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CENTER DISCUSSION PAPER NO. 26

THE CHANGING STRUCTURE AND ROLES OF THE
CHILEAN AGRICULTURAL SECTOR

Markos Mamalakis

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INTRODUCTION

Chilean agriculture possesses some unique characteristics in the Latin American hemisphere. Its share of value added in domestic product, during 1950-1964, has been the lowest of the continent, except for Venezuela, and half the Latin American average.¹ Furthermore, during the same period, Chile has had the lowest employment share in agriculture, with the exception of Argentina and Uruguay.² Chilean agriculture is also unique in that, unlike Peru, Mexico, and Bolivia, it has employed almost exclusively a creole labor force, and that, unlike Argentina, this creole element has been kept in a semi-serf condition up to the decade of the 1960's when its gradual emancipation was started.

The role of agriculture in Chilean economic development has changed during the 1840-1965 period.

Three subperiods of agricultural growth can be conceived. The first starts in 1840 and ends with the incorporation of the nitrate provinces of Tarapacá and Antofagasta to the Chilean economy after the War of the Pacific in 1880. The second period starts with the end of the War of the Pacific and ends with the Great Depression in 1930. Finally, the third period starts with the beginning of the Great Depression and lasts up to 1965.

¹ UNECLA, Economic Survey of Latin America, 1964 (E/CN. 121, 498/Rev. 1, 1964) Table 23, p. 36.

² FAO, Production Yearbook, 1960, pp. 19-20; 1965, pp. 21-22.

The First Period: 1840-1880.

A. The Temporary Boom of Agriculture.

During the first period agriculture played a key role as a sector providing employment, as a sector providing a surplus to be used for investment in other sectors, and, to a lesser extent, provided part of the revenues for the government's budget.

Chile and Argentina can be compared, during this period, to the East and West of the United States. Chile, like the East, developed early and first and the relatively rich regions of the Central Valley provided a base for an export sector that supplied the then Peruvian provinces of Tarapacá and Antofagasta, the United States during the gold rush, and even Australia. By 1875, the rural population had reached a level of one million and three hundred and fifty thousand persons which was approximately equal to the by now defunct Indian population of two centuries ago.¹ There exists no evidence that there was a lack of exploitable agricultural land, and, up to 1880, new lands were incorporated into cultivation even though they were of increasingly lower quality.

The Chilean export boom ended during the middle of this period. The accepted view in Chilean economic history blames the protectionist policies of the United States, the opening of Panama Canal zone, and the backwardness of the Chilean landowners for the unimpressive performance of the agricultural sector ever since the end of the first period. With the exception of Francisco Encina,² the Dean of Chilean historians, all

¹For an interesting and detailed discussion of the substitution of the Indian by the "white" element and the demographic problem see Miguel Cruchaga's Estudio Sobre la Organización Económica y la Hacienda Pública de Chile, Tomo Primero, (Madrid: Editorial Reus, S.A., 1929) pp. 457-540.

²See Francisco A. Encina, Nuestra Inferioridad Económica, (Santiago, Chile: Editorial Universitaria, S.A. 1955), pp. 19-33.

Chilean and foreign economists and historians have failed to consider the all too obvious and pervasive role of Argentina in terminating Chile's ambitions to become a major agricultural exporter.

Argentina, with a cultivable surface ten times larger than the Chilean one¹ and its exceptionally rich Pampean areas, was to Chile what the West was to the East in the United States. As the rich Argentinian pampas were opened, Chilean agriculture collapsed temporarily, shrunk and retreated to cater to the domestic market. In spite of the adverse circumstances, it succeeded in maintaining a favorable trade balance. The role of agriculture as a dynamic, strategic sector, however, was passed on from Chile to Argentina and has never been recovered. Prominent Chilean families moved over the Andes to the Argentinian side and, while contributing to the neighboring country's economic growth, were permanently lost for Chile.² Even today there exists a heavy seasonal and short-term migration of agricultural workers from Chile to Argentina.

The decline of the relative importance of Chilean agriculture in the southern tip of the continent was matched by a parallel transfer of "growth functions" from agriculture to mining within the economy. Never in recorded history did agricultural exports even approach mining exports in value terms, and even during the present period, the majority of government revenues originated from foreign trade rather than directly from agriculture.

Land ownership did and still provides political, social and economic power in Chile, and a small creole element has been very successful in

¹Ibid., p. 21.

²Francisco Encina, op. cit., pp. 19-25.

keeping this source of power to itself. However, at least during the present period, there is no indication that this power was being misused even though, it must be admitted, it was far out of proportion to the sector's contribution to income and employment. Paradoxically, landlords were free traders insofar as agriculture went, mainly because protection was not needed, but protectionists insofar as industry was concerned, since tariff protection transferred the tax burden from any specific sector to the consumers and producers as a whole.

The First Period: 1840-1880.

B. The Aristocratic Agriculture.

Agriculture in Chile has been an aristocratic sector. In its social standing, economic structure, political influence and set of values the aristocratic element has left an all too evident mark. As a social institution, the Chilean land tenure system finds its roots in Roman law, the Middle Ages, and more apparently, the Renaissance system of Spain, Germany, and France.

The landowner in Chile performs numerous functions normally relegated to the aristocracy. In his function as a patrón, he cares for the inquilinos making for them the decisions a human being in a society is normally responsible for. He, not them, is responsible for their health, housing, political affiliation, education, and interests. Since, up to recent years, the majority of the inquilinos had been illiterate and lacked any connection with the outside world, they were extremely dependent and grateful to the landowner for his willingness to represent them in

all these onerous activities which required education, knowledge, and upbringing, and for which they are neither intellectually nor mentally prepared. For the "peace" and tranquility enjoyed they had to pay a high price in terms of income. The patron had the desire and background to satisfy the most urgent needs of his non-related dependents, bringing a doctor from the city, paying for the hospitalization of a worker, and in rare cases, educating an exceptionally bright child.

Interference by the patron into the life of his inquilinos was minimal, except when he took to liking a pretty girl and turned her into his concubine. The cultivation of the patronage system has been so strongly ingrained in Chile that it appears now also in the urban sector and is most obvious in government, industry, with the household servants, but also in general between rich and poor.

The outstanding result of having an aristocratic framework in the rural sector has been preservation of the status quo both within the agricultural sector, but also its transfer to the urban sector. The status quo has to be interpreted mainly in relative terms. Although both the level of education and aspirations of the component social groups are likely to change, the aristocratic pattern of life maintains and prolongs the existing relative social status of each social group. Upward social and economic mobility have been effectively blocked both because acquisition of land requires substantial previous accumulation of wealth, especially when the fundos are involved, and also because better employment opportunities requiring special education are closed. To the inquilinos, their subsistence level of income prevents saving, and the inability of acquiring land prevents the use of excess labor to improve output quality, augment productivity, and increase the capital stock in agriculture. The stratified social system, where entry to good schools and better education

is closed to lower social strata, has blocked the paths that would permit improvement in social status.

Chilean aristocracy, even though referred to as landed and agricultural, has always been an urban one that branched out into agriculture. During the colonial and early independence years, this move was dictated by economic factors, and the aristocracy used the resource surplus from its estates to pursue its urban functions. Most of the Chilean aristocracy used hired administrators to manage the estates, a move that permitted it to be urban in the winter, rural in the summer. During the present period the landed aristocracy "branched out" to industry, mining, and services. Since, however, there existed no compelling economic, social, or political reasons to withdraw from land, the aristocracy maintained a strong hold over it and turned this ownership into an unparalleled source of political power and prestige.

The impact of the agricultural sector upon overall growth has been, therefore, according to most analysts of the Chilean scene, a predominantly sociological one. The following quotes are typical of a massive literature that has used this sociological influence to blame the Chilean landlords from practically all ills of the Chilean economy. Thus, Chile is characterized by a

"unique agrarian society characterized by an extreme land monopoly and a sharply marked social stratification".¹

"The middle class,, came to life contaminated with the stigma of the patrón system. First it was inspired by a desire to emulate and blend with the aristocracy. It was a class in transit towards the privileged caste."²

¹George McCutchen McBride, Chile: Land and Society (New York: American Geographical Society, 1936), p. xvi.

²Carlos Dávila, of his forward to McBride's book, Ibid, p. xvii.

"The chief accusation that could be made against the landowners and political bosses is not that they succeeded in perpetuating a system in which all the advantages were on their side, but that they made such poor use of it. . . . They established an "order", but certainly not such as was deserved by the centuries of loyalty, humility, and self-denial of the Zutanos."¹

The preservation of an antiquated land tenure system has been a symptom, as well as a cause, of a sluggish agricultural sector. During this period, however, there existed no "agricultural problem", since population growth was mild, agriculture satisfied domestic needs, and both tax revenues and foreign exchange were made available to government and the economy by the mining sector.

The Second Period: 1880-1930.

The Mining Bonanza and the Relative Decline of Agriculture

The incorporation of the rich mining provinces of Tarapacá and Antofagasta into Chilean territory with the War of the Pacific strengthened the forces and accelerated the process leading to a weakening, or even reversal, of agriculture's "growth functions".

Although the country continued to export some agricultural products and, overall, remained self-sufficient in food, some of the previously important functions of agriculture were transferred to mining, services and industry. Mining became a major source of employment, especially since extraction of nitrate utilized labor intensive techniques. The nitrate boom led to a heavy migration of agricultural workers from the Central Valley to the North causing a profit-reducing rise in agricultural wages which the sector could ill afford,² especially in view of the rapidly

¹Ibid., p. xviii.

²See Francisco Encina, Op. cit., p. 19-30.

declining international prices for wheat and other cereals. Furthermore, instead of being a source of investible funds, agriculture became increasingly dependent on the gold, silver and nitrate booms for the funds needed to carry out an investment program.¹

It is fairly accurate to say that Chile was never an agrarian, rural-based economic system. The urban population in 1865 was only 28.6 per cent of the total.² However, a substantially higher share was located in centers which relative to the total population and in their functions were urban rather than rural. While, however, the urban centers did indeed branch out into agriculture out of necessity up to 1880, during the present period the urban centers shifted their dependence from agriculture to mining. By 1885, the urban population had increased to 41.7 per cent of the total and in 1930 this share had risen to 49.4 per cent, or almost half the population. Urbanization was both induced and facilitated by the massive transfer of resources from mining to services and industry, and necessitated by the exhaustion of easily exploitable new land. It is very unlikely that agriculture in 1930 contributed more than 20 per cent of the domestic product. And, in view of the fact that it supported half of the total population, it would be unrealistic to expect it to make a major contribution in the form of investible funds, even if we suppose that 50 per cent of agricultural value added went to the landowners.

Even though, during this period, agriculture made a trivial contribution to government revenues, earned a relatively small amount of

¹ Francisco Encina, Ibid., p. 23.

² Urban population was 520 thousands out of a total of 1,819 thousand inhabitants in 1865. For detailed information, see Statistical Appendix, Table IIA1f2, p. A-89.

foreign exchange, and contributed no more than 20 per cent of the domestic product, it still remained the single most important source of employment in the economy employing around 40 per cent of the labor force. Disenchantment with agriculture increased steadily and was caused by the extremely low labor productivity levels in the sector. In spite of the absence of a resource transfer out of agriculture, however, the investment coefficient of the economy soared to an all-time high of 30 per cent of the domestic product during the decade of the twenties. This investment was financed directly and indirectly by the mining sector, and an unequaled in Chilean economic history level of foreign capital inflows.

Although agricultural production grew as rapidly during this period as it did both during the previous and subsequent ones, there is little discussion about stagnation and its backwardness, as the export-oriented expansion of the mining sector permitted the economy to grow, in spite of a weak agriculture, and agricultural surplus funds are not needed for social overhead and other investment. More important than that, nevertheless, is the very fact that before 1930 population growth was half as rapid as after 1930 and therefore the demand for food and agricultural products was substantially smaller and could be satisfied with its existing rate of growth.

The Third Period: 1930-1965.

Agriculture as a Bottleneck Sector.

At least momentarily, after 1930, it seemed as if agriculture would recover some of the functions it had before 1880. Since the mining sector collapsed during the Great Depression, the economy was forced to consider more carefully the possibilities of strengthening some of agriculture's contributions to growth. In addition, for the first time, Chile had to face up to the possibility of a shortage in food products as a result of a combined population and income growth that exceeded the historical rate of increase in agricultural output.

Unfortunately, by 1940, the relative importance of agriculture had been reduced so drastically that the possibilities of turning it into a sector releasing a substantial amount of resources either to cover government expenditures or for investment were extremely limited. Value added generated in agriculture was only 15.6 per cent of the gross national product in 1940, and this share progressively fell to 13.5 per cent in 1950, to 11.6 per cent in 1960, and to only 9.9 per cent in 1964. Although the contribution of agriculture to value added declined secularly in relative terms, its relative contribution to employment remained substantially higher throughout this period. Agriculture employed 37.4 per cent of the total labor force in 1940, 31.9 per cent in 1952, and 29.4 per cent in 1960.¹ A resource release was made even more difficult by the fact that in 1940 agriculture, which earned less than one sixth of total income, had to support a rural population² which was close to

¹See Statistical Appendix, Table IIA2a6, pp. A-160 to A-165.

²See Statistical Appendix, Table IIA1f2, p. A-89. Rural population was 47.5 per cent of the total population in 1940, 39.8 per cent in 1958, and 31.8 per cent in 1960.

half of the total population. By 1960 it had to support approximately one-third of the total population, even though it earned only one-tenth of total income.

Even if agriculture could release as much as 50 per cent of its value added to government in 1960, these resources would cover less than 15 per cent of total government expenditures, which amounted to approximately 33 per cent of the gross domestic product. However, a transfer of resources from agriculture to the rest of the economy did take place. Agriculture was squeezed both from the output and input side as prices received by producers declined secularly, as the inflation accelerated, and also as the input prices that agriculture had to pay increased more rapidly than the prices for its final products. Value added in 1961 prices has remained almost constant between 1955 and 1965, in spite of an annual rate of growth of 2.2 per cent in the quantum of agricultural output. Thus, even though the apparent magnitude of resources released and the apparent tax burden carried by agriculture have been minimal, the disguised resource release achieved through price manipulation has been considerable. The induced decline in the welfare of the rural population was matched by a rise in the consumption standards of the urban middle classes but failed to have a beneficial effect on the economy's overall propensity to save and investment level. It can be said that with more favorable agricultural prices the share of agriculture's value added would be closer to 20 per cent than to the actual 10 per cent of the domestic product.

Since 1930, the external menace from Argentina which Chilean agriculture faced during 1850-1900, was replaced by an internal menace. This menace came from the middle classes. During the 1880-1930 period

the urban middle classes had grown rapidly along with industry and services. Furthermore, the massive transfer of resources from the mining sector to the urban Center of Chile permitted them to enjoy high income and consumption standards. These classes suffered a substantial income reduction when this resource transfer from mining dried up as a result of the Great Depression. They were, therefore, in no mood to accept the additional sacrifices which higher agricultural prices, needed for more rapid growth, would bring about. The landed aristocracy accepted low prices for agriculture in return for a continued control over land and preservation of an admittedly backward land tenure system.

Adverse pricing policies for agriculture and an antiquated land tenure system, phenomena for which both the middle classes and the landed aristocracy are responsible, gave rise to an increasing foreign trade deficit in food since 1955. The middle classes have developed the "structuralist school" which has been used to effectively prevent the introduction of the necessary price stimuli to the agricultural sector as long as the highly unequal distribution of land ownership is maintained. Fortunately for Chile, the land tenure problem is being solved. The massive infusion of resources into Chilean agriculture, which has been always necessary but never accomplished because supposedly only the landlords would benefit from it, is likely to take place in the near future. Even though such a policy will entail a substantial income sacrifice by a major segment of the urban population, the expected long run benefits justifies this sacrifice. Even such policies, however, can not completely reverse a trend of continuous relative decline in agriculture and give this sector an overall comparative advantage which it definitely does not possess within the Latin American context.

Output and Productivity in Agriculture

The broad contours of Chilean agricultural growth were described in the first part of this paper. In the present section I want to discuss more systematically some topics concerning the notions of output and productivity in agriculture which are crucial in understanding the linkages between agriculture and overall growth, agriculture and services, and agriculture and industry.

A fundamental characteristic of agriculture in Chile is that its output is composed of:

- A. Commodities
- B. Services

Agricultural commodity output consists of:

- 1. Food
- 2. Intermediate Products and
- 3. Capital goods

and is produced by combining labor, and possibly capital goods with land.

Furthermore, agricultural services consist of two major categories:

- 1. Complementary Production Services
- 2. Autonomous Services

"Complementary production services" are those being necessary for the production of the agricultural commodity output and include transport, trade, storage, repairing and maintenance and so forth. "Autonomous" agricultural services are those directly consumed by rural households, such as education, ownership of dwellings, health, entertainment and various household services and produced by agricultural labor.

The interdependence between the marginal productivity of agricultural labor in food production (MP_F) and the marginal productivity of agricultural labor in services (MP_S) is illustrated in Figure 1. The understanding of this interdependence will be facilitated by a short explanation of this figure.

The MP_F of labor is described by the line ABHK which has its first segment, ABH, in the upper quadrant, and its second segment, HK, in the lower quadrant. There is very little reason to expect that MP_F would ever be allowed to become negative. Rational farmers have two alternatives open in preventing a negative marginal product in food production. Unnecessary or detrimental labor can be shifted out of commodity into service production, and, furthermore, some services can be relied upon to either reorganize production, such as to prevent a negative product, or actively promote technological change and thus shift the MP_F curve upwards and to the right. Thus, while it can be logically impossible to prevent a negative MP_F in a commodities-only model of the agricultural sector, introduction of the possibility to produce services makes the HK section of the MP_F curve redundant.

The MP_S of agricultural labor is described by the curve FCLM. In contrast to the MP_F curve, the MP_S curve has a downwards as well as an upwards sloping section. The MP_S rises as we move away from point O towards points E, F, and onwards. The downward section of the MP_S curve, therefore, reflects a rising marginal product. This phenomenon can be explained as follows. First, increased agricultural production will require an increased amount of "complementary production" or "supporting" services. It is reasonable to expect that farmers performing these services will have a constant productivity, or a productivity corresponding to the one in food production. As a consequence, services are produced simultaneously with food, and the relative value added at the outset would be determined by the ratio of OF to OA. Whether or not the MP of farmers engaged in "complementary production services" is constant or slowly declining after the OF level, it is very likely that this productivity will fall to zero when MP_F reaches point H. Second, as total

agricultural food production rises, but MP_F declines, there is more food available to support people engaged in the production of "autonomous" services, such as health, education and so forth. Furthermore, declining MP_F is also likely to induce or even push people into the latter type of service production.

The MP_S of agricultural labor starts declining for two reasons. First, when the MP_S in complementary production services declines, and second, when, with rising total population and a declining per capita caloric intake, the effort farmers can put into service production is reduced.

Thus, there exists a substantial employment range where labor's total productivity ($MP_F + MP_S$), which is illustrated by the curve NSR in the upper quadrant, is mildly rising or almost constant. This area is shown by the distance CG on the horizontal coordinate. Total MP of labor at point O, which is measured by the distance AF, or ON is almost identical with the MP at point G, where it is measured by the distance BC. Only after employment has passed CG does the total MP start to fall. This decline is rather sharp up to point S, but tapers off subsequently over the SR range of the joint marginal productivity curve.

The simultaneous production of goods and services can be interpreted in different ways. Since productivity is normally measured for the duration of a year, one interpretation would suggest that all the workers spend part of the year producing goods and the rest producing services. This may not necessarily be efficient, and as evidence from the Chilean agricultural sector suggests, there are three types of labor. One which is engaged throughout the year in food production, another which is engaged throughout the year in service production, and a third which either produces simultaneously both or spends part of the year in food

and the rest in service production. The advanced degree of specialization within the fundo and hacienda gives rise to the first two groups, while seasonal employment requirements and the presence of the landless afuerinos (farm laborers) give rise to the third. The degree of specialization within the agricultural sector between goods and service production is apparently influenced very strongly by the type of land tenure system.

There exists another distinction of value added in agriculture which is quite parallel to the one between goods and services. Output is divided into the component measured in the national accounts and the component that remains unmeasured. While it is true that the major part of unmeasured agricultural value added is in services, it is not true that all service value added in the sector remains unmeasured. Thus, attempts have been made to make estimates of the value of the ownership of dwellings within agriculture and include them in the national accounts. These attempts have met a limited degree of success in Chile. The majority of the unmeasured value added in agriculture is also related to nonmonetary transactions.

Whether unmeasured, nonmonetary, or predominantly in services, this non-food output within the agricultural sector determines the welfare of the farmers and has to be considered whenever intersectoral productivity comparisons are made, and also when the opportunity cost of moving labor out of agriculture is being considered. In Figure 1, the "food-wage-rate" is equal to CW when employment equals CG ; however, the total real income is likely to be substantially higher and could possibly equal BC . The presence of a high service value-added component explains the need to pay urban wages that are substantially higher than the rural "food wages". However, it does not follow that urban monetary wages have to be equal to, say, CG , if agricultural employment is CG . They can be lower if farmers

moving into the cities obtain part of the services they originally produced themselves free from the State, if they obtain new services free and these compensate for the services lost, if they are able to continue producing within their household some of these services, or if they derive some new amenities by living in the cities which compensate for the loss of the service-real-income they enjoyed in agriculture.

Statistical evidence in Chile suggests that the ratio between the agricultural labor force engaged in food production and that engaged in service production is in the neighborhood of two.

The presence of the joining-output phenomenon described in Figure 1 has numerous implications. As already mentioned, MP_F can fall to zero while the joint food-service MP of agricultural labor is positive. As a consequence, while the so-called institutional, or food-wage-rate, is OW , the real wage rate when employment is equal to OV is OW . This result is obtained by postulating an upward sloping supply curve of agricultural labor beyond the area CG . However, even if the supply curve of agricultural labor continues to be perfectly elastic beyond the CG employment level, the wage rate will remain constant due to market rather than institutional factors.

The wage rate which the industrial sector has to pay to agricultural labor depends on the level of employment in agriculture. In Chile, there is no evidence that the MP_F of agricultural labor has ever been close to zero. As the degree of specialization in the economy rises and also as a result of technological change, the MP_F curve shifts to the right along with the MP_S curve. However, the more rapid shift of the MP_F curve slowly reduces the distance between the ABH and the NSR curves, until, in a state of perfect specialization, MP_S of agricultural labor falls to zero.

The welfare position of the agricultural worker rises, when his MP_F rises, only insofar as it exceeds any induced reduction in MP_S , other things being equal. Furthermore, the increase in MP_F which is induced by a rise in the degree of specialization within the economy will be accompanied by an increased demand on the part of the agricultural sector for services from elsewhere. Thus, any resource release by agriculture, whether in the form of labor or final output, will not be accepted unless a substantial share of it is allocated in the production of services. A resource release by agriculture will also develop as it becomes increasingly advantageous to specialize in the production of food and raw materials and give up the production of "non-food" agricultural commodities.

The degree of joint production of food and services changes over time as the degree of specialization in the economy increases. As a result the production possibility curves are slowly transformed from DAE, to FBG, to HCL, as shown on Figure 2.

Equilibrium is reached at points A, B, and C, with successively lower service output and successively higher food output. This movement from point A, to B, to C is associated with a reduction in the share of "overhead labor", i.e., those permanently employed on the hacienda, such as the inquilinos, to total labor. This structural change is achieved by increasing the share of "variable labor", namely afuerinos, which is employed in agricultural production only during the seasonal peak in production.

At early stages of development, agriculture produces both food and services because it has the labor to produce the services it needs, but also because it can not obtain these services from elsewhere. As the economy grows, however, it becomes less and less efficient to produce

Production Possibilities for Total Agricultural Output

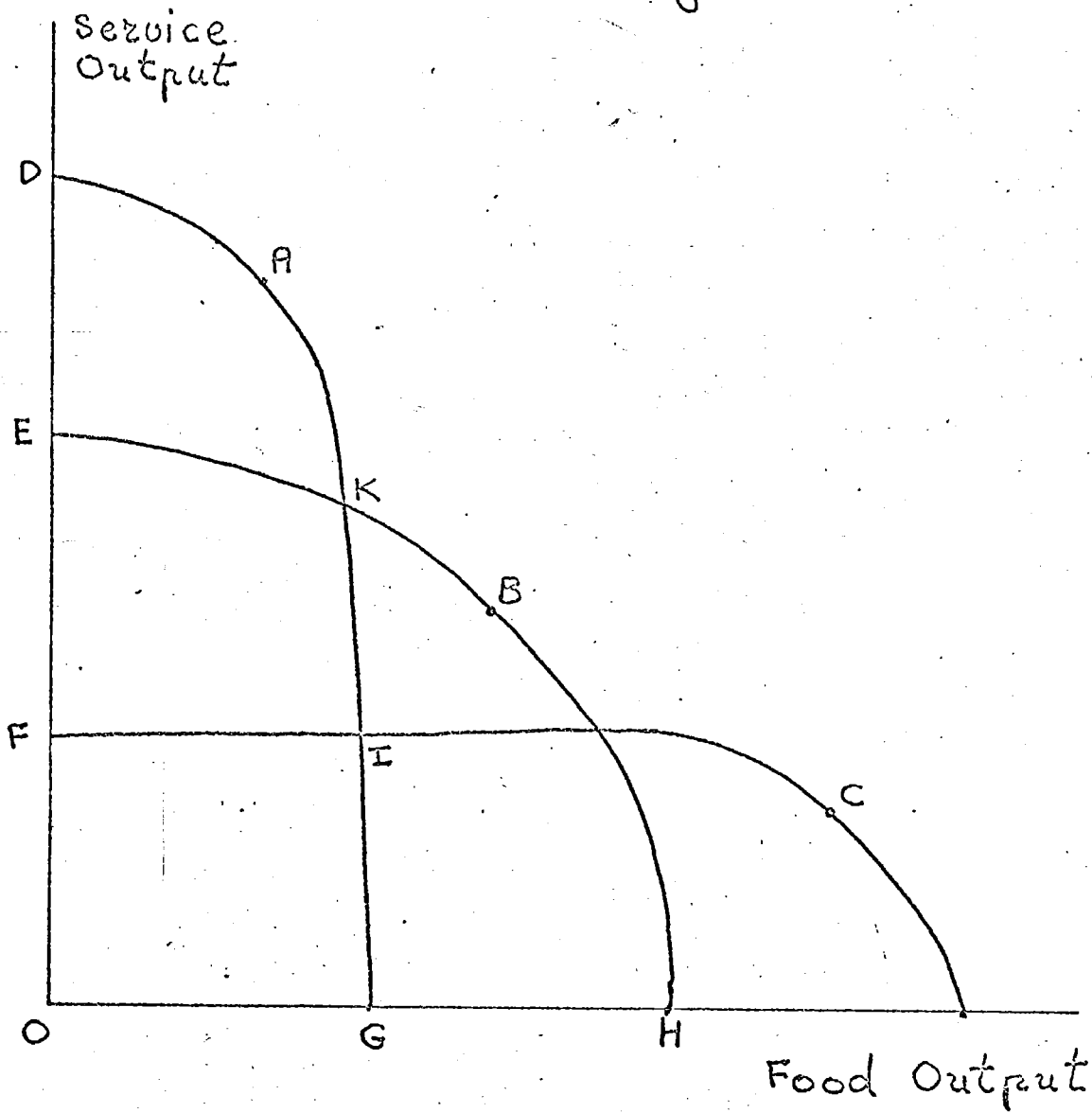


Figure 2

services internally, and furthermore, migration of labor out of agriculture deprives the sector of this "surplus labor". Some of the complementary production services will be internally produced for some time, but higher income levels make it necessary for agriculture to depend on the specialized production of autonomous services, such as health, education, repairs and entertainment, from the rest of the economy. Even a day may come when household servants on the farm become correctly classified as "household servants" rather than farmers.

In Chile, the degree of internal service and capital goods production in agriculture has declined only slowly between 1840 and 1965. A substantial part of capital formation in "construction" and "other" is internally generated and escapes to a substantial degree the national accounts. The highly stratified and historically specialized organization of production has prevented any substantial reduction in the service component of agricultural output. In 1960, Chile had reached a critical point in its development process. The commodity sectors, both rural and urban, were absorbing only a negligible amount of the additions to the labor force. In such a context, the desirability of a labor movement from rural to urban areas could not be determined by simply comparing the relative productivity levels in industry and "food agriculture". The standard comparison between industrial and agricultural productivity in food has to be complemented by the "new comparison" of urban to rural labor productivity in services. This second section of this paper has touched some critical points concerning labor productivity in rural services in an attempt to make the aforementioned "new comparison" meaningful and possible.