

The Agricultural Frontier in Modern Brazilian History: The State of Paraná, 1920-65 *

1. Introduction

In 1872, after more than three centuries, the State of Paraná had only 127,000 people within an area approximating that of Nebraska. As late as 1920, its population stood at only 686,000, not much larger than the population of the *city* of São Paulo in the same year. However, during the following 45 years, Paraná's population exploded nearly nine-fold to 5,844,000 -- an increase all the more remarkable since it consisted largely (66% during 1940-60) of *rural* population growth. Indeed, during 1940-60, the increase in Paraná's rural population amounted to fully 35 percent of the increase in the nation's rural population. This spectacular rate of settlement of Brazil's richest agricultural frontier, while much belated, was reminiscent of the advancing U.S. frontier a century earlier. Yet it has as yet received little scholarly attention. It is the purpose of this paper to review this important phenomenon of modern Brazilian economic history.

- * The material in this paper is largely a summary of a much more extensive analysis to be found in NICHOLLS, William H. & PAIVA, Ruy Miller. *Ninety-Nine Fazendas: The Structure and Productivity of Brazilian Agriculture*, chapter VI. *The North of Paraná: Maringá*. Graduate Center for Latin American Studies, Vanderbilt University, September, 1969, espec. p. 1-100. This article was recently published in English. In: RIPPY, Merrill (ed). *Cultural Change in Brazil: Papers From The Midwest Association for Latin American Studies*, Muncie, Indiana, Ball State University, October 30 and 31, 1969, 1970.

2. Brazilian and U.S. Land Settlement Compared

In 1872, Brazil as a whole had a population density of 3.0 per square mile, a level achieved by the continental United States (comparable in area) 55 years earlier (1817), despite a start later by more than a century. Perhaps a fairer comparison, given the peculiar problems of the Amazon region, is between Brazil, excluding its Northern region and half Mato Grosso, and the United States excluding its late-settled Mountain states. On this basis, Brazil (less Amazonia) in 1872 had a population density of 5.8, attained by the United States (excluding the Mountain states) only 44 years earlier (1828). Finally Brazil's four southern states from São Paulo to Rio Grande do Sul had in 1872 a population of only 4.9 per square mile, a level reached in the five East Central states (Ohio, Indiana, Illinois, Michigan, Wisconsin) 46 years earlier (1826). Of Brazil's four southern states, Paraná had in 1872 the lowest population density (1.7), a level attained by nearly every American state east of the Mississippi by 1822 and by every other Brazilian coastal state from Maranhão to Rio Grande do Sul (as well as by Minas Gerais) well before 1872.

During 1872-1920, while growing considerably faster than the national average, Paraná showed an increase in population density from 1.7 to only 8.9 — a level reached by Guanabara, Rio de Janeiro, and the six northeastern states from Ceará to Sergipe at various times before 1872; by São Paulo and Minas Gerais in 1872; by Bahia, Espírito Santo, and Rio Grande do Sul during 1890-93 and by Santa Catarina in 1901; but reached slightly ahead of Maranhão (1924) and well ahead of Piauí (1942) and Goiás (1963). In 1872, the ten Brazilian states whose population density equaled or exceeded Paraná's 1920 level of 8.9 accounted for 15 percent by area of all Brazil and only 30 percent of Brazil excluding Amazonia. In the same year, after a century of steadily expanding U.S. frontiers, every American state east of the Mississippi save Florida — plus Iowa, Missouri, Arkansas, and Louisiana — had a population density greater than 8.9. Their combined area amounted to 34 percent of the continental United States and fully 62 percent if the Mountain states are excluded — over twice Brazil's relative areas having in excess of the selected population density in 1872.

Also in 1872, the six states of Brazil's South and Center West which were to provide its modern agricultural frontiers had a population density (even after excluding half of Mato Grosso's area) of only 2.2, even São

Paulo having only 8.8 and the other three southern states averaging only 3.2, the population density of Texas at that time. Paraná was still to require the next 48 years to raise its population density from 1.7 to 8.9 — a transition which 28 of the 48 American states made in less time. Indeed, the settlement of many of the American frontier states was truly explosive, the transition from 1.7 to 8.9 people per square mile requiring only 8 years for Michigan (from 1833) and Oklahoma (from 1889); 12-14 years for Ohio (1801), Wisconsin (1842), Iowa (1843), Kansas (1862), and Nebraska (1870); and 16-19 years for Kentucky (1788), Indiana (1813), Alabama (1816), and Illinois (1824). Such rapid rates of settlement in the United States had been favored by vast expanses of exceptionally good land, strong official emphasis on internal improvements (canals, turnpikes, and railways) to give these new lands access to favorable export, and equalitarian public land-settlement policies — all conditions which came very late if ever in Brazil. It is perhaps remarkable that, given its less favorable circumstances, Brazil (with or without Amazonia) and its four southern states had achieved by 1872 population densities with so small a time lag as 44-55 years relative to comparable parts of the United States.

Indeed, these cross-national comparison of population density *circa* 1872 probably imply not so much that Brazil had until then failed to settle many of its agricultural frontiers but rather that its geographic settlement pattern was vastly different from that of the United States. Brazil's earlier course of agricultural settlement would have been much more closely approximated if the United States had followed its occupation of the southern Tidewater with initial expansion into the arid and semi-arid regions of the Mountain states and western Great Plains, leaving until much later the climatically more hospitable inner South and agriculturally richer north central states. Thus, long before 1872, Brazil's inward expansion had largely proceeded from the narrow humid littoral and semi-arid *Agreste* into the arid *sertão* of the Northeast, a vast area which was at best capable of supporting only a very limited human population based on an extensive cattle-grazing economy in which crop production was restricted to subsistence needs. Meanwhile, Brazil's richest soils — while much more scattered and far less extensive than those of the United States — had remained beneath the primeval sub-tropical broadleaf forests of its climatically more salubrious southern and central plateaus, remote from the politico-economic mainstream of Brazilian history until the mid-19th Century.

In an important sense, 1872 represented a low point in Brazilian agricultural history. The northeast's *sertão* was stagnant and the traditional slave-based agriculture of the littoral (and its immediate hinterland) from Maranhão to Rio de Janeiro, was at the end of a long period of economic decline. At the same time, the expansion of the South's agricultural frontiers had hardly begun. Since 1800, the Northeast proper had suffered a steady drop in per-capita real income as sugar-cane production had shifted southward to the State of Rio de Janeiro, which had also benefitted after 1825 as coffee displaced sugar-cane and cotton as Brazil's principal export crop. Hence, during a period (1845-1895) in which (according to Furtado) Brazil's coffee region was averaging a very healthy per-capita annual growth rate of 2.3 percent, the Northeast was actually retrogressing while the three most southerly states were enjoying only about a 1-percent growth rate.¹

Clearly it was coffee which was about to supply the dynamic force not only for Brazil's modern economic development but also for a much-belated expansion of its southern agricultural frontiers in a pattern much more akin to that of the American expansion of half a century earlier. By 1854, the rapidly declining productivity of the land in the State of Rio — whose exploitative techniques had quickly led to soil exhaustion, soil erosion, and land abandonment — had brought an expansion of coffee production into adjoining areas in southern Minas Gerais and São Paulo's Paraíba Valley. By 1872, the Paraíba Valley too had passed its peak and — with the recent completion (1867) of the railway connecting the cities of Santos and São Paulo and the impending completion (1877) of the rail link between São Paulo and Rio de Janeiro — was moving rapidly into the central and northeast parts of the state. The latter areas, with their superior *terra roxa* soils, by 1886 accounted for 80 percent of São Paulo's coffee production, São Paulo already producing 42 percent of national production, which in turn amounted to 59 percent of world production. Thereafter, as these and the older agricultural regions sought to adjust to the abolition of slavery (1888), São Paulo's coffee economy continued to prosper on the basis of free labor, a major part of which was attracted from Europe through active recruitment and heavy public subsidies.

¹ FURTADO, Celso. *Formação Econômica do Brasil*. 4.^a edição, Rio de Janeiro, Editora Fundo de Cultura, 1961, p. 114-116, 126-27, 163-71.

By 1920, as railroads had gradually been extended far to the north and west of the city of São Paulo, coffee production was heavily concentrated in the middle third of the state, which now alone accounted for 79 percent of Brazilian production and 61 percent of world production. The unrelenting search for virgin soil for the expansion of coffee production was at last accomplishing the settlement and development of the entire state, a process which was to be completed clear to the Paraná River by 1935 — in which year the western third of the state produced about two-thirds of the state's coffee. As exploitative as this process was (as in the United States) *exploitation with a difference* as fabulous agricultural profits found their way into capital formation, industrial as well as agricultural, instead of following the Brazilian tradition of *boom-and-bust* in which the longrun economic gains from earlier commodity booms had been minimal. As a consequence, during 1872-1920, with its capital city having grown from 31,000 to 579,000, São Paulo had attracted from abroad nearly 2,000,000 immigrants (a vast stock of human capital); had surpassed the city and State of Rio in manufacturing; and had increased its population density from 8.9 to 48.0 per square mile and its share of the nation's population from 8.4 to 15.0 percent — trends which were to continue in a process of self-sustaining economic development never before known in Brazil.²

More important, São Paulo had now become the regional and even national growth center from which the impetus toward development was already spreading into neighboring states — the Minas Triangle and southern Goiás to the north, southern Mato Grosso to the west, and (most important) Paraná to the south and west. Thus, the latter state — whose rich northern region represented the final step in the westward march of coffee to the Paraná River — was able to increase its population density from 8.9 to 75.9 within a compressed time span of 45 years (1920-65), far below the 72 years (1872-1944) which São Paulo had required. Paraná also made this particular transition in less time than the 53-55 years which had been necessary for fast-growing Illinois (1841-94) and California (1897-1952) and the 64 years required by New York (1793-1857). By 1965, Paraná's

² This and the previous paragraph are based primarily on the various Brazilian censuses of population and manufactures and *Café no Estado de São Paulo: Situação e perspectivas da Produção* — Capítulo I. In: *Agricultura em São Paulo*, ano VIII, 1961, espec. p. 13-29. Cf. also KUZNETS, Simon, et. al. (Editors). *Economic Growth: Brazil, India, Japan*. Durham, N.C., Duke University Press, 1955, espec. p. 31, 37-41, 87-88, and 430-40; and ALMEIDA, Vicente Unzer de. & MENDES SOBRINHO, Octávio Teixeira. *Migração Rural-Urbana*. Secretaria da Agricultura do Estado de São Paulo, p. 80.

population density exceeded that of every American state west of the Mississippi except California and Louisiana as well as that of Maine, New Hampshire, Vermont, Georgia, Alabama, and Mississippi. In general, the remaining American states which *had* reached or exceeded Paraná's population density had taken far longer to make the transition from 8.9 to 75.9 than from 1.7 to 8.9. On the other hand, Paraná had made the latter increase in slightly less time (45 years) than the earlier increase (48 years), indicating how much accelerated was Paraná's population growth after 1920. This acceleration also reflects the fact that, extending from the Atlantic far to the west, Paraná was at once both *old* and *new*. Thus, it has not yet reached the stage at which heavy in-migration is followed by heavy out-migration, as did many of the United States' earliest frontier states, especially insofar as they experienced a slow rate of industrial-urban development. Thus, North and South Carolina combined (with about the same area as Paraná) required 150 years to raise their population density from 8.9 to 75.9, and Kentucky and Tennessee combined required 130 years, as the westward movement of population first filled them rapidly and then drained off much of their subsequent natural increase in favor of still newer frontiers. After 1920, even São Paulo (like New York or Pennsylvania a century before) lost many rural-to-rural *out*-migrants, reducing somewhat its still high rate of population growth as fed by rural-to-urban *in*-migrants.

In 1965, only 8 Brazilian states exceeded Paraná in population density — Paraíba, Pernambuco, Alagoas, and Sergipe; Espírito Santo, Rio de Janeiro, Guanabara, and São Paulo. The six states of the South and Center West now accounted for about 41 percent of the nation's population, as compared with 29.0 percent in 1920 and only 17.9 percent in 1872. Of the growth in this combined share during 1872-1920, São Paulo contributed 59 percent and Rio Grande do Sul 24 percent, but during 1920-65 Paraná's contribution (44%) exceeded São Paulo's (32%), Goiás accounting for another 14 percent. During the latter period, Paraná's population increased 4.7 times, its population as a percentage of São Paulo's increasing from 15 to 38 percent in that quarter-century. However, Paraná's belated but remarkable population explosion came only after São Paulo had set the stage by establishing an efficient system of production and marketing of a highly profitable export product eminently suited to the excellent *terra roxa* soils of the north of Paraná, by extending its railway and highway network in such a way as to make both foreign

and domestic markets readily accessible to farmers of the new region; and hence by stimulating the creation of a private land company which — in sharp contrast with Brazil's always erratic public colonization efforts — brought about orderly, efficient, and rapid land settlement of the region.

3. Old Paraná. Four Centuries of Stagnation^a

Almost none of present-day Paraná was officially part of Portuguese America until treaties of 1750 and 1777 legitimized the *de facto* penetration of the Portuguese far to the west of the initial line (1494) defining the eastern border of Spanish America. Thanks to the vigor of the *vicentinos* from near present-day Santos in exploring the far reaches of Paraná, which was particularly attractive for their Indian-hunting expeditions, the efforts of the Spanish colony of Paraguay to people that territory and catechize its Indians were frustrated. While the vast western plateau of Paraná (200-400 miles west of the Atlantic) had thus been secured for the Portuguese by the mid-16th Century, it nonetheless remained virtually unpopulated for some two-and-a-half centuries thereafter. Paraná's first permanent coastal settlement, Paranaguá, dates from 1585 and its first interior settlement west of the precipitous coastal range, Curitiba, from 1683 — both in response to the *vicentinos'* quest for alluvial gold. However, the further settlement of the two eastern plateaus of Paraná followed the discovery of much richer gold deposits in Minas Gerais, whose gold rush dominated Brazilian economic history during most of the 18th Century. The effect was to create an enormous demand for both food (including beef) and beasts of burden.

With livestock herds already established in the littoral of Rio Grande do Sul, *paulistas* quickly developed a major cattle trail from Viamão (near today's Pôrto Alegre) to Sorocaba (São Paulo) which followed the highland *campos* via Vacaria, Lajes, and Curitiba. Along this trail, hamlets sprang up, herds of cattle were established, and *invernadas* — where cattle could recapture the weight lost in the long drives — were created. In the process, *paulistas* were the principal colonizers of the empty grasslands to the

^a This historical summary is based on the following sources: VIANNA, Hélio. *História do Brasil*. São Paulo, Edições Melhoramentos, 1963, tomo I, p. 33-38, 203-209, 213-17; tomo II, p. 173-78; Instituto Brasileiro de Geografia e Estatística, Conselho Nacional de Geografia. In: Grande Região Sul. *Geografia do Brasil*. Rio de Janeiro, 1963, tomo II, vol. IV, p. 9-24, 32-33, 35-36, 38-41; MARTINS, Wilson. *Um Brasil Diferente: Ensaio Sobre Fenômenos de Aculturação no Paraná*. São Paulo, Editora Anhembi Ltda., 1955, p. 71-74, 77, 94-95; and PLAISANT, Alcibíades Cezar. *cenário Paranaense: Descrição Geográfica, Política e Histórica do Estado do Paraná*. Curitiba, 1908, p. 137-163.

south. As the point (*registro*) where a tax per head of livestock in passage was collected, Curitiba became a major point of convergence in the cattle drive and was a major beneficiary as the nearby *campos* of Castro and Ponta Grossa were initially occupied. The impulse of the gold rush for the first time fixed a significant number of people to the land in Paraná, consumer needs for beef in São Paulo and Rio enabling them at least to survive the playing out of the gold fields of Minas late in the 18th Century. By 1850, most of the *campos* of Paraná and its neighboring states to the south had been occupied, the more distant cattle producers of Rio Grande do Sul depending primarily on the export of leather and *charque* (sun-dried beef), the latter finding a considerable market in the port cities of the Northeast.

With even the littoral from Paranaguá southward very sparsely populated and the occupation of the interior limited to the areas of natural grassland — which constituted only 12 percent of its original cover — Paraná still had only 61,000 inhabitants when it became a separate province in 1853. The large area in pine woods, which had originally covered 38 percent of the state's land and still covered most of the eastern third of the state not in *campo*, were as yet virtually unoccupied. These extensive pinecovered regions — except for meeting local lumber needs and the somewhat broader demand for the Paraguayan tea gathered from the pine-associated *erva mate* tree — had little economic value and were cleared only as farmers felt the need for new cropland for subsistence food production. Since the underlying soil, like that of the *campos*, was basically infertile and highly acid, a shifting agriculture based on a cycle of clearing, short-term cropping, and abandonment to natural reforestation was prevalent. As Paraná's first governor took command of this large but nearly empty new province — which in 1853 remained little more than a *lugar de passagem* between São Paulo and Rio Grande do Sul — he immediately turned his efforts to the stimulation of immigration and colonization. However, Paraná enjoyed only limited success in attracting the Germans, who were so important to the colonization of Santa Catarina and Rio Grande do Sul, and the Italians who were also very important to the latter state, during the 19th Century. With a total population of only 249,000 in 1890, Paraná had since 1853 received only 19,000 immigrants and, of those who did come, most established small and isolated settlements on difficult soils more conducive to failure than success. Over the entire period 1829-1934, Paraná received only about 116,000 immigrants

— a number often exceeded in a single year during the 1890's by São Paulo — of whom 47 percent were Poles, 19 percent Russians, 13 percent Germans, and 9 percent Italians. Thus, whether from foreign immigrants or from internal migration, Paraná had to wait until after 1920 before the march of coffee across São Paulo brought the settlement and rapid growth of the previously undeveloped north of Paraná.

Meanwhile, as Paraná lay largely dormant, the rapid general economic development of its bellwether neighbor to the north had brought from the city of São Paulo an ever-widening network of communications which was to play a crucial role in Paraná's future development. To be sure, by 1885, Curitiba was linked by rail with Paraná's principal seaport, Paranaguá, and extensions of this railway had tied the major *campo* areas of the eastern plateaus to Curitiba and Paranaguá by the late 1890's. However, much more important was the construction of the São Paulo—Rio Grande railway which connected Sorocaba with Ponta Grossa by 1899 and with União da Vitória (on Paraná's southern border) a few years later. With construction of this railroad proceeding simultaneously from Rio Grande do Sul, the final gap across Santa Catarina was closed by 1910, with considerable federally-sponsored colonization by Poles and Russians along the way. The São Paulo—Rio Grande railway, while giving further impetus to the growth of Curitiba, Ponta Grossa, and other older towns of the eastern *campos*, did not — in the absence of important commercial crops in the region traversed — become a major transforming force in the economy of eastern Paraná. However, these railway developments, supplemented by the beginnings of road construction, had by 1920 gone far to integrating the previously isolated town of eastern Paraná into a broader communications network.

Far more significant for the future development of Paraná, however, was the westward extension of the Sorocabana Railway, which reached Ourinhos (311 miles west of the city of São Paulo) in 1908. Thereafter, as this railway was gradually extended to the Paraná river, settlement of the lower part of western São Paulo proceeded apace. More important for present purposes, however, Ourinhos was ready to serve as the rail gateway to the north of Paraná. The construction of a railway southward from Ourinhos to a junction with the São Paulo—Rio Grande Railway at Jaguariaíva (completed about 1920) penetrated an area whose first settlements dated from the 1860's and, by 1925, the first 20 miles of a railway projected to run westward through the north of Paraná had been

completed to Cambará. However, further progress of the latter railroad was then interrupted as financiers began to doubt if the colder climate of this new region would support coffee. Meanwhile, well in advance of these railways, *mineiros* and *paulistas* had established the first coffee plantations in this *Zona Velha* of the north of Paraná. However, only as the extension of these railways was anticipated, and even more after actual arrival, was the stage at last set for the spectacular *coffe rush* into the *Norte Novo* which was now immediately at hand.

4. Settlement of the North of Paraná⁴

As already noted, the initial settlement of the north of Paraná was spontaneous, following the future course of the São Paulo—Paraná Railway, which did not reach the Tibagi River until 1932. Cambará (1904-1908) marked the start of the conquest of the new region and most of the land from there to the Tibagi was privately owned in large tracts. Colonization of much of this area was private as large land owners divided their properties into small lots which they sold for urban lots and agricultural settlement. By the time the railway reached each new town, the nearby virgin forests had already fallen before a quick wave of settlers and it was flourishing, creating a reputation for riches which accelerated each new invasion of newcomers. The magnificent high broad-leaf forests of predominantly deciduous hardwoods, which had originally covered most of São Paulo and about half of Paraná, were closely associated with the region's richest soils. Those of Paraná, limited to the state's long unpopulated north and west, had scarcely been touched in 1920. Yet, beneath them for eons had lain areas of highly fertile *terra roxa* soils, far greater in extent than any found in São Paulo, including the zone of Ribeirão Preto. Since *terra roxa* was the soil *par excellence* for coffee culture, its magnetic pull was inevitable as its presence became known.

West of the Tibagi River, lay large areas of these rich soils on land which still remained largely in the public domain. Yet in 1920 there

⁴ The principal sources of this section were a preliminary manuscript on the settlement history of the north of Paraná which the author, Mauro Resende Lopes, economist of the Fundação Getúlio Vargas (IBRE) generously made available; *Geografia do Brasil*. Op. cit., tomo II, p. 32-34, 41-42; MARTINS, Wilson. Op. cit., p. 90-108; a series of newspaper articles on the north of Paraná in *Folha da Manhã* (São Paulo) beginning in the issue of November 14, 1952, and continuing at more or less weekly intervals through December, under the byline of M. Mazzei Guimarães; and the author's own analysis of Brazilian census data.

was widespread dischantment with the slow pace of colonization under state auspices — with its lack of continuity, limited financial resources, and official ineptitude — while World War I had not only seriously interrupted the flow of immigrants but had created considerable suspicion of those already present. As a consequence, the State of Paraná during 1922-32 made a substantial number of concessions of land to private colonizing enterprises, preferring to use its public resources for schools and roads. It was under this policy that a British land company, the *Companhia de Terras Norte do Paraná* (a subsidiary of Paraná Plantations, Ltd. of London), was established in 1925. Acquiring 4,806 square miles of unclaimed State lands in the *Zona Nova*, this private land company and its Brazilian successor company (1944) clearly deserve credit for having executed the most successful colonization scheme, public or private, in Brazilian history. Although other private land companies also played a smaller role, the intensive occupation of the *Zona Nova* began with the founding of the city of Londrina (*Little London*) by the CTNP in 1929.

Chosen as the headquarters of the Company and projected as the commercial capital of the new region, Londrina was in that year staked out as the first caravan of settlers arrived from Ourinhos. Setting the pattern for subsequent development, the Company demarcated and sold the urban lots, built streets and roads, installed water and electric facilities, and constructed some of the first buildings. Assuming the direct responsibility for extending the railway west from Londrina, the Company also built secondary roads from the advancing rails to give its rural lots access to transportation, establishing urban nuclei every 7.5-10.5 miles along the way. Either directly or through participation in the capital of various smaller local companies, the Company was ultimately responsible for the establishment of some 62 towns or cities in the north of Paraná.

With reference to rural development, the Company first cleared the land titles (a formidable task under Brazilian conditions), as a result of which there were surprisingly few conflicts between those with old land claims and the new settlers. All rural lands were then surveyed and, where possible, soil maps were also made. Diviling the land in relatively small lots which (as sold) averaged 96.8 acres per farm, the Company explicitly stated that its policy was "to favour and support small farmers without, however, ignoring those of larger resources" — the latter meaning that the purchase of multiple lots was permitted for those willing to pay the established prices for the component parts. (As a consequence, land-

holdings in Company territory are typically some multiple of 5 *alqueires paulistas*, that is, 12.1 ha. or 29.3 acres.) In general, rural lots were delineated according to a plan in which each farm would be an independent unit with mixed activities. From the ridges — which the main transportation lines followed — the less frost-prone upper slopes were reserved for coffee while the lower-lying land was left for subsistence crops and pasture, with access to a spring-fed water supply, a residual area also being provided for an orchard and garden. Widespread propaganda was used to attract settlers, the first of whom were offered free transportation, with the promise of full ownership of the land within four years and even some financial and technical assistance. Since it was first necessary to clear the forests, the initial economic activity was the exploitation of the timber, followed by the planting of coffee, sugar cane, cereals, and other crops. Livestock production also developed rapidly, particularly swine production on the smaller farms and cattle production on the excellent planted pastures of the larger farms, many of which were established on lands less suited by soil and topography for coffee production.

Such an idyllic plan was not in itself remarkable, since thousands of such paper plans have probably long gathered dust, with little or no execution, in the files of Latin American public colonizing agencies. What was remarkable was that the Company's plan was successfully executed on a large scale. Thus, by 1944 — when the wartime liquidation of British foreign assets brought the transfer of the Company to Brazilian hands — it had already disposed of 1,038,180 acres of agricultural land (34.4% of its original concession) and 6,122 urban lots, had extended the railroad some 40 miles from Londrina to Apucarana, and had built 927 miles of roads which, while of dirt, were well-drained and were maintained by the Company until *municípios* were created and took over road maintenance. During 1945-50, another 1,166,440 acres of agricultural land (leaving only 26.9% of the original concession undisposed of) and 12,071 urban lots (twice the entire number before 1944) were sold; the railway had reached Maringá some 45 miles further to the west; and an additional 936 miles of roads had been constructed.⁵ Thanks to these efforts, as well as to the concomitant development by organized or spontaneous settlement of areas outside of the Company's territory, the north had, by 1950, been generally settled within the area of 5,549 square miles roughly bounded by the Tibagi, Paranapanema, Pirajó, and Ivaí rivers.

⁵ Manuscript of Mauro Resende Lopes, *op. cit.*

It population density grew from less than 18.7 to 74.9 per square mile (nearly twice the state average) during 1940-50 alone. During that decade, this zone had attracted some 288,000 in-migrants as its population increased more than four-fold. During 1950-65, this central zone of the north of Paraná attracted an additional 333,000 people by net in-migration, its total population by 1965 standing at 1,049,000 people for a population density of 189.0 per square mile, ten times its density a quarter-century earlier.⁶

The extension of this march of settlement west of the Pirapó and south of the Ivaí came largely during the 1950's. However, the nuclear centers — notably Maringá, Paranavaí, Cruzeiro d'Oeste, and Campo Mourão — had been established during the 1940's. During 1940-50, the wester zone of the north of Paraná (6,946 sq. mi.) received its first 100,000 people (most of them settling from Mandaguari and Maringá to Paranavaí) but during the 1950's attracted some 552,000 in-migrants, raising its population by 1960 to 693,000, the population density of this newest zone having increased from 14.5 to 99.8 in that single decade. This expansion had followed two major routes of penetration — northwestward from Maringá to occupy the triangular area of sandy soils between the Paraná—Parapanema and the Ivaí (largely outside of Company territory but much of it developed by smaller land companies) and southwestward from Maringá to Cianorte, along the projected railroad to Cruzeiro d'Oeste and Guaíra which made the most western extremes of the Company's original land concession. With a further net in-migration of only 56,000 during 1960-65, this western zone had 873,000 people (125.5 per square mile) by 1965.

During 1940-65, the population of the entire north of Paraná (including the eastern *Zona Velha* between the Tibagi and Itararé rivers) skyrocketed from 340,000 to 2,681,000 people within an area of 18,569 square miles which approximated half the area of Indiana. Having received some 1,530,000 in-migrants in a quarter-century, the north's population density had increased from only 18.3 to 144.4, the latter higher

⁶ For present purposes, we have defined north of Paraná in terms of the physiographic zones of the 1960 Brazilian Census, adjusting the data from earlier censuses to approximate the same boundaries. Our *north* includes the Tomazina zone, the Census *Norte* (which we divide at the Tibagi river into the eastern north and central north), and that part of the Census *Oeste* which lies north of the Lower Ivaí river plus the *municípios* of Rondon, Cianorte, Jussara, Terra Boa, Engenheiro Beltrão, and Araruna south of the Ivaí (the western north). All 1965 estimates of population were aggregated from Ministry of Planning-IBGE projections of *município* populations for the State of Paraná (mimeo.). All migration estimates are the author's.

than that of São Paulo (135.7) or Indiana (128.9) in 1960. The North's increase in population density during these 25 years was far faster than the 85-97 years it took for New York (1808-1891), Illinois (1852-1942), and Ohio (1825-1922) to make the same transition, even São Paulo requiring 68 years (1894-1962). With a population in 1965 well above Paraná's total population in 1950, the North had increased its share of the state's population from 27.5 to 49.0 percent during 1940-60 and, despite the rapid settlement of the west of Paraná from 1950 on, still accounted for 45.9 percent in 1965. Thanks to its thousands of in-migrants — largely nationals from the states of São Paulo, Minas Gerais, Bahia, and Rio rather from the old eastern regions of Paraná to whom coffee culture was unfamiliar — the north of Paraná had within a few decades evolved from an uninhabited area to the most prosperous region of the state. As a direct extension of the *paulista* coffee economy, the development of the north of Paraná was firmly based on the technical know-how, capital, and experienced labor of the older coffee regions of São Paulo.

In the whole historical development of transportation, first of railways and then of paved highways, it was also São Paulo rather than Old Paraná which took the lead in the economic penetration of the north of Paraná, which was soon closely tied to the dominant port of Santos, to São Paulo's major concentration of marketing and financial services, and to the nation's most important domestic markets for the region's food and industrial crops. With its vastly weaker private and public resources for development — reinforced by a conflict in cultural outlook between the aggressive and progressive *paulistas* and the more serene and traditional attitude of the natives of Old Paraná — Curitiba's long neglected of the transportation needs and other infrastructure requirements of its north had, by the 1950's, caused a strong spirit of political separatism. However, since 1960, highway development has gone far to integrate Curitiba and the port of Paranaguá with the north and, as Curitiba has finally begun to emerge as the major industrial-urban center (save only Pôrto Alegre) south of São Paulo, the political and economic ties between the east and north of Paraná have been considerably strengthened. Nonetheless, more recent improvements in Paraná's highways and public services are probably more important — given the very strong links which tie the north to São Paulo — in assuring the integration of the now fast-expanding west of Paraná into the politico-economic orbit of Curitiba and Old Paraná.

5. Settlement of the West of Paraná

The West of Paraná, as here defined,⁷ has an area of 34,354 square miles (twice the size of the north of Paraná and nearly as large as Indiana) which, as late as 1940, had a population of only 145,000, two-thirds of it in the relatively early-settled *Campos do Oeste* and in the southwest, south of the Iguaçu river. The west as a whole had a population density of only 4.2, even the *Campos do Oeste* having only 10.1 people per square mile. Except for its areas of natural grassland, the west had been settled very slowly. Particularly along the major watersheds under predominantly pine woods, initial settlement was scattered and often nomadic and exploitative. Typically, the more accessible pine-covered areas were invaded by the sawmill operator who devastated the forested areas without regard for conservation, and by the *safrista* who burned the forests, planted and *hogged down* crops for a few years, and then moved on to repeat the cycle. Coming from eastern Paraná (where such a destructive pattern was an old tradition) or from the *Campos Gerais* of São Paulo (where they frequently had been squatters), these settlers frequently came into open conflict with would-be coffee colonizers in the more northerly reaches of the western pine forests.

With no railway in the entire region except a branch of the São Paulo—Rio Grande Railway to Guarapuava, its earliest east-west roads also occasioned some public and private colonization of the region during 1920-40. However, such colonies — isolated, far from markets, faced with precarious roads and the lack of technical and financial assistance — were frequently temporary. Insofar as settlement of the south-west and west of Paraná was permanent, the settlers were typically from the families of *colonos* in northern Rio Grande do Sul, the adjoining rio Peixe zone of Santa Catarina, and the Slavic settlements of eastern Paraná — reflecting the heavy population pressure on the small farms founded a generation or two earlier by European immigrants. Significant numbers of *colonos* from Rio Grande do Sul also found their way into the north and north-

⁷ The west of Paraná is here defined as consisting of the Census zone of *Campos do Oeste* and all of the *Census Oeste* excluding that part which we assigned to the western zone of the north of Paraná (Cf. previous footnote). It is bounded on the east by the Upper Ivaí river and the Serra da Boa Esperança, on the south by Santa Catarina, on the west by the Paraná river, and on the north by an irregular line (approximating latitude 24°S) delineated by the previous definition of the West of North Paraná. For some purposes, we have also divided our west (exclusive of the *Campos do Oeste*) into the Frontier Northwest, Frontier West, Frontier Southwest, and Residual West, all but the latter as defined in MINISTÉRIO EXTRAORDINÁRIO PARA A COORDENAÇÃO DOS ORGANISMOS REGIONAIS. Superintendência do Plano de Valorização Econômica da Região Sudoeste do País. *Informe Estatístico*. Rio de Janeiro, novembro de 1966, vol. II.

Finally, the West suffered from exceptionally poor transportation, a condition which the state has begun to correct largely after, rather in advance of the region's rapid population growth. Nonetheless, the recent completion of the paved federal highway from Paranaguá and Curitiba (via Ponta Grossa, Guarapuava, and Laranjeiras do Sul) to Foz do Iguaçu and Asunción—Paraguay having been conceded a *zona franca* in Paranaguá for its imports and exports through that seaport — bodes well for the future. In giving much of the west better access to markets and at last integrating that long empty region into the economy of eastern Paraná — which in turn has greatly benefitted from highway construction between São Paulo and Rio Grande do Sul — this new 485-mile highway across the state is of paramount importance to the west's continued economic development.

6. Some Consequences of Paraná's Recent Progress^a

Between 1920 and 1940, Paraná's total farmland increased only 15 percent. However, during 1940-60, the area of land in farms in Paraná nearly doubled, virtually all of the increase of 12,421,000 acres being in the north and west, which shared nearly equally in this large increment of new agricultural land. Together the north and west increased their share of all farmland in the State from 47 to 70 percent. During the same 20 years, farmland as a percentage of *total land area* in Paraná increased from 31.4 to 57.2 percent, the United States as a whole requiring 56 years (1888-1944) to make the same transition. Although very little additional land was brought into farms in the old eastern region, the north's percentage of total land area in farms increased from 27.4 to an amazing 80.3 percent in 1940-60, the increase in the west (comparable to that made by the U.S. during 1854-1910) being from 18.2 to 46.3 percent. However, much of the total land area incorporated into farms still had its natural forest cover, not yet having been cleared for agricultural exploitation. If we consider only that farmland currently being exploited as cropland, pasture, and planted forest, such farm land constituted 14.1 percent of Paraná's land area in 1940 and 31.8 percent in 1960. In the old eastern region, the increase was from only 49.4 to 55.0 percent as compared with an increase from 8.3 to 56.6 percent in the north and from 9.0 to 20.5

^a All comparisons in this section are based on the author's analysis of the data from the Brazilian censuses of 1940, 1950, and 1960 after a laborious effort to standardize all data to fit the 1960 boundaries of our three state regions, the north, the west, and the east. For additional detail, see NICHOLLS & PAIVA, *op. cit.*

west of Paraná where, frequently preferring cattle to coffee, they often became some of the most successful migrants. It was largely from such sources that the west of Paraná — as well as the extreme west of Santa Catarina, the south of Mato Grosso, and even the contiguous areas of Argentina, Paraguay, and Bolivia — was to be definitively settled.

During the 1940's, the population of the west doubled from 145,000 to 295,000 on the basis of some 116,000 in-migrants as it was being penetrated both from the south and, as a spillover effect of the new coffee region, from the north via Campo Mourão and along the projected railway from Cianorte to Guaíra. During 1950-60, however, in-migration into the west jumped to 580,000 and total population to 988,000 — nearly a seven-fold increase in twenty years — and with a further acceleration in net in-migration (422,000 in *five* years) after 1960, had reached 1,584,000 by 1965. In the latter year the entire west had a population density of 46.1 per square mile, greater than that of eastern Paraná in 1965 if the Curitiba zone is excluded and only 16 years behind the north (1949) in reaching such a level. Making the transition in population density from 4.2 to 46.1 in 25 years, the west (with virtually no urbanization) had done so in far less than the 38-50 years required by Illinois, Ohio, and Indiana over a century earlier, even São Paulo needing something over 50 years and Rio Grande do Sul and Santa Catarina 86-90 years for the same increase in density. As a result of Paraná's second wave of population explosion by in-migration, the west's share of the state's population increased from 11.7 to 27.1 percent during 1940-65 and, combined with the North, increased from 39.2 to 73.0 percent in the same quarter-century.

In many ways, the recent settlement of the west of Paraná has been more spectacular than that of the north. Lacking the pull of a fabulously profitable cash crop — except insofar as coffee invaded the west in optimistic disregard of the realities of the frost line — the west did not attract the entrepreneurship and capital which so easily flowed into the north from São Paulo. While not entirely lacking in *terra roxa* and other superior soils, especially along the major rivers with their broad-leaf forests, the west also had large areas of pine cover with much less hospitable and durable soils. Its in-migration had to be much more fully spontaneous and disorganized, in the absence of private or public land-settlement agencies of the high caliber of the north's great Company.

percent in the west. Finally, while the east of Paraná was increasing its percentage of total farmland planted to crops (U.S. average 27.7 percent in 1959) from 11.0 to 17.0 percent during 1940-60, the corresponding increases for the north and west were from 23.2 to 49.9 percent, and from 5.8 to 22.6 percent, respectively. These data indicate how dramatically Paraná's vast empty spaces were occupied and actively exploited in recent decades.

After doubling from 1920 to 1940, the number of farms in Paraná increased from 64 to 269 thousand farms during 1940-60. Of the latter increase, the north accounted for 47 percent, the west for 42 percent, and the east for only 11 percent. In all three regions, the number of farms increased considerably more rapidly than the area in farms, with a consequent drop in average size of farm. During 1940-60, the average size of farm in the north fell from 213.9 to 83.5 acres and that of the west fell more sharply from 484.0 to 107.2 acres, the average in the east declining from 193.6 to 128.0 acres. In the process, the relative importance of large farms (all classes above 121.0 acres) dropped substantially in all regions while that of smaller farms (particularly those with 12.1-48.4 acres) rapidly increased. It was in the north and west where farms of 12-48 acres flourished, their combined share of such farms in the state increasing from 33.6 to 80.5 percent during 1940-60. Within the north, at least, this trend might in part be attributed to the influence of the Company's policies favoring small farms. However, it probably reflects primarily the tendency for the north's larger farms to be broken up into relatively small share-cropping units as they were developed — larger landholdings initially counted as single farms being divided into several operating units each of which later became a Census farm.

Thus, while owner-operated farms dominated in all regions of Paraná, it was the north in which farms operated by cash renters and *autonomous* share-croppers increased much more rapidly than the total number of farms, the relative importance of such renter-operators in the north increasing from 13.1 to 33.4 percent (38.7 percent including *non-autonomous* share-croppers on properties reported as operated by owners or administrators). As a consequence, by 1960 the north (with 41.5 percent of all farms in the state) had 82.0 percent of the state's share cropper-operated farms (average size 32.4 acres). However, far from being a cause for social concern, such small operating units were — given the richness of soils and the highly labor-intensive and profitable nature of the region's

coffee production — quite capable of producing at *normal* crop yields very satisfactory annual net incomes even for cropper families.⁹

Also revealing are the trends in squatter-operated farms and in farms whose land was owned public entities, particularly in the west where private land companies played only a minor role. During the 1950's, the increase in the number of squatter-operated farms, as a percentage of the increase in all farms, was 38 percent for Paraná but fully 81 percent for the west, which in 1950 claimed 66 percent of the state's squatters (*ocupantes*) and 84 percent of the state's farms on public-owned land. During 1940-50, squatter-operated farms expanded their share of the west's farms from 22 to 51 percent, while farms on the west's public-owned land expanded their share of all farms from 19 to 48 percent, suggesting the extent to which unclaimed state lands were being occupied by squatters. While the 1950's saw a much more rapid absolute expansion of farms in both categories, the total number of farms expanded considerably more rapidly. Hence, although by 1960 the west had 86 percent of the state's squatters and 95 percent of its farms on public-owned land, their shares of the west's farms had declined substantially even though they still stood at 31 and 28 percent, respectively. During the same period, squatters and farms on public-owned land were of only minor importance (6 and 2 percent respectively at their 1950 peak) in the north, thanks to its more orderly organized settlement, but in 1950 were more significant the newer the zone, and in 1960 were largely limited to those less desirable peripheral areas of the older zones which had been bypassed in the original march of settlement.

During 1940-60, Paraná's share of Brazil's coffee production increased from only 7 to 52 percent. With the state's area in permanent crops growing over eight-fold, 87 percent of the increase was in the north, most of the remaining increase being found in the west as coffee moved south of the Ivaí river. By 1960, 85 percent of Paraná's land in permanent crops was in the north, where fully 36 percent of all farmland was planted to coffee and other permanent crops. Not only was 50 percent of the north's

⁹ On the basis of our Maringá survey of 1963, Paiva and I (Op. cit., Table 6.9) estimated the following longrun *normal* median annual net family incomes (residual income to remunerate for operator inputs of labor and management) from our small sample: farm-operator families \$435 (owner-operators of coffee \$763, autonomous share-croppers \$715, owner-operators of non-coffee farms \$134) and resident share-croppers \$597 (coffee \$597 and non-coffee \$413). Median family incomes of other classes of resident hired farm workers were \$435 for administrators, \$357 for *colonos* (a special class of coffee workers), \$260 for cattle workers, \$232 for swine workers, and \$198 for other crop workers. For non-resident seasonal workers, the comparable average family income (after annualization) was \$214.

farmland under cultivation by 1960 but 73 percent of that cropland was by then in bearing coffee trees which, along with massive land clearing, represented a huge capital investment in the land. Between 1940 and 1960, Paraná's total cropland had increased by 6,478,000 acres, of which the north accounted for 61 percent and the west for 31 percent. However, since so much of the north's new cropland was turned to coffee, the three-fold increase in land planted to *temporary* (annual) crops — excluding those interplanted in the coffee — fell more largely to the west (52 percent) than to the north (30 percent). In 1950 — before the west's expansion had yet had a large impact — the north produced 98 percent of the state's cotton, 85 percent of the rice (one-fourth interplanted), 72 percent of the beans (three-quarters interplanted), 79 percent of the sugar-cane, and 46 percent of the corn (one-third interplanted). However, during 1950-63, the west's contribution to Paraná's crop production increased from 8 to 32 percent for beans, from 4 to 28 percent for rice, from 21 to 27 percent for corn, and from 0.2 to 20 percent for cotton, with corresponding declines in the north's share except for corn. However, by 1963 (1962-64 average), the two new regions together accounted for 100 percent of the state's cotton, 86 percent of its rice and beans, and 79 percent of its corn. As a result, by the early 1960's, Paraná produced 24 percent of Brazil's beans, 17 percent of its corn, 15 percent of its cotton, and 7 percent of its rice.¹⁰

During 1940-60, Paraná's area in natural pasture remained nearly constant, the tendency of the major areas of *campos* to divert such land to crops being approximately offset by the limited amounts of natural pastures added in the expansion of the west and north. Much more important was the nearly ten-fold increase in Paraná's area of planted pasture. In 1950, the north had 83 percent of the state's planted pastures and the west 7 percent; by 1960, these percentages were 62 and 33 percent, respectively. Thanks to these superior pastures, Paraná's cattle numbers increased nearly four-fold during 1940-60, the north contributing 64 percent (and the west 28 percent) of the increase. During the two decades, the north's share of the state's cattle increased from 11 to 49 percent, the west's share (after dropping from 33 to 23 percent during the 1950's)

¹⁰ The 1950 crop-production data are from the 1950 Census of Agriculture and (yet lacking such data from the 1960 Census) we have used the data for 1962-64 (average) from MINISTÉRIO DE PLANEJAMENTO. *Plano Decenal de Desenvolvimento Econômico e Social. Versão Preliminar.* Rio de Janeiro, março de 1967, tomo IV, vol. I, p. 109, 130, 161, and 173. We have adjusted the latter data (reported in percentage terms) to roughly fit our own regions.

standing at 30 percent in 1960. Meanwhile, Paraná's swine production was expanding almost in proportion to its rapidly growing corn production. During 1940-60, Paraná's swine numbers increased over three-fold and by 1965 were five times their 1940 level, Paraná raising its share of the nation's swine herds from 8.8 to 12.5 percent during the quarter-century. During the same period, the north's swine numbers increased from 34 to perhaps 50 percent, and the west from 22 to 40 percent or more.

As a result of this spectacular expansion of crop and livestock production in the north and west, Paraná's total farm labor force (Census of Agriculture) increased more than four-fold during 1940-60, exceeding one million by 1960. Of this vast new increment of agricultural employment, the north contributed 59 percent and the west 31 percent. Together, the two new regions increased their combined share of the state's farm labor force from 45 to 80 percent during the two decades, a period in which their share of the state's total population increased from 39 to 72 percent. At the same time, while Paraná was enjoying a rapid increase in the number of cities and towns, it was in the north and west in which most of its larger towns were to be found. Thus, between 1940 and 1960, the number of Paraná cities with over 10,000 people grew from only 4 to 15, the old east adding only 3 cities as compared with 7 for the north and one for the west. During the same period, the number of cities with populations of 5,000-10,000 increased from only 4 to 35, of which increase the east contributed only 5 as compared with 19 in the north and 7 in the west, many of the latter achieving within 10-20 years populations which only 14 cities of the east had reached after many decades or even centuries.

Of Paraná's 10 largest cities in 1960, 6 were in the north. Curitiba, the state capital, was easily the largest city, having grown from 99,000 to 345,000 people during 1940-60. Ponta Grossa was still in second place with 78,000 (29,000 in 1940) but was closely pressed by Londrina, which had sprung from virgin forest to Paraná's fourth largest city during the decade of the 1930's, continued to explode from 10,500 to 74,000 people between 1940 and 1960 and by 1965 had displaced Ponta Grossa as the state's second city. The growth of the north's city of Maringá was even more spectacular. Non-existent in 1940, Maringá grew from 7,000 to 42,000 during the 1950's (by 1960 it ranked as Paraná's fourth largest city) and by 1965 had 65,000 people, now vigorously contesting Londrina's once-safe

claim to the position of regional capital of the north. The old seaport city of Paranaguá, whose 13,000 people were enough for third place in 1940, had dropped to fifth by 1960, its population of 28,000 being rapidly overtaken by three more towns of the north, where Paranavaí, Arapongas, and Apucarana had in some 20-25 years grown to 21,000-22,000 each. The spectacular rise of Londrina created an environment so favorable to urban real-estate that a veritable industry devoted to the creation of new cities in the north of Paraná had quickly developed. Through numerous offices in São Paulo, small urban lots had been sold to thousands of buyers who had hoped to participate in the growth of a *new* Londrina. Far more often than usual in the checkered history of real-estate booms, their hopes for enormous speculative gains were probably fully realized.

By 1961, 8 of Paraná's largest banking centers were in the north, with Londrina and Maringá ranking after only Curitiba in total demand and time deposits. Londrina and Maringá also followed only Curitiba in total value added by manufactures. By that time, 80 percent of Paraná's value added by manufactures was concentrated in its *municípios* with a city of 5,000 or more, these *municípios* having 55 percent of the state's population. Such *municípios* in the east (dominated by Curitiba and Ponta Grossa) had 37 percent of the state's value added and only 17 percent of the population. However, the corresponding *municípios* of the north, (led by Londrina, Maringá, and Cambé) already had a share of the state's value added (34 percent) significantly above their share of the population (26 percent), only the west (9 and 12 percent) showing an adverse relationship. In such other indexes as retail and wholesale trade, the north was also making rapid strides as its general industrial-urban development followed its initial agricultural development.

Thanks to the remarkable growth of its agriculture (particularly in the north) as well as to substantial industrial growth (both east and north), Paraná increased its per-capita real income from \$232 to \$377 during 1947-60 — a gain well in excess of the 51-percent increase for Brazil as a whole. Very largely on the basis of agriculture, Paraná in both years ranked fourth after only Guanabara (city of Rio), São Paulo, and Rio Grande do Sul among Brazil's 21 states.¹¹ Thus had Paraná, after centuries

¹¹ Per-capita income data were computed from BAER, Werner. *Industrialization and Economic Development in Brazil*. Homewood, Ill., Richard D. Irwin, Inc., 1965, Table 7-7, p. 170. As a percentage of the national average, Paraná's per-capita income increased from 103 to 111 during 1947-60. São Paulo's relative income declined slightly from 184 to 178, although its per-capita real income increased from \$414 to \$605 during the same period.

of dormancy and near-stagnation, leaped into the select group of fast-developing states of the nation's South.

7. Conclusions

Except insofar as the Brazilian Northeast's arid *sertão* became definitively but very sparsely settled at a relatively early date, the agricultural frontier in Brazil long played only a minor developmental role as compared with that of the United States. Far longer than in the United States, Brazil's northeastern equivalent of the U.S. southern Tidewater dominated politically, socially, and economically. Early U.S. economic development was far more balanced, being based on nearly simultaneous development of southern agricultural exports, New England shipping and manufactures, and cheap midwestern food. The result was that the aristocratic and agrarian philosophy of the slavery-based plantation South had to face increasingly strong competing forces and social ideas which (culminating with the Civil War) kept it from dominating the entire nation. Like the Brazilian Northeast, the U.S. South was long content to specialize on the production of primary products for export, wanting industrial-urban development neither for itself nor (via tariff protection) for New England. Nor did it view with much enthusiasm the democratizing influences on national policy toward immigration, public education, and foreign-financed internal improvements which the equalitarian land-settlement pattern of the Midwest made politically inevitable. Nonetheless, in large part because of the dilution of its political power which followed from the expanding midwestern agricultural frontier, the U.S. South had to bow to other regional and sectorial interests well before the emergence of coffee gave the long-stagnant Brazilian South the opportunity to displace the Northeast in terms of politico-economic dominance.

Like the U.S. Midwest 50-75 years earlier, agricultural development in the Brazilian South was able to avoid many of the unfavorable social effects of a slave-based agrarian society, proceeding on the basis of substantial capital investment and a high rate of capital formation, a very able rural entrepreneurial class, and a large and valuable influx of free immigrant labor. For the first time in Brazilian history, a large agricultural surplus, once produced, was turned to general economic development — initially in the form of extending railways along which the agricultural frontier was rapidly pushed back, with concomitant agricultural development; and later in industrial-urban development,

which through providing growing markets and an improving infrastructure, further stimulated the nearby agriculture. In this process, the state of São Paulo was at the outset the major beneficiary, but the ultimate effect was to hasten the settlement of the substantial agricultural frontiers of neighboring states as the economic orbit of São Paulo gradually embraced the entire South and Center-West. Thus, by 1940-60, some 3,000,000 largely rural-to-rural migrants moved into Paraná, Goiás and the Minas Triangle, and Mato Grosso, Paraná alone accounting for 1,932,000 with an additional 812,000 following during 1960-65. As in São Paulo 50 years earlier, it was the pull of coffee which filled the north of Paraná so rapidly, although coffee was of minor importance in settling the west of Paraná and the other southern agricultural frontiers.

As in the United States, these agricultural frontiers of the Brazilian South served to permit many migrants to enjoy a considerable degree of upward social mobility, preventing Brazil (particularly the South) from becoming the closed society which it is so commonly alleged to be. On the other hand, having long since reached the stage of a labor-plentiful rural economy with very heavy agricultural underemployment, most of Brazil (like the U.S. South) also needs a much greater expansion of non-agricultural employment than its recent impressive but unduly capital-intensive industrial development has yet supplied. Nonetheless, out-migration has served as an important *safety valve* against rural overpopulation in the lower-income regions, with rural-to-rural migration often offering the opportunity for greater improvements in economic status than has the more commonly recognized rural-to-urban migration. With Brazil's last remaining agricultural frontiers outside of the difficult Amazon region likely to have been filled up within another current existence can now offer no more than a temporary and partial respite in the continuing need for a rapid expansion (and greater regional dispersion) of non-agricultural employment. Meanwhile, however, the rapidity with which Brazilians have at long last been pushing back their agricultural frontiers — ever accelerating as the highway network is bringing the entire South and Center-West into a single integrated regional economy, with increasing impact on the North and Northeast as well — has been a highly impressive and significant phenomenon.

At the same time, as in the eastern United States a century earlier, the existence of vast empty spaces in Brazil has not been conducive to land and forest conservation. The illusion of an inexhaustible land supply

has encouraged the mining of new lands until they are exhausted and abandoned in favor of newer lands, whose initial high crop yields tend to offset the low yields on the older lands. Only as the agricultural frontiers are becoming so distant that transport costs more than counterbalance their superior natural fertility does conservation and the use of fertilizer and other land substitutes become economic in the older regions. Little of Brazil has yet reached this stage although such older areas as the Paraíba Valley and Ribeirão Preto — given their favorable location relative to the South's major cities, particularly for meeting the need of perishable products — are now undergoing the same kind of agricultural rehabilitation which New England underwent late in its history.

Clearly, the agriculture of both the north and west of Paraná is still in an exploitative stage, based on the high natural fertility of its recently-cleared forest soils. With cropping techniques still almost entirely manual, these new regions have not yet had to face the problems of soil maintenance through rational systems of crop rotation and soil conservation, the effective use of animal manure and commercial fertilizers, and generally improved cultural practices. However, certainly, the farmers of the north — and less certainly those of the west, much of whose future still depends on further improvements in the highway network — are sufficiently within the mainstream of the South's relatively advanced agriculture to give one hope that they will be able to make the transition to a more conservative and generally progressive agriculture as the need arises.

In any case, according to a recent study of Maringá's agriculture, Ruy Miller Paiva and I determined that (at least in a gross sense, given our small sample) the allocation of land, labor, and capital inputs in the north of Paraná is probably more nearly optimal at prevailing factor and product prices than one finds in most parts of Brazil. Certainly, conditions in the north were unusually propitious for achieving relatively efficient results. First, from the beginning of the north's settlement and development, it had the benefit of long-accumulated technical know-how which was bodily transferred from São Paulo's old and relatively efficient coffee sector and, to a lesser extent, from the superior cattle and swine sectors of Rio Grande do Sul and other southern states. Second, the relative backwardness of Paraná's state agricultural services mattered far less since São Paulo's relatively advanced agricultural research and development services were readily available and easily adaptable to the north of Paraná. Third, the prospects of fabulous profits from coffee were such that *paulista*

and other Brazilian capital flowed freely into the region, not only for the rapid clearing of the land and the formation of coffee groves and planted pastures, but also for provision of the whole necessary infrastructure in terms of marketing and transportation facilities, financial and credit institutions, and urban development.

Fourth, thanks in considerable part to the well-conceived and well-executed colonization scheme of the major private land company of the north, the initial lack of a farm labor force was quickly overcome as the opportunities for land ownership or superior conditions of farm tenure and employment brought wave after wave of in-migrants, many of whom were already well-schooled in coffee culture and livestock production. Finally, the rapidity with which urban (commercial-industrial) development followed agricultural development made it less difficult to absorb any excess of in-migrants into non-agricultural employment — either full-time or contracyclically to the seasonal variations in the agricultural demand for labor — while maintaining farm wages at relatively high levels. Under such unusually favorable circumstances — gradually reinforced as the State of Paraná also assumed increasing responsibility for highway development, public education, and other social services — it is not surprising that the north's agriculture was able to achieve a close-to-optimum adjustment of resources in a structural setting in which moderate-sized farms were an asset rather than a liability.

So far as the north of Paraná is concerned, the only dark cloud which disturbs this otherwise rosy picture is the question of how often that region is to be assaulted by frosts and freezes which can have disastrous effects on coffee yields. During the twenty years 1949-69, the north has suffered five *geadas* each of which interrupted coffee production for 1-3 years depending upon their local severity. Such *geadas*, which had only infrequently been a problem in São Paulo, have usually been more severe within the north of Paraná as one moves west and south. Thus, the severe 1963 freeze (which followed a less severe one in 1962) affected in some degree 44 percent of the coffee trees east of the Tibagi river, 64 percent in the zone from Londrina to Maringá, and 77 percent in the coffee to the west and south of Maringá.¹² However, the extremely

¹² The corresponding percentages for coffee trees *most seriously* affected (involving a three-year interruption of production) were 16, 30, and 53 percent, respectively (INSTITUTO BRASILEIRO DO CAFÉ. *Cafeicultura no Paraná*. Rio de Janeiro, 1964, p. 129).

During 1958-62, as the output of the north of Paraná increased some five-fold, Brazil's coffee stocks again exceeded two years' consumption. As a consequence, the Brazilian government

severe *geada* of 1969 has had a very high incidence even close to Londrina, raising a new doubts about the ecological suitability of the north for coffee production. However, in our own study of Maringá — even after making allowance for a much higher frequency of freezes than most Brazilians would have considered reasonable before the 1969 *geada* — we concluded that it was still more profitable, at relative prices and land values of 1963, to keep in coffee that land which remained in coffee after the local farmers had adjusted their land use (largely by substituting planted pasture for eradicated coffee trees) following the 1962 freeze. As to whether the diversion of coffee lands to planted pastures was a better allocation of land resources (from a profit-maximizing viewpoint) than their diversion to food and industrial crops, our statistical analysis was inconclusive. Nonetheless, the undesirable social effects are obvious, the diversion to pasture substantially reducing *normal* agricultural employment, already subject to severe instability in view of widely fluctuating coffee yields.

Insofar as the frequency and severity of freezes forces a further reduction in coffee acreage, an expansion in both annual crops and planted pasture will add some stability to local agricultural income although the level of both that income and agricultural employment may be considerably reduced. However, there appears to be little room to doubt that — even if the north must become more diversified by reducing its dependence on coffee — its rich soils, reliable rainfall, and easy access to Brazil's best urban markets are such as to assure its continued prosperity even if it fails fully to live up to its fabulous reputation. The future of the west

sought to eradicate 2 billion low-yielding coffee trees through a system of subsidy payments, permitting the planting of no more than one new tree for each tree eradicated and encouraging the diversion of freed coffee lands to staple food crops. Between June 1962 and April 1967, some 1,379 million coffee trees — approximately the total number of trees in Paraná in 1963 — were eradicated and, of these, 250 million trees (18% of the total) were in Paraná: Initially, most of the latter were relatively old trees in the *Zona Velha* but, following the successive freezes of 1962 and 1963, many farmers of the newer zones with unfavorable experience participated in the program. The effects of this program on the coffee industry's productive capacity are as yet somewhat uncertain, although Brazil's average coffee output during 1965-67 was 21.5 percent below the very high average of 1961-63, while the average for 1963-67 (two of five harvests following freezes) was 31.0 percent below the 1958-62 average and only 9.7 percent higher than the 1954-58 average (two of five harvests following freezes). During 1962-65, much of the land whose coffee was eradicated under the public program was diverted to planted pastures rather than to food crops, a diversion no longer permitted during 1966-67. However, the crop-diversification objectives of the program were at best only moderately successful, as a consequence of which the attempt to prevent a considerable drop in farm employment was far from realized. Summarized from an unpublished paper by Kenneth D. Frederick, *Production Controls Under the International Coffee Agreement: An Evaluation of Brazil's Programs* (U.S. Agency for International Development).

of Paraná is more problematical. Much depends upon how fast its network of highways is extended to give it adequate access to urban markets. Furthermore, even more than the north, the west needs expanded public agricultural services which can bring to its typically small to medium-sized landowners the innovations (especially in the more complex field of live-stock production) needed to increase the efficiency and profitability of their farming operations. Thus far, these new regions of Paraná owe most of their spectacular agricultural development — and much of their strikingly successful colonization — to private managerial and financial resources. If national and state agricultural agencies — particularly those concerned with research and extension — are at last adequately staffed and financed, those fantastic new regions can at last fully realize the position of the El Dorado which for 20-50 years they have already been fabled to be.

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