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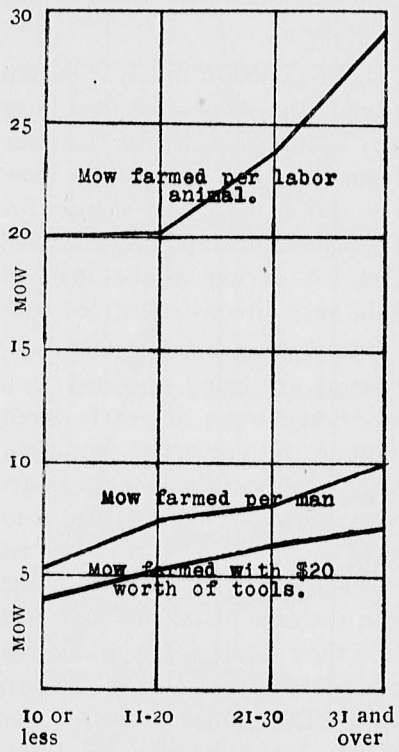
Table I. Size of Farm Related to Various Factors

Factors		Line No.	Farms grouped according to size (in mow)				
			10 or less	11-20	21-30	31 and over	Total (or average)
No. and size of farms ...	No. of farms	1	14	51	17	20	102
	% of farms in the group	2	13.7	50	16.7	19.6	100
	Av. size of farms	3	7.9	15.9	25.1	59.8	24.9
	Av. no of crop mow	4	13	27.9	44.8	107.7	44
Labor, man	Productive work units per man	5	53.1	77.5	88.9	110.8	82.5
	No. of men per farm	6	1.5	2.2	3.1	5.9	2.97
	Mow farmed per man	7	5.3	7.3	8.1	10	7.1
Labor, animal... ...	Productive work units per labor animal	8	14	21.4	24.9	30.3	24.1
	No. of farms having labor animals	9	1	42	17	20	80
	No. of labor animals per farm having	10	.5	.81	1.06	2.05	.91
	Mow farmed per abor animal*	11	20	20.1	23.7	29.2	24.8
Implements	Value of tools and equipments per farm	12	$39.60	61.58	76.00	165.63	81.53
	Mow farmed with $20 worth of tools and equipment	13	4.00	5.2	6.3	7.1	6.03
	Investment in tools and equipment per mow farmed	14	$4.95	3.85	3.16	2.81	3.75
Investment in buildings ...	% of total capital invested in buildings	15	8.2	4	10.3	8.5	7.3
Income ...	% making labor income of $50 and over	16	7	21	33	50	.....
	Av. farm labor income	17	$23.60	11.59	13.66	46.60	15.44
Receipts and expenses ...	Receipt per mow farmed	18	$20.25	18.15	18.24	18.58	18.46
	Labor cost per mow farmed	19	$14.04	10.31	8.86	7.35	8.84
	Receipts minus labor cost per mow farmed	20	$ 6.21	7.84	9 38	11.22	9.62
	Other expenses and interest per mow farmed	21	$12.46	11.45	12.69	11.58	11.76
Profits ...	Net profits per mow farmed	22	$-6.25	-3.21	-3.31	-0.35	-2.14

* The figures in this line do not quite agree with those published in the first bulletin due to an error in the first calculations.

This means, then, that 24.8 mow, given (line 11) as the number of mow farmed per labor animal, is the area cultivated on the farms to which the animals belong. If we take the total amount of land for all farms, i.e., 2543 mow, we would have 27.2 mow farmed per labor animal. This is probably nearer the amount of land actually farmed by one animal, since some animals are used on other than the home farms.

Figure I. Relation of Size of Farm to Efficient Use of Labor and Equipment



It will be noticed (line 8) that the **labor animals worked only an equivalent of twenty-four full days** during the whole year. The problem of keeping labor animals busy is a universal one throughout the country. It could be partially solved in this region by the use of animal pumps in place of man power pumps for irrigation, such as are used in many other parts of China. This would release labor needed for cultivation of the rice and would also allow children to attend school and give women more time to perform their home duties. (See figures 3, 4, and 6).

The relation of the size of farm to the efficient use of man animal labor and equipment is shown in figure I.

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The **investment in tools and equipment per mow farmed** (line 14) is $3.75. (On page 17 of the first bulletin of the Wuhu survey the amount given was $2.42 per mow. This should have read "per crop mow." This amount represented the average value for each farm rather than the average secured by dividing the total crop mow into the total investment in tools and equipment).

Investment in buildings (line 15) gives no correlation with the size of the farm. This is an unexpected result and does not agree with other surveys partially completed which show a decrease in the per cent of capital invested in buildings with increase in the size of farm.

The **receipts per mow** (line 18) remain nearly constant with the different sized farms but the labor cost, per mow farmed (line 19) decreases very noticeably with the increase in size of the farm, thus causing the receipts per mow farmed minus labor costs, (line 20) to be nearly double for the large farms. Other expenses and interest per mow farmed (line 21) also remain constant. A saving in the item of labor expense is thus shown to be very directly connected with increased profits.

Line 22 shows that the farms are being operated at a loss of $2.14 per mow. The average wage of yearly hired labor was $72.00 and in computing the net profits per mow this amount was charged for the operator's labor as part of the labor expense, thus giving a loss per mow rather than a profit. The only reason that these farmers can stay on their farms is because they own land enough to live on the interest of their investment. In the case of tenants and part owners who rent part or all of their land, a fair income is made because of the small rent paid (see page 24). Even the farms in the largest group of thirty-one mow and over lacked about $20.00 of making wages. It may be noted, however, that the **farm** labor income for tenants was $0.72 and for part owners $74.00 as against the tenant **operator's** labor income of $106.00 and the part owner **operator's** labor income of $156.00 showing that the loss falls largely on the

landlord and the owner (see page 26 for statement of labor incomes and page 2 for definition of farm labor income). This loss is accounted for in part by the high investment in land and sometimes in buildings without an income proportionate to the investment.

VARIATION IN SIZE OF FARMS

Figure II shows the variation in size of farms, which is much less for the tenant farms than in the other classes of land tenure. Evidently few tenants have large farms. However, the fact should not be overlooked that only thirteen tenant farms are represented and it may be that with a larger number of farms surveyed much larger tenant farms might be found although probably not in this region.

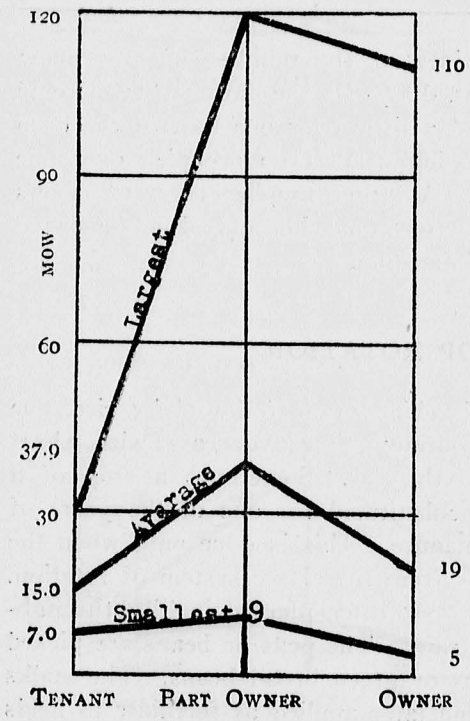

FIGURE II. VARIATION IN SIZE OF FARM

CROP AREA

The cultivated land amounted to 98.6% of all the land owned, the remainder being devoted to ditches, division lines, threshing floors and the like. Winter crops, rape, wheat, barley, broad beans and field peas, occupied 84.1% of the cultivated area, and 100% of this land was planted to a second crop, rice, in the summer. Fields left vacant during the winter were planted to rice in the early summer.

TABLE II. DISTRIBUTION OF CROP MOW

Kind of crop	No. of farms growing the crop	% of farms growing the crop	No. of mow devoted to the crop	% of total crop mow	1st or 2nd crop harvest of the season
Rice	102	100	2394	53.4	2nd
Wheat	44	43.1	232	5.2	1st
Rape	98	96.1	1613.5	35.9	1st
Wheat and Peas	23	22 5	136	3	1st
Glutinous rice	14	13.7	70	1.6	2nd
Barley	10	9.8	28	.6	1st
Wheat and broad beans ...	6	5.8	13	.3	1st
Total ...	.....	.....	4486.5	100	.....

Table II gives an idea of the number of crop mow devoted to various crops. 100% of the farms grew rice in the summer and occupied a little over one half of the crop mow. Rape, the second important crop occupied over one third of the crop mow. A larger number of part owners planted more kinds of crops, and hence had a somewhat more diversified type of farming.

CROP ROTATION

The crop rotation is chiefly rape followed by rice, one crop of each annually continuing for five years, with wheat in place of rape the sixth year. Sometimes a crop of a red flowered legume is substituted for one of the years of rape for use as green manure. This is done only when the land begins to yield less from the above system of rotation. Field peas or broadbeans are often planted in hills throughout fields of wheat and rape. The peas or beans are picked for eating as green peas or green broad beans. The stalks are then pulled, piled and later applied as fertilizer to fields to be devoted to the rice crop after the wheat or rape crop is harvested.

CROP YIELDS

The crop yields per mow are given in Table III. Rice was the one crop which gave a good yield per mow.

TABLE III. AVERAGE CROP YIELD

Kind of crop	Number of farms	Av. crop yield per mow (in picul)*
Rice	102	4.0 (unhulled)
Wheat	44	1.0
Rape	98	1.0
Wheat and peas	23	1.0
Glutinous rice	14	3.9 (unhulled)
Barley	10	1.3
Wheat and broad beans	6	1.0

* One picul equals 133 1/3 pounds.

DISPOSITION AND MARKETING OF CROPS

Table IV shows what crops and the proportion of each are sold on the market and what are eaten by the family, and indicates that 44%, a little less than one half of the usable produce is consumed by the family. This amount is much

TABLE IV. PROPORTION OF CROPS SOLD AND USED BY THE FAMILY

Item	Value		Per cent	
	Sold	Used by family	Sold	Used by family
CROPS: Rice	$143.10	$138.52	51	49
Glutinous rice	10.51		100	
Wheat	5.74	5.39	52	48
Barley	.87	.38	70	30
Rape	78.76		100	
Wheat and pea		5.12		100
Wheat and bean		.49		100
Straw (for fuel)		37.10		100
MISCELLANEOUS		.83		100
TOTAL	238.98	187 83	56	44

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less than is usually assumed as being consumed by the farm family and raises the question of how many families one farm is really able to feed. Rape, the source of rape oil is grown as a cash crop. The entire crop is sold, a great deal being exported from the treaty port of Wuhu. Wuhu also exports large quantities of rice.

A brief investigation into the marketing of these crops indicates that the farmer is probably getting nearly as much for his crops as he could expect. The farmer sells through a local country grain merchant to middlemen who ship the rape seed and rice, usually by boat, to Wuhu. The buyers, chiefly from Shanghai, come to Wuhu and purchase from the middlemen who bring the grain from the country to the big grain merchants in Wuhu. Both the small and the large grain merchants act as commission merchants in bringing the seller and buyer together, in measuring the grain and in settling disputes. A small commission is charged for this service. It is the middlemen who seem to be in the greatest danger of loss because of the fluctuations in price between the time of purchasing and that of selling. Further study of this problem is needed, however, before conclusions can be drawn.

DISTRIBUTION OF FARM EXPENSES

In Table V, man labor constitutes a little over three fourths of the farm expenses. The owners' expenditure for hired labor was 21.5%, which is over twice the percentage spent by the tenants. The part owners' expense for hired labor was 17.3%. In other words the owners used less of their own labor, including that of the family, and spent more for hired labor. This is another evidence that the owners are not, on the whole, as industrious as the part owners or tenants.

TABLE V. DISTRIBUTION OF FARM EXPENSES

Items	All farms	
	Av. value	% of total value[1]
Hired labor	$36.52	18.8%
Family labor	111.86	57.5
Animal labor	2.21	1.1
Building and repairs	17.11	8.8
Farm tools and repairs	7.11	3.7
Seeds	.16	.1
Seedlings	.03	
Seeds for animal	1.18	.6
Fertilizers	.56	.3
Taxes	6.66	3.4
Dibao (local officer)	.09	
Veterinarian	.03	
Livestock purchased	4.95	2.5
Decrease of capital	6.19	3.2
Total	$194.66	100%

[1] The percentages in this column do not quite agree with those given in the first bulletin because of the omission of certain items in the former and the addition of an item of expense which should have been classified under labor.

DISTRIBUTION OF RECEIPTS

The distribution of receipts for all farms is given in Table VI which shows that nearly all the cash receipts are from crops. Of the cash crop receipts over half are from rice and one-third from rape. The small amount (3.6%) of cash receipts from livestock is typical of much farming in China. The ratio between the food supply and the demand for it for human consumption has apparently reached the point where better living can be had by consuming the crops direct rather than by feeding them to animals and then eating the animal products. In an analysis of the distribution of receipts according to land tenure the per cent of products from the farm used by the family was 48% for owners, 48.7% for tenants, and 37.8% for the part owners, showing

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that, proportionately, the part owners had more crops to sell because of the larger size of their business. The value of the items sold by the part owners was two to three times that of the tenants and owners.

TABLE VI. DISTRIBUTION OF RECEIPTS

Items	All farms	
	Av. value	% of total value
CROPS: Rice	$143.10	31.0
Glutinous rice	10.51	2.3
Wheat	5.74	1.2
Barley	.87	.2
Rape	78.76	17.1
STOCK AND STOCK PRODUCTS:		
Sheep	.08	
Hogs and pigs	16.50	3.6
Chickens	.01	
Ducks and geese	.08	
NON-CASH		
Increase of capital	4.28	.9
Products from farm used by family	193.62	42
MISCELLANEOUS RECHIPTS	7.64	1.7
TOTAL	461.19	100.0

FARM PRODUCTS USED BY THE FAMILY

In Table VII on the **distribution of products used from the farm it** should be noted that the part owners evidently had a better diet since more kinds of food or larger quantities of each kind were consumed. This is quite in accordance with what might be expected, for it is a generally known fact that farmers in a good year eat much more than in a poor year. The part owners have more to eat and evidently eat it. Whether this is more than they require is a question which needs further investigation.

TABLE VII. KIND, AMOUNT AND VALUE OF PRODUCE USED FROM THE FARM BY THE FAMILY

(Quantities are give in piculs except for chickens and eggs which are per piece).

Items furnished by the farm	Tenants (Thirteen farms)			
	No. of farms using	Av. am't of product per family using	Av. value for families using	% of value to total value.
Rice (Unhulled)	13	33	$98.86	67.9
Wheat	2	2.5	12.50	8.6
Chickens	8	3	.90	.6
Wheat and broad beans ..	1	2	10.00	6.9
Eggs	12	112.5	2.25	1.6
Straw	13	65.2	21.01	14.4
Total			145.52	100

ems furnished by the farm	Part owners (Thirty-three farms)			
	No. of farms using	Av. am't of product per family using	Av. value for families using	% of value to total value
Rice (Unhulled)	33	57.6	$172.75	51.2
Wheat	11	5.5	25.21	7.5
Barley	3	2.1	7.47	2 2
Wheat and peas	9	6.4	30.31	9
Chickens	28	6.1	18.36	5.4
Wheat and broad beans ...	4	2	10.00	3
Eggs	32	301.6	6.09	1.8
Straw	33	164.7	54.85	16.2
Miscellaneous	5		12.6	3.7
Total			337.64	100

Items furnished by the farm	Owners (Fifty-six farms)			
	No. of farms using	Av. am't of product per family using	Av. value for families using	% value to tota value
Rice (unhulled)	56	42.5	$127.55	60.1
Wheat	20	2.5	12.35	5.8
Barley	1	3.0	9.00	4.2
Wheat and peas	14	5.6	17.86	8.4
Chickens	53	3.6	1.08	.5
Eggs	54	178.9	3.57	1.7
Straw	56	89.3	30.38	14.3
Miscellaneous	2		10.63	5.0
Total			212.42	100.0

Items furnished by the farm	Total (One-hundred and two farms)				
	No. of farms using	Av. am't of product per family using	Av. value for families using	Av. value for all farms	% of value to total value for families using
Rice (unhulled)	102	46.2	$138.52	$138.52	55.3
Wheat	33	3.5	16.65	5.39	6.7
Barley	4	2.4	7.85	.38	3.1
Wheat and peas	23	5.9	22.73	5.12	9.1
Chickens	89	4.3	1.30	1.14	.5
Wheat and beans	5	2.0	10.00	.49	4
Eggs	98	210.8	4.23	4.07	1.7
Straw	102	110.6	37.10	37.10	14.8
Miscellaneous	7		12.04	.83	4.8
Total			250.42	193.04	100

The amount of rice eaten by the family seems unusually large, but the farmers of this region eat a large quantity as compared with the average city person. This item was also checked by the writer, who asked several qualified persons the quantity of rice eaten by one person in a year. The answer invariably was the same amount as that shown by the survey, i.e., approximately six piculs of hulled rice per capita (one picul of unhulled rice is equivalent to approximately 70 catties of hulled rice).

The **straw is used largely for fuel.** It is sometimes used for thatching roofs. Rice straw constitutes the principal roughage for the farm animals when green pasturage is not available. The amount of straw used for fuel from the farm constitutes only a portion of the fuel used by the family. In one of the villages especially, a great deal of peat is used. This is obtained by digging down two or three feet below the bottom of the lagoons and ponds which are used for irrigation. It may be noted that the part owners use twice as much fuel as the owners and two and a half times as much as the tenants.

In this region more attention is given to the **home vegetable garden** than is the case in many districts. The value of the vegetables raised was not included in the produce used from the farm by the family and the amount would not

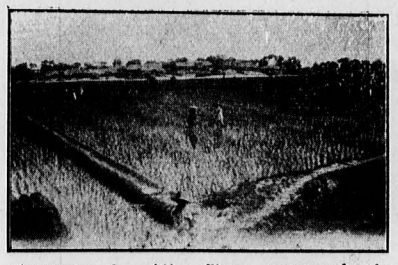

FIGURE 3. T'a Tan, one of the villages surveyed. This village consists almost entireiy of houses of mud walls, thatched roofs and earth floors. Two women of the village are hoeing rice in the foreground.



FIGURE 4. Two women and a fourteen year old girl hoeing rice on the outskirts of the village of T'a Tan. During the busy season of irrigating and hoeing rice nearly as many women as men are seen in the fields. See page 5.



FIGURE 5. Within the village of T'a Tan showing some of the vegetable gardens and piles of rape and wheat straw. The children are the chief occupants of the village in the day time during the busy season of irrigation and hoeing rice.



FIGURE 6. Two women pumping water by hand from one rice field to another.



FIGURE 7. A stack of wheat straw at the left and a stack of rape straw at the right in one of the farmer's yards. This shows very clearly the much larger proportion of land devoted to rape.



FIGURE 8. Wheat drying in the sun in the same farmer's yard as in Figure 7.



FIGURE 9. A common type of farm house of thatch roof and mud walls, although kept in better repair than the average in the same village of T'a Tan. The heap of black at the foot of the steps is peat being dried for fuel.



FIGURE 10. A rich farmer's house in a neighboring village. The types of houses shown in figures 9 and above are found in almost every village.

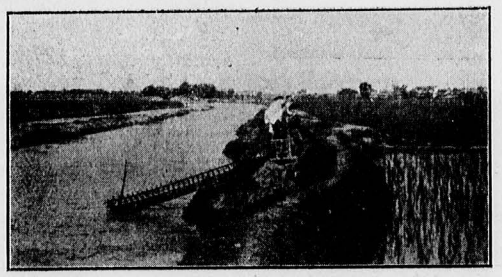

FIGURE 11. Irrigating rice from a lagoon used as a reservoir. The foot pump is the common method of irrigating in this region.

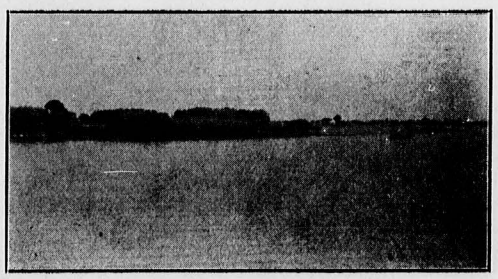

FIGURE 12. Farm woodlots of willows growing on the low land between the main channel and the dyke. See page 18.

have been great, for the gardens are small. Still, enough vegetables are grown to help out greatly in making the diet what it should be, especially in vitamines. In the village of T'a T'an the gardens are well fenced, neat and well kept. This village might be used as a moded in home gardens for thousands of other villages throughout the country (See figure 5).

AMOUNT AND DISTRIBUTION OF LIVESTOCK

The **amount and distribution of livestock** is given in Table VIII. Every farmer raised chickens, averaging ten to each farm. About one-third of the farmers kept yellow cows as draft animals and the remainder used water buffaloes. 31% of the tenant farmers, 51% of the owner farmers, and 81% of the part owner farmers had water buffaloes, thus indicating that the part owner with their larger farms found it more profitable to use the water buffalo than the yellow cow.

TABLE VIII. AMOUNT AND DISTRIBUTION OF LIVESTOCK

Kind of livestock	No. of farms having	% of farms having	Av. No. of animals per farm having	Av. No. of animal units per farm having	Av. No. of animal units for all farms	% of total animal units
Water buffalo ...	59	58	.98	1.5	.85	57.8
Yellow cow ...	34	33	1	1	.33	22.5
Sheep	1	1	1	.14	.....	.. ...
Hogs and pigs ...	79	77	1.8	.24	.19	12.9
Chickens	102	100	10	.1	.1	6.8
Ducks and geese...	4	3	1.9	.02	.....	.....
Total	... ..	.....	.....	.. ...	1.47	100.0

It is interesting as well as significant to note (Table IX) that the farmers with **water buffaloes** had a higher farm labor income than those with yellow cows. This agrees with the accepted idea that farms with water buffaloes are larger and more prosperous than farms with yellow cows. Farms having both water buffaloes and yellow cows have a lower income, not on account of the combination but because of the fact that several farms in this group lost a great deal on the year's business due to the heavy investment in buildings.

TABLE IX. KIND OF ANIMALS RELATED TO FARM LABOR INCOME

Kind of animals	No. of farms	Av. crop mow per farm	Av. size of farm	Av. farm labor income
Water buffalo	46	42.4	24.6	$29.15
Yellow cow	21	29.9	17.2	1.80
Water buffalo and yellow cow	13	118.2	63.5	-15.33
No labor animal	22	16.9	10.3	18.00
Av. all farms	.....	...	.. ..	15.44

Of the part owners 91% raised hogs while only 29% of the tenants and 69% of the owners had hogs. The part owners also kept three more chickens per farm than did the average farmer.

The total number of animal units for the 102 farms was 149.5, or **225 animal units per square mile** of cultivated land. There was **one animal unit for each 17 mow,** nearly three acres of land. The value of feed eaten from the farm was $24.89 per animal unit.

CAPITAL

The **relation of capital to profits** is shown in Table X. Definite correlation to profits is evident in the first two capital groups and the income in the third group of $2,501 and over is about twice as great as that in the first group. The reason for the lack of direct correlation throughout is without doubt the high investment in buildings and land. On some farms this is above the requirements of the farm and without a corresponding increase in yields.

TABLE X. RELATION OF AMOUNT OF CAPITAL TO FARM INCOME.

Amount of capital	No. of farms	% of total farms	Av. farm labor income
$1,500 or less	21	20	$ 7.56
$1,500-2,500	38	37	21.52
$2,501 and over	43	43	13.91

The **distribution of capital** (Table XI) brings out very clearly the high investment in land in proportion to the other items. The interest charge alone, at 8%, amounts to $219.00 per farm.

TABLE XI. AVERAGE CAPITAL AND ITS DISTRIBUTION

Distribution	Value (averages)	% of total capital
Land	$2,737.36	87.9
Buildings	227.21	7.3
Trees and ponds	2.81	.1
Farm tools and equipment	88.59	2.8
Seed, grain, fuel and supplies ...	4.93	.2
Livestock	54.04	1.7
Total	$3,114.94	100

LAND VALUES AND METHODS OF SELLING LAND

Land values on farms of ten mow or less are $114 per mow; of 11-20 mow, $111; of 21-30 mow, $118; and of 31 mow and over, $106, showing that the larger farms are valued at less per mow than the smaller ones. The landlord's investment was $105.51 per mow.

One of the **methods of selling land** in this district is somewhat unusual in that the land may be sold with certain reservations and when disposed of in this manner brings a lower price than when sold outright. The purchaser may then rent the land to the tenant who will pay a deposit (ya ban 押板) of five dollars down and an annual share of one-fourth to two-fifths of the rice crop. The price of land when bought outright is usually between $100 and $150 per mow.

The majority of the land sales however, are made with the reservation that the buyer must rent his land to the seller forever. Most people prefer this method for the following reasons: (1) The seller can still farm his land. If he once disposed of his farm entirely it would be difficult

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to get hold of another farm because of the very dense population and consequent demand for land; (2) The rich secure more land with less money; (3) Only a low payment to rent is made to the landlord, i.e., three-tenths of the rice crop; and (4) The tenant does not have to pay any rent deposit.

Land is **mortgaged** in this district at one-fourth its value.

FARM FORESTRY

Farm forestry is a common practice on the low flood land between the dyke and main channel of the streams of this region. Willows only are used and there is a saying "If a family has a thousand willow trees there is no need for worry about the fuel supply." The plots of woodland are divided from each other by ditches. The protection of the trees from man and beast is carried out by an organization of the farmers owning the farm woodlots. Trees may be cut only at a certain time of the year, and this time is decided by the organization, thus insuring each one cutting only his own trees. The trees are beheaded rather than cut close to the ground so that the trunk sends out branches which may be recut every few years. Planting the trees on this low flood land causes the silt of the stream at flood times to drop more readily than on the lands not so treated (See figure 12).

DWELLINGS

The average value of the dwellings is $218, the lowest being $30, and the highest $2,500 (See figures 9 and 10 for a comparison of dwellings).

The average number of rooms per dwelling is 6.7, the lowest being 3 and the highest being 18 rooms. All of the houses have earth floors. The average number of windows is four per house. The use of rooms per house is as follows: bedrooms, 2.9; kitchen, one; guest rooms, 1.17; store room, 0.75; and animals, 0.84.

GENERAL

The small number of productive work units per man (Table I, line 5) raises the question of how much work is done in **home industries or in activities outside the home.** In this region some of the farmers go to Wuhu to make candles at the candle factories, but only a small proportion of the total number of farmers of the region were thus occupied. None of the farmers surveyed were doing work outside of their own farming.

An explanation should be given of the **small number of productive work units** required for growing one mow of **rice** as indicated in the first bulletin of this Wuhu survey (page 12). In an average year it takes twelve to fifteen days of labor for irrigating alone but during the year in which the survey was made there were such heavy rains that little irrigating was necessary.

In most districts farmers are able to give the **number of mow** that can be **worked by a man or an animal.** The number of mow given is usually above the average because the amount of work that **can be done** by the better farmers is most often taken as the basis. In the district surveyed the farmers say one man can cultivate 10 mow and one water buffalo 20-30 mow. Table I shows the average mow farmed per man to be 7.1 mow and the average per animal to be 24.8 mow.

A comparison of the **size of the family** with the labor income and family income gave no correlation, the large families having no more to live on than the smaller ones. This is not in agreement with the results shown by the survey made by the China International Famine Relief Commission (A study of Rural Economy), or with other studies made by the writer to be published later showing that there is a definite correlation of size of family and income.

The **average age** at which the farmer became an operator was 28 and the average age of the operators was 43 at the time of the survey.

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A **comparison of the land owned and operated at the time the operator began to farm and at present** showed an increase of 2.3 mow, or 10.2% in 15 years. This increase occurred most largely among part owners and is due to at least three reasons; first, some of the grave land has been put under cultivation; second, the low land formerly subject to floods has been built higher, or dyked, and third, some families have moved to other regions and have left land to be cultivated by those who remain.

Only one family had a **servant.** Of the **operators' fathers,** ninety-eight were farmers, one a scholar and one a doctor. Of the **operators' wives' fathers,** twenty-three were farmers, thirteen merchants, five blacksmiths, three carpenters, and three scholars (This information was obtained from 47 farms only).

Twenty five per cent of the farmers' chief **home amusement** was playing the flute.

Of the farmers reporting as **belonging to an organization,** eleven per cent are members of one of the numerous Buddhist sects known as Ti Chang Hwei (地藏會).

The following information, which lends itself best to tabulation form, is given for its immediate interest and for comparison with results in other districts as soon as such are published. Starred items are averages by farms rather than by totals.

	Average.
LABOR INCOME.	
Owner operator	$-15.57
Part owner operator	156.32
Tenant operator	105.82
Average (all operators)	55.51
Farm labor income on tenant farms	0.72
Farm labor income on part owner farms	73.87
Average farm labor income (all farms)	15.44
FAMILY INCOME.	
Owners	$120.05
Part owners	267.15
Tenants	63.43
Average (all farm families)	160.43
Per cent received by the landlord for his investment*	2.5%
Per cent of farms directing man labor	100%

Value of labor directed per farm	$145.38
Number of animal units per farm	1.46
Number of mow in crops	24.6
Per cent of farms having one or more crops selling for at least $100	41%
Value of farm tools and equipment per mow in crops	$3.60
Value of farm tools and equipment per crop mow[1]	$2.01
Rate of taxation per mow	$0.27
Value of land per mow	$111.68
Number of mow in crops per man	7.8
Number of crop mow per man	14.9
Animal units per man	.49
Productive work units (man labor) per farm*	268.2
Number of labor animals per farm	.92
Mow in crops per labor animal per farm	26.8
Crop mow per labor animal per farm	48
Productive work units (animal) per farm*	24.8

[1] See investment in tools and equipment, page 5.

POPULATION

The name, age, and occupation was obtained for each member of the operators' household. Table XII gives the distribution of population by ages (Chinese[1]) and sex. It should be noted that the investigator failed to make sure of getting all those below the age of two years.

The apparent discrepancy in the age group of 11-20, of the per cent of the total population is very probably due to the fact that it is often difficult to secure information about marriageable daughters. Another possible reason might be that these particular families surveyed had more engaged daughters sent to their prospective parents-in-law than they had received as prospective daughters-in-law. It is a common practice to send engaged daughters to the family of the prospective mother-in -law for two reasons which usually are

[1] Ages in China are calculated in relation to the time of birth to the Chinese New Year. A baby is a year old the first day it is born. If born on New Year's Eve it is two years old on New Year's Day. A year is added to a person's age at each New Year's Day rather than on the birthday itself.

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mutually advantageous; (1) The parents of the daughter are hard pressed economically and are anxious to transfer her support as early as possible (2) The future mother-in-law needs a girl to help in the running of the household.

TABLE XII. POPULATION

(Grouped by number and percentage of males and females for each decennial group).

Age group	Male		Female		% of total population in this group.
	No.	%	No.	%	
10 & under	89	60.1	59	39 9	27.1
11-20	62	68 9	28	31.1	16.5
21-30	57	48.7	60	51.3	21.4
31-40	48	48.5	51	51.5	18.1
41-50	19	42.2	26	57.8	8.2
51-60	22	57.9	16	42.1	6.9
61-70	6	60	4	40	1.8
Total	302	55 2	245	44.8	100.0

The **average number of persons** per household is 5.36, thus giving a population of 826, per square mile of land in farms or 4.65 mow per capita. There were 41 hired men living in the households of which Table XII is an enumeration, and these are not included in the table or in the estimate of density of population. Including these hired laborers the density is 886 per square mile. The largest household contained 21 persons.

The people of this district are almost entirely native to the region. There is some emigration due to the pressure of population and most of these emigrants continue farming in the less densely populated regions of nearby districts. Very few go to the cities. A number of young men go away to other districts and this evidently accounts for the lower percentage of men than women in the groups 21-30, 31-40 and 41-50.

Two-thirds of the male and one-third of the female population make up the total under the age of twenty. When the writer inquired whether or not girl babies are drowned or otherwise disposed of the answer was invariably without hesitation that it was a very common practice. However, it is also a frequent occurrence for families not able to support all their new born to send girl babies to the orphanage at Wuhu, which is a philanthropic organization for the care of children not wanted as well as for those without parents. Such orphanages are found in many places.

The proportion of females to males in the groups of 1-10 and 11-20 can often be used as an indication of economic pressure or the pressure of over-population, and there is little question that this region has reached its population density point as far as the present methods of obtaining subsistence is concerned. If living is to be better without lessening the density of population, more work must be found and this will have to come largely in the development of industries since the farm is primarily adapted to rice growing.

TENANCY

The forty six farmers renting all or part of their land secured it from **thirty six different landlords.** The **ages of these landlords** ranged all the way from eighteen to seventy-two with about one half of them above and the other half below, the age of forty.

The **occupations of these landlords,** with the number in each class, are as follows: merchants, 23; scholars, 4; farmers, 2; officials, 2; Wuhu orphanage, 1; Buddhist priests, 2; student 1, and no occupation, 1.

The average amount of land owned by each landlord is 1,300 mow for merchants, 1,540 for farmers, 1,650 for officials, 1,000 for orphanage, 580 for scholars, 460 for priests, 120 for those with no occupation and no information for the one student. The merchants own 75% of the total 39,668 mow possessed by these landlords.

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Only one tenant was related to his landlord.

All contracts for the leasing of land are written. The length of contract is indefinite for thirty of the tenants, while for eight others leases were made for five years, six for three years and one for two years All contracts provide for the maintenance of the fertility of the land by the addition of fertilizer, but the amount is not stated.

There are **two methods of collecting rent,** one by the landlord himself and the other by a head tenant (莊頭) appointed by the landlord. The former method is used by 11% of the landlords, most of whom rent less than fifty mow of land. The other method is used by 89% of the landlords. The tenant who is engaged by the landlord to undertake the collection of rents must at the time the rice crop is maturing go with the landlord to see all of his rented land and classify the crop according to prospective yield. The tenants are required to pay for the first class harvest 160 catties of rice as rent for each mow, for the second class harvest 140 catties and for the third class harvest all the way from nothing to 120 catties of unhulled rice. As soon as the crop is classified, the head tenant will gather togther all the tenants to dine in his home with the landlord for the purpose of announcing the classification of each one's crop and the amount each class should pay as soon as the crop is harvested. The landlord himself, or his representative stays in the home of the head tenant until all the rent is collected and shipped to the home of the landlord at the latter's expense. The landlord receives a share (about one-fourth) of the rice crop only—all other crops belong to the tenant in full.

The head tenant receives the following advantages from his appointment: (1) The landlord aften furnishes a house for him; (2) He pays ten per cent less rent than other tenants; (3) Other tenants may give him a bribe in return for which the head tenant is supposed to give them a classification requiring less rent to be paid to the landlord (a common practice where rent is collected by proxy).

DYKE MAINTENANCE

The land in this district is so low that it has to be protected by dykes ten to fifteen feet high. The dykes were first built through a local organization formed for this purpose by the landowners of the region. This organization was registered with the government and the dyke was built largely through government funds but also by personal contributions on condition that the landowners should keep up its maintenance. This is done in two ways; (1) by men hired by the owners themselves who own land along the dyke; (2) in case the owners are landlords the tenants do the work and the value of their labor is subtracted from the rent given the landlord.

DATA FROM MAHU, A SMALL VILLAGE NEAR WUHU

A survey of fifty-one farms was made in the village of Mahu, near Wuhu, Anhwei, in the summer of 1920. The data secured was not entirely complete, but there are a few items worth noting.

Land tenure. There were three owner farms, 37 part owner and 11 tenant farms averaging 22, 26 and 13.5 mow in size, respectively. The average size for all the farms was 20.5 mow. The smallest farm was 1.7 mow and the largest, 90 mow.

Labor income. Farms of 15 mow or less made an average labor income of $68.50, of 16 to 30 mow an average labor income of $109.50 and of 31 mow and over $380.46, thus showing a very direct relation between size of farm and profits.

Efficiency in the use of tools. Farms of 15 mow, or less cultivated 2.8 mow with $40 worth of tools and equipment. On farms of 16-30 mow, 4.9 mow were cultivated, and of 31 mow and over 6.6 mow were cultivated with the same amount of equipment, thus indicating the greater efficiency of the larger farms in the use of equipment.

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General. The average age of the operator was 43.9 years, the youngest being 18 and the oldest 67.

Thirty out of 37 part owners **inherited their farms.**

There were 7.7 persons in the operator's household, which gives a **population density** of 1,280 persons per square mile or 3 mow per capita.

SUMMARY

This summary is for the complete survey (Parts I and II).

1. The farm management principles revealed in this survey are practically the same as those that have already been found to hold true in the United States. This leads us to the conclusion that the fundamental principles in farm management, as in any other branch of agricultural science, hold true the world over. The quantities and values of the various factors which make up a successful farm business vary greatly just as the application of the principles of other branches of agriculture differ but the principles remain the same. Size of business, quality of business (yield per mow and production per animal), efficiency in the use of man and animal labor and in the use of capital all bear the same relation to successful farming.

2. The owners actually lost $15.00 a year which so brings down the average that the operators as a whole lacked $16.00 of making wages, in spite of the fact that the part owners made wages twice over and the tenants made wages one and a half times over.

3. The highest profits came from the largest business. The operators on the larger farms made the most money; 50% of these larger farms making a labor income of over $50 while only 7% of the smallest farms made as much.

This fact may be accounted for partly at least in three ways. First, the actual labor costs including the value of the operator's labor and that of his family, was only one half as great on the large farms as on the small ones. In

other words, labor was twice as efficient on the larger farms. Second, animal labor was one and one half times as efficient on the large farms as on the small farms. Third, the large farms used tools and equipment one and one half times as efficiently as did the small farms.

4. Contrary to the general opinion, farm labor is not cheap; for labor constituted 76.3% of all expenses (excluding interest on capital invested) and hence must be used economically if receipts are to be increased. This large item of expense for labor is due to the hand methods used which allow only for small accomplishment in return for a day's work and to the bad distribution of work throughout the year which causes the farmer much idle time as well as certain periods when he is overworked.

The same holds true for animal labor, only in greater degree, as the animals worked only 24 efficient days throughout the whole year. The introduction of an animal irrigation pump would give animals more to do and at the same time release man labor for hoeing or other work.

5. A very large per cent of the capital, 87.9%, is invested in land and it follows that the investment in tools and equipment, buildings, and livestock is very small. The result is that hand labor takes the place of capital which might be invested in more efficient tools of production, that by-products such as straw must be stacked out-doors rather than in barns and that dependence must be put on vegetable products, such as cereals, for food rather than animal products.

6. In spite of the fact that the operators as a whole are not making wages when we place the farm on a strictly business basis, still they had an average of $395 a year for living purposes in addition to a house. This amount includes the value of the products used by the family from the farm. Nearly two thirds of this income is from interest on capital alone.

7. Good character (not gambling and drinking to excess), hard work, and progressiveness enable the part owners as a group to become the most successful farmers of

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this region. It is these farmers who are increasing the size of their farms by renting land in addition to what they own, sufficiently to give them a paying business.

8. Farm tenancy does not seem to present any serious problems other than that of keeping the land out of the hands of small owners. The per cent of tenants in this region is larger than the survey of the limited number of farms would indicate but the attendant evils so often present with the tenancy system were not found. One of the chief reasons is that the landlords do not seem to be the grasping kind and are content with a small interest, 2.5% on their investment. The possession of land seems to be almost an end in itself.

9. Each farm family is raising enough productes to support a little over two families, his own and one other. This raises the question of how much more than fifty per cent of the families in China are farm families. Undoubtedly a much higher per cent because a large quantity of agricultural products is shipped out of the country. However, the often estimated farming population of 80 to 85% of the total population should possibly be revised to read "rural population," thus including rural artizans and those engaged in transportation, such as wheelbarrow men, carters and boatmen.

10. Population seems to have reached the saturation point, for emigration is taking place toward the nearby more sparsely settled districts. The density of population was 886 per square mile of land in farms for the 102 farms. However, at Mahu, not far away, the density was 1,280 per square mile of land in farms for fifty-one farms. The writer is of the opinion that the latter figure would more truly represent the Wuhu district as a whole. More intensive methods of farming are very difficult because the soil is primarily adapted to rice and this crop is already being grown quite intensively. The only possible way the region might support a larger population would seem to be the development of industry.

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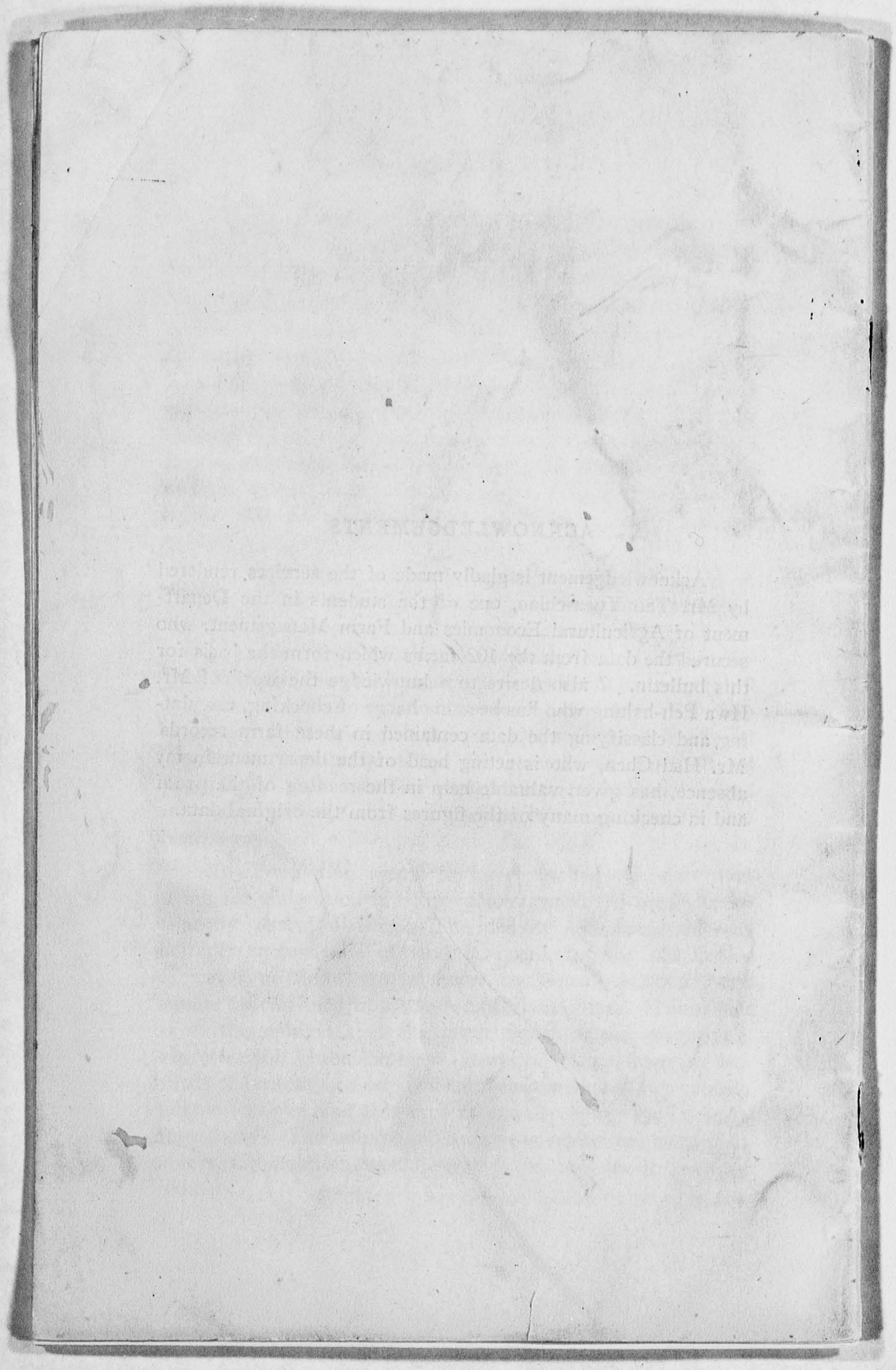

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CHINESE RURAL ECONOMY

BY
JOHN LOSSING BUCK

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CHINESE RURAL ECONOMY

JOHN LOSSING BUCK
UNIVERSITY OF NANKING, NANKING, CHINA

This article is a brief résumé of a series of studies made during the past eight years of farm economy in seventeen localities in seven provinces of China[1], primarily for the purpose of training Chinese students in methods of collecting information on rural economics and of making available to them and to others knowledge of agricultural conditions in China.

A total farm area of 21,000 acres was included in the survey, with a capital investment of $2,600,000[2], and of 17,000 persons. To the vast expanse of China and to the vaster numbers of her population, these figures must of necessity seem small, but they have this value: the data were collected by persons who were trained and who were fitted by peculiar circumstances of location to obtain reliable information, and the studies covered a field fairly typical of a much larger one. In the absence of other and more widespread data these, therefore, have their importance.

The areas studied were typical of North and East Central China, although the conditions in these regions differ a good deal in climate, soil, and topography. In North China one finds the prolonged dry seasons which leave the land almost without rainfall ten months of the year. July and August have two-thirds of the entire annual rainfall. These excessive rains produce disastrous floods. Rainfall is much more evenly distributed in East Central China and this region is fairly free from the famines which besiege North China. Both regions lack adequate means of transportation, however, and this is one of the chief obstacles to a successful agriculture in China. Good roads alone could do much to prevent famine in some places.

[1] ~~*Studies in Chinese Rural Economy*~~ *Farm Economy*, by John Lossing Buck, published in U.S.A. by the University of Chicago Press, Chicago, 1930, and published in China by the Commercial Press, Shanghai, 1930.

[2] All currency amounts are in gold, or United States currency, at a rate of $1.893.

The average farm in either region is, to the western farmer's thinking, appallingly small, measuring only a little over five acres. The field system is that of the open field with the plots usually non-contiguous. The farmhouse, moreover, is most frequently not near the land. Farmers in China live clustered in little villages whence they go out to their fields, and the amount of time wasted in going to the fields would be a serious problem to the western farmer.

The type of farmhouse differs very much in the two regions. In North China the houses are smaller and are usually made of tamped earth and are covered with thatch, while in East Central China they are larger and made of brick and have a tile roof. But certain conditions are common to both; there is little attempt at any beautification or even at the comfort of home, and the living rooms are often the granaries where the crops are stored when they are harvested and sometimes where even the animals are housed. The dooryard is often the threshing floor, and poor sanitation, the proximity of pigpens and privies to the wells, is almost universal.

A study of the limited farm area and of the uncomfortable housing of the average Chinese farmer leads one to the query of how large his farm business is. There is no wholly satisfactory yardstick by which to measure it, but when several factors are taken together, a fairly accurate result is found. Since farms are so small, the crop area is necessarily small. But crop area in itself is an inadequate measure, for small as it is in China, it is still much greater than in Japan. The number of days of labor on the farm is a possible measure and in these two regions this was found to be, taking all family and hired labor into consideration, only 194 working days of ten hours each a year. Animal work units as well are low in number, for animals are idle much of the time and many farmers do not own animals at all but depend on borrowing from richer neighbors, or only own on shares with other farmers. Much of the labor done by men might be done by animals.

Measured by capital invested, the farm business is small. The average total capital invested is only $934, and is lower

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by one-fourth in North China than in East Central China. Three-fourths of this investment is in land and after that the highest proportion is in buildings. Very little is in livestock or in farm implements, partly because there is no animal industry such as in the United States, and partly because there is no labor performed by power other than human or animal.

Farm receipts averaged only $199 per farm, with a difference of $147 in North China and $257 in East Central China. About two-fifths of these receipts were from grains and two-fifths in produce, also mostly grain, consumed by the farm family. Livestock was less than five per cent of the whole and tubers less than 3.4 per cent. In no locality was livestock ten per cent of the total receipts; this is very different from the United States, where livestock produces at least a third of the receipts on the average farm.

But if receipts are low, so also are expenses. The average farm expenses were only $72 per farm and were about two and a half times greater in East Central than in North China. Contrary to the general opinion that labor in China is cheap, hired labor is the Chinese farmer's highest item of expense. It went to as high a proportion of the total as $47 a farm, although a better distribution of labor or the introduction of labor-saving machinery might help to reduce this item.

Taxes are high, since the Chinese farmer receives few benefits in return. The average cost of these taxes is an average of $0.56 per acre of farm area, $0.29 in North China, and $0.87 in East Central China. This may be compared with $0.314 per acre in the United States in 1913-14, and of $0.709 in 1921-22. Fertilizer averaged about four per cent of all the Chinese farmer's expenses.

With small receipts and comparatively small expenses, profits might be expected to be correspondingly modest. The average family earnings for the year on the average farm, after house rent was deducted, were $147, and were about twice as great in East Central as in North China. On a per capita basis, it was found that the earnings were only $2.30 a month and at that were 1.9 greater in East Central than in North China. After all expenses were subtracted

from receipts, the amount of money the average farm family had to live on, aside from raw material for clothing and rent supplied from the farm, was $73 a year. Nearly a half of the farmers, however, had some source of income other than farming, but even so, the average amount of this income was only $19 a year. This small farm business, evident from low figures everywhere, means small profits for the farmer and a quality of living determined by a small scale business.

With the evidence of the extremely small size of the farm business, the next step was to find out what size of farm business did in reality prove to be the most profitable. The farms were divided into five groups of graded size, and the profits were then measured by such standards as farm labor earnings, operator's labor earnings, family earnings, labor returns, net profits per crop hectare, and other like measures, in order to see what relation the size of farm had to each of these factors. It was found without exception that on the larger farms the profits were higher and labor efficiency greater than on the smaller farms. A farmer on a large farm works with nearly twice as much efficiency as he does on a small one, and this applies to animal as well as to human labor.

The relation of the size of the farm to crop yields is also interesting. It has been thought that smaller farms must have proportionally higher yields because of the more intensive care given to crops. But data do not prove this point. Crop yields in both regions were in favor of the larger farm. On the larger farm, moreover, less capital investment, in both land and equipment, was found to be required. But even the largest size-group farms studied in these two regions was yet too small for constant returns to begin to operate. In other words, the Chinese farmer on a farm considerably above the average in his region has still a farm too small to be economically profitable.

The natural question which follows is: why are the farms so universally small? The answer is: an over-supply of farmers. There are not a sufficient number of industries developed as yet in China to draw the surplus of men off the land, consequently each succeeding generation the land

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is divided and sub-divided until it is now in plots too small for the best economic unit. It is one of most irrefutable proofs of the over-population of the country.

There are, however, some possible remedies for the situation. The amount of cultivated land can be increased by certain definite policies, such as reclamation of land now too dry or too wet or used for graves. Industries, if encouraged by a stable government, would help. More intensive farming methods would increase yields. Some suitable means of giving farm credit would be of real use, and equally important is the problem of transportation. The Chinese farmer in some parts is farming mountain sides that should never have been shorn of their forests. The timber is worth little because it cannot be shipped out, but the land must be wrongly used for farming because food cannot be shipped in and yet must be had at all costs. None of these remedies will give more than temporary amelioration, however, unless some means is found to check the growth of population.

With the Chinese farmers doomed then, by their very numbers, to wrest their living from an amount of land too small to support them adequately, it is interesting to find how many of them at least own the land which they work. Over three-fourths of the farmers in North China are owners, but less than one-half in East Central China. There seems to be no apparent difference in size of farms owned by operators and those only partly owned or wholly tenant. A study of the labor earnings on the three types of farms shows rather astonishingly that the owner earns less than either the part owner or the tenant. Apparently from a business standpoint it pays in China to be a tenant farmer rather than an owner. This conclusion must be modified, however, when one considers that after all, the real advantage is the owner's because he saves a yearly payment which is about equal to interest on investment in land and buildings, cost of taxes, upkeep of the farm, and landlord's profit. Farm labor earnings also show an advantage to the tenant, and generally it can be stated that if the tenant were able to farm as well as he does now with the supervision given by many landlords, he would really be better off financially than the owner operator, although family earnings are higher on the owner operated farms. This does not mean, however, that tenants deservedly have a lower income than owners. In China a large proportion of the land is inherited, and it is very difficult for the young farmer who does not inherit land to come into the owner class, although as the data show in many cases, he works harder and farms better than the owner farmer. Tenants in most regions cultivate the same land for life, and this land may even pass from generation to generation. In at least one region there is serious objection to changing tenants; for witness the proverb, "Every time a tenant moves, three are made poor, the landlord, the tenant, and the land."

As to what rent the tenant should pay for his land, it is evident from the data that no general rule can be laid down, because in some places landlords are actually not receiving a proper interest on their investment, while in others tenants are paying much too high rents. From an estimate based on dividing expenses in proportion to receipts, however, rents should, to be fair, be reduced over one-fifth the present rate.

One of the most interesting aspects of the study is an investigation into the cropping systems which the Chinese farmer has learned to follow from centuries of custom and experience. It was found that there are several marked differences between the cropping systems of China and the West. In China there is a far greater amount of double cropping, averaging about fifty per cent of the total crop area. Nearly all of these crops were planted after the winter crops, but in certain parts of East Central China two rice crops were harvested in one season. The double cropping is made possible by the long growing season and by the use of crops that mature before the autumn frosts.

A second difference is that in China crops are grown primarily for their grain, fiber, or leaf products, because the Chinese farmer has no animal industry (in the western sense) and crops are raised primarily for direct human utilization. The by-products, such as stalks and straw, are used for fuel, fodder for labor animals, building, or for kindred purposes.

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A third difference is that in China the crops must provide fuel as well as food, not only for the country population but for the city as well. The result is that soil suffers in some degree, because less organic matter is returned to the land than would be if all stalk and straw did not have to be carefully harvested and if more of this material were fed to animals and used as manure. The need for producing fuel throws a heavy burden on the Chinese farm.

The cropping systems themselves are very elastic. Sometimes when wheat or rice is the chief cash crop, these are planted year after year until the land ceases to give a return, and then, in the case of wheat, millet or grain sorghum is introduced, both of these being well-tilled and manured crops. Crop rotations are a definite part of the cropping systems, these varying, of course, with the localities. The cultivated crops include wheat, barley, and rapeseed, which are cultivated at least once in North China and two or three times in East Central China. Kaoliang, or grain sorghum, corn, sweet and Irish potatoes are usually cultivated more than the cereals, with the exception of rice.

Legumes, winter and summer, or second crop, are found everywhere. Peas are often planted with wheat, as are broad beans also in East Central China, although either may be used as a single crop. In the last region these legume crops are sometimes turned under as green manure, but not in North China where the climate is too dry for green manure.

The cropping systems of North China show far greater diversification than those of East Central China, because more kinds of crops can be grown on the upland soils of the north than on the low rice lands. North China farmers also like to be as self-sufficient as possible, feeling that this reduces the cost of living and is more convenient. The diversification, of course, lessens risk from crop failure, distributes income over a larger part of the year, and gives a better labor distribution.

Most of the cropping systems of both regions, except in the rice-fields, contain the essentials of a rotation system: a shallow rooted crop, a cultivated crop, and a leguminous crop. In all of the localities grain farming was the predominant type, and wheat and rice covered the greatest areas. Ninety-one per cent of the farmers in North China and sixty-seven per cent in East Central China grow wheat, while in the latter region ninety-two per cent grow rice. Wheat in China has a very wide geographical distribution since climatic condtions generally are favorable and it is one of the few crops that can stand the winters.

In general, it seems true that the Chinese farmer is growing the crops best suited to his locality although often he fails to make an adaptation as quickly as the situation demands. For instance, in one section near Nanking, Kiangsu, the low hills are admirably suited to the growing of peanuts, sweet potatoes, and fruits, all of which are insufficient for the local market; yet with a few exceptions farmers are not growing these crops, although the soil and topography seem ideal for them.

Of all crops, 54 per cent are sold as cash crops, a little over two-fifths of the total in North China and a little over three-fifths in East Central China. This shows a fairly commercialized agriculture, contrary to common belief, and shows also that the farmer has requirements which need ready cash. Very few crops are raised entirely for sale, however, although some, such as rapeseed and sesame, which are commercially valuable for their oils, are almost entirely sold.

Crop yields in China, except for rice, are not as high as observers of Chinese agriculture have been led to believe in the past. Wheat yields are approximately the same as in the United States where agriculture is commonly thought to be more extensive than in China. Corn yields less than one-half in China what it does in the United States, although sweet potatoes yield two or eight times as much in China. In summarizing the data on yields, it is safe to say that the agriculture of China is not as intensive as has been supposed and that yields can be increased by the use of better seed, more fertilizer, and the utilization of labor now idle.

The keeping of livestock has a definite relation to crop production and the maintenance of soil fertility. If animals are kept mainly for draft purposes, it is evident not only that the people eat little meat, except where fish is

plentiful, but it is also probable that animal manure is not one of the chief sources of soil fertility. These draft animals are used largely for labor. In the north the oxen and in the East Central China the buffalo are the most common, with donkeys coming third, hogs and chickens next, and ducks and geese in lesser numbers. Some sheep are raised in Shansi. All animals except oxen are found more frequently on the East Central China farms, and of all animals a little more than two-thirds are used for draft purposes.

The farms in both regions are very lightly stocked, only 2.00 animal units per hectare, on the average. This means in relation to the soil that a very limited amount of fertilizer is from animals. In both regions, however, human feces are used, and if this is taken into consideration the fertilization is about 3,344 pounds annually per crop acre. But there is no conservation of organic matter such as crop stalks and residue. All this material is rigidly gleaned from the fields, and taking this into consideration, it is evident that the soil on the whole is insufficiently fertilized for high yields. In the absence of transportation and credit facilities, this constitutes a real problem to the Chinese farmer.

Since animals are kept primarly for draft purposes, their relation to labor on the farm is pertinent. Labor was expended in the greatest amount on the two chief crops, rice and wheat, although the wheat in East Central China takes twice as much labor as it does in North China because the soil of the rice fields is stiff clay. Cotton, one of the most important of all crops, takes the next highest amount of labor, and then hemp, vegetables, squash, tobacco, indigo, and melons. The man labor requirements per acre are, of course, much larger in China than in the United States where so much machinery is used. Winter wheat, for instance, in the latter requires only 11 hours per acre in comparison to 243 in China, and cotton in the United States requires 117 hours per acre of man labor and in China 656 hours. Animal labor comparisons for the two countries show the same tendencies, although in somewhat less extreme measure.

The average farm in the two regions shows an average equivalent of two working men. If the total number of working days is considered, it is evident that each laborer is idle for several months of every year. That is, only about one-~~sixth~~ *fourth* of each year, taking into consideration rainy days and holidays, is directly utilized in productive enterprises. Of the labor on the farm, two-fifths is performed by members of the family, one-fifth by hired labor, and another two-fifths, approximately, by the operator himself. Of this hired and family labor, a little over one-fifth is by women, 31.6 in East Central China; and only 11.8 in North China, where foot-binding is still prevalent. Children do about 6.1 of the hired and family labor.

Animal labor on the farm is evidently not well planned, for while a man performs an average of about 119 ten-hour days a year on productive enterprises, an animal works only about 63 ten-hour days a year, and it is a common sight to see a man toiling in the sun while his beast lies resting in the shade of a tree.

Another point in relation to labor is its distribution over the year. In most of the places this distribution could be better planned, for the months of sowing and harvest are too heavy, and during the winter months, except at Wutai, Shansi, where some sheep are raised, there is almost a total lack of work for man and beast. This lack of work during the winter limits the income, since expense goes on for food and shelter and there is no productive income. The problem of winter work is, however, nowhere an easy one. Supplementary work, either at home or away, is one possible solution. In Su Hsien, Anhweo, for instance, the women and children make winter shoes of felt from cows' hair. In some places it is a regular practice for the young men of the family to go to the cities to find work. It is a question whether China will not find it well to develop industries on a scale small enough to be managed in the home rather than in the large centers one finds in the West.

The cost of labor in China, while wages are low, is on the whole astonishingly high. The average annual wage paid to a laborer in North China is $22 and in East Central China $42, but these wages make up a total of 63.5 of

the total farm expenses, exclusive of the operator's own labor.

The whole problem of labor on the Chinese farm is a most significant one, because of its high cost, its uneven distribution, and its inefficiency from the point of view of accomplishment. And yet, taking these all into consideration, it is doubtful whether the Chinese farmer can afford to substitute machinery for human labor. Human labor is the great natural resource of China, and capital in the form of money is at a premium. Farmers pawn their tools, their clothes, anything they can collect, to raise a little money. Labor is much more abundant with them than land or credit, and when one considers not only the investment cost of machinery but also its operating costs, and above all, the poor roads which make impossible in many cases the transportation of machinery from one scattered plot of land to another, it seems inadvisable to suggest the innovation of western farm machinery to the Chinese farmer. The real problem on his farm is not primarily how to reduce labor, but how to diversify it, and how to enlarge the farm business by more intensive farming so as to increase rather than to decrease the number of working days in the year.

This abundance of labor is only one of the manifestations of the greatest of China's problems, that of the number of her people. The density of population in a country has a very definite relation to farm practice, for on the number of people per unit of land depends the answer to the question whether standards of living are high or low. Labor is scarce or abundant, and bandits are few or many. In China the farm family is of the large family type; that is, there is not only the marriage group of the male head, his wife and his children, living under one roof, but also relatives of the male head. Sixty-four per cent of the families in the two regions were of this type and 42.5 of the population were relatives of the male head. A third of these relatives were daughters-in-law, and mothers and fathers were next highest in proportion. The average age of marriage of the male head was 19.7 years and of their wives, 17.9 years. The length of a generation is approximately one-fifth of a century. The number of persons in the average farm family

was 5.7 as compared with 4.4 in the United States and 5.19 in Japan for the same number of families. Size of family bears a clear relation to size of farm, increasing in numbers as the farm increases in size.

The age distribution in population for the two regions in China, compared with a similar distribution in such countries as Japan, Germany, France, and Sweden, shows a much smaller number of persons for the years under two and over sixty, and a larger number of persons for the years between than in any other country except France. Probably the population of the farm groups studied in China is between the progressive and stationary types. If this is true, then the population is increasing.

Sex distribution varies in China according to four periods: the first having a predominance of males, the second of females, the third about equal, and the fourth with females predominating. The average ratio of males to females is 105.7. The differences in sex distribution can be explained without difficulty. In the first period male children received better care than the female; in the second many of the young males emigrated, about 3.7 of the population, less than one per cent of which are females; the third period is that of child birth for women and probably the incidence of death is high; and the last period the natural longevity of women over men is true in China also.

The density of population in North China is 621 per square mile and in East Central China is 839. These figures may be compared with 78 in Denmark, with 1,238 in Japan, and with 49 in the United States. Denmark and the United States have a relatively sparse population because of the the use of more animal products which require considerable land, and because in both countries there is a definite unwillingness to accept a lower standard of living. Chinese farmers themselves are constantly referring to the increase of population and from ancient times the whole question of the number of people to the unit of land has been held to be an important one, in view of the grave question of how to feed this increasing multitude.

In China much of the food consumed by the farm family is, as has been noted, produced on the farm and the question

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of the dietary therefore, depends a great deal on the type of crops grown. Of the food consumed by the farm families of the two regions 83.3 per cent was furnished by the farm and the rest was purchased. The amount of food purchased depends somewhat on the crop year; if it is good, less food is needed from the outside. Distance of the home from the market may also be a reason for buying less of such foods as fruits, meats, beancurd, and the things seldom raised on the farm. In some cases where good cash crops are produced these will be sold and inferior food bought and eaten. But the bulk of the food comes from the farm, and such foods as fruit and sugar are not considered essential parts of the diet. Vegetables, especially in North China, are used in a very limited quantity, the farmer there giving as his reason that he does not know how to grow them. The probable reason is a disinclination to master the methods of vegetable growing.

Nine-tenths of the food energy consumed by the families of the two regions came from seeds and their products and eight per cent from roots, mostly sweet potatoes. Beans come next in importance and, after these, vegetable oils. Because of the extremely large percentage of energy from seed why the Chinese farmer can subsist on such on such a small amount of land, for his utilization of the land is thus direct rather than through the medium of animals as it is in the United States. The average number of calories consumed per adult-male unit in China is 3,461, and this may be compared to the western standard of 3,400 calories.

There is very little variation in the dietaries of the localities; a few products are consumed in large quantities and there is a general insufficiency of vitamines, calcium, and certain protein radicals. Dietaries are chiefly seasonal in nature and in North China especially show a hand-to-mouth existence with a hard race against starvation in years of bad crops. The whole problem of fuel, too, is closely related to that of food, because the scarcity of grass and stalks in many places makes the proper cooking of food a difficulty.

But beyond the matters of food subsistence there are other necessities of life and in any study of farm management it is desirable to discover, in so far as it is possible, the quality of living which the farm business gives the family. The cost of living is first to be found, although this does not in itself constitute a measure of the standard of living.

In the families studied the value per adult-male unit of all goods consumed showed an average expenditure of $26.45 divided as follows: food, $17.95; fuel, $2.25; clothing, $1.61; rent, $1.01, and all other items, $3.53. On a per capita basis, this means an average value of goods consumed annually of only $20.31. The average value per household for the four physical necessities for a year was $72.00 for food, $13.38 for fuel and light, $9.14 for clothing, and $5.98 for rent. All other items amounted to $20.12 per household. It is obvious that the higher the proportion the four necessities bear to the total income the lower the standard of living netted. The average proportion for North China was 86.4 per cent and for East Central China 79.7 per cent.

The expenditure of $120.61 per household of 5.7 of the families studied in China may be compared with $1,598 per family of 4.8 in the United States, with $506 in Japan per household, and with $1,263 in Denmark. The ratio between the Chinese family and that of the United States is 1 to 16. But this does not necessarily mean that the difference is wholly in the standard of living. The Chinese family gets its chief source of food from a cheaper one than the United States does and of course price levels must also be considered. The fact remains, however, that when all things have been considered, the Chinese farmer must be satisfied with far less than his fellow farmer in the United States.

Of things other than the four necessities, education is one that may be mentioned. Of the present generation of farmers less than one-half have ever attended school and of the generation of their children seventy-five per cent are not in any school. This is less important than it seems for such schools as are available in these country districts are for the most part of the old classical type which require only the memorizing of ancient books and have therefore little practical value for the farmer in his daily life.

Besides education, a little money is expended on recrea-

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tion, chiefly at the time of the New Year holiday and consisting of tea-drinking and gambling. The cost of recreation per family for those who reported it was $1.01; and this may be compared with $22.50 for the farm family in the United States.

In general, one observes from the data a standard of living appreciably higher in East Central China than in North China. But even with this, the standards of the two regions, when compared with those of other countries, are too low. The Chinese farmer has to spend too much of his income on the bare essentials and has even then nothing but food unvarying and lacking in nutriment, clothing of the cheapest sort, and a home which is nothing more than a shelter. The chief cause of this low standard is without doubt the small size of his farm and the density of the population which makes it necessary, and all remedies will be of little but temporary value unless something is done to check the growth of the population.

Nor will mere economic relief bring to any certain degree the farmer's improvement in standard of living. More money may simply mean more gambling or some such useless expenditure unless the burden of ignorance is removed from the people. Poor communications have kept the rural people isolated; their inadequate education has kept them ignorant; and there has been but little to open and enlarge their minds to those things which pertain to socialization, and which are necessary to the happy and fruitful human life.

Nevertheless, even after taking all into consideration, this pressure of population and the somewhat primitive methods of farming in China, no great immediate change seems possible. The Chinese farmer has by the trial and error method arrived at many sound and practicable conclusions for his situation. He does need help, however, in adjusting his cropping systems to the now changing demands of markets and prices, to dietary needs, and, in some cases, even to soil and climatic conditions. And, in order to increase his yields, he needs help in procuring better seeds, in control of insects and pests, and in more intensive methods of fertilization and cultivation. Improved transportation and credit

and better marketing facilities would also do much to aid the Chinese farmer. Besides these he lacks a vital and satisfying mental and social life. The future of Chinese agriculture depends for its development upon the fulfillment of these needs of the farmer.

In closing this article it seems pertinent to question the worth of such a study as this, involving as it has an immense amount of labor and no small cost. Of what value is it to those of us who live in the East and in the West to know these details of farm life in China? In the first place, little is known of the actual conditions of rural life in China. Generalizations have been made from casual observations, but the accuracy of these generalizations can only be tested by the meticulous use of schedules and figures applied to and gathered from the individual farms. Such data are essential not only in conveying the truth about China to westerners, but to the Chinese as well. China has been a country without reliable statistics and it is to her advantage to obtain them, not only from the point of view of taking her place in world statistics, but also for the important reason of self-knowledge before there can be self-improvement. This study was begun with the idea of collecting accurate data on Chinese farming conditions to teach Chinese students, and not only data, but methods of collecting such information, so that these students might in the future discover for themselves the facts of their own country.

But beyond this there is yet other value in having made this study, slight as it must appear in the future when others more profound and more useful will be made. In the age which is upon us the question of international relations is an outstanding one; if we are to live at peace with each other as nations in the world, it must be upon a basis of mutual understanding and cooperation. China has not hesitated to study and to appreciate the West and to adopt as quickly as she has been able many of the western methods of thought and education, particularly in science. But the West has not so readily reciprocated, partly because of self-absorption, and partly because of the difficulty of making such studies. Yet if there is to be a real understanding between nations it must be mutual. We cannot know a people

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until we know accurately their conditions of life; and research, the collection and analysis of facts, is a constructive contribution to international welfare in so far as it promotes this understanding.

Research, therefore, into the life of the farmers of China is in this way constructive international work. Since so large a proportion of China's people are farmers, it is fitting that the primary emphasis on understanding China should be laid on an understanding of her rural life. If we are to estimate and appreciate the agriculture of China we must know about her soils, her crops, her livestock, her conditions of land ownership, in short, about all those conditions which affect the lives of millions of China's people and doom them to ignorance and poverty or lead them to affluence and freedom. Such study is difficult because of the wide diversity of the conditions in various parts of the country, but not the less necessary.

If the study will contribute, therefore, in any measure to this two-fold purpose, the furnishing of information to Chinese students regarding some phases of the agriculture of their own country, and the adding to that gradually accumulating body of accurate knowledge about China, a country so rich in every kind of human experience, for the benefit of those of international mind, it will have performed the duty for which it was made.

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Bulletin No. 13

An Economic and Social Survey of 150 Farms Yenshan (鹽山) County, Chihli Province, China

J. LOSSING BUCK
Department of Agricultural Economics and Farm Management

UNIVERSITY OF NANKING
INCORPORATED 1911

June, 1926

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AN ECONOMIC AND SOCIAL SURVEY OF 150 FARMS IN YENSHAN COUNTY, CHIHLI PROVINCE, CHINA

J. LOSSING BUCK

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Table corrections

Page	Table	Column	Line				
29	16	6	3	change	56.4	to	56 4
53	28	last	13	insert	".1"		
54	29	last	boxing	change	"old"	to	"gold"
55	30	last	boxing	change	"m"	to	"mow"
55	30	last	1	change	$0.73	to	$-0.73
59	33	last	1	insert	".7"		
84	56	5	2	change	"59"	to	"53"
84	56	last	2	change	"105.8"	to	"105.7"

Text corrections

Page					
Page	5,	Par.	8,	change	"page 6" to "page 7"
,,	7,	,,	2,	,,	"page 4" to "page 5"
,,	13,	,,	1,	,,	"page 11" to "page 15"
,,	14,	Note	1,	,,	"page 4" to "page 5"
,,	14,	,,	2,	,,	"page 3" to "page 4"

Wu Chia	92	85	2/3 E
Kuo Chia	127	56	1 2/3 NE
Yang Mao	18	9	6 S

[1] *Acknowledgements:* The writer is indebted to Dr. W. I. Myers and to Dr. F. A. Pearson, both of Cornell University, and to Dr. E. Sydenstricker, Statistician of the United States Health Service, for helpful suggestions in the preparation of this material for publication. Acknowledgement is also gratefully made of the service rendered by Mr. R. T. Tsui, a student of the department, who secured the original data, and by Mr. P. H. Hwa, who has rendered valuable assistance in the tabulation of the data.

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AN ECONOMIC AND SOCIAL SURVEY OF 150 FARMS IN YENSHAN COUNTY, CHIHLI PROVINCE, CHINA

J. Lossing Buck

INTRODUCTION[1]

PURPOSE AND SCOPE OF THE STUDY

The purpose of this study is to determine the factors which make farming successful or unsuccessful in a normal year in a region often subjected to famine conditions. These factors are found by a detailed study of a year's business, on a large number of farms of an area that is an agricultural unit. Schedules for a year's business were used for this purpose and were filled by one of the writer's advanced students for his own farming village, and two of his neighboring farm villages, for 150 farms and farm families in Yenshan County, Chihli Province, for the year April 1, 1922, to March 31, 1923. As may be seen from the sample record of a typical farm (table VI, appendix), the questions asked the farmer were in his own terms of thinking and pertained to every detail of his business. Answers to many of the questions can be cross checked and it is thus very difficult for any serious error to creep in. Data were also included in the study which related only indirectly to the farm business, for size of family, density of population, good and bad habits and many other more strictly sociological factors affect the business in many ways.

The number of farms in the villages studied and the number of farms from which records were obtained, are shown in table 1. Care was taken to include farms representative of the region.

Table 1. Sources of Data by Villages

150 Farms, Yenshan County, Chihli, China (1922)

Name of village	Total number of farm families in the village	Number of farm families included in this study	Distance (in miles) and direction from the county seat of Yenshan
Wu Chia . .	92	85	2/3 E
Kuo Chia . .	127	56	1 2/3 NE
Yang Mao . .	18	9	6 S

[1] *Acknowledgements:* The writer is indebted to Dr. W. I. Myers and to Dr. F. A. Pearson, both of Cornell University, and to Dr. E. Sydenstricker, Statistician of the United States Health Service, for helpful suggestions in the preparation of this material for publication. Acknowledgement is also gratefully made of the service rendered by Mr. R. T. Tsui, a student of the department, who secured the original data, and by Mr. P. H. Hwa, who has rendered valuable assistance in the tabulation of the data.

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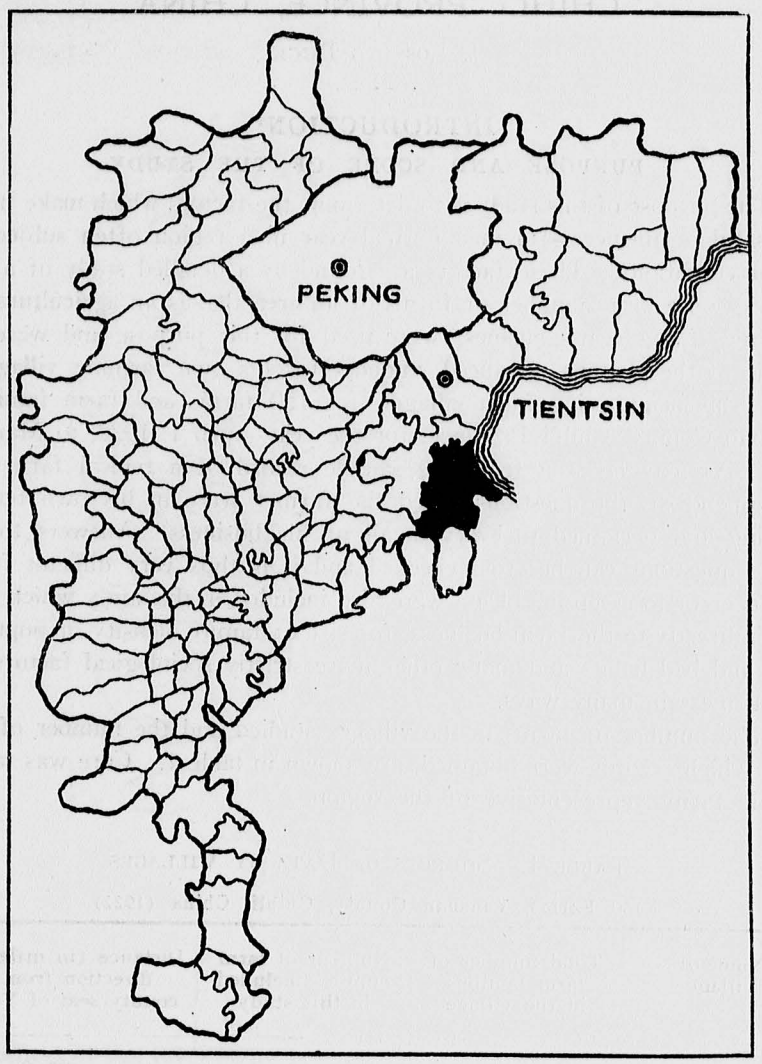

FIGURE 1*a*. A map of Chihli Province, China, showing county ("hsien") boundaries. The black area is Yenshan County.

There were, of course, difficulties in making a survey of these farms, chiefly because the farmers were somewhat in doubt of the purpose of the investigator. The reasons for their attitude are illuminating and may be summarized thus: They thought

(1) That the survey might be used as the basis of taxation;

(2) That the survey might be used as the basis for famine relief;

(3) That the survey might be used as the basis for the sale of property to the President-elect, General Tsao Kun.

The third point of view is well illustrated in the following incident reported by Mr. Tsui:

"A farmer in my own village asked me, 'Which is better, to state my condition better or poorer than it really is?'

"I replied, 'It is better to state your true condition.'

"He did so, but after a few days he came to my home and asked me to report him a little better than his actual condition.

"I asked him why, and he replied: 'I hear that General Tsao Kun will be the president of China, and that he will purchase all the land of the province of Chihli and all the farmers will be his operators.'"

The village head and the village school teacher, however, were more intelligent and gave invaluable assistance in explaining the purpose of the survey to the farmers. In this way the suspicions of the farmers were for the most part overcome.

The reader should keep in mind that while Yenshan county is one of the poorest agricultural districts of China this study was made in the west half of that county, which is the better half.

EXPLANATION OF TERMS USED

Age refers to age at last birthday according to Western methods of computation unless otherwise indicated. Ages in China depend on the relation of the time of birth to the Chinese New Year. A year is added to a person's age at each New Year's day rather than on the birthday itself. In this table one year has been subtracted from the Chinese age, thus making the data equivalent to age at last birthday as obtained in Western countries. A Chinese child of three years or under may have its age given in terms of "chow" (週), or, if under one year of age (Western), in months. The term "chow" is equivalent to one year Western age and the term "month" refers to the lunar month. A baby born on New Year's Eve (before 12 midnight) is two years old the next day.

Adult-male unit is used for the purpose of a more accurate measurement of the size of family than that of the capita basis. Atwater's scale in table 2 was used:

TABLE 2. CONVERSION FACTORS FOR CHANGING INDIVIDUALS OF DIFFERENT AGES AND SEX TO ADULT-MALE UNITS

Age	Equivalent "adult-male units."		Age	Equivalent "adult male units."	
	Male	Female		Male	Female
Adult (over 16) .	1.00	0.80	10—11 . .	0.60	0.60
15—16 . . .	.90	.80	6—9 . .	.50	.50
13—14 . . .	.80	.70	2—5 . .	.40	.40
12 . . .	.70	.60	Under 2 . .	.30	.30

An animal unit is estimated by taking the ox as a unit. Other animals are reduced to animal units by considering an equal amount of feed eaten and manure produced as being equivalent to one unit. Thus five hogs, ten pigs, two-thirds of a water-buffalo, one horse, one mule, two donkeys or 100 chickens, equal an animal unit.

An animal-work unit is the average amount of work accomplished by a labor animal unit in a ten-hour day, and is used to measure the efficiency of animal labor on productive farm enterprises such as crops or animals.

Average is the mean, or arithmetic average, and is a calculated number affected by every value of a variable.

Weighted averages are used unless otherwise indicated and are obtained by dividing total values rather than the sum of average values.

Average of averages is obtained by adding, for instance, net profits per crop mow per farm and dividing by the number of farms included in the study (see net profit per crop mow in table 41 for an instance of a very great difference between a weighted average and an average of averages).

Crop area represents the actual area devoted to crops.

Crop mow refers to the number of mow of different crops raised in one year. Since double-cropping is often practiced, one mow of crop area may be equivalent to two or more crop mow. One crop mow in this study is equivalent to 0.657 crop area mow.

Correlation coefficient or gross correlation (r) is a number that indicates the degree of association between two factors or variables. It can never be higher than +1 or lower than —1. The nearer it is to ±1 the higher the positive or the negative correlation. Such a coefficient begins to be significant when it reaches about 0.30.

Coefficient of variability (c) is a number that indicates the extent to which a factor or variable varies and which may be used to compare with other factors. It is the best dispersion measure for all classes of observations.

The terms *"family"* and *"household"* are used synonymously and refer to all the people living and eating together. In most cases, this includes near relatives of the operator and his wife, such as operator's brothers, brothers' wives and children, operator's parents, employés, etc.

Family income is the difference between cash receipts and cash expenses of the farm business, plus any net income from other sources. It is the net amount available in cash for family living expenses and for savings.

Family earnings is the difference between receipts and expenses (less value of family labor) of the farm business, plus any net income from other sources.

Farm is the area of land controlled by one operator.

Farm area refers to the total amount of land in the farm, regardless of whether or not it is all growing crops.

Farm earnings is the difference between farm receipts and farm expenses. It is equivalent to farm income (income from capital and operator's labor, as the term is used in the United States) plus the value of farm products used.

First crop refers to the crop that is the first to occupy the land during the growing season and which is harvested during the same season. For example, wheat is a first crop although it is planted in the autumn. Kaoliang, which is planted in the spring and which is usually the only crop harvested during the same season from the same piece of land, is a first crop. See definition for second crop, page 6.

Household (see family).

Labor earnings are the returns the farm operator receives for his year's labor and management, after deducting farm expenses and the interest on his capital investment.

The interest rate used is 8 per cent, a common bank rate which could be secured by the farmer if he should sell out and invest his money in a modern bank savings account. It is much lower than the local interest rates.

Capital includes the value of land as well as livestock, tools, equipment and farm buildings (including residence).

The unpaid labor of the family, except that of the operator, is charged as an expense. The produce from the farm used by family is included as a receipt.

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The term labor earnings, rather than labor income, is used because in the United States labor income has come to mean the income from labor and managing ability exclusive of the value of produce used from the farm by the family. In China such a large amount of the products raised on the farm is consumed by the family, and the families vary so greatly in size, that it is very difficult to measure returns by the labor income method.

Labor income differs from labor earnings in that produce from the farm used by the family is not included as receipts.

Labor returns are the earnings from labor for the total man equivalent. It is computed in the same way as labor earnings except that no labor charge is made.

Man equivalent measures the number of workers on the farm in terms of the equivalent of one man working for a period of twelve months.

A man-work unit is the amount of work the average farmer accomplishes in a ten-hour day, and is used to measure the efficiency of man labor done on productive farm enterprises such as crops or animals.

Mean is synonymous with the arithmetic average.

Median is the middle-most, or central, value of a variable when the values are arranged in order of magnitude.

Mode is the value of a variable which occurs with the greatest frequency.

Multiple correlation (R) is the correlation between one factor and the combined effect of a number of other factors.

Net, or partial, correlation is the correlation between two factors when one or more other factors are eliminated by holding them constant.

Probable error is a number computed to indicate the reliability of results and is written with a plus or minus sign before it. Four times the probable error when added to and subtracted from a given result indicates that there is a chance of less than one in a hundred that other observations of the same phenomena will occur outside these limits.

Operator refers to the farmer who manages the farm and who usually participates in the manual labor of the farm.

The *owner* is an operator who works his own land.

Oxen refer to the "yellow cow", the literal translation from the Chinese. The female cow as well as the castrated and non-castrated animals are included in the term oxen as used throughout this bulletin. The female cow is never used for milking purposes at Yenshan, or anywhere else in China proper, by the ordinary farmer.

Standard deviation is a number which when added to and subtracted from the mean of the observed phenomena will include 80 per cent of all the observations. It measures variability within the same class of observations.

Second crop refers to the crop that is planted after the harvest of the first crop of the season, but which is harvested during the growing season in which it is planted. Yellow soy beans planted after wheat is a common example of a second crop. See definition for first crop, page 4.

Weights, measures and currency.

Units used in Yenshan County	Equivalent in		
	Peking Government Standard	United States	Metric system
Mow..	1.31405 mow	0.19951 acres	0.08074 hectare
Tan	1.81499 tan	5.33333 bushels	187.93643 litres
Catty.	1.01333 catties	1.33333 pounds (avoirdupois)	0.60477 kilogram
Ounce	1.00000	1.33333 ounces (avoirdupois)	37.33324 grams
Li	1.0 li	0.35790 miles	0.57599 kilometers

One *catty* of *live hog* equals 28 Chinese ounces.

One *catty* of all *other farm products* equals 16 Chinese ounces.

One *tan* of wheat equals 240 catties. Tan (石) is the dry capacity measure unit. One-tenth of a tan is one tow. This term tan should not be confused with that for picul (擔) which is a weight and not a measure of capacity.

One *acre* equals 5.01022 Yenshan mow.

All *values* are given in Chinese silver currency (Mexican), unless otherwise indicated. The average bank exchange rate for one gold dollar for the year for which the data was obtained was $1.8479 in silver.

REGIONAL CONDITIONS

Yenshan county is in the southeastern corner of Chihli province, latitude 38° and longitude 119°, and a portion of it borders on the Gulf of Chihli. The county was formerly the bed of the Gulf of Chihli. The outstanding characteristic of the soil is its high content of calcium salts (mostly chlorides and sulfates), containing in spots as much as 38.58 per cent soluble salts. The type of soil is largely very fine sand, or sandy loam, but with many alkali spots. Its *geological origin* is alluvial, and it is a part of the great plains region of North China.

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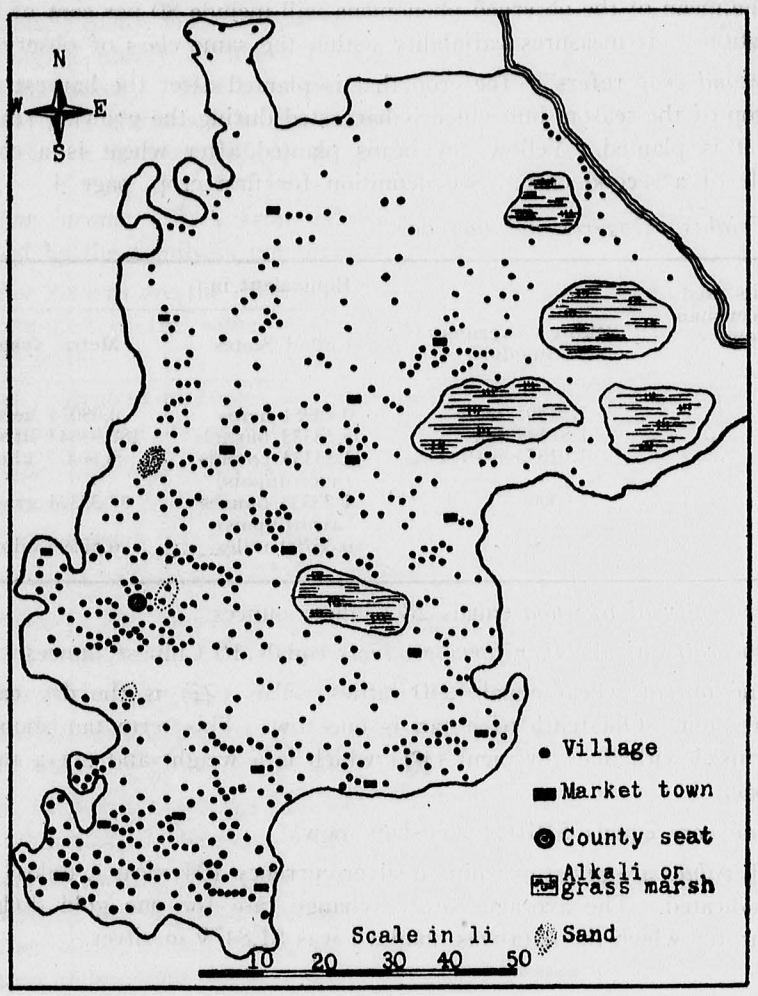

FIGURE 1*b*. A map of Yenshan County. Data for the 150 farms were obtained from the three villages within the dotted circles. Sparsely settled portions of the country represent the more alkali and less well drained areas. All villages were connected by a network of earth roads.

The *topography* of the county is level, with depressions here and there of a mile or two in diameter, and a few feet lower at the center than at the edges. These depressions collect the heavy summer rainfall and often become lakes. The water usually recedes in time to plant wheat in the autumn. The harvest date for wheat is about the middle of June, and it is seldom that the summer rains come early enough to destroy the crop of growing wheat.

Villages are located around the edges of these depressions. Such depressions are a typical feature of many sections of the northern provinces of Honan, Shantung and Chihli, as well as of the northern portions of Anhwei and Kiangsu provinces. These lowlands are often planted to a second crop after wheat harvest, in the slight hope of reaping a return.

The *elevation* of the county is probably less than 100 feet above sea level.

Irrigation in most places does more harm than good because of the alkaline condition of the water. Water is obtainable from wells ten to twenty feet deep.

Meteorological data[1] are available for the port city of Tientsin one hundred miles to the north, where climatic conditions are nearly the same. The annual rainfall for the thirty-year period 1894-1923 was 19.35 inches. Most of this precipitation occurs in the summer months, especially in July and August (figure 2). Data for the years 1904-1910 show that 18 inches of the total precipitation was during the growing season and 61.1 per cent of the total was during July and August. Years of extremely heavy or extremely light precipitation are rare. Exceptions are found in 1902 and 1920 when the precipitation was 9.99 and 11.06 inches respectively; and in 1894 and 1912 when it was 30.5 and 31.32 inches respectively. Because of the irregularity of the rainfall, however, the region is subject to either floods or drought during the growing season.

The average date of the *last killing frost* is about April 5 and of the *first killing frost* about October 15, with a consequent *frostless season* of 193 days.

The mean temperature for the years 1907-1917, as shown by records of the Siccawei Weather Bureau at Tientsin, a hundred miles to the North of Yenshan, is 56.1° Fahrenheit. The lowest monthly mean of 28.8° Fahrenheit occurred in February, and the highest monthly mean of 79° Fahrenheit is for July (table 3).

[1] China Year Book, 1923 and 1925.

It is estimated that 80 per cent of the days between September 1 and June 1, and 20-40 per cent of the days during July and August, have sunshine of 90 per cent intensity.

The evaporation of the region is very great because of high winds from the dry inland country to the northwest and the consequent prolonged periods of dry weather.

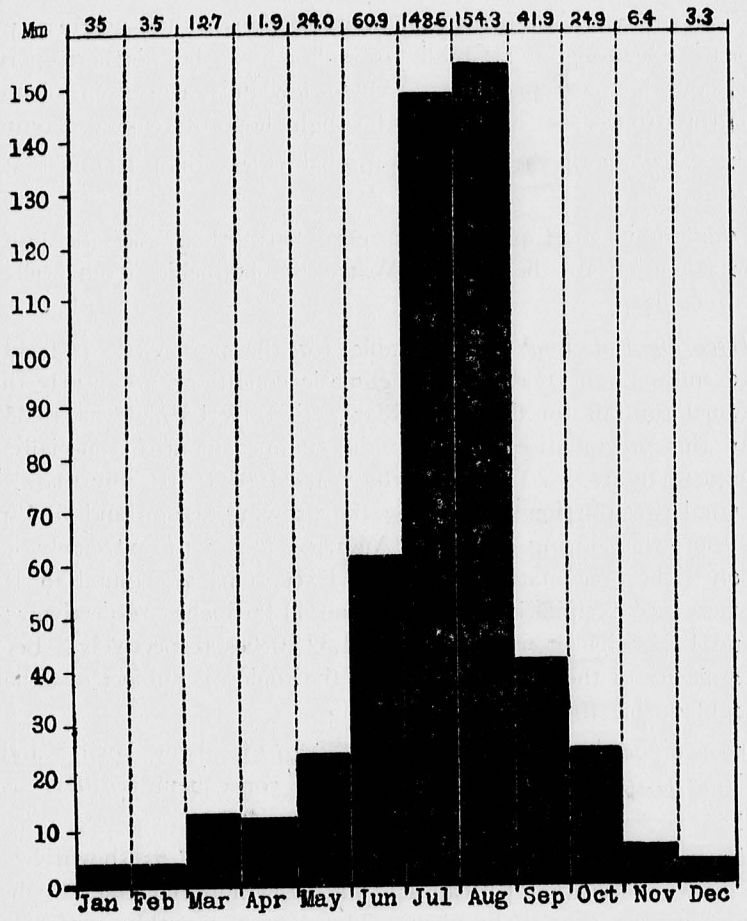

FIGURE 2. Mean monthly precipitation in millimeters at Tientsin, China (1904-1910).

TABLE 3. MEAN, MAXIMUM AND MINIMUM MONTHLY TEMPERATURES

Tientsin, China, (1904-1910)

Month	Temperature (Centigrade)		
	Mean	Extreme maximum	Extreme minimum
January	—4.1	10.8	—18.7
February	—1.8	14.2	—18.6
March ...	4.7	24.3	—10.3
April	12.7	32.7	— 2.5
May	19.5	41.2	4.9
June	23.7	41.9	9.4
July	26.1	40.4	16.4
August	25.9	39.4	13.7
September	20.8	32.8	9.1
October	14.2	31.3	0.4
November	4.5	21.7	—12.1
December	—2.4	11.3	—15.8
Annual	12.0	41.9	—18.7

FARM ORGANIZATION

FARM LAYOUT

The approach to the Wu Chia village is by a cart road (figure 4) which passes through the edge of the village but with the buildings to one side. This is the road shown in figure 3. The farm layout consists of the farmstead located in the farming village and of the scattered plots of land a short distance from the village. A plan of the arrangement of a typical farmstead is given in figure 3. The rear entrance on a farmstead is shown in figure 5.

The farm buildings of the Wu Chia village, as well as other villages of the region, have walls constructed of tamped earth with wheat straw as a binder, but with brick for the foundations. The roofs are made with unhewn poles supporting the sheathing of kaoliang stalks and the surface is water proofed with a kind of earth and lime cement. Details of construction are shown fairly well in figure 5.

The scattered plots of land are usually individual fields, although more than one field to a plot may occur. One of the advantages of such scattered plots among the more serious disadvantages is the distribution of different grades of land to each farmer, so that, for instance, one farmer does not have all "lake land."

The average number of non-contiguous plots per farm for the 150 farms was 4.3, and with an average distance from the farmstead of 1.4 li (nearly half a mile). The distance of the farthest piece found on these 150 farms was 6 li, or 2 miles. The average distance of the farthest pieces for all farms was 2.4 li (about three-fourths of a mile). The average size of the fields was 5.4 mow, or a little over an acre.

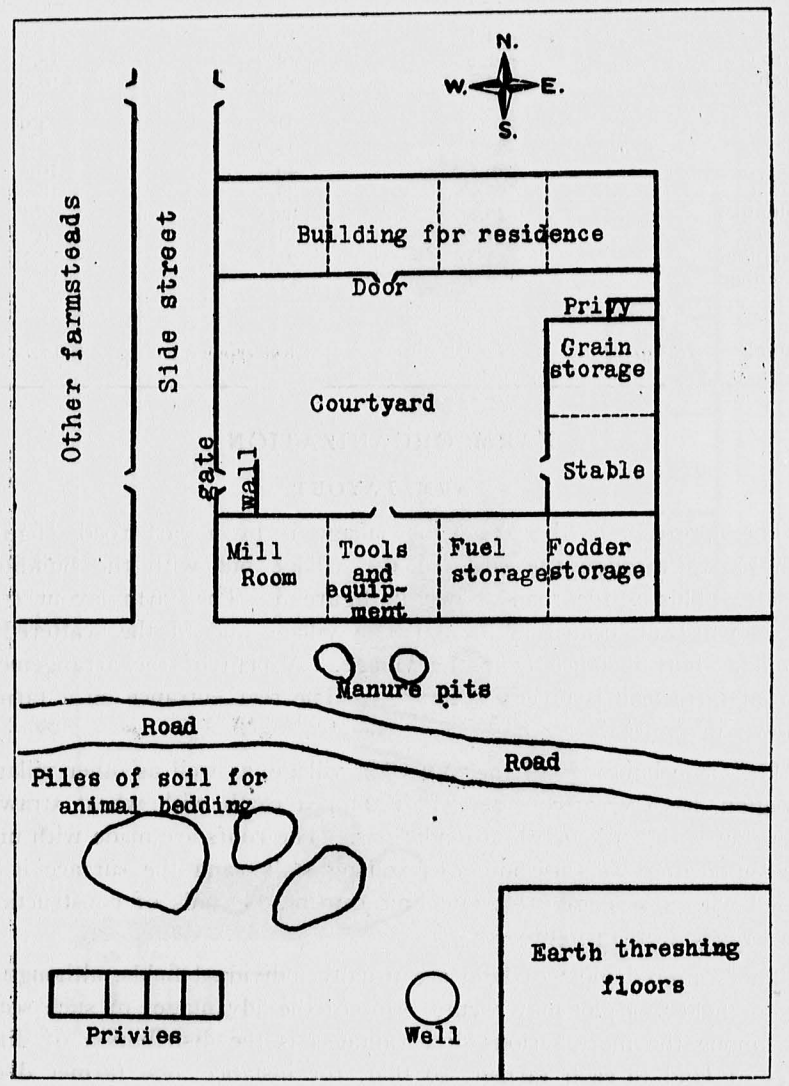

FIGURE 3. Plan of typical farmstead.

LAND TENURE

It is only occasionally in this region, as in some other parts of North China, that a tenant farmer is found. The farmers included in this study were all owners. Nearly one-third of the owners mortgaged land from others and had the use of such land as the interest on the mortgage (table 4). This system of mortgaging, which is typical of most mortgaging systems in China, is further described on page 11.[1]

TABLE 4. OWNERSHIP OF LAND FOR FARMS GROUPED BY SIZE OF FARM AREA

150 Farms, Yenshan County, Chihli, China (1922)

Farms grouped by size of farm area (mow)	Per cent of farm area		Per cent of operators who are	
	Owned	Mortgaged to the operator as mortgagee	Owners	Both owners and mortgagees
10 or less	92.8	7.2	87.9	12.1
11—20	94.8	5.2	81.2	18.8
21—30	94.5	5.5	73.5	26.5
31 and over	87.2	12.8	40.0	60.0
Total	90.8	9.2	71.3	28.7

SIZE OF FARM BUSINESS

Size of farms, crop areas and amount of double cropping

The distribution of farms according to size and the areas in farms, in crops and double-cropped for each size group, is given in table 5. The total amount of land in these 150 farms was 3671, or 734.2 acres. The average size of farm area was 24.5 mow, or 4.9 acres. The smallest farm area contained 3 mow (0.6 acres) and the largest 173 mow (34.1 acres). There were only three farms (116, 171 and 173 mow each) above 72 mow in size. The median and mode for all farms and for farms grouped by size is as follows:

[1] Farmers who mortgage land are not classed as part owners because the term part owner, as has been used in other surveys, refers only to those farmers who rent land from others in addition to that which is already owned. The man who mortgages land invests more capital than the tenant who only pays a rental fee.

Farms grouped by size of farm area (mow)	Median	Mode
10 or less	8	9
11 — 20	15	15
21 — 30	24	22
31 and over	42	35
150 farms	19	15

Because of waste land the farm area had a higher variability (C=95.06±6.20)[1] than did the crop area (C=88.77±5.55). Crop mow varied still less because of the larger percentage of land double-cropped on the smaller farms (C=85.99±5.27).

TABLE 5. FARMS GROUPED ACCORDING TO SIZE SHOWING AREAS IN FARMS, IN CROPS, AND DOUBLE-CROPPED

150 Farms, Yenshan County, Chihli, China (1922)

Farms grouped by size of farm area (mow)	Farms in the specified group		Total area (mow)			Average area per farm (mow)			Per cent of farm area in crops	Per cent of crop area double cropped
	Number	Per cen	Farm area	Crop area	Crop mow	Farm area	Crop area	Crop mow		
10 or less	33	22.0	250.0	250.0	402.0	7.6	7.6	12.2	100.0	60.8
11 — 20	48	32.0	747.0	717.0	1,094.0	15.6	14.9	22.8	96.0	52.6
21 — 30	34	22.7	835.0	803.5	1,241.5	24.6	23.6	36.5	96.2	54.5
31 and over ...	35	23.3	1,839.0	1,651 5	2,498.5	52.5	47.2	71.4	89.8	51.3
Total	150	100	3,671.0	3,422.0	5,236.0	...	...	...	93.2	53.0
Average		...	...	...	...	24.5	22.8	34.9	...	..

The crop area for all farms is 93.2 per cent of the total farm area, or an average of 22.8 mow per farm. All of the farm area of farms in the group of ten mow or less is devoted to crops, compared with 90 per cent of the farm area in crop area for the group of farms of 31 mow and over. In other words, as size of farm area increases, the amount of crop area also increases but not at the same rate (r=0.575±0.037)[2]. This is caused by the large farms naturally having more unproductive land.

The 6.8 per cent of total farm area not in crops consists chiefly of roads, paths, graves, ditches, threshing floors and alkali spots. The last are not entirely unproductive as certain alkali-resistant plants growing wild

[1] Refer to definition of coefficient of variability, page 4, for explanation of "C".

[2] Refer to definition of correlation coefficient, page 3, for explanation of "r".

are of economic value. Spots too alkaline to grow anything are used to produce salt.

Double-cropping is prevalent in this region, and 53 per cent of the total crop area is planted to a second crop during the same growing season. The average number of crop mow per farm is 34.9 (7 crop acres). The variability of crop mow per farm for 147 farms, omitting the three extremely large farms (C=61.01±3.19), is greater than the variability in crop acres per farm in McHenry County, Illinois, United States (C=42.5±0.9).

The amount of double-cropping decreases with the increase in the size of farm (table 5) and is about 10 per cent less in the largest group of farms (for 147 farms, r=–0.289±0.051). The chief reason for this greater amount of double-cropping on the smallest farms is not because the farms are small but because the smallest farms have better and higher land which gives a larger proportion of crop area that can be profitably double-cropped.

The number of crop mow per farm is very closely associated with the crop area per farm (r=0.977±0.003).

The number of crop mow per farm gives a still higher correlation with farm area per farm (r=0.989±0.001).

Capital, its amount, distribution, and efficiency

Total capital and its distribution per farm are given in table 6. The item of mortgaged land is the equivalent of additional land rented from others. It is obtained by loaning the owner a sum of money equal to the value of the land. The mortgagee has the use of the land as interest until the debt is repaid. This is a common method of mortgaging land in many sections of China, except that the usual mortgage value is about one half of the market value. The legal time for refunding, in many places, is three years, but the debts are often not paid at this time and the mortgagee continues to use the land.

With the transfer of land, trees are bought and sold as separate property. Not quite two-thirds of the capital is invested in land and trees, and a little less than one-fourth is in buildings, making a total of 86 per cent of all capital invested in real estate. The investment in buildings is higher than in a number of regions surveyed, partly because the value of the land in the farmstead is included with the value of the buildings and partly because of the low land values. Many of the threshing floors are public property, and it is very common to use waste alkali spots for such

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floors. The floors are made by wetting and rolling the ground until it is packed hard and smooth.

The item of fuel was included with supplies and should not appear under capital, since it is a household expense. Probably one-half the amount of $32.19 is for fuel.

The average capital investment per farm was $762 (gold $412).

TABLE 6. TOTAL CAPITAL AND ITS DISTRIBUTION PER FARM

150 Farms, Yenshan County, Chihli, China (1922)

Items	Per cent of farms having specified items	Total capital	Average capital	
			Per farm having specified items	Per farm (all farms)
Land owned ..	100	$60,343.00	$402.29	$402.29
Investment in land mortgaged	28.7	6,045.00	140.58	40.30
Buildings ...	98.0	27,731.00	188.65	184.87
Livestock	94.7	5,232.58	36.85	34.88
Trees	82.7	4,876.50	39.33	32.51
Supplies and fuel ...	100	4,827.50	32.19	32.19
Seed and grain	100	2,657.00	17.71	17.71
Farm tools and equipment	97.3	2,644.50	18.11	17.63
Total	...	114,357.08	...	...
Average	...	...	...	762.38

The percentage distribution of capital by farms grouped according to size (table 7) reveals that with increase in size of farm area, there is an increasing percentage of investment for land and a decreasing percentage investment for buildings. The investment in buildings is 13 per cent less on the larger farms than on the smaller ones. Large farms do not have to increase building space in proportion to the increased size of farm area. This is especially true of the part of the buildings used for residence.

The percentage investment in farm tools and equipment increases with the increase in the size of farm area. This is contrary to the usual rule

in countries such as the United States, and is caused by the small farmers borrowing most of their tools and equipment from the larger farms.

The investment in livestock averages $35.00 per farm, and is greater for the larger farms partly because more livestock, such as labor animals, is required on the larger farms; but this increase is greater than one might expect because most of the small farms borrow labor animals.

TABLE 7. PERCENTAGE DISTRIBUTION OF CAPITAL BY FARMS GROUPED ACCORDING TO SIZE

150 Farms, Yenshan County, Chihli, China (1922)

Items	Farms grouped by size of farm area (mow)				Per cent of total capital (all farms)
	10 or less	11-20	21-30	31 and over	
Land owned and mortgaged	52.6	54.8	59.3	59.9	58.1
Buildings	34.0	27.7	24.0	21.0	24.2
Livestock	1.0	4.0	4.3	5.7	4.6
Trees	3.9	4.0	4.1	4.5	4.3
Supplies and fuel.. ...	5.7	5.4	3.9	3.6	4.2
Seed and grain	1.6	2.3	2.2	2.5	2.3
Farm tools and equipment	1.2	1.8	2.2	2 8	2.3
Total	100	100	100	100	100

A more significant criterion of the distribution of capital is the investment per mow of farm area for different kinds of capital (table 8). Land values per mow are slightly less on the larger farms because of the greater proportion of low land. The average value per mow of farm area was $18.08, the lowest was $2.75 and the highest was $37.50.

The largest farms saved over $7.00 per mow in the investment in buildings. The small farms saved 34 cents per mow in investment in tools and equipment as compared with the larger farms, because of the practice of borrowing. If the small farms had invested in all equipment needed without borrowing, a much higher investment per mow than that on the largest farms would have been necessary.

The amount of capital per mow for all farms is a little over $31.

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TABLE 8. VALUE PER MOW (FARM AREA) OF CAPITAL FOR FARMS GROUPED BY SIZE

150 Farms, Yenshan County, Chihli, China (1922)

Kind of investment	Farm grouped by size of farm area (mow)				Average value per mow of farm area (all farms)
	10 or less	11-20	21-30	31 and over	
Land owned and mortgaged	$20.44	$17.91	$19.63	$17.14	$18.08
Buildings	13.23	9.04	7.96	6.00	7.55
Livestock	.40	1.31	1.42	1.61	1.43
Trees	1.51	1.31	1.37	1.29	1.33
Supplies and fuel	2.23	1.76	1.28	1.03	1.32
Seed and grain	.61	.76	.73	.72	.72
Farm tools and eqiupment	.47	.59	.71	.81	.72
Total value per mow	38.89	32.68	33.10	28.60	31.15
Interest per mow at 8 per cent on investment	3.11	2.61	2.64	2.28	...
Investment per farm	294.66	508.61	812.66	1,502.56	...

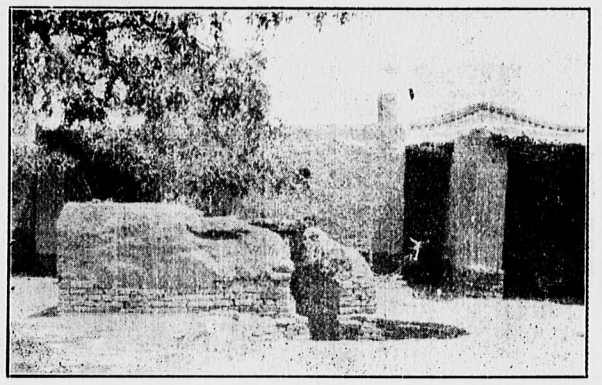
TABLE 9. RELATION OF CAPITAL TO LABOR EARNINGS

150 Farms, Yenshan County, Chihli, China (1922)

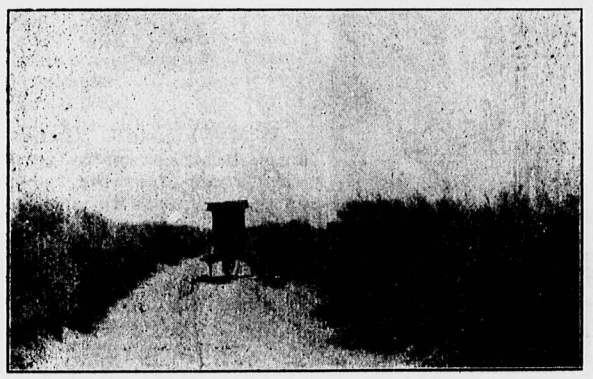
Capital	Farms having the specified capital		Average labor earnings	Per cent of farms making labor earnings of $50 and over
	Number	Per cent		
$400 or less	41	27.3	$22.99	7.3
401 — 700	40	26.7	42.91	35.0
701 — 1000	36	24.0	40.20	41.7
1001 and over	33	22.0	55.94	57.6
Total	150	100	...	34.0
Average	...	...	39.67	...



At left—FIGURE 4. Approach to Wu village. The iris plant, Iris ensata, at the left is used for making twine and shoe soles.



At right—FIGURE 5. One of the farmhouses off the main road of the village. The entrance is under the tree to the left. A pigpen is in the foreground with steps leading into the round manure pit about ten feet deep. The building at the right is a shed for the farm cart.



At left—FIGURE 6. Two rows of tamarix on either side of a public highway. The tamarix is used for making baskets and for fuel. The cart is the typical passenger vehicle of North China.

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At left—FIGURE 7. A typical hoeing scene. The angle of the hoe is such as to cause many a backache. The farmer pulls the hoe toward himself, rather than with an up and down motion as in the United States. The weeds here have such a start that eradication is difficult. The crop in the background is kaoliang.



At right—FIGURE 8. Artemisia annua L growing wild in an alkali spot and amidst which is Mr. Tsui. The seed is used for food by poor farmers. Notice the attempt to grow beans in the foreground and at the left.



At left—FIGURE 9. Gathering a basket of green grass and weeds for the labor animals. An alkali spot to the left.

The average investment in farm equipment per mow farmed is 72 cents; per mow in crops 77.3 cents, and per crop mow 50.5 cents. This is equivalent to $1.36 gold per crop acre.

Some idea of the kind of equipment used may be gained from figure 11.

The relation of amount of capital to labor earnings (table 9) indicates an increase in labor earnings per farm of two and one-half times as much for the largest as for the smallest sized group of farms. Seven per cent of the farms in the smallest group made labor earnings of $50 and over compared with 58 per cent in the largest sized group of farms. A large business offers more favorable opportunities for greater profits.

Amount of receipts and their distribution

The distribution of receipts for all farms (table 10) shows that 91 per cent of the cash receipts are from crops. A slightly larger percentage

TABLE 10. AMOUNT AND DISTRIBUTION OF FARM RECEIPTS

150 farms, Yenshan County, Chihli, China (1922)

Items	Unit of quantity	Per cent of farms having specified receipts	Amount of Products			Value of receipts			
			Tota	Average per farm having	Average per farm (all farms)	Total	Per cent of total value of receipts	Average per farm having	Average per farm (all farms)
CASH RECEIPTS									
Crops:									
Wheat	tan	98.7	1,028.65	6.95	6.86	$10,614.09	42.2	$71.72	$70.76
Millet	tan	35.3	88.5	1.67	.59	514.90	2.0	9.72	3.43
Kaoliang (a grain sorghum)	tan	29.3	83.9	1.91	.56	478.80	1.9	10.88	3.19
Chinese jujübe	tan	5.3	95.5	11.94	.64	321.00	1.3	40.13	2.14
Corn	tan	9.3	21.0	1.50	.14	131.60	.5	9.40	.88
Yellow soy beans	tan	18.0	16.95	.63	.11	101.90	.4	3.77	.68
Vegetables	—	1.3	...	...	...	51.00	.2	25.50	.34
Green beans (Phaseolus aureus)	tan	4.7	1.6	.23	.01	11.70	.1	1.67	.08
Livestock and its Products:									
Eggs	each	85.3	30,050.0	234.77	200.33	249.36	1.0	1.95	1.66
Hogs	each	6.0	11.0	1.22	.07	235.00	.9	26.11	1.57
Mules	each	.7	2.0	2.00	.01	90.00	.4	90.00	.60
Chickens	each	37.3	158.0	2.82	1.05	21.93	.1	.39	.15
Skins	—	.7	...	...	...	8.00	...	8.00	.05
Manure	—	.7	...	...	...	5.00	...	5.00	.03
Miscellaneous		40.0	...	...	...	317.50	1.3	5.29	2.12
NON-CASH RECEIPTS.									
Products from the farm used by family		100.0	.	...	...	10,522.49	41.8	70.15	70.15
Increase of capital		55.3	...	...	...	1,496.05	5.9	18.02	9.97
Total	...	...	...	...	...	25,170.32	100.0	...	...
Average	...	...	...	...	...	...	...	...	167.80

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of receipts from crops occurs here than for the 102 farms at Wuhu. Wheat is the chief cash crop, and during the year constituted 87 per cent of the cash receipts from crops and 42 per cent of all receipts. All but two operators sold wheat. Millet was the next cash crop in importance, but it represents only two per cent of total receipts and was sold by only one-third of the farmers. Forty-two per cent of the receipts were from farm products used by the family.

A study of the value of receipts per mow and the percentage of each kind of receipt of the total receipts for farms grouped according to size revealed no significant difference between small and large sized farms. Wheat gave a little greater value per mow on the small farms because of the higher yield.

Amount and distribution of expenses

Labor expense constituted the greatest percentage, 36.5 per cent, of all expenses and was more than twice as much as any other single item (table 11). Family labor (exclusive of that of the operator) constituted over three-fourths of the total labor expense. Labor expense on 102 farms in Wuhu County was 76.3 per cent of the total expenses.[1] One of the chief reasons for the lower cost at Yenshan is that of the cheaper price of farm labor. Farm labor received $30 per year (including the value of food furnished) at the time this study was made, but since then, has advanced $10 to $20 per year.

It is customary for the operator to furnish both hired labor and family labor with a hat, towels, tobacco and liquor, all of which are considered as labor expense. Since these items are all cash expenses they have been included under hired labor. The cost per farm for all farms was $1.25 for hat and towels and $0.97 for tobacco and liquor.

Fertilizer was the next highest item of expense and constituted 15 per cent of the total expenses.

All farms had expenses for items of taxes and the "dibao" (constable). Nearly all farms made expenditures on buildings and their repair. A little over four-fifths of the farmers had expenses for fertilizer and for farm tools and repairs. Not quite half of the operators employed family labor. The item for feed, occurring for 59 per cent of the farms, was largely for millet and alfalfa.

Five farms carried on some home industry work in direct connection with their farm business. The expenses of this industry have been included

[1] Buck, J. Lossing, "An Economic and Social Survey of 102 Farms near Wuhu, Anhwei, China," Bulletin seven, College of Agriculture and Forestry, University of Nanking.

in farm expenses and the receipts in farm receipts. The nature of the industry was not reported.

TABLE 11. AMOUNT AND DISTRIBUTION OF FARM EXPENSES

150 farms, Yenshan County, Chihli, China (1922)

Item of expense	Per cent of farms having specified expense	Amount of expense			
		Total	Per cent of total	Per farm having	Per farm (all farms)
Family labor	44.7	$2,870.50	28.5	$42.84	$19.14
Fertilizer	82.7	1,513.50	15.0	12.21	10.09
Buildings and repairs	95.3	1,289.90	12.8	9.02	8.60
Feed	59.3	1,006.00	10.0	11.30	6.71
Hired labor	100.0	801.35	8.0	5.34	5.34
Livestock purchased	66.0	502.79	5.0	5.08	3.35
Farm tools and repairs	84.7	458.70	4.6	3.61	3.06
Seed	79.3	438.20	4.3	3.68	2.92
Taxes	100.0	326.00	3.2	2.17	2.17
Lumber, cart oil	26.0	230.80	2.3	5.92	1.54
Decrease of capital	26.0	220.60	2.2	5.66	1.47
Home industry	2.7	142.00	1.4	35.50	.95
Fee for "dibao" (constable)	100.0	116.80	1.2	.78	.78
Trees (seedlings)	48.7	82.40	.8	1.13	.55
Trading	4.7	64.00	.6	9.14	.43
Veterinarian	6.0	6.00	.1	.67	.04
Total	...	10,069.54	100	...	67.14

The percentage distribution and cost per crop mow of farm expenses for farms grouped by size is given in table 12. The largest group of farms have twice the percentage expenditure and nearly three times the cost per crop mow for family labor as do the smallest group of farms. This is accounted for chiefly by the larger families on the larger farms where the proportion of labor performed by members of the family to that done by the operator is much greater than on the small farms. Because of the small amount of family labor on the 0-10 mow group of farms, the percentage distribution of hired labor is twice as great as for the largest farms while the expenditure per crop mow is only a little more than one-fifth more on the smallest farms.

A larger percentage of expenses for fertilizer occurred in the smallest group of farms, although the expenditure per crop mow was practically the same.

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The larger farms spent more for buildings and repairs of buildings because, probably, they could more easily afford to do so. Since the larger farms had more tools and equipment and more livestock, it is only natural that expenses for these items should be greater than for the smaller farms.

Taxes, which were only a little over 3 per cent of all farm expenses, were at the rate of 8.8 cents per mow, or 23.8 cents gold per acre.

Fertilizers, which were 15 per cent of all farm expenses, cost 44.2 cents per mow, or $1.20 gold per acre.

The average farm expenses for all farms was $1.92 per crop mow. The total expenses per crop mow were 40 per cent greater on the larger farms than on the smaller farms and this is because most of the labor on the smaller farms is performed by the operator whose labor is not charged in table 12.

TABLE 12. PERCENTAGE DISTRIBUTION AND COST PER CROP MOW OF EXPENSES BY SIZE OF FARMS

150 farms, Yenshan County, Chihli, China (1922)

Items of expense	Percentage distribution by size of farm area (mow)				Per cent of total expenses (all farms)	Cost per crop mow by size of farm area (mow)				Average cost per crop mow
	10 or less	11-20	21-30	31 and over		10 or less	11-20	21-30	31 and over	
Family labor	15.1	28.0	29.1	30.0	28.5	$0.23	$0.43	$0.54	$0.66	$0.55
Fertilizer	9.2	15.3	14.5	14.7	15.0	.30	.23	.27	.32	.29
Buildings and repairs	7.0	11.0	13.5	13.8	12.8	.11	.17	.25	.30	.25
Feed	8.4	7.7	11.8	10.1	10.0	.13	.12	.22	.22	.19
Hired labor	14.5	10.7	5.5	7.4	8.0	.22	.16	.10	.16	.15
Livestock purchased	.4	3.7	4.3	6.2	5.0	.01	.06	.08	.14	.10
Farm tools and repairs	3.4	4.6	4.9	4.5	4.6	.05	.07	.09	.10	.09
Seeds	6.1	5.0	4.3	4.0	4.3	.09	.08	.08	.09	.08
Taxes	5.2	4.0	3.1	2.8	3.2	.08	.06	.06	.06	.06
Lumber, cart oil	.6	1.0	3.0	2.6	2.3	.01	.01	.06	.06	.04
Decrease of capital	.9	3.4	2.3	1.9	2.2	.01	.05	.04	.04	.04
Home industry	16.4	1.8	...	.2	1.4	.25	.03	...	...	.03
Fee for "dibao"	1.4	1.6	1.1	1.0	1.2	.02	.02	.02	.02	.02
Trees (seedling)	.4	1.5	.8	.7	.8	.01	.02	.01	.01	.02
Trading	1.0	.6	1.7	.1	.6	.01	.01	.03	...	.01
Veterinarian	...	.1	.1	...	.1	...	...	...	...	...
Total	100	100	100	100	100	1.53	1.52	1.85	2.18	1.92
Total expenses per farm	...	...	...	...	...	18.90	34.82	67.89	156.18	...

Size of farm related to various efficiency factors

The size of farm is an important factor in determining the amount of labor earnings per farm, the net profits per crop mow, and the efficient use of man and animal labor, implements and investment in buildings.

Labor earnings per farm and labor returns per man equivalent.—The average amount of labor earnings on the larger farms was over two and one-half times as great as on the small farms. The per cent of farms making labor earnings of $50 and over was more than six times as much on the large farms as on the small ones, table 13.

TABLE 13. RELATION OF SIZE OF FARM TO LABOR EARNINGS AND TO LABOR RETURNS PER MAN EQUIVALENT

150 farms, Yenshan County, Chihli, China (1922)

Farms grouped by size of farm area (mow)	Number of farms	Average crop mow	Per cent making labor earnings $50 and over	Average labor earnings per farm	Average labor returns per man equivalent
10 or less	33	12.2	9.1	$23.07	$33.73
11-20	48	22.8	27.1	38.03	40.43
21-30	34	36.5	41.2	38.72	40.27
31 and over	35	71.4	60.0	58.54	47.90
Total	150	...	34.0	...	...
Average	...	34.9	...	39.67	42.38

The correlation coefficient between labor earnings per farm and crop mow per farm is not very high, but it is high enough to be significant ($r=0.441 \pm 0.044$).

Labor earnings are a measure of the operator's individual income. Labor returns per man equivalent are a measure of the welfare of all workers in agriculture and are the best measure when considering returns from the agricultural industry as a whole. Labor returns per man equivalent were over a third again as great for the larger as for the smaller farms which indicates that from the standpoint of both labor returns and labor earnings, the larger farms are the more desirable.

The group of farms of 21-30 mow give practically the same labor earnings and the same labor returns per man equivalent as the 11-20 mow group chiefly because of the marked decrease in capital investment of $6.21 per crop mow for the 11-20 mow group as compared with the 0-10 mow

group. The saving in interest on this amount is $0.50 per crop mow, and the saving in farm expenses is one cent per crop mow, making a total saving in expenses of $11.63 per farm for the 11-20 mow group. The interest on investment for the 21-30 mow group was $0.03 higher per crop mow and the farm expenses were $0.42 higher per crop mow than the 11-20 mow group, accounting for the fact that farms of this size were no more profitable than those of 11-20 mow.

The increase in the amount of labor earnings, with the increase in size of farm, is not caused directly by size only. Man labor, animal labor and the use of capital in buildings is much more efficient on the large farms, thus cutting down the cost of production with a consequent increase in profits.

We may conclude, then, that of the different sized groups of farms studied, the largest group offers the most favorable opportunity for profits

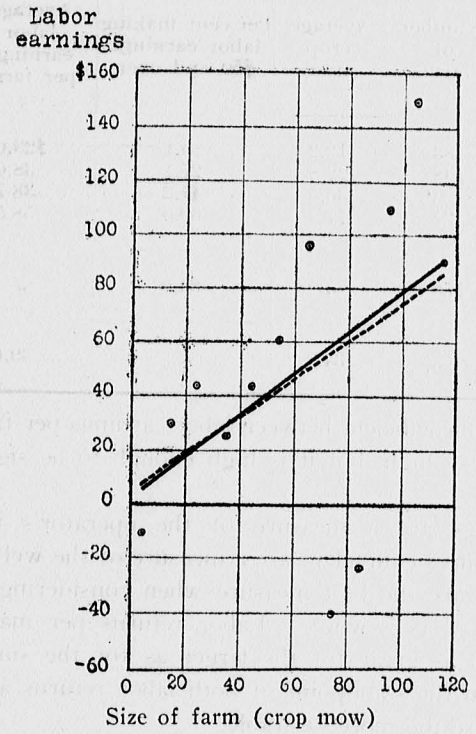

FIGURE 10. The relation of size of farm (crop mow) to labor earnings per farm. Every additional ten crop mow increases the labor earnings $7.59 (or $0.76 per each crop mow increase). Means of the group ⊙; straight line,——; logarithmic line,- - - - -.

(figure 10). The average size of this group is 71 crop mow or 47.2 mow in crop area. If we exclude the three largest farms, the average size is 39.7 mow in crop area and the labor earnings are $36.44. A study of some of the other efficiency factors is first necessary before conclusions can be drawn as to what is the best sized farm.

Receipts, expenses, labor cost and net profits per crop mow.—The receipts and expenses per crop mow are given in table 14. The average gross receipts per crop mow were 69 cents more for the farms in the smallest group because of the higher yield of wheat (due to better land) on the smaller farms. However, the labor cost was so great on the small farms that the receipts minus labor cost per crop mow were 34 cents less than those on the largest farms. The net profits per crop mow were three and one-half times as great for the second largest and for the largest group of farms as for the smaller groups. A partial explanation for the high net profits in the second sized group is the same as for labor earnings, page 25.

TABLE 14. SIZE OF FARM RELATED TO RECEIPTS, EXPENSES, LABOR COST AND NET PROFITS PER CROP MOW

150 farms, Yenshan County, Chihli, China (1922)

Size of farm area (mow)	Average receipts per crop mow	Average labor cost per crop mow*	Average receipts minus labor per crop mow	Average other expenses and interest per crop mow	Average net profit per crop mow†
10 or less... ...	$5.38	$2.22	$3.16	$3.03	$0.13
11-20	4.98	1.79	3.19	2.72	.47
21-30	4.70	1.40	3.30	3.00	.30
31 and over ...	4.69	1.19	3.50	3.05	.45
Average	4.81	1.44	3.37	2.97	.40

Net profits per crop mow offers a better measure of returns from the agricultural industry in a densely populated country where the average farmer has too little land to keep himself profitably occupied, than in countries where land is more plentiful. It measures both income per man and income per mow in that there can be no profit until the agricultural workers are paid the current farm wage; then, any net increase of receipts above expenses from more intensive methods represents income in addition to wages.

* Labor cost includes the value of the operator's labor at an average of $25.88 per year.

† Net profits per crop mow multiplied by the number of crop mow per farm, plus the value of the operator's labor, gives the average labor earnings per farm.

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The net profit of 40 cents per crop mow indicates that these farmers, after paying all expenses, including interest on capital invested, are making profits higher than farm wages. This is in sharp contrast to the loss of $2.14 per mow for the farmers at Wuhu. The Wuhu farmers are not paying all expenses, including interest on capital (this is high because of the inflated land values), so we may say that, although the Yenshan farmers are poorer than those at Wuhu, still they have placed their farming on a better business basis. A well-managed farm pays all expenses, including interest on capital, and leaves profits of more than hired men's wages.

Man labor efficiency is indicated in table 15. The man equivalent on the large farms was nearly three times as great as on the small farms, the average being 1.51. The crop mow worked per man on the large farms was a little over two times as great as on the small farms. Since crops vary in intensity, a better measure of the amount of work actually done is the man-work units per man. These are also a little over twice as high on the large farms, indicating that crops of about the same intensity were grown on the large as on the small farms. We may conclude, therefore, that the large farms are twice as efficient in the use of man labor as the small farms.

The similar intensity of farming for all groups is indicated by practically the same number of man-work units per crop mow ($r=0.110\pm0.054$).

The average number of crop mow farmed per man was 22.9 (4.6 crop acres) which is about twice the number for the farmers of Wuhu county, Anhwei. The man-work units per man were 92.6 per year, with a medium variability per farm ($C=48.65\pm2.30$). The variability of man-work units per crop mow was very low ($C=10.12\pm0.43$). Labor earnings per farm when associated with man-work units per man gave a higher correlation ($r=0.532\pm0.40$) than when correlated with size of farm (crop mow).

TABLE 15. RELATION OF SIZE OF FARM TO MAN LABOR EFFICIENCY

150 farms, Yenshan County, Chihli, China (1922)

Size of farm area (mow)	Total man equivalent	Average crop mow per man	Average man equivalent per farm	Average man-work units		
				Per farm	Per crop mow	Per man
10 or less ...	29.49	13.6	.89	49.8	4.09	55.8
11 — 20 ...	61.15	17.9	1.27	93.3	4.09	73.2
21 — 30 ...	52.52	23.6	1.54	146.8	4.02	95.1
31 and over ...	85.42	29.2	2.44	287.5	4.03	117.8
Total	228.58	...	...	...	...	...
Average ...	...	22.9	1.52	141.2	4.05	92.6

Animal labor efficiency is shown in table 16. Of the 150 farms, 108 had labor animals. In the group of farms of 10 mow or less, 88 per cent did not have labor animals; and in the group of 11 to 20 mow, 27 per cent had no labor animals. These small farms obtained their animal labor by borrowing from their more prosperous neighbors. The average number of times animals were borrowed per farm for all farms was 6.4; the average number of times loaned was 12, the difference being caused by some farmers loaning to other farmers not included in the survey. The number of animal-work units loaned or borrowed was not included in the data obtained.

The number of crop mow worked per labor animal was one-third greater on the larger farms. The work units per labor animal on large and small farms are a better measure of the efficiency of such labor, but were also just one-third greater on the large farms, showing that one animal does one-third more work on the larger farms.

The number of labor animal-work units per crop mow was the same for each sized group of farms. This indicates the same intensity of cultivation of soil, so far as use of animal labor is concerned.

TABLE 16. RELATION OF SIZE OF FARM TO ANIMAL LABOR EFFICIENCY FOR FARMS HAVING LABOR ANIMALS.

150 farms, Yenshan County, Chihli, China (1922)

Farms grouped by size of farm area (mow)	Number of farms of specified size	Farm of specified size having labor animals		Average number of labor animal units per farm	Average crop mow per labor animal unit	Average number of animal work units		
		Number	Per cent			Per farm	Per crop mow	Per labor animal unit
10 or less ...	33	4	12.1	.44	37.1	20.4	1.3	46.6
11 — 20 ...	48	35	72.9	.58	40.9	30.0	1.3	51.8
21 — 30 ...	34	34	100	.65	56.4	46.0	1.3	71.1
31 and over ...	35	35	100	1.45	49.1	90.9	1.3	62.5
Total	150	108	72.0	...	...	...	...	...
Average ...	...	...	...	.88	48.8	54.4	1.3	61.9

The efficiency in the use of implements and equipment is given in table 17. The investment in implements and equipment per crop mow is nearly twice as much on the larger farms as on the smaller ones.

Other surveys usually show that larger farms have a smaller investment per mow. In this region it does not hold true, because the farmers on the samll farms make a habit of borrowing tools from the larger farms.

TABLE 17. SIZE OF FARM RELATED TO EFFICIENCY IN THE USE OF TOOLS AND EQUIPMENT.

150 farms, Yenshan County, Chihli, China (1922)

Farms grouped by size of farm area (mow)	Average investment in tools and equipment per crop mow	Average value of tools and equipment per farm
10 or less	$0.29	$3.56
11 — 20	0.41	9.25
21 — 30	0.48	17.47
31 and over	0.60	42.54
Total	0.51	17.63

Efficiency in the use of capital in buildings has already been shown in table 7. The small farms had 13 per cent more of the total capital in buildings than did the large ones. This is accounted for by the fact that the amount of building space does not have to be increased proportionately as the farm increases in size.

Our study of these various efficiency factors leads us to the conclusion that a farm having a crop area of 40 mow would be about the right size for the average farm family of two adult male workers and one labor animal unit (such, for instance, as the ox, or mule). This size would give profits which could insure a standard of living much better than the average standard for the farms studied. Exceptional operators with one good additional male worker could probably farm at least 50 mow in crop area. Farms of very much larger size than 40 or 50 mow in crop area are not likely to be increasingly profitable because they pass beyond the family sized farm, which usually is the most efficient unit for farm operations.

Man-work units the best measure of size of business

The man-work unit is the best measure of the size of farm business because it registers the actual amount of work accomplished. It takes, for instance, in this region, four times as many man-work units to raise

a mow of corn as it does a mow of wheat. A very definite relation between amount of man-work units and labor earnings is shown in table 18. Farms having 151 man-work units, and over, made more than two times the labor earnings of the group of farms having 90 or less man-work units, and more than six times as many had labor earnings of $50 and over.

TABLE 18. RELATION OF PRODUCTIVE MAN-WORK UNITS TO LABOR EARNINGS.

150 farms, Yenshan County, Chihli, China (1922)

Productive man-work units	Farms having the specified man-work units		Average man-work units (all farms)	Average crop mow	Average labor earnings per farm	Per cent of operators having labor earnings of $50 and over
	Number	Per cent				
90 or less ...	53	35.3	61.4	14.8	$26.12	9.4
91 — 150 ...	48	32.0	114.6	28.4	37.22	33.3
151 and over ...	49	32.7	253.8	63.0	56.76	61.2
Total ...	150	100	...	...	...	...
Average ...	...	...	141.2	34.9	39.67	34.0

TYPE AND BALANCE OF BUSINESS

The type and balance of business consists of the kind, area, rotation and disposition of crops grown; the kind and amount of livestock (including poultry) raised; the amount of fertilizer applied per crop mow and the semi-monthly labor (man and animal) requirements for the various crops.

Crops

Kind and area of crops. The distribution of crop mow for the different crops by size of farms is shown in table 19. Wheat is raised by practically all the farmers. It is the only winter crop, and constituted 54.8 per cent of the crop area and 35.9 per cent of the total crop mow. Ninety-six per cent of the wheat land was planted to a second crop. The re-

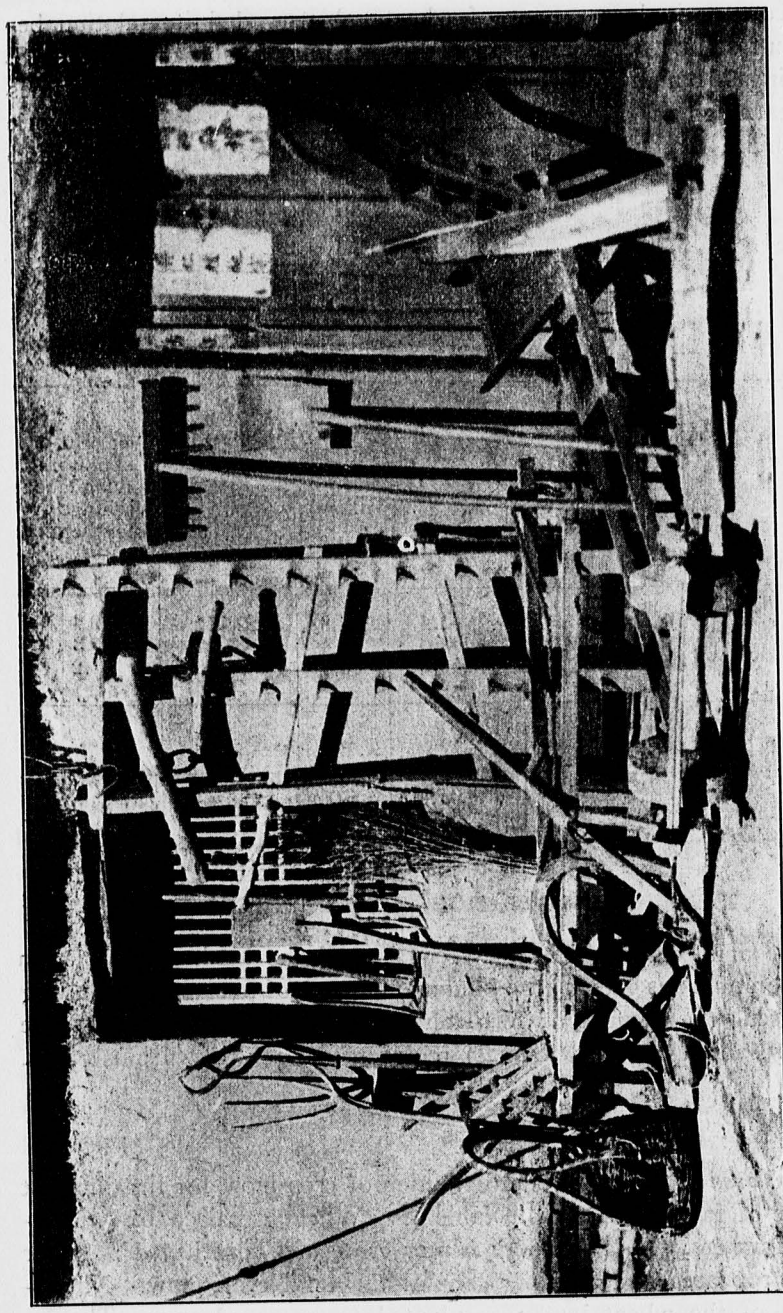

FIGURE 11. The farm tools of a typical farm. Left to right (back row): wooden fork, hoe, sickle, tool for picking up manure droppings, wooden shovel for winnowing grain, bamboo broom for use on the threshing floor, two rowed spike-tooth harrow with whiffletrees hanging from the top, wooden rake, wooden shovel and drill which sows two rows at a time.

Left to right (front row): basket, shovel cultivator, plow with iron beam and wooden handle, stone roller for packing soil after seeding with drill and large knife for cutting fodder for animals.



At left—FIGURE 12*a*. A crop of kaoliang at the left, and one of yellow soy beans and millet (two rows of millet and four of beans) at the right, with a row of tamarix on the boundary between.



At right—FIGURE 12*b*. This minature wheat straw stack vividly tells the story of the very poor wheat crop of 1923 caused by drought. The top and the base of the stack are plastered with mud to keep out moisture during the rainy season.



At left—FIGURE 12*c*. Rings are often cut around the trunks of the Chinese jujube trees, in some of the orchards in Yenshan County, for the purpose of retarding wood growth with the consequent stimulation of fruiting buds.

maining crop area of 38.7 per cent was devoted to crops planted in the spring and harvested in late summer or in the autumn. The first crops of the season, such as wheat and kaoliang (a grain sorghum), occupied about two-thirds of the crop mow, while the second crops took up the other third. The per cent of crop area per farm, double cropped, had a very low variability (C=9.47±0.25).

TABLE 19. AMOUNT AND PERCENTAGE DISTRIBUTION OF CROP MOW

150 farms, Yenshan County, Chihli, China (1922)

Crop	Per cent of farms growing the crop	Number of mow devoted to crop	First or second crop of the season	Percentage of crop mow by size of farm area (mow)				Per cent of total crop mow
				10 or less	11-20	21-30	31 and over	
Wheat	99.3	1878	First	38.8	35.2	36.0	35.6	35.9
Kaoliang	88.0	1034.5	First	15.7	21.4	19.6	19.8	19.8
Corn and yellow soy beans	70.7	641	Second	28.8	12.5	13.3	8.9	12.2
Yellow soy beans	54.7	573	Second	3.0	10.6	12.9	11.4	10.9
Millet	67.3	470	First	4.0	7.6	8.5	10.6	9.0
Corn	52.0	407	Second	4.5	6.7	6.7	9.2	7.8
Yellow soy beans and millet	12.7	108	Second	1.5	2.7	.6	2.6	2.1
Green beans (Phaseolus-aureus)	10.0	31	Second	...	.3	.5	.9	.6
Kaoliang and millet	3.3	24	First	3.2	.5	.5	...	.5
Fruit (Chinese jujube)	5.3	18	First	.5	.5	...	.4	.3
Yellow soy bean and green beans	2.0	15	Second	...	.3	1.0	...	.3
Black soy beans	2.0	13	Second	...	1.2	...	...	.2
Corn and black soy beans	.7	12	Second	..	...	...	.5	.2
Vegetables	5.3	5.5	First	...	.2	.2	.1	.1
Corn and green beans	.7	4	Second	...	.3	...	...	.1
Potatoes, sweet	.7	2	Second	...	...	.2	...	...
Total	...	5236	...	100	100	100	100	100

Kaoliang is second to wheat in crop area occupied and is grown by 88 per cent of the farmers.

Sweet potatoes are just beginning to be grown. Eight years ago there were none. The chief reason why they have not been used more extensively is because of the danger of theft while maturing. The sweet potato furnishes an immense amount of food per acre and is one of the intensive crops which should be grown more than it has been in the past,

in order to help in the adequate support of the dense population of the region.

The chief differences in percentage of crops grown for the different sized farms is that the larger farms had a larger per cent of crop mow in soy beans (yellow), millet and corn, and a very much smaller percentage in corn and soy beans (yellow) intertilled. The operators on the smaller farms have found it more profitable over a long period of time to grow corn and soy beans as intertilled crops on the high land, which is considered the best land; but this particular year all intertilled crops gave lower yields than the non-intertilled, because the higher land suffered from the late summer drought.

In addition to the crops given in table 19, a number of important economic plants grow wild (figure 8) on the alkali soils of the region and are as follows:

Name of the Plant[1].	*Uses*	*Found on soils of the following percentage of soluble salts before ignition (largely chloride but considerable sulfate*[2]*.*
Artemisia annua L (Comp) 臭蒿 Local name: (*hao tsi*) 蒿子	Stems for fuel, and as a deterrent for mosquitoes by burning. The seed is used for extracting oil. The seed cake is used for mucilage and is called "ma sen."	1.25
Iris ensata Thumb (Irid) (*ma lan*) 馬蘭	An iris plant, the leaves of which are used for making twine and soles of shoes ..	1.25
Artemisia scoparia W and K (Comp) (*hwang tsai*) 黃蒿	The leaves are edible when green. It is cut in the autumn and the stalks used for fuel. The seed is used as a food, especially by poor farmers in the winter time	4.51
Tamarix chinensis Lour (Tamaric) 柳檉 Local name: (*ging tiao*) 金條	The stems are used for fuel and for basket making ..	4.51
Salsola (Chen) 鹹蓬	"Kien" a soda, is made from the whole plant, and is used for washing clothes and making bread	38.58

[1] Identifications were obtained through the assistance of Mr. A. N. Steward, Botanist, University of Nanking.

[2] Analyses were made through the assistance of Mr. Charles O. Lee, Department of Chemistry, University of Nanking.

The tamarix is allowed to grow along roadways and on boundaries between fields, and is often planted in these places, see figures 6 and 12a. It is also allowed to grow wild on spots too alkali for farm crops.

Rotation of crops. Four cropping systems are found on the farms studied (table 20). One-fourth of the farms use system number one, another fourth use system number two, while another third use a combination of both one and two (table 21). The remaining farms use various combinations of the four systems.

TABLE 20. CROP ROTATION SYSTEMS.

150 Farms, Yenshan County, Chihli, China (1922)

Cropping system number	Year	1st crop of the year	2nd crop of the year
1	First	Wheat	Soybean and Corn
	Second	Kaoliang, millet	
2	First	Wheat	Corn
	Second	Wheat	Corn and Soybean
	Third	Kaoliang, millet	
3	First	Wheat	Soybean and millet
	Second	Kaoliang, millet	
	Third	Wheat	Corn
4	First	Wheat	
	Second	Wheat	

The systems of rotation contain the following essential elements of a rotation system; a shallow rooted crop; a deep rooted crop; a cultivated crop; and a leguminous crop.

If at the end of the second year the land is still producing good wheat, it may be planted to wheat a third year—or even longer, if a good previous crop is obtained.

TABLE 21. PERCENTAGE DISTRIBUTION OF CROPPING SYSTEMS.

150 Farms, Yenshan County, Chihli, China (1922)

Cropping system number	Percent of farms having the system
1 & 2	34.0
2	26.6
1	24.0
1 & 3	5.3
2 & 3	4.0
2 & 4	1.3
1, 2, 3 & 4	1.3
3	.7
4	.7
2, 3, 4	.7
1 & 4	.7
1, 2 & 3	.7

Disposition of crops. The farm family consumed over two-thirds, or 37 per cent, of the value of all the crops raised (table 22). More than three-fourths of the crops of corn, yellow soy beans, green beans, kaoliang, millet, black soy beans and sweet potatoes and only 5 per cent of the wheat crop were used by the family. One-fourth of the chickens were consumed by the family. Other livestock products were all sold.

In general, most of the seed products are used for food by the farm family, or else sold; while the by-products of straw and stalks are used for fuel, fodder, or industrial purposes. Millet straw and kaoliang leaves (harvested green) are especially good fodder. Kaoliang stalks, bean straw and corn stalks are the by-products chiefly used for fuel.

Wheat which is the only important cash crop, does not, perhaps, fill any greater place than kaoliang in the economy of these farmers. Kaoliang has many uses all of which may be summarized under food, fuel, fodder, and industrial uses[1].

[1] The importance of kaoliang in China can better be understood from an enumeration of its various uses. The grain is used mainly for human food but also for feed and for making liquor. The leaves are used for fodder. The stalks are utilized for fuel and for various industrial purposes, such as building purposes (lath, sheathing, and siding for walls), garden fences, baskets, toys, and household utensils. Brooms are a very important product made from the panicles.

TABLE 22. PROPORTION OF PRODUCTS SOLD AND USED BY THE FAMILY.

150 Farms, Yenshan County, Chihli, China (1922)

Items	Value per farm (all farms)		Per cent of value	
	Sold (or to be sold)	Used by family	Sold	Used by family
Crops:				
Corn	$ 0.88	$10.70	7.6	92.4
Wheat	70.76	3 89	94.8	5.2
Yellow soy beans	.68	6.08	10 0	90.0
Green beans (Phaseolus aureus)	.08	.27	22.9	77 1
Kaoliang	3.19	14.05	18.5	81.5
Millet	3.43	12.32	21.8	78.2
Chinese jujube	2.14	.22	90 7	9.3
Vegetables	.34	.51	40.0	60 0
Black soy beans	...	.14	...	100
Potatoes, sweet	...	.01	...	100
Total	81.50	48 19	62 8	37.2
Livestock and Its Products:				
Chickens	.15	.08	65 2	34.8
Eggs	1.66	.48	77.6	22.4
Hogs	1.57	...	100	...
Mules	.60	...	100	...
Hides	.05	...	100	
Manure	.03	...	100	...
Total	4.06	.56	87 9	12 1
Miscellaneous Receipts	2.12	21 40	9.0	91.0
Total of all	87.68	70.15	55 6	44.4

Livestock

Amount and distribution of livestock. The number of each kind of livestock by size of farms (table 23) and the amount and distribution of livestock (tables 24 and 25) give an idea of the nature of the animal industry in this region.

TABLE 23. KIND AND NUMBER OF LIVESTOCK BY SIZE OF FARMS.

150 Farms, Yenshan County, Chihli, China (1922)

Farms grouped by size of farm area (mow)	Horses	Oxen	Donkeys	Mules	Hogs	Pigs	Chickens	Ducks
10 or less	...	...	3.5		...	...	123.5	3 0
11 — 20		4.5	27.5	2.0	.5	1.0	256.5	2.0
21 — 30	1.0	5.5	31.0	...	..	5	217.0	1 0
31 and over	1.5	25 5	35 75	6.0	10.0	16.5	250.5	2.0
Total	2 5	35.5	97 75	8.0	10 5	18.0	847.5	8 0

TABLE 24. AMOUNT AND DISTRIBUTION LIVESTOCK.

150 Farms, Yenshan County, Chihli, China (1922)

Kind of Livestock	Farms having specified livestock		Animal units per farm (all farms)	Average number per farm having	Total animal units	Per cent of total animal units
	Number	Per cent				
Donkeys	96	64 0	.33	1.02	48.88	45 5
Oxen	37	24.7	.24	96	35.50	33 1
Chickens	141	94 0	.06	6.01	8 48	7 9
Mules	7	4.7	.05	1 14	8.00	7 4
Horses	3	2.0	.02	.83	2 50	2 3
Hogs	13	8 7	.01	.81	2 10	2 0
Pigs	20	13.3	.01	90	1.80	1 7
Ducks	8	5 3	.0	1 00	.08	1
Total	...	...	...	...	107.62	100
Average	...	...	.72	...	...	...

Most of the animals are raised as labor animals; only 11.7 per cent are kept primarily as productive animals. The horse, ox ("yellow cow"), donkey and mule are labor animals; while the hog, pig, chickens and ducks are productive animals, which, with their products, are sold or sometimes consumed by the family. Nearly one-half of the total animal units are donkeys, and nearly one-third are oxen. Nearly two-thirds of all the farmers

2 0 0 3 4 2 4
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have donkeys and ninety-four per cent keep chickens averaging six per farm. The money from eggs sold goes to the housewife as "pin-money."

Farmers within a radius of about three miles of the city do not keep mules or horses for fear of having them commandeered from time to time by the military. Many donkeys are kept because they can be used for several kinds of work, such as pack animals, the grinding of grain and as draft animals. A donkey is usually one of the animals to be found in any team.

Many farmers share ownership of labor animals with their neighbors; thus we find farmers owning half a horse, half an ox, or even half a donkey. One case occurred where one-fourth of an ox was owned by one farmer and the other three-fourths by a neighbor.

The total number of animal units for the total crop area of 150 farms was 107, or 101 animal units per square mile of crop area. There was 0.72 of an animal unit per farm. The actual number of labor animals per farm was 0.95, and the number of labor animal units per farm was 0.63. The number of mow in crop area per animal unit was 31.8 (6.36 acres) and the number of crop mow per animals unit was 48.7 (9.5 acres).

TABLE 25. AMOUNT OF LIVESTOCK BY SIZE OF FARMS.

150 Farms, Yenshan County, Chihli, China (1922)

Farms grouped by size of farm area (mow)	Crop area per animal unit (mow)	Crop mow per animal unit	Total labor animal units	Total productive animal units	Total animal units
10 or less	82.0	131.8	1.75	1.30	3.05
11 — 20	31.0	47.3	20.25	2.89	23.14
21 — 30	33.1	51.1	22.00	2.29	24.29
31 and over	28.9	43.7	50.88	6.26	57.14
Total	...	...	94.88	12.74	107.62
Average	31.8	48.7	...	...	...

Fertility Maintenance

The information in the previous paragraph leads one to the conclusion that these 150 farms are lightly stocked with animals since the number of animals (9.5 crop acres per animal unit) is not sufficient

to maintain properly the fertility of the land. The manure from these animals is at the rate of 0.165 tons per crop mow (0.827 tons per crop acre) per year. Denmark has approximately one animal unit per acre. Dr. G. F. Warren of Cornell University states that a farm having 6 or more acres of crops per animal unit is lightly stocked and one having 1 to 3 acres of crops per animal unit is heavily stocked[1]. The farms studied in Wuhu County, Anhwei, China, were mediumly well stocked (5 crop acres per animal unit). It should be remembered, however, that human excreta is used as fertilizer in China. At Yenshan most of the urine is lost, for care is chiefly taken to use the feces. The latter is mixed with farm manure and is then applied to fields in a pulverized and partially rotted form. This is characteristic of much of North China whereas at Wuhu, which typifies Central China conditions, both urine and feces are conserved and are applied to the land in liquid form. Assuming at Yenshan that two-thirds of the night soil is saved, this would add 77.5 pounds of fertilizer per crop mow per year[2]. Any consideration, then, of maintenance of fertility in China should take into account human as well as domestic animal excreta, although at Yenshan the former constituted only about one-fourth of the manure produced on the farm. Fertilizers (soybean and sesamum cake, farm manure and night soil, in addition to the night soil and farm manures produced on the farm, were purchased at a cost of $0.29 per crop mow which, when reduced to farm manure values[1] would probably bring up the total application to two-fifths of a ton per crop mow per year[2]. In New York State two tons of manure per acre per year is considered a good application. The amount applied for the Yenshan farms was also approximately two tons per crop acre per year.

A classification of farms was made, according to the value of fertilizer used per crop mow for the purpose of ascertaining the effects of increasing amounts of fertilizer on crop index and on labor earnings. Land values and size of farm also increased with the increase in cost of fertilizer so that the small difference in crop index from 94 to 109 cannot be ascribed to fertilizers alone, since the crop index is also higher for the more expensive land (table 31). Whether or not increased use of fertilizer would pay needs demonstration.

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[1] Warren, G. F., Farm Management, pp. 211.

[2] Heiden's estimate of 1000 pounds of excreta per individual was used in this calculation.

[1] Estimated value at $1.50 per ton.

[2] A production of eight tons of manure per animal unit per year was used in this calculation.

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Labor

The greater efficiency of man and animal labor on the larger farms has already been referred to in the discussion of size of farms. There are very few hired farm laborers in this section, because the farm family can take care of the small-sized farms and still have idle time. On the farms studied there were only five farms with hired men by the year and each farm had one man. This lack of demand for farm labor evidently is one reason why the price of labor is so much lower than in other regions. The average wage is $10 per year and food, the food being worth about $20[1]. Wages, however, have advanced some $10 to $20 since 1922, the year to which these data refer. This increase is due in part to the opportunities for farm laborers in Manchuria.

The man-work units and animal-work units per crop mow for the various crops are given in table 26. The number of man hours required to produce an acre of wheat or an acre of corn on the farms studied is four and one-half as much as in New York State, U.S.A.

A few more hours of animal labor are used per acre in Yenshan than in New York for these crops. However, New York State uses one-third more hours of animal labor than man labor. In Yenshan

TABLE 26. MAN AND ANIMAL WORK-UNIT REQUIREMENTS FOR VARIOUS CROPS.

20 Farms, Yenshan County, Chihli, (1922)

Crop	Number of work units per crop mow	
	Man	Labor animal
Wheat	1.7	1.0
Corn	5.5	1.3
Soy beans	3.3	.6
Kaoliang	6.5	1.9
Millet	5.3	1.9
Corn and soy beans[2]	5.5	1.3
Soy beans and millet[2]	5.3	1.0
Soy and green beans[2]	5.4	1.0
Sweet potatoes[2]	8.5	1.3
Vegetables	18.0	...

[1] These farm laborers had their meals with the family for whom they were working, but they did not sleep in quarters provided by that family as is so often done in many regions.

[2] These crops were grown on a limited acreage. The investigator from his experience and by comparison with the other crops was able to give an estimate of the number of work units required.

County, China, the farmers use nearly twice as many man labor hours as animal labor hours. This is largely caused by the small amount of machinery used in the farm operations. Animals are often idle under the shade of trees when they might be hitched to a cultivator to take the place of the man and his hoe.

Amount and semi-monthly distribution of man labor. The distribution of man labor for all crops on the 150 farms is given in figure 13. The

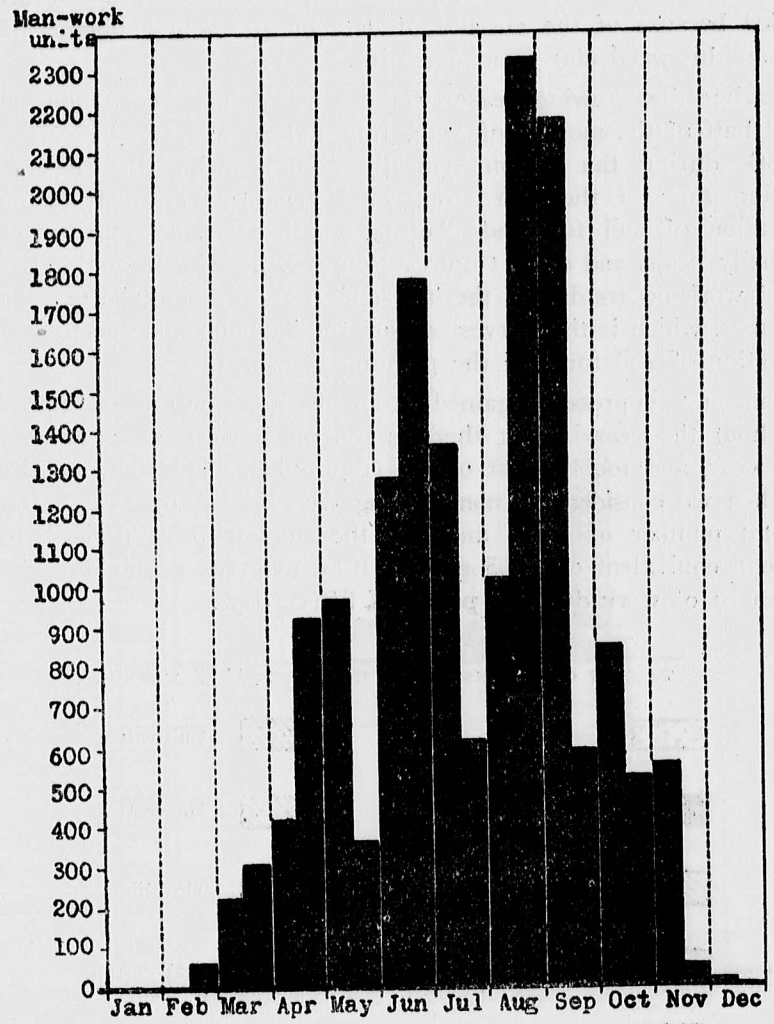

FIGURE 13. Semi-monthly distribution of total man labor (man-work units) for all crops on 150 farms, Yenshan County, Chihli, China (1922).

distribution is not good because of the absence of winter work and the uneven distribution during the growing season. There is little work in the four months of the winter season. Picking up manure droppings along the roadside for fertilizer is the most common kind of winter employment. It also represents the most profitable work available for most of the farmers. The amount of actual time given to this is considerable, and, if included in man-work units required for each crop, would undoubtedly raise the number appreciably. It has not been so included because of the absence of data on the actual amount of time spent on this particular farm operation.

During the growing season there is very little work done in the second half of the months of May, July and September. The first peak of work during the season typically occurs during the harvest and threshing time of the first crop, wheat (figure 14), and during the preparation of soil for, and planting of the second crops which are principally beans and corn, (figures 14 and 17). The second and higher peak of work occurs during the last half of August and the first half of September, which is the harvest season for kaoliang and the time of the preparation of soil for, and the planting of wheat.

The first impression gained from the distribution of man labor throughout the year is that there is too much work at certain seasons of the year, and too little at others (figure 13). This may possibly be true when we consider the non-working days caused by rain. However, the total number of work units of the highest peak divided by the total man equivalent of 228.5 gives a little over ten actual days (of ten hours each) of work during a period of fifteen days.

KEY TO FARM OPERATIONS SHOWN IN FIGURES 14-17 AND 19-23.

Cleaning	Cultivating
Plowing	Harvesting
Fertilizing	Threshing
Harrowing	Leaf-cutting
Planting	Unclassified

An indication that the total amount of work on the farm was not very great is the man-work units per farm, which were 141.2. Rainy days and holidays use up a good many days in the year but are not responsible for the total difference between 93.2 man-work units per man and 365 days in the year. The difference is principally due to small

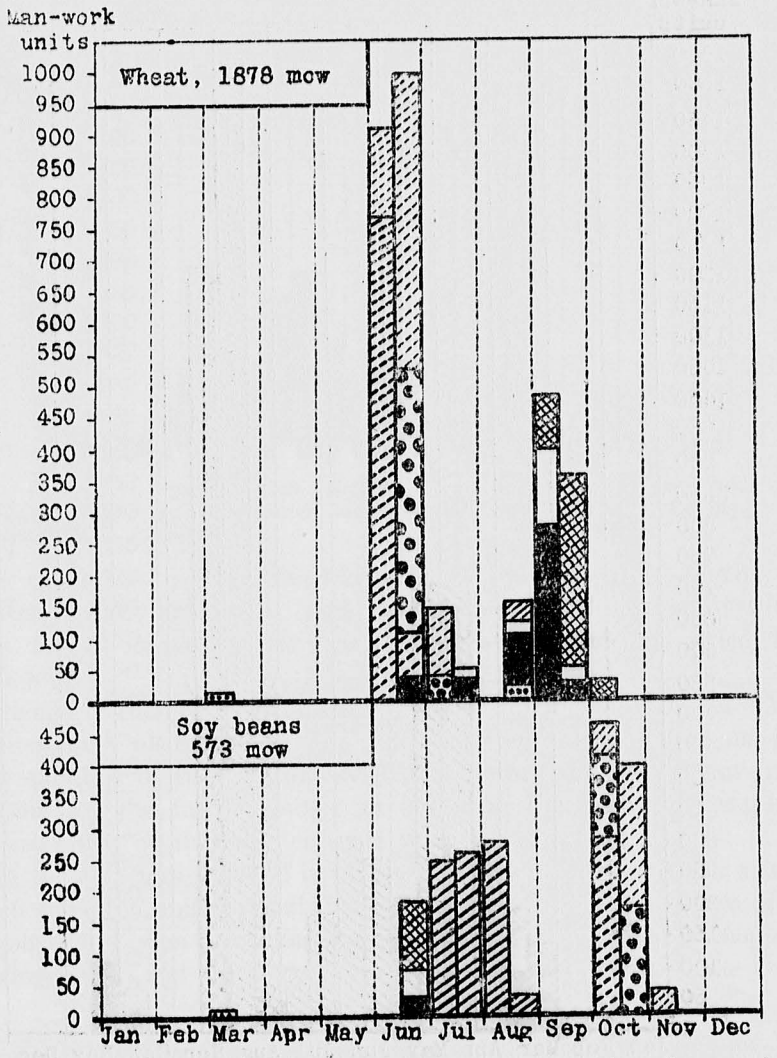

FIGURE 14. Semi-monthly distribution of man labor (man-work units) for wheat and yellow soy beans on 150 farms, Yenshan County, Chihli, China (1922).

farms and an extensive type of agriculture, i.e., grain farming and the absence of work during the winter months. There is no animal industry, or farm woodlot, or fruit industry (pruning) to provide winter work; moreover, the people in this region have not developed home industries, although that some go away to find work for the winter months is indicated in table 40.

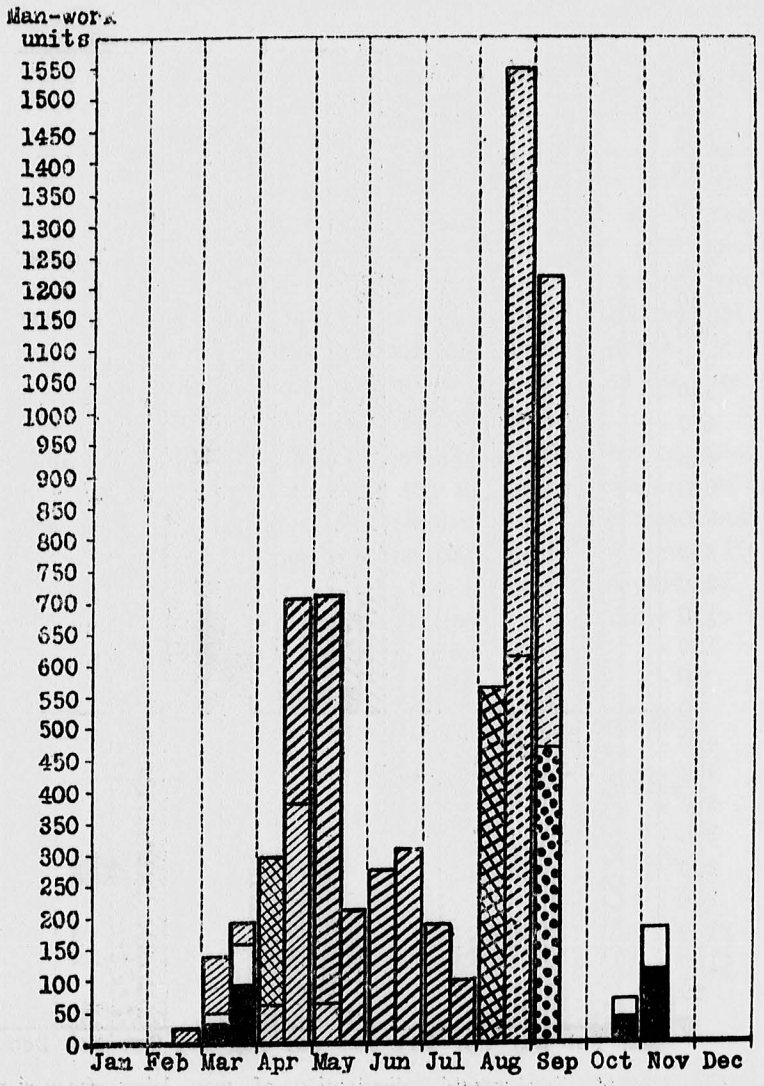

FIGURE 15. Semi-monthly distribution of man labor (man-work units) for 1034.5 mow of kaoliang on 150 farms, Yenshan County, Chihli, China (1922).

Figures 14 to 17 showing the distribution of man labor by kind of operations for total mow of each crop and table 27 giving the distribution of man labor per mow by crops are useful for determining which crops give the most or the least work at any one period.

Plowing for wheat in the early summer was either on "lake land," which could not be planted to second crops because of flooding during the summer rainy season or on land left fallow until wheat planting time.

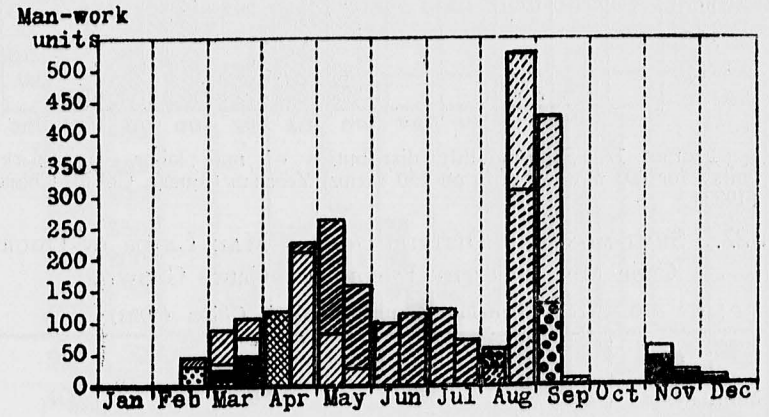

FIGURE 16. Semi-monthly distribution of man labor (man-work units) for 470 mow of foxtail millet on 150 farms, Yenshan County, Chihli, China (1922).

It is customary to strip the leaves from the lower three-fourths of the kaoliang stalks before the grain has matured. A portion of these leaves is fed to animals while green and the remainder is dried for winter fodder.

A change in the cropping system which would include a better labor distribution must also consider the following points: its effect on the desirable qualities of the rotation system; its effect on the present food requirements of the farm family; its effect on the cash income; and the marketability of the new crop, if it is a cash crop.

With these factors in mind it is suggested that a fiber crop as a cash crop, such as cotton, might possibly be added to the rotation in place of so much kaoliang. Cotton has a fairly even distribution of labor[1] throughout the growing season and also is more alkali-resistant than most of the crops grown.

[1] This is shown to be true from studies made in Shantung under the direction of the writer and is partially caused by the picking of cotton as it ripens, rather than at one time as in the United States.

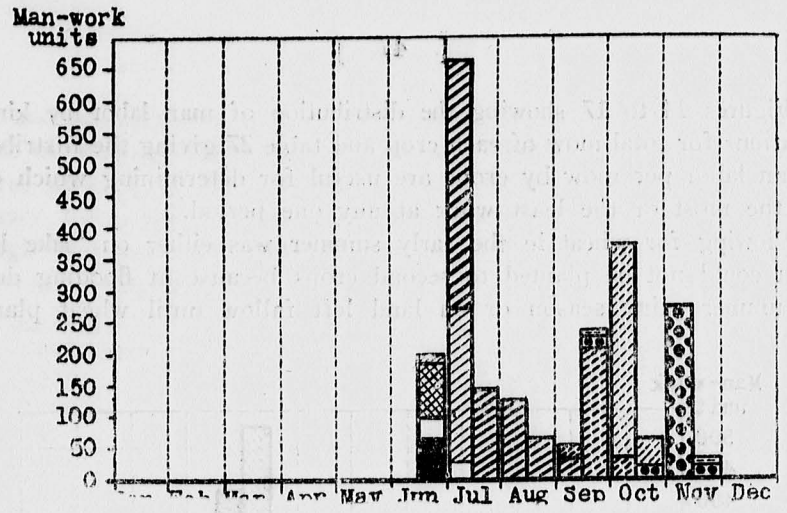

FIGURE 17. Semi-monthly distribution of man labor (man-work units) for 407 mow of corn on 150 farms, Yenshan County, Chihli, China (1922).

TABLE 27. SEMI-MONTHLY DISTRIBUTION OF MAN LABOR IN HOURS PER CROP MOW FOR THE IMPORTANT CROPS GROWN.

150 Farms, Yenshan County, Chihli, China (1922)

Months	Half Months	Important crops				
		Millet	Kaoliang	Corn	Yellow soy beans	Wheat
January	1st	...	...	...	...	...
	2nd	...	...	...	...	...
February	1st	...	...	...	...	...
	2nd	.9	.2	...	...	...
March	1st	1.8	1.3	...	.1	..
	2nd	2.2	1.8	...	...	.1
April	1st	2.5	2.9	...	...	...
	2nd	4.7	6.9	...	...	.
May	1st	5.6	6.9	...	...	...
	2nd	3.2	2.0	...	...	...
June	1st	1.9	2.7	...	...	1.2
	2nd	2.4	3.0	4.8	3.1	5.3
July	1st	2.7	1.8	16.3	4.2	.8
	2nd	1.6	.9	3.4	4.5	.3
August	1st	1.3	5.4	3.1	4.8	...
	2nd	11.3	15.0	1.7	.5	.8
September	1st	9.2	11.8	1 2	...	2 6
	2nd	.1	...	5.7	...	1 9
October	1st	...		9.1	8.1	.1
	2nd	..	.7	1.6	6.8	...
November	1st	1.3	1.8	6.8	.7	...
	2nd	.4	...	.7	...	...
December	1st	.2	...	...	...	...
	2nd	...	...	...	...	...
Total ...	...	53.3	65.1	54.4	32.8	16·7

To offset the decrease in food production and possibly even supply an increase, sweet potatoes might be utilized. The peak of work for this crop would occur in the last half of October and possibly into November, when there is now only a small amount of work to be done.

White potatoes should be given a trial on the better soils. Sugar beets is another crop which might be adapted to the region especially since they are more alkali-resistant than most crops. The chief objection to raising sugar beets might be the difficulty of finding a market, although in some places in China the people have used them directly as a food.

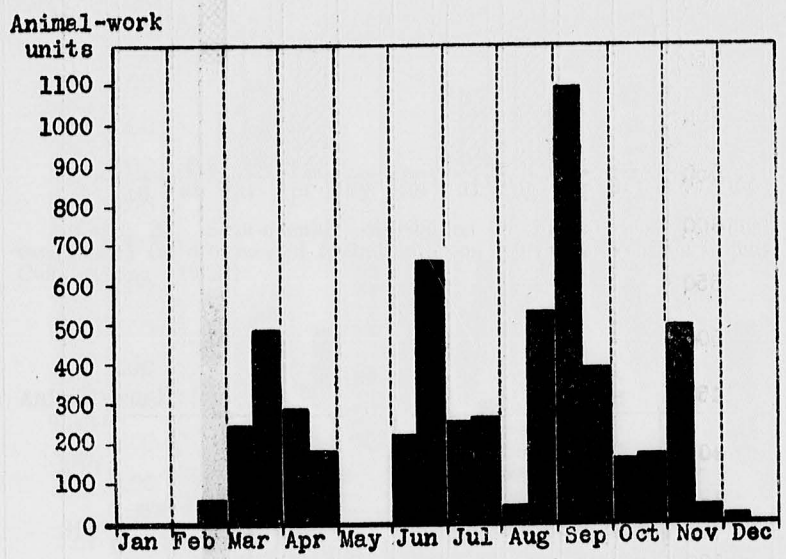

FIGURE 18. Semi-monthly distribution of total animal labor (animal-work units) for all crops on 150 farms, Yenshan County, Chihli, China (1922).

Amount and semi-monthly distribution of animal labor. The chief work of the labor animals of this region is plowing, harrowing, drilling, cultivation with a shovel plow, carting and, in the case of donkeys, pack-carrying and some grinding of flour. Figure 18 shows that not only are the animals idle during the four months of winter, but also during two full months of the growing season. The animal-work units per labor animal unit were 61.9, which indicates still more clearly the small amount of work done by labor animals. The crop mow per labor animal unit were 48.7. Better methods of cultivation and greater use of cultivators for the growing crops would help to utilize the animals more fully throughout the growing season. Much work is done by hoeing which could be accomplished better with a cultivator (figure 7). The amount

of carting work available during the winter time is very limited. One possible use of labor animals during the winter months when the ground is not frozen would be the reclamation of alkali and wet spots and the maintenance of any such completed projects.

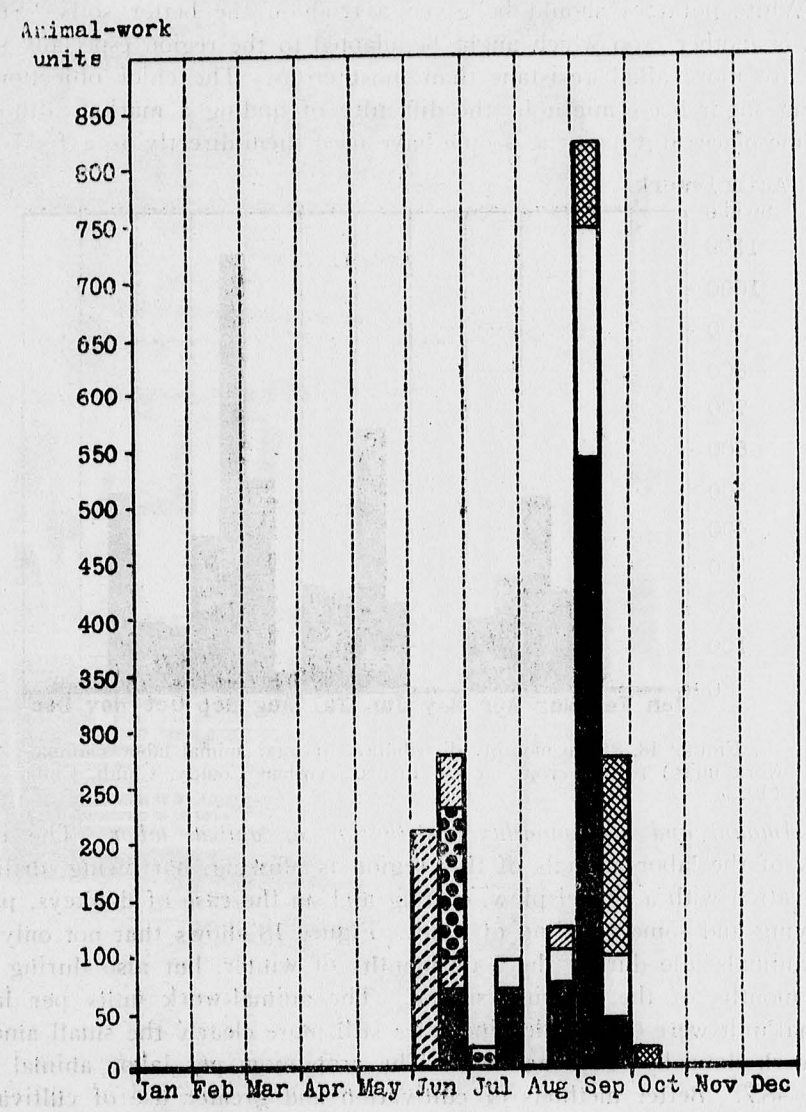

FIGURE 19. Semi-monthly distribution of animal labor (animal-work units) for 1878 mow of wheat on 150 farms, Yenshan County, Chihli, China (1922).

The two peaks of work for animal labor are similar to those for man labor in that they occur at the time of the two planting and the two harvesting seasons. During the highest peak which occurs in the first half of September labor animals are working 11.5 days (of ten

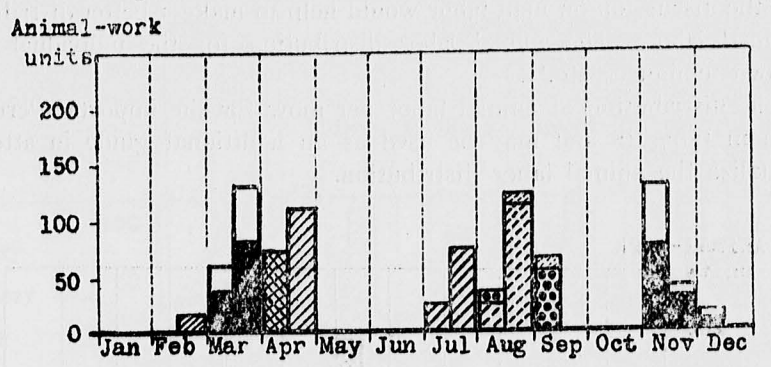

FIGURE 20. Semi-monthly distribution of animal labor (animal-work units) for 470 mow of foxtail millet on 150 farms, Yenshan County, Chihli, China (1922).

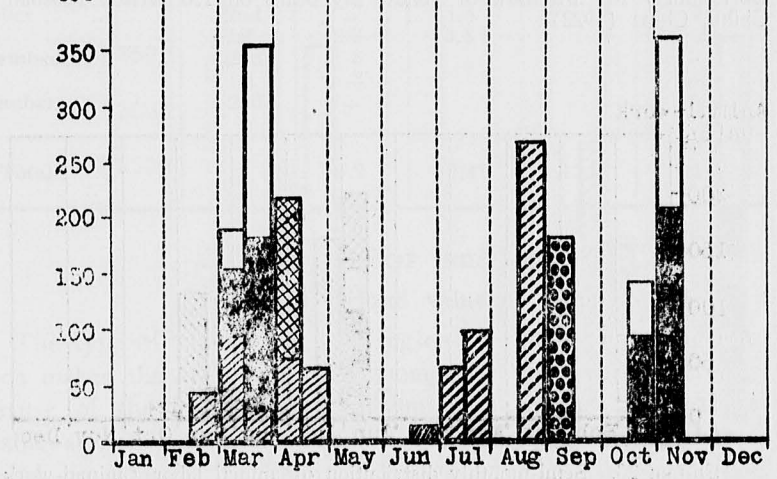

FIGURE 21. Semi-monthly distribution of animal labor (animal-work units) for 1034.5 mow of kaoliang on 150 farms, Yenshan County, Chihli, China (1922).

hours each) out of a total of 15 days available. Some of these 15 days may be rainy, therefore one cannot advocate fewer labor animals, because there are hardly enough animals to accomplish well the work to be done at the two peak periods. The changes in cropping systems suggested under the discussion on man labor would help to make a better distribution of animal labor. The animal labor distribution for the individual crops is shown in figures 19-23.

The distribution of animal labor per mow for the important crops is shown in table 28 and may be used as an additional guide in attempts to equalize the animal labor distribution.

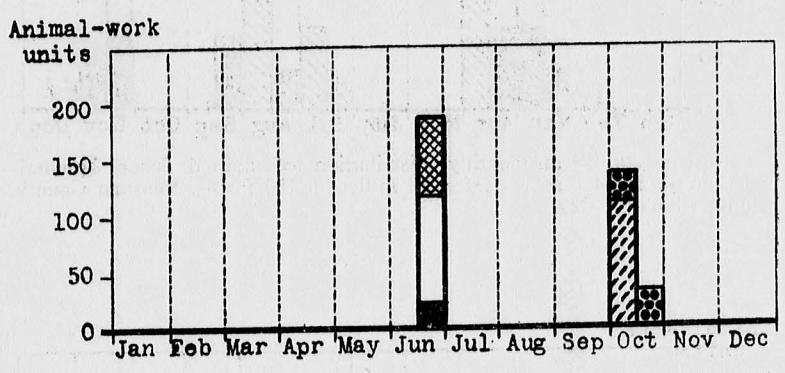

FIGURE 22. Semi-monthly distribution of animal labor (animal-work units) for 573 mow of yellow soy beans on 150 farms, Yenshan Chihli, China (1922).

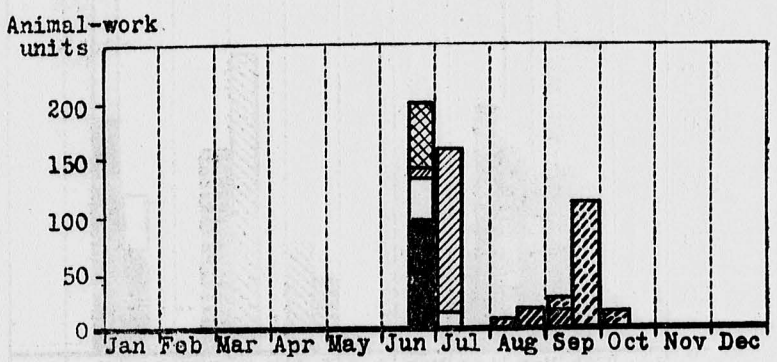

FIGURE 23. Semi-monthly distribution of animal labor (animal-work units) for 407 mow of corn on 150 farms, Yenshan County, Chihli, China (1922).

TABLE 28. SEMI-MONTHLY DISTRIBUTION OF ANIMAL LABOR IN HOURS PER CROP MOW FOR THE IMPORTANT CROPS GROWN.

150 Farms, Yenshan County, Chihli, China (1922)

Months	Half months	Important crops				
		Millet	Kaoliang	Corn	Yellow soy beans	Wheat
January	1st	...	...	...	...	...
	2nd	...	...	...	...	...
February	1st	...	...	...	...	...
	2nd	.3	.4	...	...	...
March	1st	1.2	1.8	...	...	...
	2nd	2.8	3.4	...	..	...
April	1st	1.6	2.1	...	...	...
	2nd	2.4	.7	...	...	...
May	1st	...	...	...	...	...
	2nd	...	...	..	...	...
June	1st	...	...			1.1
	2nd	...	.1	4.8	3.2	1 5
July	1st	.5	.7	3.8	...	.
	2nd	1.6	.9		...	.5
August	1st	.7	...	.2	...	...
	2nd	2.7	2.6	.3	...	.7
September	1st	1.4	1.8	.6	...	4 4
	2nd	...	...	2.8	...	1.5
October	1st	...	...	.3	2.4	.1
	2nd	...	1.4	...	.5	...
November	1st	2.9	3.5	...	...	...
	2nd	.8	...	...	..	...
December	1st	.3	..	...	...	...
	2nd	...	..	...	...	...
Total	...	19.2	19.4	12.8	6.1	9.9

QUALITY OF BUSINESS

Crop yields and value of crops

The type of farming in this region is chiefly that of grain farming which makes the crop index, the composite yield for all crops, the best measure of the quality of the farming business. Since there are no reliable statistics on crop yields for Chihli province, it has not been possible to compare the yields with those of the whole province. However, it will be seen from table 29 that the crop yields are low. This is caused by the naturally low productivity of the soil and the uneven

amount of moisture available for plant growth, sometimes causing either floods or severe drought.

One is also impressed with the need of better cultivation of crops in the region. In many fields the writer observed weeds that should have been destroyed a week or two earlier (figure 7). It would seem that more rapid methods of cultivation through the more extensive use of animals might be introduced. The farmers of this region evidently do not appreciate the importance of cultivation as much as those in other regions. This is perhaps, because they cannot profitably spend too much effort on a poor soil. However, it seems that there is an absence of understanding of the importance of keeping the weeds down and of preserving soil moisture, not only for the moisture itself, but also to check the accumulation of alkali at the surface.

The yields of wheat and millet were good for this region, as the season was very favorable for these crops. The other crops were below normal, because of the late summer drought. The Chinese jujube gave the highest gross returns, $53.61 per acre, and wheat was next with $16.18 per acre (table 29). Yellow soy beans gave the lowest returns per acre, $2.46.

TABLE 29. YIELDS PER MOW AND PER ACRE AND VALUE OF CROPS IN CHINESE AND UNITED STATES CURRENCY.

150 Farms, Yenshan County, Chihli, China (1922)

Crops	Yields		Value of crops			
	Tow per mow	Bushels per acre	Per tow (silver)	Per mow (silver)	Per bushel (gold)	Per acre (gold)
Wheat	5.8	15.5	$1.03	$5.97	$1.04	$16.18
Yellow soy beans	1.5	4.0	.60	.90	.62	2.46
Kaoliang	4.4	11.8	.52	2.29	.53	6.21
Millet	8.1	21.6	.54	4.57	.54	11.82
Corn	3.7	9.9	.61	2.26	.62	6.11
Chinese jujube	60.0	160.1	.33	19.80	.33	53.61
Yellow soy beans and millet[1]	1.0	2.6	.60	.60	.62	1.62
	1.8	4.8	.54	.97	.54	2.61
Corn and yellow soy beans[1]	2.0	5.3	.61	1.22	.62	3.31
	1.1	2.9	.60	.66	.62	1.80

[1] Intercropped.

Crop Index

The average yields for these 150 farms has been taken as 100 and a comparison has been made between groups of farms of different crop indexes (table 30). The crop index was not very variable (C=20.27±0.82). The effect of good yield is shown very clearly in the net profit per crop mow which was minus $0.73 for farms grouped with the lowest index and $0.95 for farms in the highest crop index group.

Labor earnings per farm were six times as much for farms having the highest index of 125 and over as for farms having an index of 75 and under. Farms having a crop index of 100-124 gave higher labor earnings than the farms in the next lower index group in spite of a smaller size of 14.6 crop mow.

TABLE 30. RELATION OF CROP INDEX TO LABOR EARNINGS AND NET PROFITS PER CROP MOW

150 Farms, Yenshan County, Chihli, China (1922)

Farms grouped by crop index	Farms having the specified crop index		Average crop mow per farm	Average labor earnings per farm	Per cent of farms making labor earnings of $5) and over	Net profits per crop m
	Number	Per cent				
75 and under	9	6.0	25.7	$6.74		$ 0.73
76 — 99	65	43.3	44.2	37.56	35.4	.22
100 — 124	55	36.7	29.6	47.29	36.4	.69
125 and over	21	14.0	24.2	40.43	38.1	.95
Total	150	100	...	...	34.0	...
Average			34.9	39.67		.40

A comparison of the yields of the various crops by farms grouped according to size showed a significant difference for wheat. The wheat yield per mow was 15.8 per cent greater for the farms in the smaller group, as compared with the farms in the larger sized group. Wheat is considered the most important crop and the farmers with small farms devote their best land to it, which accounts for this higher yield. Corn and soy beans followed wheat on this land and gave lower yields than the same crops planted on low land on the large farms because of the greater effect of drought on the high land.

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The crop index, the composite yield for all crops, is seven per cent greater for the smaller than for the larger farms.

The partial correlation for 147 farms between labor earnings and crop mow, holding crop index constant, is $+0.469 \pm 0.043$ which is slightly higher than the gross correlation between labor earnings and crop mow and which can be accounted for by the higher yields on the small farms.

Land value and crop index. The low productivity of the soil is reflected to some extent in the land values; they averaged $18.08 per mow of farm area and had a comparatively low variability ($C = 30.03 \pm 1.27$). The relation of value of land to a number of factors is given in table 31. Farms having land valued at $19.99 or less per mow of farm area had a crop index of 95, while those having land valued at $20 and over and averaging $23.51 had an index of 110. The amount of double cropping was a little higher on the more valuable land. The higher labor earnings per farm and the higher net profits per crop mow for the farms in the lower land value group may be caused, partially at least, by the larger size of farms.

TABLE 31. VALUE OF LAND PER MOW RELATED TO CROP INDEX, DOUBLE-CROPPING, LABOR EARNINGS AND NET PROFITS PER CROP MOW

150 Farms, Yenshan County, Chihli, China (1922)

Farms grouped by value per mow of farm area	Farms having specified value per mow		Average value per mow	Average crop mow per farm	Average crop index	Per cent of land double-cropped	Average labor earnings per farm	Net profits per crop mow
	Number	Per-cent						
$1 9.99 or less ...	75	50.0	$14.44	41.0	95	51.9	$46.46	$0.48
$2 0 and over ...	75	50.0	23.51	28.8	110	54.6	32.89	.28
Total	150	100.0	...	...	...	53.0	...	...
Average	...	...	18.08	34.9	100	...	39.67	.40

SUMMARY OF THE YEAR'S BUSINESS

A summary of the year's business for all farms is given in table 32. There was an increase during the year of $40.46 per farm in land values,

which has not been included under increase in capital. It is customary in this region for land values to fluctuate with good and bad crop years. The year previous to this survey was one of low crop yields and the current year was one of good yields, so the land inventory at the beginning of the year gave a low value per mow, while that at the end of the year was much higher.

The average labor earnings of operators, amounting to $39.67, are higher by $9.47 than the average wage paid to farm laborers. A little over four-fifths of all the operators had labor earnings in the group of $0—$99 (table 33). The variation was from minus $219 to plus $389 per farm ($C = 138.29 \pm 11.83$). The median for labor earnings was $38 and the mode was $25.

The average family income of $56.48 ($30.56 gold) consists of $33.90 in cash and $22.58 in wheat saved for sale when ready cash is needed. The year was a good one for wheat, and this caused the savings to be larger than the yearly average. The cash income of $33.90 checks quite closely with the family expenditures, (table 48) which were $34.28 per family.

Fifty-two per cent of the average family earnings of $135.13 were from farm products used by the family. This large amount of income which is used by the family without turning it into cash is sufficient argument for using labor earnings, rather than labor income in measuring returns for the operator's labor and management. The labor income of minus $30.48 gives a totally wrong impression of the farm business.

The Wuhu farmer[1] had over two and one-half times this amount of family earnings for practically the same sized family. The family earnings per capita at Yenshan were $25.24 (Gold $13.66) or $33.31 ($18.03 Gold) per adult man equivalent. These amounts may be compared with income in other parts of China and of the world by adding the value of rent furnished by the farm. Estimating the value of rent at ten per cent of the capital value of the residence and estimating one-half of farm buildings as used for residence the value of rent would be $9.24.

The item of hired labor includes expenditures for laborers of $1.25, for hats and towels, and of $0.97 for tobacco and wine.

The income from other than farm sources was 11 per cent of the family earnings, indicating that over one-tenth of the family earnings comes from sources other than the farm. Most of this income from other than farm sources was from work done outside the community and nearly one-half was from the absent members of the family (table 40).

[1] See footnote on page 22.

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TABLE 32. SUMMARY OF THE YEAR'S BUSINESS (AVERAGE PER FARM)

150 farms, Yenshan County, Chihli, China (1922)

Farm receipts.	
Crop sales	$ 81.50
Animal products sold	4.06
Other cash receipts	2.12
Products from the farm used by the family	70.15
Increase of capital	9.97
Total	$167.80
Farm expenses.	
Hired labor (including board)	$ 5.34
Value of family labor (unpaid)	19.14
Cash expenditures (other than hired labor)	41.19
Decrease of capital	1.47
Total	$ 67.14
Farm earnings (Farm receipts minus farm expenses)	$100.66
Interest on capital ($762.38 at 8 per cent)	$ 60.99
Labor earnings (Farm earnings minus interest on capital)	$ 39.67
Labor income (Labor earnings minus value of farm products used by the family)	$-30.48
Income from other than farm sources	$ 15.33
Family income (Crop sales plus animal products sold plus other cash receipts plus income from other than farm sources)—(cost of hired labor plus other cash expenditures)	$ 56.48
Family earnings (Farm receipts plus income from other sources minus all farm expenses except value of family labor)	$135.13
Per cent return on capital invested (Farm earnings minus value of operator's labor divided by average capital)	9.8

TABLE 33. VARIATION IN LABOR EARNINGS.

150 Farms, Yenshan County, Chihli, China (1922)

Labor earnings	Number of farm	Per cent of farms
$ 300 — 399	1	
200 — 299	...	...
100 — 199	12	8.0
0 — 99	123	82.0
0 — -99	11	7.3
-100 — -199	2	1.3
-200 — -299	1	.7
Total	150	100.0

The good yield of wheat, the normal land values and the cheapness of labor are the three chief factors in giving a fair return, 9.8 per cent, on the capital investment.

Table 34 gives a statistical summary of the more important factors which may be used for comparison with other regions.

The three factors, crop mow, man-work units per man and crop index determine 34 per cent of the labor earnings (table IV, appendix)[1]. The efficiency with which man labor operates was apparently the most important factor included, the per cent determination was 22; and for crop mow it was 10.

The multiple correlation between labor earnings, and crop mow, man-work units per man and crop index is

$$R_{1.246} = 0.578$$

and shows that the three factors measure 34 per cent of all the factors effecting labor earnings.

We may summarize the year's farm business by the statement that it gave returns to the operator a little better than if he had hired out as a farm laborer. In addition, however, the farmer had the satisfaction that comes from independence in the complete ownership of one's own business.

[1] Wright, Sewell. Corn and Hog Correlations. U. S. Department of Agriculture, Department Bulletin 1,300, P. 37, January, 1925.

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TABLE 34. SUMMARY OF IMPORTANT FARM ORGANIZATION FACTORS.

150 Farms, Yenshan County, Chihli, China (1922)

Factors		
Size of business.		
1. Man-work units per farm	141.2	
2. Animal-work units per farm (all farms)	39.2	
3. Crop area (mow) per farm	22.8	(4.6 acres)
4. Crop mow per farm	34.9	(7.0 crop acres)
5. Per cent of crop area double-cropped	53.0	
6. Man equivalent per farm	1.52	
7. Capital per farm	$762.38	($412.57 gold)
8. Animal units per farm (all farms)	0.72	
9. Man-work units per crop mow	4.05	(20.0 per crop acre)
10. Animal-work units per crop mow	1.1	(5.5 per crop acre)
Type and balance of business.		
11. Per cent of crop mow devoted to cash crops (wheat)	38.4	
12. Per cent of capital in:—		
(a) Real estate	86.6	
(b) Livestock	4.6	
(c) Equipment and supplies	8.8	
13. Crop mow per animal unit (including labor animals)	48.7	(9.7 crop acres)
14. Crop area per animal unit (including labor animals)	31.8	(6.36 crop area acres)
15. Manure per crop mow (in tons)	0.165	(0.827 per crop acre)
16. Value of fertilizer purchased per crop mow	$0.29	($0.79 gold, per crop acre)
17. Labor distribution (good, fair, poor)	Poor	
Labor efficiency.		
18. Productive man-work units per man	92.6	
19. Crop mow per man	22.9	(4.58 crop acres)
20. Crop area per man	15.0	(2.99 crop area acres)
21. Animal-work units per labor animal unit	61.9	
22. Crop mow per labor animal unit	48.8	(9.76 crop acres)
23. Labor returns per man equivalent	$42.38	($22.93 gold)
24. Labor returns per man-work unit	$ 0.45	($0.24 gold)
25. Per cent of total man labor expenses to all farm expenses (exclusive of operator's labor)	36.5	
26. Labor cost per crop mow	$1.44	($3.90 gold)
Capital efficiency.		
27. Value of farm area per mow	$18.08	($9.78 gold per acre)
28. Value of buildings per farm	$184.87	($100.04 gold)
29. Per cent of capital in buildings	24.2	
30. Per cent of capital in land and trees	62.4	
31. Value of farm tools and equipment per crop mow	$0.51	($1.38 gold per crop acre)
Rate of taxation per mow of farm area	$0.09	($0.25 gold per acre)
Profits.		
32. Labor earnings	$39.67	($21.47 gold)
33. Labor income	$–30.48	($–16.49 gold)
34. Family income	$56.48	($30.56 gold)
35. Family earnings	$135.13	($73.13 gold)

THE FARM FAMILY AND POPULATION

THE FARM FAMILY

Any study of farm management problems should include consideration of the human element. This is especially true in China, where there is even a greater inter-dependence of social and economic forces than in a country like the United States. Such relationships are revealed in the next pages, particularly where it is shown how the size of farm determines the size of the family. As has so often been said, farming is a home business, but too frequently this relationship has not been appraised in farm management surveys.

Nativity of the operator and his family

Information on the nativity of the farmer and his family was obtained from the majority of the families surveyed. Of a total of 129 operators 125, or 97 per cent, were born in the same village in which they are now living.

Of a total of 117 operators' fathers 110, or 94 per cent, were born in the village in which the operator himself is now living. All but one of these fathers were farmers, the one being an army officer.

Of 120 operators' wives 8, or 6.6 per cent, were born in the same village as that of the operator. The other 112 wives were born in 73 different villages, and three were born in three other counties than Yenshan. Eight were born in the county seat of Yenshan. Nearly all of the fathers of these operators' wives were born in the same villages as their daughters. All but two of the fathers-in-law of the operators were farmers by occupation. One was a teacher and the other a laborer.

The information on nativity is significant in that the occupation of farming is handed down from one generation to the next. Not a single tradesman is represented in these two generations of farmer ancestors. Another important fact is the wide range of villages between which intermarriage occurs. There is little evidence here of intermarriage among blood relations.

Composition and size of the farm family

The composition of the "greater" family, as it is sometimes spoken of in China, is made clear in table 35. A large number of operators have their mothers living in the household. This does not represent a move on the part of the mother after the death of the operators' fathers, as a rule, because it is the custom when sons marry to bring their brides to their old homes rather than to start new homes. This is clearly seen

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from the fact that 27 per cent of the families have sons' wives living in the household. The number of daughters in proportion to sons is naturally less because the daughters leave home when they marry.

The average size of this "greater" family was 5.35 persons, and is smaller than one would expect. The variability of the size of family is considerable (U=54.39±2.66).

TABLE 35. COMPOSITION OF THE FARM HOUSEHOLD.

150 Farms, Yenshan County, Chihli, China (1922)

Head of the family:	Families having the specified members	
	Number	Per cent
Male head	148	98.7
Female head	2	1.3
Other members in relationship to the male head or to deceased husband of female head:		
1. Wife	119	79.3
2. Son	106	70.7
3. Daughter	67	44.7
4. Mother	44	29 3
5. Son's wife	40	26.7
6. Grandson	26	17.3
7. Granddaughter	23	15 3
8. Brother's wife	18	12.7
9. Brother	17	11 3
10. Father	13	8 7
11. Brother's son	7	5.3
12. Brother's daughter	7	4.7
13. Sister	4	2.7
14. Grandmother	3	2.0
15. Grandson's wife	2	1.3
16. Great grandson	1	.7

Size of farm, size of family and profits

Farms, when grouped by size (table 36) show a significant increase in size of family as the size of farm increases (r=0.735±0.025). Families of eight persons and over had five times as much land as those of three persons and under. Crop mow per adult-male unit, which is another way of expressing this relationship, indicates that the largest farms have twice the crop mow area per adult-male unit of the smallest farms.[1]

With the dividing and re-dividing of the land by inheritance, generation after generation, some of the farms have become so small that only small-

[1] So great a difference is caused by the three unusually large farms in the largest sized group and which did not have proportionately larger families.

sized families can obtain a living. This has been one of the chief factors in breaking up the patriarchal family and thus bringing about the close relationship between size of farm and size of family.

The decrease in size of farm area of 14.5 per cent for all farms, which averaged 4.1 mow, was caused by the division among brothers of inherited land (table 37). This decrease was greatest, 53 per cent, for the smallest sized farms, whereas the farms in the largest sized group had a 5.6 per cent increase in size.

The actual increase in size of farm for each additional member of the family is 5.01 crop mow (3.27 mow of crop area), and this relationship is caused by the necessity of regulating the size of the patriarchal family to the size of farm (figure 24). Land in Yenshan County is limited; families can break up and move elsewhere; privation causes premature deaths; and all of this makes possible the adjustment between size of farm and size of family. No evidence was found of conscious birth control.

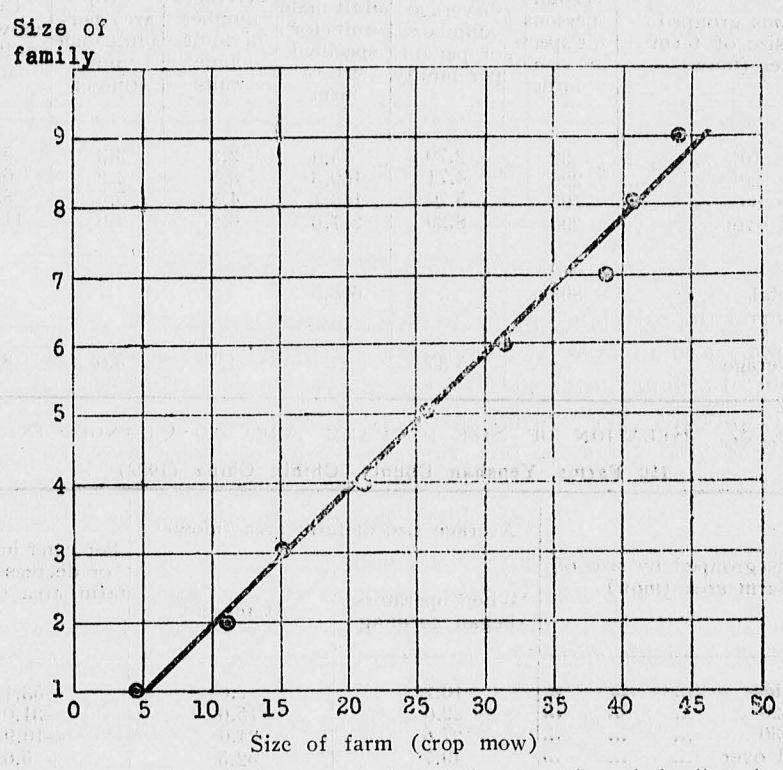

FIGURE 24. The relation of size of farm to size of family. An increase of 5.01 crop mow (3.27 mow of crop area) occurs for each additional member of the family. 150 farms, Yenshan County, Chihli, China (1922).

There is only a slight relationship between size of family and labor earnings per farm ($r=0.128\pm0.054$). Family earnings (table 38) is a better measure than labor earnings when considering family well being, because all income, including income from other than farm sources, is considered. Family earnings are a little over three times as great for the large farms as for the small farms. The correlation between size of family and family earnings is $+0.644\pm0.032$. This relationship may also be expressed in average family earnings per adult-male unit, the largest farms show only slightly higher earnings as compared with the smallest (table 38). Family earnings are not wholly dependent on so many variable factors as labor earnings and consequently have a lower variability ($C=72.92\pm4.08$).

TABLE 36. RELATION OF SIZE OF FARM TO SIZE OF FAMILY.

150 Farms, Yenshan County, Chihli, China (1922)

Farms grouped by size of farm area (mow)	Total persons for specified size of farm	Average number of persons per family	Tota adult-male units for specified size of farm	Average number of adult-male units	Crop area per adult male unit (mow)	Crop mow per adult-male unit
0 — 10	92	2.79	75.0	2.3	3.3	5.4
11 — 20	226	4.71	169.5	3.5	4.2	6.5
21 — 30	195	5.74	146.4	4.3	5.5	8.5
31 and over	290	8.29	217.6	6.2	7.6	11.5
Total	803	...	608.5	...	..	...
Average	...	5.35	...	4.1	5.6	8.6

TABLE 37. RELATION OF SIZE OF FARM AREA TO CHANGES IN SIZE.

150 Farms, Yenshan County, Chihli, China (1922)

Farms grouped by size of farm area (mow)	Average size of farm area (mow)		Per cent increase or decrease of farm area (mow)
	When operators began farming	At present	
10 or less	16.2	7.6	—53.1
11 — 20	22.6	15.6	—31.0
21 — 30	27.6	24.6	—10.9
31 and over	49.7	52.5	+ 5.6
Average	28.6	24.5	—14.3

TABLE 38. RELATION OF SIZE OF FARM TO INCOME FROM OTHER THAN FARM SOURCES, AND TO FAMILY EARNINGS.

150 Farms, Yenshan County, Chihli, China (1922)

Farms grouped by size of farm area (mow)	Average income from other than farm sources					Average family earnings	
	Families having		Amount			Per farm	Per adult-male unit
	Number	Per cent	For farms having	For all farms	Per adult-male unit		
10 or less	14	42.4	$66.50	$28.21	$12.41	$77.70	$34.19
11 — 20	12	25.0	42.00	10.50	2.97	98.96	28.02
21 — 30	4	11.8	84.50	9.94	2.31	133.40	30.98
31 and over	6	17.1	87.83	15.06	2.42	240.61	38.70
Total	36	...	...	...	...	...	...
Average	...	24.0	63.89	15.33	3.78	135.13	33.31

Income from other than farm sources

The close adjustment between size of family and size of farm with the consequent small number of 8.6 crop mow (5.6 mow of crop area) per adult-male unit made it necessary for some of the farm families to increase their income from sources other than the farm. The amount of that income, although small per adult-male unit, and averaging only $3.78, was for the largest farms $1.36 less than the average, but for the smallest farms it was $8.63 greater than the average (table 38).

Thirty-nine per cent of the families on the small farms had income from other than farm sources compared with 17 per cent for the families on large farms (table 39). Twenty-three per cent of all families had such other income and nearly one-half of it was from remittances by absent members. The average amount per family having such income was $64 while the average for the 150 families was $15 (table 40).

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TABLE 39. RELATION OF SIZE OF FARM TO OPERATORS HAVING AN OCCUPATION IN ADDITION TO FARMING, AND TO OPERATORS FARMING ONLY

150 Farms, Yenshan County, Chihli, China (1922)

Size of farm area (mow)	Operators having an occupation in addition to farming		Operators farming only	
	Number	Per cent	Number	Per cent
10 or less	13	39.4	20	60.6
11 — 20	12	25.0	36	75.0
21 — 30	4	11.8	30	88.2
31 and over	6	17.1	29	82.9
Total	35	23.3	115	76.7

TABLE 40. FAMILY NET INCOME FROM SOURCES OTHER THAN THE FARM

150 Farms, Yenshan County, Chihli, China (1922)

Sources of income	Number of families having specified income	Total income	Per cent of total income from each source	Average income per family	
				For those having	For all farms
Remittances by absent members	11	$1,107	48.1	$100.64	$7.38
Interest on loans	4	342	14.9	85.50	2.28
Trading	7	328	14.2	46.86	2.19
Making roof tiles	9	301	13.1	33.44	2.01
Home industry	2	142	6.2	71.00	.95
Labor	4	80	3.5	20.00	.53
Total	36*	2,300	100.0	...	...
Average	...	...	...	63.89	15.33

* This number is not the total of the column because some operators have income from more than one source.

Relationship between character, size of farm and profits

Those farmers who gambled and drank liquor to excess were considered to have bad character. One-fourth of all farmers were in this class. A large part of the gambling was done during the New Year Holiday season. Most farmers who did not gamble were also idle. Sixty-three per cent of all farmers gambled, and thirty-one per cent drank liquor, to a greater or less degree.

The good farmers inherited farms averaging 24.8 mow each, while those farmers classed as bad inherited farms averaging 35.7 mow (table 41). After inheritance, land has been purchased, mortgaged, or sold, thus increasing or decreasing the size of the farm. The average net decrease in size per farm for the 113 good farmers was 2.1 mow, and for the 31 bad farmers the average net decrease was 5.8 mow per farm. Gambling debts amounted to as much as $20 for two of these 31 farmers and as high as $10 for several others. It is probable that such debts as these have been the chief cause of the 176 per cent more rapid decrease in size of farms for the farmers drinking and gambling to excess than for those who did not indulge in these excesses.

It is probable that the men inheriting the larger farms were from richer families than those inheriting small farms. Perhaps wealth had something to do with the formation of bad character, in that idle time gives opportunity for gambling and possession of money makes possible the excess use of liquor.

TABLE 41. RELATION OF CHARACTER TO SIZE OF FARM, VALUE OF LAND AND CROP INDEX

150 Farms, Yenshan County, Chihli, China (1922)

Character	Operators having specified character		Size of farm area (mow)		Average crop mow	Value of farm area per mow	Crop index
	Number	Per cent	Present	Inherited			
Good	113	75.3	22.7	24.8	32.5	$18.92	103*
Bad	37	24.7	29.9	35.7	42.3	19.15	100†
Total ...	150	100	...	...	...	...	...
Average ...	....	...	24.5	27.5	34.9	18.08	102.5

* Probable error of ± 1.395.
† Probable error of ± 2.393.

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Farmers classified as having good character made higher labor earnings and more of them made labor earnings of $50 and over than did farmers having bad character, in spite of the fact that the farms of the latter were 30 per cent larger (table 42). The per cent of operators having good character was ten per cent higher for the smallest farms than for the two largest sized groups of farms. The tendency for operators of bad character to farm inefficiently probably lowers the returns from the larger farms beyond what they would be if all the operators had good character.

The coefficient of association[1] between gambling and labor earnings was —0.212, which indicates that men who gambled had smaller labor earnings. The value of land for the good farmers was slightly below that of the farmers having bad character, while the crop index was three points higher. The real cause for the higher labor earnings of the good farmers lies in the fact that their expenses (including interest on investment) were $0.39 less per crop mow, or, expressing it in another way, the net profits per crop mow (weighted average) were $0.44 higher and the net profits per crop mow (average of averages) were $0.98 higher.[2]

TABLE 42. RELATION OF CHARACTER TO LABOR EARNINGS, FAMILY EARNINGS, AND EXPENSES AND NET PROFITS PER CROP MOW

150 Farms, Yenshan County, Chihli, China (1922)

Character	Average family earnings	Labor earnings per farm	Per cent of operators making labor earnings of $50 and over	Expenses per crop mow*	Net profits per crop mow	
					Weighted average	Average of averages
Good	$136.02	$43.44	35.4	$1.81	$0.53	$0.52†
Bad	132.47	28.19	27.0	2.20	0.09	−0.46‡
Total	...	...	34.0	...	...	...
Average	135.13	39.67	...	1.92	0.40	0.30

* Including interest on capital and value of operator's labor.

† Probable error of ± 0.088.

‡ Probable error of ± 0.354.

[1] Yule, G. U., An Introduction to the Theory of Statistics p. 38, 1922.

[2] This is an excellent example of the great difference sometimes obtained between a weighted average and an average of averages.

We may conclude, then, that the farmers who gambled and drank to excess were men who were not careful "spenders" in their farm business, or, in other words, they were poor managers. Farmers having good character also had over twice the income from other than farm sources of those farmers having bad character (table 43). *Good character in Yenshan County appears to be a greater business asset than bad character plus a large sized farm.*

TABLE 43. RELATION OF CHARACTER TO FAMILY NET INCOME FROM OTHER THAN FARM SOURCES.

150 Farms, Yenshan County, Chihli, China (1922)

Character	Number having other income	Average other income	
		Per farm	Per farm having
Good	28	$17.90	$72.25*
Bad	8	7.49	34.63†
Total	36	...	...
Average	...	$15.33	$63.89

The relation between education of operators and size of farm and profits

One-fifth of all the farm operators had some education, averaging 5.9 years of schooling; all but one had attended the old-type all-year school.

The operators with education made nearly twice the labor earnings of those without education; also a higher percentage made labor earnings of $50 and over (table 44). Another way of expressing this relationship of greater labor earnings for operators with education is by means of the coefficient of association which was +0.292. These greater earnings, however, for those having had some education were caused in part, at least, by the 46 per cent larger size of farms (crop mow). However, if we take the average increase in labor earnings of $0.76 for each crop mow increase (figure 10) we find that labor earnings for farmers with education are increasing faster than this rate, while labor earnings of farmers with no

* Probable error of ± 9.971.

† Probable error of ± 9.692.

education are increasing at nearly this same rate. The difference is hardly great enough to warrant very definite conclusions although the operators with education seem to be getting ahead a little better than those without education, even though a larger percentage of men with education have bad character compared with those with no education.

The crop index between farmers with and without education varied by only one point.

In the township of Ban Wu there are 16 modern primary schools with 157 boy and 20 girl students. There are four old-type schools with 24 boy students. This gives .02 per cent of the total population in school. Even the existing schools are not filled to capacity with students, because many farmers prefer to have their children stay at home and work on the farm.

TABLE 44. RELATION OF EDUCATION TO PROFITS

150 Farms, Yenshan County, Chihli, China (1922)

Operators classified according to education	Operators having the specified education		Total area (mow)		Average size of farm area inherited	Crop Index	Average family earnings per farm	Average labor earnings per farm	Per cen of operators making labor earnings of $50 and over
	Number	Per cent	Farm area	Crop mow					
No education..	119	79.3	22.4	31.9	24.7	103	$119.62	$33.80*	31.1
With education... ..	31	20.7	32.5	46.5	38.0	102	194.74	62.26†	45.2
Total ...	150	100	...	...	...	...	...	...	34.0
Average...	...	...	24.5	34.9	27.5	102.5	135.13	39.67	...

The relation of good character to education is given in table 45. Of the 119 farmers having no education whatever, slightly over three-fourths had good character; while of 31 farmers with some education (an average of 5.9 years) only a little over two-thirds had good character. This tendency of a larger proportion of good character for operators of no education is expressed by the coefficient of association which is +0.237. In general, education is given to children of families who can more easily afford it, and consists largely of the study of the classics. The amount in the case of

* The probable error is ± 2.914.
† The probable error is ± 8.890.

the present operators was extremely small. The data would indicate that education either did not contribute to better character, or was offset by other influences such, perhaps, as the development of bad habits through lack of necessity for the industry required by parents of children who did not go to school. Education and manual work are distinctly separate in China, and this, too, may have had its effect.

TABLE 45. RELATION OF GOOD CHARACTER TO EDUCATION

150 Farms, Yenshan County, Chihli, China (1922)

Education	Operators having the specified education		Operators of the specified education having good character	
	Number	Per cent	Number	Per cent
No education	119	79.3	92	77.3
With education	31	20.7	21	67.7
Total	150	100	113	75.3

Value and distribution by items of products consumed per farm household

Table 46 on the value and distribution by items of products consumed per farm household is obtained by combining the value of products used by the family from the farm (table 48) with the value of items purchased for family consumption (table 49) and adding the value of rent (estimating one-half of the farm buildings as being used for residence and charging a rent of 10 per cent on the capital investment). Three outstanding conclusions may be drawn from this table. First, over two-thirds of the products consumed are furnished by the farm. Second, food constitutes the bulk of expenditures for the four physical necessities of food, shelter, clothing and fuel (largely for cooking). Third, the physical necessities make up 87 per cent of total expenditures, which leaves entirely too small a per cent for a satisfactory living standard to say nothing of the possible inadequacy, from the standpoint of well being, of the necessities so furnished.

A comparison of the Yenshan expenditures is made in table 47 with expenditures for families in Peking and in other countries[1] and indicates for

[1] Kirkpatrick, E. L., "The Standard of Living in a Typical Section of Diversified Farming" Bulletin 423, Agricultural Experiment Station, Cornell University. P. 39.

Yenshan County a higher percentage expended on items other than the bare necessities as compared with the 18th and 19th century budgets in Europe, but a lower percentage when contrasted with 20th century budgets in the United States. The high expenditure for fuel for Yenshan as compared with the other budgets emphasizes the acuteness of the fuel problem; this is true in many parts of China and especially in north China, where agriculture supplies most of the fuel. It is possible that the item of fuel for the Tsing Hua budgets is low because of the practice of gleaning common in that district. The lower expenditure for food at Yenshan as compared with Tsing Hua is partially caused by the gathering of the wild hwang-tsai seed (Artemisia scoparia) for food during the winter months. Such seed has little commercial value and was not, therefore, included in the cost of food. Moreover, expensive food like wheat was used to a very limited extent.

TABLE 46. VALUE AND DISTRIBUTION OF EXPENDITURES PER FARM HOUSEHOLD

150 Farms, Yenshan County, Chihli, China (1922)

Items	Value of specified items			Per cent of total of all items
	Furnished by the farm	Purchased	Total	
Food	$48.75	$13.46	$62.21	54.7
Rent	9.24	...	9.24	8.1
Clothing...	...	6.68	6.68	5.9
Fuel	20.52	...	20.52	18.1
All other expenses	...	...	15.02	13.2
Maintenance of health ...	...	*.40*	*.40*	*.3*
Advancement	...	*10.34*	*10.34*	*9.1*
Personal	...	*3.40*	*3.40*	*3.0*
Unclassified	*.88*	...	*.88*	*.8*
Total	79.39	34.28	113.67	100.00
Per cent furnished by farm and per cent purchased ...	69.8	30.2	...	...

In table 46 the items under "all other expenses" are from table 49 with the exception of "unclassified." Expenditures for maintenance of health were for medicine; for advancement, they included New Year's holidays, social demands, education, and religious practices; for personal, they included liquor, tobacco and gambling losses.

TABLE 47. COMPARISON OF PERCENTAGES OF TOTAL EXPENDITURES USED FOR THE VARIOUS GROUPS OF LIVING COSTS IN DIFFERENT SECTIONS

Item of expenditure	Eden's 73 English budgets, 1796	Engel's Belgian budgets, 1853	Le Play Method, 100 budgets, 1829-1888	U.S. Dept. Labor, 2,562 budgets, 1890-91	U.S. Dept. Labor, 12,096 budgets, 1918-19	Groton, New York 92 budgets, 1919	North Livingston County, New York, 402 budgets, 1920-21	Tsing Hua, Peking (Dittmer) 193 budgets 1916	Yenshan County, Chihli, China 150 budgets (1922)
Food	73	66.9	56.8	41.1	38.2	41.7	39.2	73.9	54.7*
Rent	12	7.6	6.8	15.1	13.4	13.1	12.0	8.2	8.1
Clothing ...	7	14.9	16.5	15.3	16.6	11.3	13.8	6.7	5.9
Fuel and light	5	5.6	4.3	5.9	5.3	6.8	7.4	6.5	18.1*
All other purposes ...	3	5.0	15.6	22.7	26.4	27.1	27.7	4.7	13.2

* See discussion on pages 71 and 72.

Distribution of family living from the farm

The distribution of family living from the farm is given in table 48. Over 90 per cent of the farm families use wheat, yellow soy beans, kaoliang, and corn for food, and kaoliang stalks and corn stalks for fuel; over 70 per cent use millet for food and wheat straw for fuel. Eggs are used by a little over half the farmers.

Only eight farmers raised vegetables for home use; this well illustrates the condition in large sections of North China in respect to the home garden. Usually the growing of vegetables in North China is confined to the truck gardener, the general farmer feeling that he cannot grow them because of lack of experience. However, one of the reasons for not raising more vegetables in Yenshan is because they are not adapted to alkaline soils. To the west of the city the soil is nearly alkali-free, and many vegetables are raised there, largely by truck gardeners. Only one family used sweet potatoes, in spite of the fact that the sweet potato probably gives higher food value in calories per acre than any other crop. Eight families raised the Chinese jujube and also consumed a fairly large quantity in spite of the good price they brought on the market.

With the extreme difficulty of eking out a bare living, it seems strange that more intensive crops, such as vegetables and root crops, are not raised to a greater extent for home consumption. As has been mentioned, one difficulty is the harm from irrigation because of the alkaline condition of the water. However, such crops as sweet potatoes do not need to be irrigated.

The item of salt does not appear as an expense because the farmers make their own salt from the alkali spots.

Experienced farmers state that 30 mow of land will support a family of six, but without opportunity for savings of any kind. The actual number of mow in crop area for the farms studied divided by the total persons gives 4.2 crop area mow per capita, which is 16 per cent smaller than the people themselves feel is necessary. The additional income from other than farm sources makes up the deficit.

TABLE 48. DISTRIBUTION OF FAMILY LIVING FROM THE FARM

150 Farms, Yenshan County, Chihli, China (1922)

Kind of products	Unit of quantity	Per cent of families using the specified product	Amount of product			Value of product			
			Average per family using	Average per family (all families)	Total	Per family using	Per family (all families)	Total	Per cent of total value (all families)
Wheat	Tan	99.3	0.38	0.38	57.00	$ 3.91	$ 3.89	$ 583.11	5.6
Kaoliang	,,	90.7	3.05	2.76	414.60	15.50	14.05	2,107.90	20.0
Stalks* (kaoliang and corn)	Picul	97.3	38.95	37.91	5,687.00	13.65	13.28	1,992.50	18.9
Millet	Tan	72.7	3.21	2.33	350.00	16.96	12.32	1,848.35	17.6
Corn	,,	90.0	1.96	1.76	264.30	11.89	10.70	1,605.20	15.2
Straw (mostly wheat)*	Picul	78.8	20.43	16.07	2,411.00	9.20	7.24	1,085.50	10.3
Yellow soy beans	Tan	96.0	1.05	1.01	151.34	6.33	6.08	912.09	8.7
Home industry	...	5.3	...	...	...	10.00	.53	80.00	.8
Vegetables	Catty	5.3	2,062.50	110.00	16,500.00	9.50	.51	76.00	.7
Eggs	Each	56.0	72.00	40.32	6,048.00	.86	.48	72.15	.7
Trees (for lumber)	...	10.0	...	...	...	3.52	.35	52.80	.5
Green beans (Phaseolus aureus)	Tan	12.7	.31	.04	5.85	2.10	.27	39.85	.4
Dates	,,	5.3	1.56	.08	12.50	4.13	.22	33.00	.3
Black soy beans	,,	2.7	.78	.02	3.10	5.25	.14	21.00	.2
Chickens	Each	24.7	2.35	.58	87.00	.30	.08	11.04	.1
Potatoes, sweet	Catty	.7	200.00	1.33	200.00	2.00	.01	2.00	...
Total	...	...	...	...	...	...	70.15	10,522.49	100

Amount, value and distribution of family cash expenditures

The family cash expenditures are given in table 49. Food constituted slightly over one-third of these cash expenditures, and clothes not quite one-third.

Vegetables constituted 12.8 per cent of the cash expenditures for food. This is significant because the average value of vegetables bought was $4.37 per farm, while the value raised per farm was only $0.51. As has already been mentioned, the farmer would probably find it to his advantage to raise

* Used for fuel.

more of his vegetables. Only 15 out of 150 farmers bought any meat during the year.

TABLE 49. FAMILY CASH EXPENDITURES

150 Farms, Yenshan County, Chihli, China (1922)

Item of expense	Unit of quantity	Per cent of farms having the specified expense	Amount of products			Cost of expenditures		Average per farm having	Average per farm (all farms)
			Total	Per family using	Per family (all families)	Total	Per cent of total		
FOOD									
Undesignated	.....	18.0	.....	.....	.....	$ 844.00	16.4	$31.26	$5.63
Vegetables	.....	93.3	.....	.....	.....	655.50	12.8	4.68	4.37
Kaoliang	Tan	18.0	37.7	1.40	.25	205.10	4.0	7.60	1.37
Yellow soy beans	,,	16.0	17.3	.72	.12	107.60	2.1	4.48	.72
Millet	,,	14.7	19.0	.86	.13	102.30	2.0	4.65	.68
Meat	.....	10.0	.....	.....	.....	46.50	.9	3.10	.31
Corn	Tan	4.0	5.1	.85	.03	30.80	.6	5.13	.21
Green peas	,,	5.3	2.3	.29	.02	9.75	.2	1.22	.07
Potatoes, sweet	Catty	4.0	920.0	153.30	6.10	5.30	.1	.88	.04
Black soy beans	Tan	1.3	.80	.40	.01	5.20	.1	2.60	.03
Dates	,,	1.3	3.00	1.50	.02	2.00	.1	1.00	.01
Barley	,,	.7	.20	.20	.....	1.60	.....	1.60	.01
Salt	.....	.7	.....	.....	.....	1.00	.....	1.00	.01
Total food	.....	.....	.....	.....	.....	$2,016.65	39.3	.....	$13.46
OTHER ITEMS									
Cloth	.....	98.7	.....	.....	.....	$1,001.50	19.5	$6.77	$6.68
New Year's holidays	.....	100.0	.....	.....	.....	580.50	11.3	3.87	3.87
Social demands	.....	96.0	.....	.....	.....	428.50	8.3	2.98	2.86
Education	.....	22.0	.....	.....	.....	289.50	5.6	8.77	1.93
Liquor and tobacco	.....	94.7	.....	.....	.....	278.50	5.4	1.96	1.86
Gambling losses	.....	41.3	.....	.....	.....	231.10	4.5	3.73	1.54
Religious practices	.....	89.3	.....	.....	.....	252.25	4.9	1.88	1.68
Medicine	.....	12.0	.....	.....	.....	60.60	1.2	3.37	.40
Total (other items)	.....	.....	.....	.....	.....	$3,122.45	60.7	.....	$20.82
Total (all expenditures)	.....	.....	.....	.....	.....	5,139.10	100.0	.....	34.28

The farmer's diet

The diet of the farm family varies with the season. The chief grain foods are kaoliang, millet and corn. Wheat is the cash crop and more expensive; little wheat is consumed, therefore, as compared with the total of the other grains. In the spring, in the latter part of the summer and in the autumn, when there is plenty of work, the farmers eat three meals a day. The well-to-do farmer will have corn or millet bread for the noonday meal and white kaoliang bread—a cheaper food—for breakfast and supper. In the early part of the summer, just after the harvesting of wheat, for a period of forty or fifty days nearly all farmers have wheat bread for dinner.

In the winter time when there is no work and farmers more or less hibernate, only two scant meals are eaten, and nearly all farmers take the

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cheapest food possible. The seed of Artemisia scoparia (黃 蒿), a plant that grows wild on the alkali spots, makes up part of the diet, but is unhealthful in that it causes diarrhoea. This food is used in years of famine to a still greater extent, because it frequently produces seed when all other crops fail. The green leaves of this plant are often eaten in the summer time and undoubtedly supply some of the needed vitamines. The investigator has estimated that two tan of the seed and 500 catties of the leaves of Artemisia scoparia are consumed each year per family.

The kind and the estimated proportion of the 547 catties of vegetables consumed per family per year is as follows:

Name of vegetables	Proportion of total amount (per cent)	Total amount consumed (catties)	Number of months during which the specified vegetables were consumed	Amount per family per month for months during which the vegetable was consumed (catties)
Winter radish ...	18	98	12	8.2
Carrots	16	87	7	12.4
Cucumber ...	14	76	5	15.2
Cabbage ...	12	66	6	11.0
Squash	12	66	3	22.0
Onions	10	55	12	4.6
Eggplant ...	8	44	2	22.0
Leek	6	33	12	2.8
Celery	4	22	3	7.3
Total	100	547	...	...

The lunar months of the year during which the various kinds of vegetables are consumed are as follows:

Lunar months	Kinds of vegetables eaten during the specified month							
1	Winter radish,	Onions,	Leeks,	Carrots,	Cabbage			
2	,,	,,	,,	Cabbage				
3	,,	,,	,,	,,				
4	,,	,,	,,	Cucumber,	Artemisia scoparia			
5	,,	,,	,,	,,	,,			
6	,,	,,	,,	,,	,,	Squash		
7	,,	,,	,,	,,	,,	,,	Carrots,	Egg-plant
8	,,	,,	,,	,,	,,	,,	,,	,,
9	,,	,,	,,	Carrots,	Cabbage			
10	,,	,,	,,	,,	,,			
11	,,	,,	,,	,,	,,			
12	,,	,,	,,	,,	,,			

The food energy (calories) furnished by these vegetables have not been included in table 52 because the quantities of each kind have been estimated

and because the chief benefit derived from vegetables is in other ways such, for instance, as in vitamines.

Whether or not the farmer can eke out a living during the year depends on the yield of wheat. There is a saying that "one good harvest of wheat will give a living for three years."

TABLE 50. TOTAL QUANTITY OF FOOD PRODUCTS CONSUMED PER FAMILY[1]

150 Farms, Yenshan County, Chihli, China (1922)

Kind of products	Unit of quantity	Furnished by the farm	Purchased	Total quantity used	Total quantity consumed per family in kilograms (waste eliminated)[2]
Wheat	Tan	0.38	...	0.38	45.9
Kaoliang	Tan	2.72	.25	2.97	344.7
Millet	Tan	2.31	.13	2.44	283.2
Corn	Tan	1.64	.03	1.67	226.1
Yellow soy beans	Tan	.86	.12	.98	135.1
Eggs	Each	40.32	...	40.32	2.4
Green beans ... ... (Phaseolus aureus)	Tan	.03	...	.03	4.1
Dates	Tan	.08	.02	.10	7.3
Chickens	Each	.58	...	.58	.7
Sweet potatoes	Catty	.83	6.1	6.93	4.2
Green peas	Tan	...	.02	.02	2.8
Meat (pork)	Catty	...	1.5	1.5	1.0

About the only way in which the adequacy of the diet can be measured with the data at hand is by the number of calories it furnishes the family in terms of calories per adult-male unit. Such computation has been made by combining in table 50 the food consumed from the products furnished the family by the farm (table 48) with food purchased (table 49). The amounts of each kind of food have been reduced to calories (table 53) by use of the chemical composition given in table 51 and the calories per kilogram for each food given in table 52. The computation has excluded the probable portion of the original weights of the products which constituted waste (such, for instance, as millet hulls).

The degree of adequacy of this diet of the rural population of Yenshan County needs a more detailed study than can be presented with the data at hand. Further information on the vitamine content of food consumed is

[1] The seed and green leaves of Artemisia scoparia, which are gathered from public alkali spots, and 1.5 catties of vegetables per day per family have not been included.

[2] Weights used per bushel in pounds for edible portion are as follows: Wheat, 50; kaoliang, 48; millet, 48; corn, 56; soy beans, 57; dates, 30; vegetables and sweet potatoes, 5 per cent waste.

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particularly important. Calorimeter tests of the seed of Artemisia scoparia are essential. The size of the adult individual should also be known as well as the expenditure of energy. The writer estimates that the farmers should probably be classed as "moving about and at moderate work" which according to Chamberlain[1] for individuals in the Occident require 3,000 calories per day.

The total population of 808 persons (including the 5 hired men) is equivalent to 613.5 adult-males, or 4.1 adult-male units per family. We have, then, a consumption of 2,598 calories per adult-male unit per day, excluding the considerable consumption of the seed and fresh leaves of Artemisia scoparia, and the various vegetables that amounted to 1.5 catties per family per day.

That this number of calories is below rather than above the actual amount produced by the food consumed is verified by local experience, which indicates that an equivalent of 2.5 tan of grain is required per individual per year. Table 50 shows that 1.6 tan of grain per individual per year is actually consumed. Artemisia scoparia seed and leaves, and the value of vegetables in terms of grain make up the difference between 2.5 tan required and the 1.6 tan actually consumed.

Table 53 reveals that these Yenshan farmers obtained approximately 98.7 of their food energy (calories) from grains (mostly from kaoliang, millet, corn and yellow soy beans) and from Artemisia scoparia seed consumed to a considerable extent during the winter months. It is this dependence on a grain diet, as compared with large amounts of meat, that enables farmers in north China to spend so little for their food.

The amount of protein, carbohydrates, and fat furnished per day per male-adult unit by this diet (excluding vegetables and Artemisia scoparia seed and leaves) in comparison with Playfair's standard for a man at moderate work is shown in table 54. The marked deficiency, especially, in fat and protein is undoubtedly partially accounted for by the omission of the seed of Artemisia scoparia from the calculations.

We may conclude, then, that the diet probably furnished sufficient food energy (calories) but that there is a deficiency in vitamines—especially during the winter months when fresh vegetables are not available. From the standpoint of both diet and good farm management a more detailed study of the diet of these farm families would have been invaluable in determining the adequacy of the present diet and the changes that should be made in the kind of crops grown. This is an excellent illustration of the necessity for rather comprehensive studies in a community if one is to make certain of the best possible recommendations for future welfare.

[1] Chamberlain, W. Q., Organic Agricultural Chemistry, Chap. XVII.

TABLE 51. CHEMICAL COMPOSITION OF FOOD PRODUCTS CONSUMED

150 Farm Families, Yenshan County, Chihli, China (1922)

Kind of products	Per cent of protein	Per cent of carbohydrates	Per cent of fat
Wheat[1]	12.1	75.2	1.8
Kaoliang[2]	11.9	64.8	5.0
Millet[4]	8.2	70.6	4.2
Corn[1]	10.7	78.7	5.0
Yellow soy beans[2]	39.2	25.4	17.4
Eggs[1]	12.4	.	10.7
Green beans[3] (Phaseolus aureus)	22.1	58.8	0.8
Dates[6]	1.1	29.3	...
Chickens[5]	21.6	...	2.5
Sweet potatoes[3]	1.8	27.4	0.7
Green peas[4]	4.0	16.0	.5
Meat (pork)[4]	32.6	...	19.7

[1] The Principles of Human Nutrition, W. H. Jordan.
[2] Contributions from the Peking Union Medical College, Volume I, 1921.
[3] Food Products, Henry C. Sherman.
[4] Food and Dietetics, Robert Hutchison.
[5] Chemistry of Food and Nutrition, Henry C. Sherman.
[6] The Chinese Jujube, U.S.D.A., Bul. 1215, April, 1924.

TABLE 52. NUMBER OF CALORIES PRODUCED BY ONE KILOGRAM OF FOOD PRODUCTS CONSUMED[1]

150 Farm Families, Yenshan County, Chihli, China (1922)

Kind of products	Number of calories in one kilogram of products			
	Protein	Carbohydrate	Fat	Total
Wheat	484	3,008	162	3,654
Kaoliang	476	2,592	450	3,518
Millet	328	2,824	378	3,530
Corn	428	3,148	450	4,026
Yellow soy beans	1,568	1,016	1,566	4,150
Eggs	496	...	963	1,459
Green beans (Phaseolus aureus)	884	2,352	72	3,308
Dates	44	1,172	...	1,216
Chickens	864	...	225	1,089
Sweet potatoes	72	1,096	63	1,231
Green peas	160	640	45	845
Meat (pork)	1,304	...	1,773	3,077

[1] Calculations were made by use of the chemical compositions given in table 50 and by use of the following:
One gram carbohydrates, as eaten, yields 98% of 4.1 = 4.0 calories.
One gram fats, as eaten, yields 95% of 9.45 = 9.0 calories.
One gram proteins, as eaten, yields 92% of 4.35 = 4.0 calories.

TABLE 53. AMOUNT OF CALORIES PER FAMILY PER YEAR FOR EACH PRODUCT CONSUMED

150 Farm Families, Yenshan County, Chihli, China (1922)

Kind of products	Protein (calories)	Carbohydrate (calories)	Fat (calories)	Total calories for each crop	Per cent of total calories
Wheat	22,215	138,067	7,436	167,718	4.3
Kaoliang	164,077	893,462	155,115	1,212,654	31.2
Millet	92,890	799,757	107,050	999,697	25.7
Corn	96,771	711,763	101,745	910,279	23.4
Yellow soy beans ...	211,837	137,262	211,567	560,666	14.4
Eggs	1,190	...	2,311	3,501	.1
Green beans (Phaseolus aureus)	3,624	9,643	295	13,562	.4
Dates	321	8,556	...	8,877	.2
Chicken	605	...	158	763	...
Sweet potatoes ...	302	4,603	265	5,170	.1
Green peas	448	1,792	126	2,366	.1
Meat (pork)	1,304	...	1,773	3,077	.1
Total	595,584	2,704,905	587,841	3,888,330	100

Calories consumed by one adult-male unit per day = 2598 calories.

TABLE 54. AMOUNT OF PROTEIN, CARBOHYDRATES AND FAT FURNISHED PER DAY PER MALE-ADULT UNIT FOR 150 FARM FAMILIES YENSHAN COUNTY, CHIHLI (1922) COMPARED WITH PLAYFAIR'S STANDARD (ENGLAND)[1]

Food constituent	Number of grams		Percentage less than Playfair standard
	Yenshan	Playfair	
Protein	99	119	16.8
Fat	44	56	21.4
Carbohydrates	452	531	14.9

[1] This table omits the consumption of Artemisia scoparia seed and leaves, and the 1.5 catties of vegetables per family per day.

POPULATION

Density of population

Data from records of the township of Ban Wu, in which the villages surveyed were located, give the total number of families as 1,314, the population as 7,907 persons, and the mow of land as 25,527. These data give an average size of family of 6.02 persons and a density of population of 992 per square mile of farm area.

The density of population of the 150 farms surveyed is 751 persons per square mile of crop area.

History of the population

There is no earlier history of the population of the region than the second year of Yung Loh (永樂), the third king of the Ming dynasty, for the reason that everyone was killed in the war between Yen Wang (燕王) and Yuen Shun Ti (元順帝), the last king of the Yuen dynasty. This was in 1405 A. D. After this annihilation, immigration to the region occurred from the provinces of Shansi, Shantung and from the section of the country north of Peking. Evidences of this war can still be seen about the old site of the city of Kiuchow. The present population is 99 per cent native to the region. The other one per cent is soldiers who have come from the South to make their homes here.

About fifty years ago people seldom married before the age of 23 or 24, but now most people marry earlier. The actual age at which the operators and their wives included in this study married, was 18 and 17 respectively. This change is due largely to two things: (1) parents are anxious for grandchildren as early as possible; (2) parents who are poor are anxious to rid themselves of the support of their daughters as early as possible.

There are several evidences of a considerable increase in population. Local residents say that 60 years ago the village of Wu Chuang had a population of 200, whereas now there are 448 persons, besides the 70 men who are working in other places. Since that time no other families have migrated into the village. There is evidently considerable natural increase in the population of the region. The decrease of 14.3 per cent in the size of farms is another evidence of the increase in population, page 86.

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Emigration

The increasing density of population has also caused emigration from the region to Manchuria and Tientsin. This migration first began in the year 1899, because of the opportunities for work in connection with the building of the Manchurian railway by the Russians. A large amount of migration began again in 1919 and is continuing with the development of Manchuria.

This migration is of three types. The least frequent is where the whole family leaves its native country permanently. This occurs only in case of extreme necessity. A second type is that of the individual, almost always the young man, who is obliged to seek work for his living and to assist in the support of his family. Some of these individuals return to their homes at least once a year, usually at the New Year season, while others may not return for several years. The third kind is that of the individual who leaves for short periods when there is no work to do at home. This is most common after the harvests are over, migration beginning then to Tientsin or some nearby place. The chief occupation of these temporary migrants is making brick and roof tiles. These people return to the village in time for spring work on the farm. The occupations of these last two types for the farms surveyed are indicated in table 40.

A news item of this migration to Manchuria appeared in the North-China Herald for April 12, 1924. Part of the report is as follows:

"As is generally known, immediately after the Chinese New Year holidays there is a great exodus of coolies from their homes in Shantung and Chihli to the Manchurian provinces, where labor is plentiful and wages good. Special cheap excursion trains are run by the Peking-Mukden line for the benefit of these emigrants, and these are patronized by hordes of coolies, in some cases accompanied by their families."

This emigration to other regions is of significant proportions. Seventy men from the Wu village, or 13.5 per cent of the population of the village, have migrated, mostly to Manchuria. In the whole township of Ban Wu, 130 families, or 9 per cent of the total population, have gone either to Manchuria or Tientsin, in addition to the individual men, the number of which is unknown.

In table 55 the present occupations of the 49 persons who have migrated from the farms surveyed, are indicated. Over half became laborers. Forty-nine per cent are sons and 29 per cent are brothers of the operators of the farms included in this study.

TABLE 55. NUMBER, OCCUPATION AND RELATIONSHIP OF ABSENT MEMBERS OF THE FARM FAMILY

150 Farms, Yenshan County, Chihli, China (1922)

Kind of occupation	Families having the specified occupation		Number and relationship to the operator of absent members						
	Number	Per cent	Father	Mother	Brother	Brother's wife	Son	Grandson	Son's wife
Soldiers	7	14.3	..	...	1	...	6	...	...
Laborers	28	57.2	...	...	10	...	13	5	...
Officers	2	4.1	1	...	1	...	...	...	...
Trading	5	10.2	...	...	1	...	3	...	1
Maid-servant	1	2.0	...	1	...	...	...	...	...
Prisoners	2	4.1	...	...	...	...	2	...	...
Doctor	1	2.0	...	...	1	...	...	...	...
Nurse ...	1	2.0	...	...	...	...	...	1	...
Unknown	2	4.1	...	...	...	2	...	...	...
Total	49	100.0	1	1	14	2	24	6	1
Per cent of total absent members	...	...	2.0	2.0	28.6	4.1	48.9	12.3	2.0

The total number of persons in the 150 farm households studied was 803, excluding the immediate members of the family not living at home but who send a part of their earnings to the family. The "economic family" is often larger than the household. Absent members have not been included in statements on size of family, or in density of population. The family earnings do, however, include the $7.38 per family sent by absent members.

Age and sex distribution of the population

The distribution of population according to sex and age for the farm household (table 56) and for the absent members of the "economic family" (table 57) must be used with caution, for 803 persons is rather a small sample of the total population of the county. However, it does seem to reveal a situation worth recording not only for this particular study but for comparison with other population groups. There are at least three outstanding facts to be explained in connection with these two tables. Young men between the ages of 14 and 39, with the exception of the group 30-34, are fewer in number than females, as is shown by the markedly low ratio of males to females. This is caused by the emigration to Manchuria already mentioned and this is verified partially, at least, by the age distribution of

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Table 56. Age and Sex Distribution by Five Year Groups

150 Farms, Yenshan County, Chihli, China (1922)

Age groups	Both sexes		Number of each sex		Ratio of male to 100 females by five year age groups
	Number	Per cent	Male	Female	
0 — 4	79	9.8	40	39	102.6
5 — 9	109	13.6	56	59	105.8
10 — 14	97	12.1	47	50	94.0
15 — 19	78	9.7	34	44	77.3
20 — 24	50	6.2	24	26	92.3
25 — 29	61	7.6	20	41	48.8
30 — 34	63	7.8	40	23	172.6
35 — 39	70	8.7	32	38	84.2
40 — 44	46	5.7	25	21	119.0
45 — 49	32	4.0	17	15	113.3
50 — 54	28	3.5	16	12	133.3
55 — 59	30	3.8	14	16	87.5
60 — 64	19	2.4	8	11	72.7
65 — 69	23	2.9	11	12	91.7
70 — 74	8	1.0	3	5	60.0*
75 — 79	4	.5	2	2	100.0*
80 — 84	5	.6	1	4	25.0*
85 — 89	1	.1	...	1	...
Total	803	100	390	413	94.4

absent members of the family (table 57). The high ratio of males to females for the ages 30-54 (excepting the group 35-39) is caused largely by the suicides of women who have quarrels with their husbands or other members of the family, and probably also because of deaths of women in child birth. The other important factor is the low ratio of males to females during the old age period which coincides with other population studies made in China[1] and other countries.

* The number of each sex represented is so small that these numbers probably do not represent conditions for the total population of the region.

[1] Taylor, J. B. and Malone, C. B., A Study of Chinese Rural Economy, China International Famine Relief Commission, Peking.

Table 57. Age and Sex Distribution for Absent Members

150 Farm families, Yenshan County, Chihli, China (1922)

Age group	Number for both sexes	
	Male	Female
10 — 14	2	...
15 — 19	12	...
20 — 24	8	...
25 — 29	6	3
30 — 34	6	...
35 — 39	10	...
45 — 49	1	1
Total	45	4

Table 58. Age and Sex Distribution for Farm Household Population Under 5 Years of Age by Single Years

150 Farm households, Yenshan County, Chihli, China (1922)

Ages	Both Sexes		Number of each sex	
	Number	Per cent of total population	Male	Female
0 — 1	9	1.12	5	4
1	16	1.99	9	7
2	18	2.24	8	10
3	33	4.10	18	15
4	3	.37	0	3
Total under 5 years..	79	9.84	40	39

The number, age and sex of children under five years of age are given in table 58. The number of children under three years of age is small and is probably caused by some of the informants failing to report babies. The important point is, however, the almost total absence of children for the four year age. This is caused by death or possibly sale of babies during the famine year of 1920-21. This is a good example of how conditions of a given year will effect age distribution throughout a whole generation.

2000 3424 0508

Comparison with other population types

The comparison of the age distribution of population with the population of Sweden, so often used as a standard of a stationary population, indicates clearly the non-enumeration of babies for Yenshan (table 59).

TABLE 59. A COMPARISON OF THE POPULATION ON 150 FARMS, YENSHAN COUNTY, CHIHLI (1922) WITH THE STANDARD AGE DISTRIBUTION OF SWEDEN

Age group (years)	Yenshan population		Sweden population Per cent
	Number	Per cent	
0 — 1	9	1.12	2.55
1 — 19	354	44.08	39.80
20 — 39	244	30.39	26.96
40 — 59	136	16.94	19.23
60 —	60	7.47	11.46
Total	803	100.00	100.00

The Yenshan population included in this study may be classified as approaching the definitely progressive type (table 60) which bears out all the other indications of an increasing rather than a stationary population. The birth and death rates were not obtained for this population group, but have been obtained in a later study of 133 farm families about seven miles distant. For this latter study the birth rate was 58.4 per 1,000 and the death rate 37.1 per 1,000 in a total of 687 persons. This was a 2.13 per cent yearly increase in the population. This population increase is associated with an intensity of production that is remaining nearly stationary, and is the chief reason for emigration.

TABLE 60. THE TYPE OF POPULATION ON 150 FARMS, YENSHAN COUNTY, CHIHLI (1922) COMPARED WITH POPULATION TYPES[1]

Age group (years)	Per cent of population in population types			Yenshan population	
	Progressive type	Stationary type	Regressive type	Number	Per cent
0 — 14	40	33	20	285	35.49
15 — 49	50	50	50	400	49.81
50 —	10	17	30	118	14.70
Total	100	100	100	803	100.00

[1] Whipple, G. C., Vital Statistics, p. 189.

Solutions of the population problem

As in other large sections of China proper, overpopulation is one of the outstanding agricultural and social problems of Yenshan County. The problem is difficult, but the following possible solutions are suggested:

Temporary solutions: 1. Greater production by

a. Growing more intensive crops to supply a larger amount of food per acre.

b. Increasing the yields of present crops by plant improvement and by better cultural methods. Some of this increase could be obtained without additional expense simply by using what is now idle time of the family. Better cultivation, drainage and control of alkali all come within this sphere. The use of more fertilizers would undoubtedly increase yields; the only question is whether or not it would be profitable. Even if profitable, there would probably be another problem of furnishing credit to the farmer for purchasing such fertilizer.

2. Emigration to the more sparsely settled portions of the country, such as Manchuria.

3. Development of home or city industries to absorb some of the surplus population.

4. Supplementing the farm work with other kinds of work to a greater extent than is now being done, such as work in the city during the winter months.

Permanent solutions: 1. Limiting the growth of population to the food supply by:

a. Increasing the number of years in school, thus postponing the marriage age.

b. Education, which will create new desires and wants.

c. Eradication of the harmful aspects of ancestral worship, which makes the bringing of sons into the world the chief ambition of parents.

d. Conscious limitation of offspring.

The temporary solutions are only temporary, because we see in these villages in Yenshan County the working of Malthus's population theory under our very eyes. The population has kept increasing until the region, with present methods of production, cannot support the increasing population, and often in times of crop failures from flood or drought does not even support the existing population. In other words, the population has increased beyond the food supply. Any measures to increase production

without any attempt to check population growth are of only temporary benefit. The present generation may enjoy the fruits of such increased production and multiply their kind, but the succeeding generation, or generations, will again have to face the menace of over-population. One may conclude, then, that in any work of improvement for the country, such as in agriculture, in industry, or in transportation, its effect in favoring the increase of population soon offsets its benefits, unless there are corresponding checks on population growth.

OTHER SOCIAL AND ECONOMIC FACTORS

RECREATION

There are two kinds of amusement, home and public. The number of times these were indulged in is shown in table 61. Information was obtained for only one kind of home amusement. Each time represents a minimum of half a day, the usual maximum being a full day, although in such cases as attending the theater or fair, it might be two days. Almost everyone attended the theater during the year, and over half the farmers gambled in some public place. Most of the drinking and gambling takes place during the New Year Holiday season. The gambling is with small amounts and quite largely for the game's sake. The time of those watching the gambling has also been included.

Another form of recreation and social intercourse is the "yao hwei," known in the district as the "ching hwei," a kind of loan association.

"Fairs" are also another and most common source of public amusement and recreation (page 89).

TABLE 61. KINDS OF AMUSEMENTS[1]

150 Farms, Yenshan County, Chihli, China (1922)

Kind of amusement	Number of operators indulging	Percentage of operators indulging	Average number of times operators attend per year
Home			
Gambling	10	6.7	14.9
Public			
Theatre	140	93.3	5.8
Gambling	87	58.0	29.8
Side show	43	28.7	14.0
Fair	11	8.7	5.0
Drinking	45	30.0	12.1

[1] Another form of home recreation not listed in the table is that of playing checkers.

FAIRS

The term fair, as used here, is from the Chinese word "hwei," which refers to any gathering of people, small or large, and for any purpose, religious, recreation or marketing. Most of the "hwei" where large crowds of people come together include recreational features and often are attended for that purpose alone; whereas the name of the fair would indicate it to be of a religious, or marketing nature.

In the county of Yenshan there are two of these "hwei," or annual markets, the summer fair occurring just before the kaoliang harvest in late August, and the winter fair occurring in the middle or late eleventh moon (December). These large fairs are held at the county seat, Yenshan city, and smaller ones are held in the outlying districts, too far to be of easy access to the county seat center. The large fairs last for a period of 10 days. In many other sections of China these annual market days occur in April or May, before the wheat harvest.

At the summer fair the farmer can purchase anything in the nature of farm equipment, house furniture, clothes (new and old), vegetables and other food products. There are a number of recreational features at these fairs, which add greatly to their popularity and which are bright spots in the monotony of farm life.

A second type of fair is the religious or "temple fair." Farmers attending this spend a large portion of their time at the theatricals that form a prominent part of the fair.

MARKETING

Of the total quantity of products sold, over three-fourths are marketed immediately after harvest, the remainder being disposed of in small quantities through the year as the farmers need the money (table 62). Wheat is the chief crop exported to other regions, with corn and kaoliang next. Crops are sold largely on market days, which occur every five days at the market villages and every other day at the city of Yenshan.

Yenshan is about 30 miles from its railroad station, Tsangchow, and is reached by mule cart over unimproved earth roads. The grain is shipped by rail from Tsangchow for the most part to Tientsin about 75 miles distant. Country buyers purchase the grain from the farmers and in turn sell it to outside agents who ship from Yenshan to Tsangchow and Tientsin. Local speculators purchase wheat especially immediately after harvest when the famers sell over four-fifths of this crop and when prices are lowest, and hold until prices are higher in the winter and spring. The seasonal variation in

the price of wheat is greater in China than in the United States and this makes speculation additionally tempting. Whether or not the farmers would receive larger returns by holding crops requires further study.

TABLE 62. PROPORTION OF TOTAL CROPS SOLD THAT ARE MARKETED IMMEDIATELY AFTER HARVEST

150 Farms, Yenshan County, Chihli, China (1922)

Kinds of Crops	Per cent
Corn	100.0
Wheat	87.5
Green beans	87.5
Kaoliang	80.3
Millet	75.7
Soy beans	71.7
Chinese jujube	65.4

CREDIT

Money is chiefly borrowed for funerals and weddings and is obtained by selling land, by mortgaging land, or by borrowing in other ways. There are two methods of borrowing money in other ways: (1) from shops at 30 per cent interest for ten months; (2) from the "ching hwei" known in this district as the "yao hwei," a kind of mutual loan association. A farmer in need of money invites his neighbors and friends to his house and asks them to join this organization for the purpose of loaning him some money. Good food and wine are prepared by the farmer, so that it becomes a social as well as a business meeting or gathering. Friends and neighbors when asked to participate cannot very well refuse. If there are ten people who join, there will be ten meetings of the group. Each member loans the same amount each time and each has his turn to receive the total amount originally borrowed by the initiator of the loan society.[1]

COOPERATION

There is a great deal of cooperation among the farmers in various ways. A Chinese proverb well illustrates this: "There is no time when one must not ask help." (沒有不求人的時候).

[1] See co-operative loan societies, chap. 14, Village Life in China, by Dr. Arthur H. Smith, for a full description of this type of loan association, of which there are many kinds.

In times of distress farmers go to help a neighbor even without request. Labor animals and farm implements may be borrowed free of charge. In some cases the richer farmers are specially willing to help the poor farmers by lending animals or implements to them; otherwise they fear that the poor farmers might burn their houses or destroy their crops. Labor is exchanged in planting season and in transporting crops from the field to the farmstead. The number and percentage of farmers borrowing and loaning labor and equipment, and the number of times borrowed or loaned are shown in table 63. One-half of the farmers borrowed and loaned donkeys, drills, plows, and farm carts.

TABLE 63. EXCHANGE OF LABOR AND EQUIPMENT

150 Farms, Yenshan County, Chihli, China (1922)

	Farmers exchanging		Total number of times		Average number of times	
	Number	Per cent	Borrowed	Loaned	Borrowed	Loaned
Equipment						
Drill	109	72.7	...	...	...	...
Plow	98	65.3	...	...	...	...
Farm cart	82	54.7	...	...	...	...
Harrow	32	21.3	...	...	...	...
Hoe	4	2.7	...	...	...	...
Stone roller	1	.7	...	...	...	...
Total	...	...	572	509	5.1	7.7
Labor Animals						
Donkey	113	75.3	...	...	...	...
Cow	67	44.7	...	...	...	...
Horse	3	2	...	...	...	...
Total	...	...	669	849	6.4	12.0
Labor	1	.7	10	8	10	8

PRICES

Prices of the commodities of a region or country over a long period of time, are an excellent barometer of economic and social conditions. The

index numbers of producers' prices (in copper) of eight commodities at Yenshan are given in table 64. The data were secured for single years by ten-year periods. Prices increased during the sixty-one year period 1864-1914, 186 per cent as compared with the much more rapid rise of 180 per cent in the short period 1914-1923.

The year 1920 was a famine year. The prices of a food product like wheat, and a non-food product like the farm cart reacted differently to economic conditions in a famine year. In 1920 the price of wheat rose to 225 per cent of 1914, whereas the price of a farm cart fell to but 53 per cent of the value in 1914. The index numbers indicate the marked decrease in the price of farm implements as compared with the marked increase in the price of grain during a famine year.

TABLE 64. INDEX NUMBERS OF PRICES (IN COPPER) OF EIGHT COMMODITIES AND OF THE EXCHANGE RATE BETWEEN COPPER AND SILVER AT YENSHAN, CHIHLI PROVINCE, CHINA.

1914=100.

Commodity	1864	1874	1884	1894	1904	1914	1919	1920	1921	1922	1923
Farm cart	27	33	47	53	67	100	120	53	167	233	267
Plow	37	37	50	63	75	100	125	63	188	225	250
Harrow	40	40	50	60	70	100	120	60	160	200	250
Corn	25	27	33	40	73	100	140	220	180	200	207
Kaoliang	23	25	31	41	75	100	156	218	175	188	200
Wheat	25	33	35	45	85	100	165	225	160	200	255
Soy beans	33	33	42	50	92	100	183	283	217	283	308
Farm Wages ...	70	75	80	90	100	100	150	150	250	350	500
Index	35	38	46	55	80	100	145	159	187	235	280
Exchange between silver and copper ...	...	...	...	59	74	100	100	104	119	141	152

The usual effects of famine on prices may be listed as follows:

1. Food products and often fuel (especially stalks and straw) increase greatly in price.

2. Non-food products remain the same in price or else decline.

a. Farm implements are sold to secure money with which to purchase food.

b. Lumber (and often wood for fuel) decreases in value because of the tremendous flooding of the market with supplies from the village trees, which are frequently used as a reserve for times of famine.

Timber from dwellings and furniture are often placed on the market during a famine period. Clothing is also sold.

c. Labor animals are placed on the market in large numbers, first because money is needed with which to buy food and second because the animals are consumers of food and fuel products.

d. Land values decrease because large numbers of farmers sell property to obtain money with which to purchase food.

e. Even human beings are sold, especially women and children, because the demand for food is so great.

3. The rich become richer and the poor poorer. The rich buy the land, and, of course, reap a handsome profit when conditions return to normal. However, without the rich to buy the land and with no credit facilities, the poor farmer is fortunate if he can find any market for his land. Often a point is reached when there is no market for any non-food product.

The marked advance in prices during the last decade is caused by a number of factors:

1. The exchange rate between silver and copper has advanced 52 per cent over that of 1914. This accounts for part of the rise. The increase in the rate of exchange was general throughout the country and may be ascribed to:

a. Fall in the silver price of copper ingots.

b. Excessive minting of copper coins.

c. Reducing the amount of copper in the coins.

d. In recent years the number of shops issuing paper money has also very greatly increased.

2. Another important factor in the rise in prices at interior points, such as Yenshan, is the recent demand for grains from these producing areas. Until this demand occurred, the prices were comparatively lower in the interior than at the port cities where grain entered domestic or foreign commerce. With the development of railroads and with the increased demand for grain products prices rose to a much higher level in the interior.

The silver index number for 1923 was 184, compared with the index number of 156.4 of 147 commodities, Bureau of Markets, Shanghai.

The price index of 147 commodities at Shanghai, as computed by the Bureau of Markets of the Ministry of Finance, clearly shows how much more slowly the rise has been of late years at the port cities than at interior

points. The indexes for these port cities for the years 1920-24 varied from 141.6 to 159.9 when February 1913 is taken as 100. At Yenshan the index number of prices for 1920-1923 varied from 159 to 280.

GENERAL

All farms were inherited but one.

The average age of the operators at betrothal was 10.7 years and at marriage 18.4 years. Their wives averaged 17 years of age at marriage. The present average age of the operators is 41.8 years. The average age at which these operators became owners was 28.7 years.

The farmers reporting their religion are classified as follows: Buddhists, 133; Catholics, 9; Protestants, 4.

Eight families had feuds, five from gambling and of the three remaining, gossip, quarrels of children and field boundaries were the sources of trouble.

Health. Summers are hot and humid, and winters dry and dusty. The drinking water is very salty and is very unsatisfactory for quenching thirst. The water is taken from wells where the water is about 10 feet below the surface of the ground. Wells are on the same side of the street as the privies and in close proximity. The ground is the receptacle for these privies so water pollution must occur. The farmers are too poor and fuel too scarce and expensive to boil the water, as is done in most other regions for making tea.

SUMMARY AND CONCLUSIONS

A few of the more outstanding results of this study are here formulated but it is impossible to summarize all the facts without too much repetition.

The study included 150 farms and families, and represented a farm area of 3,671 mow (734 acres) with a total investment $114,357 ($61,885 gold) and a density of population of 751 persons per square mile of crop area. Eighty-nine per cent of the support of this population was obtained from these farms and the remainder from work done outside the community.

The family earnings (receipts minus all cash expenses) were $135.13 ($73.13 gold), or $25.24 ($17.71 gold) per capita and $33.31 ($18.03 gold) per adult-male unit. The survey data showed that the actual amount spent for food[1] was $11.63 per capita per year. The remaining $13.61 was for all other wants.

[1] The large quantities of seed and leaves consumed as food, and gathered from Artemisia scoparia, a plant growing wild in the public alkali spots of the region, have not been included in the calculations because there is no commercial value for these products.

This small income reduces most of the farmers and their families to a mere subsistence basis. In fact, the people feed themselves in winter, just as one "roughs" labor animals through the winter by feeding as little and as poor food as possible. In seasons of little or no work only two scant meals a day are eaten, and of food of inferior quality. When there is considerable work to be done, especially in the busier parts of the growing season, three relatively good meals a day are eaten. The food consumed when reduced to a calorie basis showed an energy value of approximately 2,600 calories per day per adult-male unit.

This meager supply of food and the small cash income with which to purchase food and other wants have caused over 10 per cent of the population to migrate to Manchuria and to the port city Tientsin. This migration, together with the deaths indirectly caused by undernourishment, gives a close correlation with the size of the family ($r = +0.735 \pm 0.025$). For each increase of 3.27 mow of crop area there was an increase of one member in the family. The size of the farm regulated the size of the patriarchal family.

There is a vital population problem here even though the density of population per square mile of land in crops is only 751 persons as compared with higher densities in other regions in China. The soils of the region are poor and the climate frequently causes low yields, so that from this standpoint the population density is high. Over-population is the fundamental problem of the region and is being partially solved by migration. However, the permanent solution to the problem is not one of improved production alone, but also one of intelligent and conscious control of population increase.

It is very often taken for granted that the Chinese farmer consumes nearly all of the products that he raises. In this region the value of crops sold was 56 per cent of the total value of all crops raised. As shown by the family expenses, there are many items of expense which must be paid for in cash. Agriculture in China is not as commercial as that of Denmark or the United States, but there is a large amount of agricultural products entering domestic and foreign trade and this is on the increase, chiefly because of better transportation facilities.

With one exception the farmers were all born in the same village in which they are now living. The fathers of these farmers were also born there, thus giving two generations born in the same village. This also held true for the wives and fathers-in-law, the two generations being nearly all born in the same village.

The wives came from a large number of different villages (only eight of which were the same villages as that of the husband) and all but three from within the county of Yenshan.

The average size of farms was 24.5 mow (4.9 acres). These farms were grouped into four sizes, the smallest group of farms averaging 7.6 mow (1.5 acres) per farm and the largest group (omitting the three exceptionally large farms) averaging 39.7 mow (7.9 acres) per farm.

The farms in the largest size group when contrasted with those of the smallest showed that six times as many of the former were making labor earnings over $50 while the actual amount of labor earnings were over twice as much.

The amount of work accomplished per man was twice as much on the largest farms as on the smallest ones. The amount of work accomplished per labor animal on the large farms was also twice as much as on the small farms.

Usually there is less investment per mow in implements and equipment on the large farms than on the small farms because an implement gets more use on the larger farms. This did not hold true for this region, however, because the farmers on the smallest farms depended on borrowing their tools and equipment from the larger farms. Only the farmers on the largest farms can afford to have the expensive farm carts.

The farms in the largest sized group had 13 per cent less capital invested in buildings as compared with the smallest farms, showing that large farms used buildings more economically.

One often hears the argument that the "small well-tilled farm" is the ideal. As one might expect, the small farms had higher gross receipts per mow than did the larger farms. However, this was because the farmers on the smallest farms used their best land for the cash crop wheat. The receipts per mow minus labor costs were a little less than those on the largest farms. The net profits per mow were two-thirds greater for the larger farms. All this leads to the conclusion that the larger farms gave the best returns.

For each additional mow in crop area there was an increase in labor earnings (receipts minus cash expenses, value of family labor and interest on capital) of $1.16. Of the four sized groups of farms studied there was no indication of a point in size of farms being reached where the law of diminishing returns with increase in size began to operate.

The small size of the farm business is best understood through the fact that the farmers work on crops (no animal industry, as such) only 93 days in the year and this was quite largely with hand methods. It takes these farmers four and one half as many days of work to raise an acre of wheat or corn as it does the New York State farmers.

The size of the farm business, then, is the most serious limiting factor in the prosperity of the existing farming population of this region. The business may be made larger by (1) increasing the size of the farm,

(2) by growing more intensive crops, and (3) by better cultural methods in the growing of the present crops.

The farm may be increased in size in proportion to number of persons living on the farm by two methods, emigration and control of the excessive growth of population. The emigration of a part of the population to unsettled portions of the country, or into other occupations, such as industries, would thus give more land to those who remain in the region. While the development of industries will help to take some of the surplus farming population from the country, it is doubtful if it will have much influence in permanently solving the over-population question because of the tendency of the population to increase up to, or even beyond the capacity of the land to support such a population. Such an increase has been seen in this district during the last 50 years, where the population has more than doubled and is so dense that famine years are frequent.

If, with the development of industries, the people still left on the farm become better educated, and regulate the relation between number of children and well being, there may be some hope of a standard of living commensurate with the best development of their social and economic needs.

There are two methods of increasing the size of business, however, which are easier of accomplishment, and these are more intensive crops and the use of better cultural methods in the growing of the present crops. From the rotation standpoint, it is a question whether or not the double cropping can be extended profitably beyond the present proportion of 53 per cent of the crop area.

The region studied is not self-supporting because periodic famine relief is necessary. Such relief, when given outright, can only be temporary at best, and has always a tendency to pauperize. Participation of the government in a conservancy project for this part of Chihli province might possibly relieve the periodic famine situation by eliminating floods which are one of the major risks of the farm business of the region. The best interests of the country demand that the farm family of this region be given an opportunity to labor for its own adequate support. However, there is no one solution to the problem of greater production per capita. Both social and economic factors must be taken into consideration if permanent improvement is to be expected.

APPENDIX

TABLE I. MEANS, STANDARD DEVIATIONS AND COEFFICIENTS OF VARIABILITY OF 15 VARIABLES

150 Farms, Yenshan County, Chihli, China (1922)

	Variables	Means	Standard deviations	Coefficients of variability
X_1,	Labor earnings	39.67±3.02	54.86±2.14	138.29± 11.83
X_2,	Crop mow	34.90±1.65	30.00±1.17	85.96± 5.27
X_3,	Crop area	22.80±1.11	20.24±0.79	88.77± 5.55
X_4,	Man-work units per man	90.50±2.42	44.03±1.72	48.65± 2.30
X_5,	Value of land per mow (farm area)	18.98±0.31	5.70±0.22	30.03± 1.27
X_6,	Crop index*	100.00±1.17	21.07±0.83	21.07± 0.61
X_7,	Size of family	5.35±0.16	2.91±0.11	54.39± 2.66
X_8,	Crop mow per man equivalent	26.00±1.40	25.50±0.99	98.08± 6.53
X_9,	Farm area	24.50±1.28	23.29±0.91	95.06± 6.20
X_{10},	Family earnings	135.13±5.43	98.54±3.84	72.92± 4.08
X_{11},	Man-work units per crop mow	4.05±0.02	0.41±0.02	10.12± 0.43
X_{12},	Net profits per crop mow	0.30±0.11	2.03±0.08	676.67±253.54
X_{13},	Male-adult units	4.10±0.11	2.01±0.08	49.02± 2.32
X_{14},	Cost of man labor	50.51±1.61	29.24±1.14	57.90± 2.91
X_{15},	Index of double cropping*	154.84±0.82	14.66±0.58	9.47± 0.25

*For 147 farms.

TABLE II. GROSS CORRELATION COEFFICIENTS FOR IMPORTANT VARIABLES

150 Farms, Yenshan County, Chihli, China (1922)

(see table I for key to variables)

$r_{12} = +0.441 \pm 0.044$
$r_{13} = +0.433 \pm 0.045$
$r_{14} = +0.532 \pm 0.040$
$r_{15} = -0.055 \pm 0.055$
$r_{16} = +0.128 \pm 0.054$
$r_{17} = +0.128 \pm 0.054$
$r_{23} = +0.977 \pm 0.003$
$r_{24} = +0.641 \pm 0.032$
$r_{25} = -0.139 \pm 0.054$
$r_{26} = -0.151 \pm 0.054$
$r_{27} = +0.735 \pm 0.025$
$r_{29} = +0.989 \pm 0.001$
$r_{2,11} = -0.110 \pm 0.054$
$r_{2,12} = +0.066 \pm 0.055$
$r_{2,13} = +0.728 \pm 0.026$
$r_{2,15} = -0.289 \pm 0.051$
$r_{39} = +0.575 \pm 0.037$
$r_{46} = -0.064 \pm 0.055$
$r_{56} = +0.531 \pm 0.040$
$r_{7,10} = +0.644 \pm 0.032$
$r_{7,14} = +0.706 \pm 0.028$
$r_{8,12} = +0.247 \pm 0.052$
$r_{10,13} = +0.638 \pm 0.033$

TABLE III. PARTIAL CORRELATION COEFFICIENTS OF THE IMPORTANT VARIABLES

150 Farms, Yenshan County, Chihli, China (1922)

(see table I for key to variables)

A. First order:

$r_{12.4} = +0.152 \pm 0.054$
$r_{12.6} = +0.469 \pm 0.043$
$r_{14.2} = +0.363 \pm 0.048$
$r_{14.6} = +0.547 \pm 0.039$
$r_{16.2} = +0.220 \pm 0.052$
$r_{16.4} = +0.199 \pm 0.053$
$r_{24.1} = +0.535 \pm 0.039$
$r_{24.6} = +0.640 \pm 0.033$
$r_{26.1} = -0.233 \pm 0.052$
$r_{26.4} = -0.144 \pm 0.054$
$r_{46.1} = -0.157 \pm 0.054$
$r_{46.2} = +0.043 \pm 0.055$

B. Second order:

$r_{12.46} = +0.186 \pm 0.053$
$r_{14.26} = +0.363 \pm 0.048$
$r_{16.24} = +0.220 \pm 0.052$
$r_{24.16} = +0.519 \pm 0.040$
$r_{26.14} = -0.179 \pm 0.053$
$r_{46.12} = -0.039 \pm 0.055$

TABLE IV. MULTIPLE CORRELATION AND PER CENT DETERMINATION OF LABOR EARNINGS, X_1; BY CROP MOW, X_2; MAN-WORK UNITS PER MAN, X_4; AND CROP INDEX, X_6

150 Farms, Yenshan County, Chihli, China (1922)

r	Correlation coefficient	Path Coefficient	Per cent Determination
r_{12}	+0.441	+0.224	0.0988
r_{14}	+0.532	+0.414	0.2202
r_{16}	+0.128	+0.186	0.0238

The multiple correlation is
$R_{1.246} = 0.578$

TABLE V. NUMBER AND SEX* OF POPULATION BY SINGLE YEAR AGES

150 Farms, Yenshan County, Chihli, China (1922)

Age	0		10		20		30		40		50		60		70		80	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
0	5	4	4	1	4	3	2	1	2	1	5	..	1	2	..	..	1	..
1	9	7	21	18	6	9	16	6	8	7	4	4	2	2	2	2	..	1
2	8	10	7	3	4	1	1	1	3	..	..	1	1	1	..	2	..	..
3	18	15	14	14	5	5	16	5	5	3	2	4	2	4	1	1	..	3
4	..	3	1	14	5	8	5	10	7	10	5	3	2	2	..	..	..	..
5	8	7	15	12	1	..	4	5	..	..	2	1	1	1	..	1	..	..
6	18	15	6	8	1	1	8	1	7	4	3	..	3	3	..	..	..	..
7	18	19	5	13	11	18	9	15	4	6	3	5	4	5	1	..	..	1
8	5	3	6	2	3	6	3	6	4	3	3	6	3	1	..	1	..	..
9	7	9	2	9	4	16	8	11	2	2	3	4	..	2	1	..	..	..

Total population 803.

*M=male. F=female.

TABLE VI. SAMPLE RECORD OF A YEAR'S BUSINESS ON A TYPICAL FARM[1]

Information secured by *R. T. Tsui.*

Operator *Farm No. 25.* Province, *Chihli;* Hsien, *Yenshan;* Village, *Wu Chwang.*

Record for the year beginning *April 1, 1922 and ending March 31, 1923.*

Land Operated

Kind of property / Kind of land (indicate topography of)	Owned			Other		
	No. of mow	Value per mow	Total value		No. of mow	Total value
				Cash rented		
Good	12	$28.00	$330.00	Shared rented	...	...
Medium	...	...	...	Mortgaged	12	$313
Poor	8	8.00	70.00	Total	12	$313
Total	20	...	400.00	Total (owned and other land)	32	$713

Of the above land how much is in:—(*a*) Roads, canals, threshing floors and other unproductive land?.....mow; (*b*) Graves, dykes, dams, and other waste land.....mow; (*c*) Pasture, trees, etc.

[1] Items which appeared on the original blank but which did not occur at Yenshan have been omitted.

Capital (Summary)

Items	Value at the beginning of the year	Value at the end of the year
Land owned	$ 400.00	$ 400.00
Investment in mortgaged property.	313.00	313.00
Trees, ponds (if not included with land), etc.	20.00	20.00
Buildings	300.00	300.00
Farm tools and equipment	10.00	10.00
Seed, grain and fuel supplies ...	55.00	55.00
Livestock (from page four) ...	82.20	65.60
Total capital	1,180.80	1,163.60

Average capital $1,172.20 Capital increase $_____ Decrease $17.20

NOTE TO TABLE ON FARM CROPS (*a*) When two crops are grown together in the same field and the product harvested separately give yield of each separately (see sample record). If not already indicated in the table use the same method as in the case of corn and beans, or wheat and peas.

(*b*) Give the unit of measure or weight in which the yield is stated in the column headed yield per mow. Be sure and distinguish between picul (擔 or 担) and tan (石), the former is a unit of weight and the latter a unit of measure. Shih (石) and tan (石) are the same. For convenience use the following P = picul (擔 or 担); D = tan (石); T = tow (斗); C = catty (gin 斤).

(*c*) Weight of one tow of wheat *24 catties*. If there is no wheat substitute some other common grain.

(*d*) Where weights are used, give kind of scale used.

Farm Crops

(See note on previous page. If a crop follows another crop harvested the same season, indicate by writing the name of crop in parenthesis, for instance: Beans (after wheat). Also under "other" give number of mow in fallow and write the word "fallow.")

Kind	Crops grown			Crops sold or to be sold			Produce used by the family	
	Mow	Yield per mow	Total crop	Amount	Price	Total value	Amount	Value
Wheat	18	5 T	9 D	5 D	$10.00	$50.00	4 D	$40.00
Corn (after wheat)	8	4 T	3.2 D	...	...	...	3.2D	19.20
Millet and	5	1 T	5 T	4 T	.65	2.60	1 T	0.65
soy beans (after wheat) ...		1 T	5 T	...	...	...	5 T	3.00
Soy beans (after wheat) ...	5	1 T	5 T	...	...	...	5 T	3.00
Kaoliang	9	5 T	4.5 D	2 D	6.00	12.00	2.5D	15.00
Millet	5	1.2 D	6 D	1 D	6.00	6.00	5 D	30.00
Potato, Sweet	...	...	...	...	...	...	...	...
Vegetables	...	...	...	...	...	...	...	...
Fruits	...	...	...	...	...	...	...	...
Other:								
Total	50	...	...	...	...	70.60	...	110.85

Crop rotation Nos. 1 and 3 were used on this farm.

Livestock

Kind	Beginning of year			End of year			Sales			Purchased			Number died during the year
	Number	Value per head	Total value	Number	Value per head	Total value	Number	Price per head	Total received	Number	Price per head	Total paid	
Horses	...	...	...	...	...	...	...	...	...	...	...	..	...
Oxen	1	$35	$35	1	$35	$35	...	...	...	...	...	...	...
Donkeys ...	1	25	25	1	25	25	...	...	...	...	...	...	...
Mules	...	...	...	...	...	...	...	...	...	...	...	...	...
Hogs	1	22	22	...	...	...	1	$30	$30	...	...	...	...
Pigs	...	...	...	1	5	5	...	...	...	2	$2.50	$5	1
Chickens ...	4	.20	.80	3	.20	.60	...	...	...	...	...	...	...
Ducks	...	...	...	...	...	...	...	...	...	...	...	...	...
Geese	...	...	...	...	...	...	...	...	...	...	...	...	...
Other:													
Total ...	...	...	82.80	...	...	65.60	...	...	30	...	...	5	...

Number, kind and value of animals eaten on the farm during the year *Chicken 1 @ $0.20 total value $0.20.*

Livestock Products

Product	Sold			Used by family	
	Amount	Price	Total Value	Amount	Value
Eggs	200	...	$1.60	...	..
Manure ...	...	...	...	...	...
Total	...	...	$1.60	...	...

Miscellaneous Receipts

Item	Sold			Used by family	
	Amount	Price	Total Value	Amount	Value
Straw (wheat, millet and bean)	...	...	...	...	$12.00
Fuel (grass) etc.	...	...	...	...	$25.00
Home industries[1]	...	...	...	...	...
Other income	...	...	...	...	...
Total	...	...	...	...	$37.00

[1]If closely associated with the farm business, otherwise use Blank 30, and name the industry.

Farm Expenses for the year

Year help (Total No.)	...
Value of board of year help	...
Day help (Total days)	...
Value of board furnished day help	...
Unpaid work done (family)	$12.50
Value of board furnished unpaid work	30.00
Hats, towels, etc., for labor	3.00
Tobacco, wine for labor	2.00
Buildings, new	...
Buildings, repairs	2.00
Farm tools, new	...
Farm tools repairs	1.50
Seeds	2.00
Trees (seedlings)	0.50
Feed for animals	8.00
Manure or fertilizer	...
Lumber, cart oil	...
Taxes	2.00
Fee for "dibao", crop watchman, ferry, etc.	1.00
Veterinarian	...
Home industries[1]	...
Other:	
Total	64.50

[1]If receipts for home industries are given on page five.

Summary of Farm Business

Receipts

Crops	$70.60	...
Livestock sold	30.00	...
Livestock products	1.60	...
Miscellaneous	...	...
Increase of capital	...	...
Use of produce by family	148.05	...
Total receipts	...	$250.25

Expenses

Livestock purchased	$5.00	...
Farm expenses	64.50	...
Decrease of capital	17.20	...
Total expenses	...	$ 86.70
Total income	...	$163.55
Interest on average capital at 8%	...	$ 93.78
Labor earnings	...	$ 69.77

Net income from home industries as per Blank No. 3) $..... ....

General Information

How many pieces of land? *5* Distance of furthest piece? *3 li.*
Average distance *1 li.* Average size *6 mow.*
What amount of the crops sold were sold as soon as harvested? *Wheat, 5 D; kao-liang, 2 D; millet, 1.4 D.*

THE FAMILY

How many servants in the family? Give age and kind of work done.

Give information regarding the moral character of the operator. *Good.*

Name the organizations, religions or sects to which the operator belongs. *Buddhism.*
Has this family a feud with other families? Why?
Indicate the amount of the family expenditures for the year:

Religious practices (name kind of religion) *$1.50.*
Social obligations *$2.00.*
Gambling.
Smoking.
New Year's *$2.00.*
Education.
Medical.
Food purchased (kind and amount and value) *Vegetables $4.00.*
Clothing (ready made) clothing (raw materials) *$7.00.*
Other:

Indicate the kind of public amusements and the number of times indulging in per year.

Plays: theatre *3 times*, idle processions:, seeing magician:, side shows:, bull fights:, cricket fights:, gambling: *10 times*, drinking: *5 times*. other:

CO-OPERATION

How many days work exchanged with neighbors during the year?
What implements or animals were loaned or borrowed and for how long a period?

The Operator and his Household.

Operator and his relatives	Age	What school and number of years of schooling	Occupation and length of time engaged in	Occupation other than farming	
				Kind	Net income
Operator	*59*	...	Farming (*12* months)	...	...
Wife	*58*	...	...	..	..
Son	*30*	...	Farming (*12* months)	...	...
Son's wife	*30*	...	...	...	...
Grandson	*4*	...	...	...	...
Granddaughter ...	*14*	...	...	...	...

Operator's Nativity and Occupation.

	Where born (Province, hsien, town, village)	Occupation	Owner Operator-owner Tenant Hired man
Operator	*Yenshan*	X	*Owner*
Operator's father	,,	*Farming*	,,
Operator's wife	,,	X	X
Operator's wife's father ...	,,	*Farming*	*Owner*

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Occupation of operator's sons and daughters not given in operator's household. For married daughters, give husbands' name and occupation. Also include brother and sisters or sisters' husbands of 18 years or older.

Name	Age	Relationship to operator	Occupation	Province, hsien township, village

Operator's History.

Year	Age	Occupation	Mow			Mow owned as landlord	Mortgaged (operator is the mortgagee)	Total
			Bought	Sold	Inherited			
1905	*41*	*Farming*	...	...	*12*	...	*7*	*19*
1910	*46*	,,	*8*	...	...	...	...	*27*
1920	*56*	,,	...	...	...	...	*5*	*32*
1923	*59*	,,	..	...	...	...	...	*32*

Age (Chinese) engaged *12*. Age (Chinese) married *18*.

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(Reprinted from July Issue of THE CHINESE RECORDER.*)*

The Building Of A Rural Church

ORGANIZATION AND PROGRAM IN CHINA

J. LOSSING BUCK

IT is generally recognized among those familiar with the development of the church of China that the rural church presents problems peculiar to itself and as yet unsolved. To take only one instance, how frequently do missionaries and Chinese complain of the inadequate results obtained from the present very prevalent policy of placing in out-stations resident evangelists employed by a church organization other than the local one, and yet such evangelists continue to be employed, more because other methods have not sufficiently commended themselves than because the present one is satisfactory. This problem is but one of many in the development of a rural church whose purpose is to produce a consciousness of God and to exemplify the life of Christ in a community.

The rural church may be defined as a church located in a rural environment, as opposed to a church located in a city type of environment, which may be a city or a large market town. This definition may bring forth the query in some readers' minds: "Are there any rural churches in China?" To this question the answer is affirmative, although there is no information as to how many such rural churches exist. Certainly the number altogether self-supporting and with a resident pastor and self-governing must be surprisingly small.

The successful establishment of such a rural church cannot be accomplished without some attention to principles which may aid in successful church organization. For several centuries science has discovered laws which control many phases of physical phenomena. We are just now emerging into an era of discovery of laws which control individuals and the relationship between individuals. In other words, we are finding certain great principles which are classed under the name of sociology and psychology. These laws cannot be disregarded if one desires success in any undertaking having to do with human beings. That success has been occasional where there is no conscious knowledge of the underlying principles which produced it, is due to a chance use of the principles, and a thorough investigation would undoubtedly show that the waste from ignorance, where chance has not worked so happily is enormous.

Now a church organization is a group of human beings, a social group, bonded around the religious interest. No matter how saintly a religious leader may feel himself or his fellows to be, or may desire himself or his fellows to be, he cannot escape the fact that so long as spirits are clad in human flesh, people behave according to the laws of psychology and sociology.

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The purpose of this discussion, therefore, is to outline in a very elementary way a few simple principles which have been found essential in the experience of various rural leaders in the development of rural organizations in the United States, with the thought that what has proved constructive and useful among other human beings may prove helpful here as well. These principles briefly enunciated are as follows:—

1. The self-help principle.

2. Development of organization around a keenly felt need or interest and sponsored for the most part by the people themselves.

3. Activities which will keep the members loyal to the organization.

4. A unit of organization large enough to accomplish its aims, such, for instance, as the employing of an expert to assist the members in any way in which they need and desire such aid.

Application of these principles to the organization of the rural church.

1. *That the self-help principle is essential* to the healthy development of religious organizations has been ignored almost completely except in a purely theoretical sense, in the history of the Christian church in China. Church-workers have held as their goal the "self-supporting, self-governing, and self-propagating church," and then in the ardent desire to push the work forward to win souls, and to make some sort of a visible church organization, they have proceeded with methods which have delayed immeasurably the attainment of this goal.

Perhaps the greatest mistake in this respect has been the placing in a community a resident evangelist paid, and in most cases controlled, by some central church organization located miles away in a hsien city. Distance and the lack of well-directed supervision has resulted in very ineffective accomplishment and many evangelists have been kept in employment long after they have demonstrated their incapability to the local people whom they were supposed to serve. Such a policy as this delays and injures incalculably the Christian movement in a community. People in North China have nicknamed these men "making a groove in the bed" people (溝的炕) This situation is fully recognized by many church-workers, and yet it is allowed to continue with the hope that self-support will soon come about in some way or another, and solve the difficulty. But it is just this method of non-observance of the self-help principle which delays self-support—and so we go on indefinitely with the false hope that something will happen to bring a better day.

Fortunately, we have examples of mission work in China where the self-help principle has been more nearly followed.

In general terms, the self-help principle as used in mission work should mean, first, the winning of a few to the Christian faith in a given community, and second the nurture of this little group and the winning through their aid of additional souls. The little group may be encouraged to have its own Sunday services. As it grows it may eventually have its own church building, funds for which are raised locally. A pastor supported by the local group is often the goal although some church leaders do not consider a resident pastor essential or even advisable. In this method of evangelist work, which utilizes the self-help principle, outside stimulus is given, but buildings and a resident pastor must wait until the local group is large enough and anxious enough to finance and manage them.

The self-help principle is not concerned only with matters of finance and the routine of self-government. It must also be applied to the programme of activities of the organization. An agricultural extension worker in the United States tells of a home bureau where the home bureau agent did most of the planning for the monthly program of the bureau. The agent wondered why it was that the members of the bureau were not more interested in the work and why they did not turn out in larger numbers for the meetings. It occurred to the agent that perhaps it was because she had arranged the program by herself. Thereafter she left the entire program of meetings to the members and although they may not have seemed to the agent so good and helpful as were the programs arranged by herself, still the members turned out in much greater numbers than formerly and showed a far greater interest.

Some church-workers have found this to hold true for the church. There has been too much fostering of a stereotyped program of action and form of worship in the churches to develop the maximum amount of interest on the part of the members. This may be illustrated in one instance by the almost widespread use of foreign music and forms of worship in the churches throughout the country. If the self-help principle had been carried out all such affairs of the organization would of course have been controlled by the members.

Like most rules, however, this one of self-help has also its limitations. Organizations such as the struggling church do pass through a period when the need for development is strong but the ability to provide for the means of development is still lacking. The only answer to this is that such an organization may be subsidized temporarily with money, or preferably personnel, by a larger and central sister church as a home mission function. Such money subsidy should be limited in amount and length of time granted and the same applies to any personnel subsidy.

One requirement is essential in the subsidizing of organizations, if it is not to be harmful rather than helpful. First, the use of such temporary aid should not take from the new church any of its own

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independence. The way in which the money is to be used should be decided by the local group. It should from the first realize that the aid is only temporary and that therefore any activities which are begun with the aid of the subsidy should be such as it can manage financially within a given time. This subsidy may be given with various suitable conditions attached to it, and if the local church does not wish to fulfil these limitations, it need not accept the grant.

It is almost impossible to over-emphasize the importance of this point that the church should have power to decide how funds given it should be spent. Any other policy pauperizes and robs the local group of the very power to develop. At the same time the central organization has the final authority over its funds, for at any time that these funds are not being efficiently spent and agreements are violated, the money may be withdrawn.

The subsidy method is being used by a number of large organizations. The subsidy to the Farm Bureaus in the United States by the United States Department of Agriculture and by the State Colleges is a very good example of the efficient working of this method without any impairment of the local self-government of the Bureau by the farmers themselves.

The master key to successful rural church organization is that of self-help and this key when properly used will also make it much easier to utilize the other principles of organization.

2. Development of an organization around a keenly felt need, or interest and sponsored for the most part by the people themselves.

A local organization developed by a central organization without a real feeling of need for it on the part of the local people is in most cases a failure. In other words, one must begin from the bottom if one is to build a lasting institution such, for instance, as the rural church. It cannot be accomplished by any overhead method which for the moment seems to insure more rapid progress. The rural church must be a growth out of the feeling on the part of the Christians themselves of a real need for being banded together. The success of the Farm Bureau in the United States is quite largely due to the development of Bureaus by the farmers themselves. The farmers felt the need of improving their methods of farming and they believed that organization for the employment of an expert, the county agent, was the method by which it could be accomplished. As a result, we have many strong farm bureaus which could never have been formed except by this method of beginning from the bottom—from the farmers themselves.

Why do Christians organize themselves together into a church? In China where Christianity is only just beginning to obtain a foothold it seems to be quite largely because the representatives of the central church organizations have urged and even required Christians to organize themselves. A careful study would probably show that many churches have been organized before the Christians themselves felt any real need for it. What is the keenly felt need that the average Christian has that makes him want to organize himself with others? The Christian is told that he should become a member of a church for the purpose of publicly worshipping God. Perhaps the newly converted Christian is not conscious of this desire for public worship; perhaps he feels more keenly the need for getting alone for private worship with God. In a densely populated country like China it is not easy to be alone with God. It is pretty hard to close one's closet door and still be away from the hubbub of the family, village or street life. Christ made religion a part of everyday life. Perhaps the newly converted Christian would do the same thing if he had half a chance. Perhaps he would organize himself with the other Christians of the community into a church which had as its chief aim the worship of God not by word of mouth alone but by actually rendering needed assistance to other Christian or non-Christian members of the community. The important thing to remember is, that if we must have a church organization, and without doubt some form of organization sooner or later is desirable, let us not make the local Christians organize before they are ready of themselves to band together for some definite purpose or keenly felt need, and let us not decide arbitrarily on the form of that organization. The result then will be a local church which will live in the community, which will serve the community, and one in which the chief motive is not only "a duty to perform" in routine church and prayer meeting attendance.

3. Activities which will keep the members loyal to the organization.

It is an axiom that an organization without activities to hold the interest of its members is a dead organization. There is much talk these days about the decline of the church. The root of the difficulty lies in the fact that the activities of the church do not hold the interest of the members or are not sufficiently attractive to the Christian or non-Christian outside of the church walls. A successful organization must accomplish something very definite if it is to continue to exist and it cannot do this unless most of its members are actively participating.

The rural church has, perhaps, a more unique opportunity for including activities which will help to keep the members loyal than has the city church. The test of a Christian in the past has been largely attendance at church meetings and services, the daily reading of the Bible, daily prayer, the saying of grace at meals, the living of a moral life, and the conversion of other souls by word of mouth. Christ taught by example and deed that true religion includes the helping of others. The rural church can express religion more effectively by making constructive community service a part of the test rather than

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having its members confine their help to an occasional kind word or deed to the sick and the bereaved, important as these things are.

The rural church might, for instance, promote better agriculture and rural community improvement as a definite Christian act in itself. Agricultural missions, like educational and medical work began, in the minds of many, as an adjunct to the evangelistic work, with its chief function to make a point of contact for presenting the Gospel; in other minds it began as a method by which the economic level of the church members could be raised so that the church might become self-supporting. Those of us who are engaged in agricultural mission work feel that our work is as directly evangelistic as is that of the person who presents the gospel by word of mouth. We feel that helping the farmer to help himself by improving farming methods is a very definite Christian act. It is the Christian spirit of helping others which was so well exemplified in the everyday life of Christ and which He taught so clearly was the duty of his followers.

To the question, How can the rural church serve? the answer is, the rural church may be an active organization commanding the respect of the community and the loyalty of its members and it may be a truly evangelizing force when, in addition to its present traditional functions, it performs such Christian acts as:—

(1) Introducing improved seeds and encouraging its members to pass them on to a neighbour.

(2) Introducing into the community methods of controlling plant insects and diseases and encouraging its members to show their neighbours how to control their pests also. This will at the same time be a very great factor in overcoming superstition because the farmers universally believe that the gods send diseases and insects, and since fate has so willed it, there is no human remedy.

(3) Promoting the idea of rural co-operative credit and savings societies and encouraging its members to organize such a society and to include in it other reliable members of the community who may not be Christians.

(4) Teaching the correct relations between tenants and landlords to such an extent that the church members may put them into practice as a method of living one's religion in everyday life.

(5) Introducing to the community improved silkworm eggs and methods of rearing silkworms.

(6) Teaching the method of keeping accounts with the farm business which will enable the farmer to know why he lost or failed in some one or more of his enterprises and encouraging its members to help their neighbours to keep such books.

(7) Introducing wholesome forms of amusement and recreation, both for the community and for the home. We hear much talk about anti-gambling propaganda. The church is "anti" this and "anti" that but offers little in the way of a substitute. It is an axiom that to replace evil one must substitute good. If the church hopes to be a moral force in the community it must be the leader in various forms of amusement and recreation. No amount of anti-gambling literature laying bare the evils of the practice by itself will accomplish the desired end.

(8) Promoting public health and sanitation. The control of flies and malaria is a comparatively simple matter. A very large number of country churches and even chapels in the cities have privies which are every bit as unsanitary as those of the community. There is a saying, "Cleanliness is next to Godliness," and a strictly scientific investigation would probably find a very close correlation between the two.

(9) Promoting and even participating in the building of good roads. Church members can do a real Christian act by putting enough earth in the middle of the road so that water will run off the road rather than into it.

(10) Organizing flower clubs among girls and women for the beautification of the home. Again a careful study would undoubtedly reveal a very close relationship between beauty and true religion.

(11) Organizing schools for adult education and urging its church members to participate as teachers in such schools.

(12) Requiring of its members a truly Christ-like spirit, not as exemplified by word of mouth alone but chiefly by a life lived.

(13) Conducting rural community surveys for the purpose of finding out what problems the church should attack. The voluntary participation of every church member in helping to make such a study is again a definite Christian act in itself.

(14) Solving the various problems pertaining particularly to the country women, such for instance, as better rearing of children, better homemaking in all its phases, more leisure, labour-saving devices and the rudiments of education.

Not all of these things will be easy to do; perhaps not all should be undertaken by one church. If the church can get other organizations to help, well and good. But the church is responsible to its members and to the community to render these services. Many similar activities might be added to this list. When the church demands of its members Christian activities of the kind mentioned, one does not need to fear that the church will not be a living and active organization in the community and one commanding the loyal support of all its members and winning others to Christ.

5. A unit of organization large enough to accomplish its aim such, for instance, as the employing of an expert to assist the members in any way they need and desire.

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Some church leaders are questioning the effectiveness in any country of the pastor served church of the West and feel it most unsuitable for the rural groups in China. However, all will agree that some kind of paid religious leadership is necessary. We must have religious experts whether they be pastors of local groups of Christians or religious leaders of an area comprising many local groups. We may consider then, two types of religious experts; the pastor of the local group of Christians, or the itinerating and possibly superintending pastor who serves several local groups.

The church which desires to have a church building and the aid of an expert, in the form of a pastor, immediately commits itself to a considerable expenditure of funds. The extent of the geographical area and the number of Christians within that area and their wealth will determine first whether or not it is possible to employ a pastor and construct a building and, if this is found feasible, the next consideration is the degree of training and experience that can be paid for in a pastor, and the kind of building that may be constructed. Since a group of Christians can probably get along better without a building than it can without a religious expert our discussion will be confined to the problems of getting the right pastor. It is of course evident that the more the training and experience of the pastor the greater the salary it is necessary to pay. Therefore, if the proportion of Christians and their wealth is the same, one has to decide between a small unit area of organization with a poorly trained, poorly paid pastor and a larger unit of area with a well-trained, well-paid pastor.

The size of the unit for the local group will, in most cases, have to be small enough so that meetings can be held as often as once a week at some common, logical meeting-place. This group cannot employ a pastor or construct a church building on the self-help principle until it is large enough to command sufficient resources. While awaiting such a time it may be best for it to unite, if possible, with other groups in employing an itinerating pastor until the group becomes large enough to employ its own pastor. Even the small churches that have pastors may desire to organize into a central organization with a highly trained person to advise with the local pastors and churches. If the Church of China is established and denominations do not function as such a hsien unit of religious organization, as the next unit higher than the local church may prove desirable.

The mapping of the rural community interests showing the extent and location of the existing religious, social, educational and political interests aid greatly in the determination of the extent of area that should be included in the local church organization and in pointing out the logical center for a meeting place. A study of the Yao Hwa Men market town trade area in Kiangling Hsien reveals eight worship areas (the temple and the villages from which people go to the temple to worship) within the trade area. In addition to this each hamlet or village has its own local shrine (土地廟). In no case do any of the villagers go to the market town for worship. This is significant in the light of the general practice of selecting the market town as the centre of Christian worship. The apparent failure of this market town centre as a logical one is brought out in an Evangelist Survey made by Presbyterians (North) in South China. An excerpt is as follows:—

"The conflict of policies between the market town chapel programme and the proposed village evangelization programme.

The market town chapel was designed to function in such a way that the village work would from the first be self-supporting. But the method of subsidizing the work of the chapel created a tendency adverse to the development of village work on that basis.

Christians developed the attitude of looking towards the market place for the expression of their Christian life instead of becoming members of the Church. Such religious life and activity as they had prior to becoming Christians were connected with their villages. There the temples and ancestral halls are located. On becoming Christians, the tendency was to draw them away from the village for the expression of their religious life.

In the future the village must be brought into the centre of thought. It has been proven pretty conclusively that the market town program alone or as the main part of the evangelistic effort has failed to meet the needs of the situation. Neither this Mission, nor any other Mission, nor any independent Chinese society have had solid success with the small market town chapel but only where there is a relatively large resident population. Where the town has few people and the main dependence is on the surrounding villages as feeders to the growing church there has been no marked success. Where Christian groups exist in and for a single village they are often strong, comparatively speaking. The church must go where the people actually live—where they have their homes and largest community interests."

The decision of extent of area must also rest on a number of factors, but assuming that a pastor is desired who will carry out the principles herein enunciated then Christians must employ much better trained men than are now available in most rural churches. This training requires more time or a different content than at present. Not all pastors can be or should be highly trained men. Expressing it in another way, men of different degrees of training are needed and a greater amount of work can be accomplished than if all experts have the same training. However, no matter what degree of training, every rural religious expert, to be successful, *must have an experience of country life and must have sympathy with and understanding of the farmer and his problems and attitudes.*

In addition to the religious expert's training in the knowledge of the Bible and his religious experience, he must have training in

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methods of presentation. Since he is to work with farmers he must know enough of farming practices and of plant and animal life processes to enable him to advise the farmers and to bring to the community the assistance of experts for the solution of the particular problems found.

If our religious experts have not the requisite training for the carrying out of a Christ-like program of Christian service in the country, there is little excuse for steps not being taken at once to give such men the needed knowledge. The local Christian group desiring a pastor might better go without one than employ an inefficient person no matter how low his salary. It is probably possible to find men qualified to give the required preparation for country pastors and Bible women at already existing training centres; or at new ones which might be developed. It would not even be necessary to have additional funds. A readjustment of policy which would provide for fewer evangelists and those few better trained, for fewer buildings, and for no more expensive buildings, which often cannot even be maintained by the local church, would at once release funds sufficient to train adequately pastors and men and women evangelists. In some cases merely a re-organization of curricula in existing training schools and the elimination of some material now given to make room for subjects more practical for the rural worker, would solve the problem. Teachers could in many instances adapt themselves to this program; others would have to be replaced by better qualified persons.

In order to get the necessary knowledge and viewpoint the pastor does not have to have a four-year course in agriculture. A year's training should prove fairly adequate. Particularly important are courses in rural social and economic problems, general agriculture, recreation and amusement, first aid, public health and sanitation and one or two more technical courses in agriculture. A qualified man added to each seminary and Bible school could do much toward bringing about the training necessary, provided the rest of the faculty is in sympathy and places a reasonable emphasis upon rural work. Special attention should be given in Women's Bible Schools for the training of women evangelists in a knowledge of how to serve country women. Summer school courses, such as are given by the College of Agriculture and Forestry at the University of Nanking, are especially adapted for persons already in positions and for seminary and Bible school students. An increasing amount of printed matter is also becoming available.

If qualified religious leaders are provided who understand the self-help principle, who realize that a church, like any other organization, must be centered around a deeply felt need and must have activities which will keep the members loyal, and who perceive that the unit of organization must be large enough to command sufficient resources to accomplish its aims, there need be no doubt that a successful indigenous church will result.

Christian Missions in China may be severely criticized for their non-observance of these fundamental principles. Most organizations that are seeking the development of local units have experienced the same difficulties. Moreover, national agencies such as the Y.M.C.A., the Y.W.C.A., the Boy Scouts and the Camp Fire Girls in the United States have found that the small rural communities consider them as "alien" to the community. If this occurs within a country, one can understand the more readily how the Christian Church in China is thought of as "foreign." In speaking of the problems of such national agencies as mentioned above, Dr. Douglass* says:

"But communities frequently do not understand the efforts of the national agencies to secure standardized results by enforcing specific requirements, and feel that they are dealing with rigid overhead organizations rather than with adaptable and sympathetically helpful ones.

Again, while very generally absolving the local executive on the ground that he cannot help himself, communities suspect the national agencies of offering service in the promotional spirit and for the sake of laying a foundation on which they may carry on financial solicitation. Back of both of these attitudes is frequently the sense, already mentioned, of the externality of the national agencies. Personal contacts are inadequate with the bulk of supporting constituencies; and communities, especially the remoter ones, never get over feeling that they are dealing with alien and unfamiliar forces.

On the first point, there is grave doubt whether communities, on the whole, are convinced that the agencies are offering them their services on reasonable, equitable and generous terms.

The factual chapters of the report have presented what was called the problem of the naturalization in the rural community of organized work for boys and girls. As outlined in the Preface and as presented directly to the agencies, it was hoped to help them to see the seriousness of their problem as relatively alien forces with other major tasks, approaching rural civilization from without. The crux of the problem as formulated is how to get on the inside, so as to become an accepted and permanent part of the situation.

At this point the agencies most definitely revealed the assumptions explored in the previous chapter. They are acutely conscious that they are bringing an important contribution to rural life, both of vision and of technique. These gifts they are under the necessity of promoting by some version of deliberate organization, since, in the main, the work has not enjoyed the contagious spread of a spontaneous and self-propagating movement.

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* Douglass, H. Paul, How Shall Country Youth Be Served?
George H. Doran Co., 1926.

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The facts as presented raised the essential issue of how such national agencies can enter into partnership with actual rural communities and their indigenous agencies on terms of actual mutual contribution to a common end, so that the communities become actually participants in the service of youth and no longer mere exponents and agents of values imported from without.

The outcome of the discussion may fairly be said to have identified the problem of naturalization as presenting a genuine, essential and serious issue. Its outstanding characteristics are the frequent tendency of the agencies to be so inflexible as to aggravate the sense of their alien origin; and, on the other hand, the tendency of communities to be so self-complacent and intractable as to make partnership difficult. The essential difficulties of the issue are great enough without further complication by competition among agencies within a given community."

As long as our local rural church is controlled by some central church organization there is no hope of its being considered anything but "foreign." Just the other day I was talking with a pastor about this problem. In effect he said that one could talk himself "blue in the face" about the Church not being foreign, but so long as he was paid by an outside organization the people could not be made to believe that there was no ulterior motive behind it all. With such an attitude on the part of the local people there is little hope for a prosperous rural church. The honest evangelist realizes this, too, and he would be only too glad to adopt the self-help principle if he knew how. The self-supporting church will come quickly when the religious leader is trained in such a way that he will really help his flock so much that his services will be willingly paid for. Few pastors can get self-support in return for words, words, words. None will fail to build a self-supporting church when they have made themselves indispensable to the community.

Yet some may feel that all this has little to do with the Christian message; but Christ never enunciated a simpler or truer or more effective principle than when He said: "Let your light so shine before men that they may see it and glorify your Father which is in heaven."

This does not mean at all that bug-a-boo of some church workers, "a gospel of good works which is not unto salvation." It does mean that if we have any light within, either as individuals or as a church, we should obey Christ and shine forth into activities which will make men believe in and glorify God. There has not been a great deal of the glorifying of God in communities where Christian churches have been established, and the essence of all the reasons for it is summed up just here, that men have not seen any light shining forth, and therefore have not been aware of any necessity for glorifying God. However "saved" we may feel, and however full of personal belief in Jesus as our Savior and however we may spend ourselves to preach the cross, it avails little, if we do not practice the cross, and really do something whereby men may see God.

And in order to follow this injunction of His, which Jesus Christ gave us as a prime method of leading men to believe in the gospel, it is necessary to discover what the man in the rural community needs, before we can help him. In the past missionaries and Chinese evangelists have been assigned to country fields almost entirely regardless of whether their previous experience was in city or country and with little consideration as to whether or not they were suited for country work. The religious worker in the country should have nothing less than the best training, which is specialized training, and until this is provided we shall continue to wonder why the rural church does not prosper more abundantly and bear the fruit of a good tree.

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