

## SUGAR IN BRAZIL: ITS EARLY DEVELOPMENTS AND INTERNATIONAL CONNECTIONS IN THE XVI AND XVII CENTURIES

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It is relatively well known today the east-to-west route of expansion of sugar cane cultivation from India and Persia to the eastern Mediterranean, and from there to the islands of Sicily and Cyprus, from where it spread and was incorporated into the agriculture of southern Italy, Andalucia and Granada, in Spain, in a process in which the Arabs were the main protagonists and which took about three centuries to take place, so that by the XIVth century sugar was a much sought-after luxury product and a drug with a constant demand from princes, bourgeois and pharmacists. <sup>1</sup> This process was followed by the dissemination of sugar production into the newly discovered Atlantic islands of Azores, Madeira, Cabo Verde and São Tomé by the Portuguese in the XVth century at a moment when the affluent classes of Europe began to switch on its consumption from a drug to a basic caloric staple which rather rapidly was substituting honey as a favorite sweetener for candies, beverages and other cooking needs. It is also well known that the Spaniards transferred the sugar technology they had learned from the Arabs, from Andalucia and Granada, to the recently acquired Canaries Islands in the late XVth century thus creating, together with the Portuguese, a strong competition to the Mediterranean sugars whose markets and commercialization networks had been in dispute between the Venetians and the Genoese in the last two hundred years. <sup>2</sup> This competition, and the rise of the supply coming from the Atlantic islands, brought sugar prices down at the end of the XVth century and made this commodity more available to the consumers of the lower classes in Europe. <sup>3</sup>

Far from being detrimental to the market, this extraordinary availability

of sugar increased its demand at such a rapid rate that by 1510 the prices were going up again as the supply was becoming insufficient. Both Portuguese and Spanish producers made efforts to expand their production, and in the case of the latter the price rise had a special impact among the *encomenderos* of Hispaniola who by 1515 were facing an economic crisis as the production of the gold mines of this island was being exhausted and its Indian population liquidated. As it is known, the richest of these *encomenderos* decided to invest their savings in the construction of sugar mills in Hispaniola and asked the favor of the Spanish Crown for tax incentives and special licences to import black slaves to substitute the Indian labor which was practically exhausted by 1520. <sup>4</sup> Thus, at the beginning of the XVIth century sugar was already in the New World.

As far as we know, the early technology was similar both in the Portuguese and in the Spanish Atlantic islands. Portuguese, Genoese and Canarios became famous *maestros de azucar* and were very much looked for by the new mill owners in Hispaniola and, later, Puerto Rico, Mexico, Peru and Brazil. Sugar manufacturing consisted basically in the use of a single round stone grinder, or a two or three roller grinder, moved by water or by animal or human force, <sup>5</sup> which crushed the canes while the resultant juice was collected by the operators, who put it into a series of boilers which at different temperatures purified the syrup until it became a molasse. This intermediate product was then poured into special molds, called *hormas*, where it was filtered and crystallized until it became the final product, whose quality varied very widely according to many technical and ecological factors. <sup>6</sup> Sugar producing in the middle of the XVIth century was a technically simple but very exhausting activity for it implied many different processes from the basic preparation and tilling of the land to the supervision of forced labor, and from the proper harvesting of the cane to the crystallization and refining process which should end in the marketing of the product, both locally and in Europe.

Sugar production was a capital-intensive business, and could not develop fully in the New World without fiscal support of the State and the financial assistance of private capitalists. This was quite clear in the beginnings of the sugar industry in Hispaniola, between 1518 and 1527, and in Brazil from 1516 onwards when the King Don Manuel sent a royal decree to the *feitor* and other officials of the *Caso da India*, giving them orders for "que procurassem e elegessem um homem prático e capaz de ir ao Brasil dar princípio a um engenho de açúcar; e que lhes desse sua ajuda de custo e também todo o cobre e ferro e mais cousas necessárias ao levantamento da fábrica." <sup>7</sup> Although this first effort did not crystallize immediately, it is certain that when the Portuguese started the construction of mills in Brazil around 1532 the Crown protected these activities and, at the same time, allowed Portuguese investors to associate themselves with Dutch and Flemish merchants and traders who had the necessary capitals to finance their operations and, which is more important, possessed the control of the commercialization networks for the marketing of sugar in the Netherlands, and northern Europe. <sup>8</sup>

Thanks to the Dutch connection could the Portuguese compete favorably

in the European market by beating up the Venetians and the Genoese, and could the sugar production of the Portuguese Atlantic islands develop to their full capabilities, while transforming in some instances the economic structures of some of these insular territories. In the case of Madeira for example, it is illustrative to notice how the wheat economy disappeared to give way to sugar in the late XVth century and during all the XVIth century, when Madeira increased its production of sugar from 70,000 arrobas in 1508 to 200,000 arrobas in 1570, <sup>9</sup> although the number of sugar mills declined from 80 in 1490 to 35 in 1590, showing an evident concentration of production and/or an enlargement of the size of the mills or the increased grinding capabilities of the *engenhos*. <sup>10</sup> In the case of the other Portuguese islands the Dutch connection was also favorable, although in the Azores sugar cane was never able to produce enough saccharine due to ecological causes, and here the sugar industry remained a very weak economic activity, with the exception of São Tomé island, in the Gulf of Guinea, where it developed quickly and steadily all throughout the XVIth century thanks to the association of its producers with some Dutch traders who operated at Lisbon and had been able to secure some tax exemptions helping to make São Tomé sugar the cheapest of all Portuguese sugars by 1580, including that of Madeira and Brazil."<sup>11</sup>

Brazil did not escape from this pattern of foreign and Dutch involvement in the sugar business. We know that by 1555 Martin Afonso de Souza had been already associated with the German entrepreneur Erasmo Schetz for the operation of the third mill built in the Capitania de São Vicente, which was known as the "Engenho do Trato" or the "Engenho do Senhor Governador". Souza also bought part of another sugar mill from a Flemish capitalist named João van Hielst, enhancing his interests and creating the so called Sociedade Hielst & Schetz, which operated the well known Engenho dos Armadores. This deal was a clear example of the international capitalist enterprises in which the Dutch were so much involved at that time. <sup>12</sup>

As to the creation of the sugar industry in Brasil, there are still some obscure facts on which there is not clear agreement among the authors who have written about this subject. Simonsen <sup>13</sup> and Pedro Calmon <sup>14</sup> suggest that there was some sort of sugar making about 1526 in Pernambuco done by a man named Pedro Capico, and Simonsen quotes Varnhagen saying that there were some taxes collected at Lisbonne from the export of this sugar in 1526. But most authors agree that the real beginning of a continuous industrial activity dates from 1532-1533, when Martin Afonso de Souza was Captain General of São Vicente and gave full support to those who decided to invest in the construction of new sugar mills. This support went on according with royal instructions which succeeded one after the other in subsequent years giving out legal and fiscal protection and incentives to the *senhores de engenho*. From then on, as we have seen, Italians, Flemish, Germans and Dutch capitalists associated themselves with the Portuguese, among whom there were some enriched *marranos*, who had received *sesmarias* from the *donatários* and *capitães gerais*. At least five *engenhos* were built in the *capitanias* de São Vicente and Rio de Janeiro between 1532 and 1560, as a result of these incentive

policies. At the same time, other efforts were being made by other entrepreneurs to build sugar mills in the eastern and northern *capitanias*. Some of these efforts failed, like those made in Espiritu Santo, due especially to Indian attacks and to inadequate soil conditions, so that by 1550 this region had not yet developed a sugar industry. But it was in the northeastern coastal fringe which spans from Bahia to Paraíba that Brazil was to experience the sugar boom of the middle and late XVI century.

There, the famous *massapé* soil and the abundance of small rivers, together with dense forests which supplied abundant wood for fuel, provided the investors with an almost ideal haven to establish their plantations and sugar factories.<sup>15</sup> Thus, the sugar mills multiplied and by 1570 the *capitanias* of Porto Seguro, Ilhéus, Bahia, Sergipe and Pernambuco could boast of 55 *engenhos*, whose plantations produce a much better cane than that of the Portuguese Atlantic islands since the especial conditions of the soil were exceptionally suited to cane cultivation.<sup>15a</sup>

The sugar industry of Bahia and Pernambuco enjoyed a great leap forward under the governorships of Duarte da Costa e Mem de Sá who encouraged and protected it in spite of the difficulties in getting enough and manageable labor force from the Indian population which resisted to be enslaved by the *senhores de engenho*. Labor supply was not the least important of the requirements for setting up a sugar mill anywhere in the XVI century, and in Brazil it was particularly embarrassing, due to the Indian resistance to work in the plantations and mills, and to the resilience of the Jesuits to permit the enslavement of the Indians whom they preferred to see concentrated in the *aldeias* that the Companhia de Jesus had designed for civilizing and christianizing them. There was a bitter dispute between the Jesuits and the *senhores de engenho* on this issue<sup>16</sup> which the Crown tried to solve when King Dom Sebastião prohibited the enslavement of the Indians by a decree in 1570. The scarcity of labor was badly felt by the sugar producers from the very beginnings of the industry when the Indians were perceived unsuitable to their needs, either because of their resistance to work in the plantation or because of the Jesuits' opposition to let them be enslaved. In view of these difficulties, the Portuguese crown had already issued a decree on March 29, 1559 to the Captain General of the São Vicente Island ordering him that each *senhor de engenho* from Brazil be permitted to import from Congo up to 120 black slaves, paying only one-third of the normal taxes. For a time black and Indian labor coexisted one beside the other in the *engenhos*,<sup>17</sup> but after the decree of Don Sebastião in 1570 labor scarcity grew up, as new mills were put under construction and fewer Indians were available to work the land.<sup>18</sup>

According to Frederic Mauro,<sup>19</sup> 70 new mills were built in Brazil between 1570 and 1583, and 72 other mills were constructed between 1583 and 1610 in the northern and southern coastal regions of Brazil, so that by the beginning of the XVII century, Portuguese America could boast of 40 mills in the South, 50 in the Center, and 140 in the North. Obviously, the demand for labor increased and, according to contemporary sources, it has been estimated "that between 10,000 and 15,000 Negro slaves from West Africa were landed in

Brazilian ports in an averagely good year, the great majority of them coming from Angola during the last quarter of the sixteenth century".<sup>20</sup> The results of this traffic have been extensively studied both from the demographic<sup>21</sup> and from the social points of view,<sup>22</sup> and we will not deal with them in these pages. It is enough to say that from the middle of the XVI century, until the middle of the XIX, sugar production was inconceivable without slaves, and to be a sugar mill owner meant to be a slave owner. Moreover, the sugar industry was so dependent on black slaves that even the *lavradores*, who were merely cane growers and did not own sugar mills but who produced in some instances up to 40% or more of the cane grinded in the *engenhos*, were obliged to use slaves as workers in their plantations<sup>23</sup> and depended very much on them for supplying the factories with the cane needed.

With that great number of *engenhos*, the Brazilian sugar industry became the biggest in the world by the end of the XVIth century, surpassing by and large that of the Portuguese Atlantic islands and that of the Spanish Caribbean islands altogether,<sup>24</sup> and flooding the European market with more than 2,000,000 *arrobas* per year<sup>25</sup> which were distributed from Lisbon, Vienna and Oporto to Antwerp and Amsterdam, and from these two cities to the rest of Northern and Central Europe.<sup>26</sup> As the sugar production grew in Brazil, so did the Dutch involvement in its financial and marketing operations.<sup>27</sup> The Netherlands' association with Portuguese sugar was an old one, far more older than the Brazilian *engenhos*, and we realize this fact when we remember that as far back as 1498 Antwerp alone had been already importing 40,000 *arrobas* per year from Portugal.<sup>28</sup> Thanks to this association could Brazilian sugar spread all over Europe throughout the commercial channels opened up by the Dutch in previous centuries, and thus could Brazilian sugar compete very favorably with that of other regions of the Portuguese empire, and of the Spanish possessions in the Caribbean.

In the long run competition of Brazilian sugar ruined the sugar industry of Madeira, the Azores and São Tomé, together with that of Hispaniola for all these small islands could not produce on an economy of scale and could not match the Brazilian production costs. The case of Madeira is an illustrative one: by 1610 this island was exporting only 10% of what had been its production in the middle of the XVIth century, and had only 8 mills in operation.<sup>29</sup> The case of Hispaniola was a similar one for the *senores de ingenio* from Santo Domingo had lost their European market as one of the consequences of the Netherlands Revolution, and in the years 1603 to 1607 their export had also declined to a mere 10% of their mid-sixteenth century exports.<sup>30</sup> Madeira made a steady effort towards its recuperation as a sugar exporter in the first half of the XVIIth century, but fell definitively by 1657 when its cane fields were converted into vineyards,<sup>31</sup> but Hispaniola's sugar industry never recuperated again due to the aggravation of the economic situation of the island after the *Despoblaciones* of 1605-1606, so that by 1630 sugar exports from Santo Domingo were only a dim remembrance of good old days.<sup>32</sup>

The Netherlands Revolution affected the Brazilian sugar industry too, although in different ways. Let us remember that the union of the Portuguese

and the Spanish Crowns under Philip II changed the so far comfortable commercial relationships that the Dutch had enjoyed with the Portuguese for more than a century, for since 1580 it was the Portuguese rather than the Spaniards who suffered the most severe losses from the plunders that the Dutch inflicted on the colonial possessions of the Iberian empires. And although most of the Dutch overseas attacks were concentrated on the spice islands and territories of the Pacific Ocean in the late XVIth century, Brazil soon came into their sight as a region to be eventually conquered and exploited.<sup>33</sup> But it took some time before the Dutch interests in Portugal were seriously affected. The first threat came in 1585 when Philip II ordered a first embargo on Dutch ships harbored in Portuguese and Spanish ports and issued orders for the imprisonment of their crews. As the Dutch-Spanish relations grew worse, the embargoes followed subsequently in 1590, 1596 and 1599 affecting adversely the capacity of the Dutch to carry their trade legally with the Portuguese.

Nevertheless, the sugar flow from Portugal and its possessions to Flanders continued since Antwerp was still a city within a region under Spanish control, but the growing trade with Amsterdam had to be done through irregular channels, one of which consisted in the use of friendly Portuguese businessmen who lent their names to cover up Dutch financial and commercial operations in both the Netherlands and the Iberian peninsula.<sup>34</sup> It is interesting to note that not all of the Brazilian sugar passed through Lisbon on its way to Amsterdam, for contraband was as frequent as legal commerce. Also, a significant part of the sugar produced in Brazil was diverted to Madeira or the Azores on its way to Europe and was registered there as being produced locally. As the XVIIth century advanced, more and more of the Brazilian sugar was consumed in Europe after passing through Amsterdam, as it had circulated through Antwerp in the XVIth century. The Netherlands Revolution did not affect the ability of the Dutch to keep and enhance their commercial networks in Europe, and by 1620 the Brazilian sugar was a common product being bought and sold in the markets and fairs of France, England, Denmark, Poland, Sweden, Bologne, Austria, Germany, Monrovia, and beyond the Baltic Sea.<sup>35</sup>

So, sugar from Brazil continued flowing to northern Europe one way or another, either legally or illegally, either carried by Dutch ships or Portuguese ships, or by German ships of the Hanseatic League, whose owners took advantage of the prohibitions imposed by Philip II against the Dutch trade, and did not hesitate in becoming partners of the latter in the shipping of sugar to northern Europe.<sup>36</sup> This flow of sugar steadily increased after 1609, when the truce between Spain and the Netherlands was finally achieved and trade could be reestablished normally. As a result, a new optimism brought new capitals into Brazil and new sugar mills were constructed, profiting from a new Royal Provision issued on May 14, 1614, renewing "a *liberdade para os novos engenhos-trapiche, ou movidos por animais.*" This Provision was similar to those of mid-sixteenth century, which were granted when the first sugar boom took place in Brazil.<sup>37</sup>

Unbelievable as it seems, between 1610 and 1629 more than one hundred *engenhos* were created in Brazil, 116 to be more precise; 30 of them in the

South, 34 in the Center, and 52 in the North. <sup>38</sup> These new factories profited from a technological innovation recently imported from Peru by a Spanish priest who taught the *senhores de engenho* how to improve the efficiency of their mills by simply adding one more roller to the grinder, which until now consisted of only two horizontal cylinders, and by placing all three into a vertical position to facilitate the transfer of animal or hydraulic power for its operation. <sup>39</sup> This adaptation lowered the costs of grinding the cane and made sugar-making a much more attractive business, so that Brandonio, in his *Diálogos das Grandezas do Brasil*, written in 1618, declared that "this new milling invention", known as *engenhos de palitos*, was considered so good that he thought it would soon displace all the old cane grinders and would remain as the only one in use. <sup>40</sup> Brandonio proved to be right in his appreciations, for the three vertical roller mill became the standard sugar making machine for the next 200 years until the steam engine was introduced in the Brazilian sugar industry in 1815, and even after this date, the traditional three roller mill continued into use for many more years.

The increased productivity of the new mills and the growth of the production created a stronger demand for more ships to transport the sugar to Europe. In 1618 Brandonio declared that the sugar exports of the three *capitanias* of Pernambuco, Itamaracá and Paraíba, only, occupied between 130 and 140 ships every year, and also said that a determinant factor in these new developments had been the fiscal exemptions and privileges granted by the Crown for the next ten years to the sugar planters who wanted to build new mills and opened new plantations. <sup>41</sup> According to Boxer, "such were the vigor and persistence with which the Dutch exploited these new markets (those of the Portuguese empire's products), that by 1621 they had secured between half and two thirds of the carrying-trade between Brazil and Europe, while virtually the whole of the United Provinces' gold coinage was minted with gold from Guinea." <sup>42</sup> By 1629, the total number of mills in Portuguese America had risen to 346, most of which were spread along the coastal regions of Brazil, from São Vicente and Rio de Janeiro to Paraíba and Rio Grande do Norte. <sup>43</sup>

It was all natural, then, that in a period in which the Crowns of Portugal and Spain were united, and during which Spain was at war with the Netherlands, Brazil came to be seen by the Dutch as a logical culmination of their rip-off campaigns against the weakest of the colonial territories of the two Iberian empires, which were those of Portugal in Africa and in the Pacific. Spain was more dreaded than the Portuguese by the Dutch in America, and besides the smuggling of salt from the Araya Peninsula in the northern coast of Venezuela and some contraband in the Spanish Antilles, the Dutch did not take the war into the Spanish Main, as the East India Company did against Portugal's possessions in Africa and Asia. <sup>44</sup> Portugal America, as a target of the Dutch imperialistic expansion, was pointed out for the first time by an ambitious Antwerp pamphleteer named Willen Usselinex, who by 1608 was agitating in Holland in favor of the creation of a West India Company designed to wrest from the Portuguese the sugar colony of Brazil. It was not until the end of the Twelve Years Truce, in 1621, that this company was organized under the model

were disrupted by presence of English corsairs and Zeeland privateers in the Atlantic who attacked Portuguese ships loaded with the sugar that would serve to support Portugal's military operations. In less than two years, that is, from January 1647 to December 1648, the Portuguese lost some 220 ships, mainly in the hands of the Zeelanders.<sup>59</sup> This disruption of Portugal finances and of the Brazilian sugar economy by the effects of a war in which the Dutch had an almost complete dominion of the sea, made possible the long resistance of the Dutch in Recife, and also made possible the extension of the war, since the big profits of the privateers led the Zeelanders to take a hawkish stance at the West India Company in those moments when the King of Portugal and his Ambassador to the Netherlands were begging for peace at any price and seemed to be willing to compromise with a permanent Dutch settlement in Brazil. It was, however, the stubborn decision of the Brazilian leaders to fight the Dutch until the end which eventually decided the course of the war for, as time elapsed, the Portuguese Crown finally realized that there was an opportunity for expelling the Dutch from Brazil and, at the same time, protecting the sugar Atlantic trade by creating a so called Brazil Commercial Company, which was given the obligation of organizing a convoy system to preserve Portuguese shipping and navigation from Dutch attacks. It was the Company obligation to take the sugar cargoes safely to Lisbon and bring to Brazil the necessary reinforcements to help the combatants to fight the war. As time went by, also, the international situation evolved in favor of the Portuguese, especially after 1652 when England went to war against the Netherlands. From then on, the military situation of the Dutch deteriorated so fast that in January 1654 they had to capitulate to the Portuguese and were obliged to abandon the lands they had occupied between 1630 and 1641.<sup>60</sup>

The consequences of the Dutch presence in Brazil were many and have been studied widely. The Dutch defeat enhanced what some call the sense of a national identity among the Brazilians of that time.<sup>61</sup> But as far as the sugar industry is concerned, both the presence of the Dutch and their expulsion brought very important consequences for although the victorious leader of the restitution war, Francisco Barreto, offered guarantees and protection to all the Dutch and Jewish merchants and traders who desired to remain at Recife and other parts of Brazil, the truth was that not too many of them stayed and the majority left the country taking with them their capitals and commercial skills. Some returned to the Netherlands, others went to France, and some others travelled to New Amsterdam, in North America, but a significant group spread throughout some of the West Indian islands recently wrested from the Spaniards by the Dutch, the English and the French, like Curaçao, Barbados and Martinique, and there, especially in Barbados, they provided some capital and technical know-how to the English planters in order to help them to establish and develop a new thriving sugar industry in the non-Hispanic Caribbean.<sup>62</sup>

In fact, the Dutch had been involved in the establishment of the sugar industry in Barbados just before the Portuguese rebellion in Brazil, when Dutch ships brought to this island good quality sugar canes in exchange for 20 servants of a Barbadian planter who wanted to enter into the sugar business. The

accounts differ as to from where the first model sugar mill was imported into Barbados, since one says that it was from Holland and other states that it came from Pernambuco. But what there is no doubt about, is that some English planters travelled to Pernambuco during the Dutch occupation to learn the art of sugar making, and that by 1650, after importing new varieties of cane and new techniques, the English were producing in Barbados more sugar per acre than the Brazilians or the Dutch since their crops were being extracted from the island's almost virgin soils.<sup>63</sup> Yet, we do not know how much capital was put into Barbados by the Dutch. But there are indications that the Dutch provided much of the capital the English first planters needed and that "the first sugar planters got themselves heavily into debt to the merchants (principally Dutchmen) for the utensils with which their sugar works were set up."<sup>64</sup> Also, according to Pares, "The Dutch had at all times, many advantages. They sailed their ships more cheaply than the English, and much more cheaply than the French. The Dutch merchants and ship captains commanded capital more easily than the English and French, and therefore gave longer credit to the planters. Before 1660, the Dutch rather than the English or French, controlled the supply of the prime necessity, slaves. In addition, the Dutch seem to have been more willing than the English or French merchants to let the planters take the risks and the profits of entrepreneurs."<sup>65</sup>

In any event, as sugar production in the West Indies grew, so increased its competition against Brazilian sugar in Europe, helped by the ready availability of inexpensive Dutch shipping and lower freight rates, which influenced the lowering of the prices at a time when, ironically, sugar consumption was also increasing. In the second half of the XVIIth century, Portugal lost its dominant position as a world sugar supplier and Brazil lost much of its markets in Europe. "By the last quarter of the seventeenth century, Britain, France, and Holland were importing sugar almost exclusively from their overseas dominions and in the process causing great financial loss to the Portuguese and Brazilians. As early as 1670 Brazilian sugar planters were finding it difficult to dispose of their products. In that year Lisbon merchants accepted only half of the 65,000 tons of sugar available from Brazil. As a result prices plummeted, the usual sources of credit were closed, and many sugar growers faced ruin. The extent of the crisis may be seen in a royal decree of 1673, which stated that neither the lands, mills, nor slaves of sugar planters could be seized for debt, a ruling that was reiterated on various occasions for more than a century. By 1700 sugar exports had fallen to 26,000 tons. The figure seldom rose above that level before 1820,"<sup>66</sup>

Of course, these were not the only causes of the decline of the sugar industry in Brazil in the late XVIIth century, for there were other factors which worked towards that end at the turn of the century, like the deprivation of the labor force and skilled workers by the sudden rush to the gold mines discovered at the northwest of São Paulo, or the slow deterioration of the rate of investment in the sugar sector. But these internal processes fall outside of the scope of these pages.

## FOOTNOTES

- 1 Cf. Noel Deerr, *The History of Sugar* (London, 1949-1950), I, 73-100, and Manoelito Ornellas, *Um Bandeirante da Toscana Pedro Morganti na Lavoura e na Industria Açucareira de São Paulo* (São Paulo, 1967), pp. 3-12.
- 2 Ornella, *Um Bandeirante*, pp. 34-35.
- 3 Cf. Roberto C. Simonsen, *Historia Economica do Brasil* (São Paulo, 1962), pp. 95-96.
- 4 Cf. Mervyn Ratekin, "The Early Sugar Industry in Espanola", *Hispanic American Historical Review* (February, 1954), XXXIV, 2-19, and Frank Moya Pons, *La Espanola en el Siglo XVI. Trabajo, Sociedad y Politica en la Economia del Oro 1493-1520* (Santiago de los Caballeros, 1971), pp. 171-206, 243-268.
- 5 Judging from the engravings and drawings from the late XVth and the XVIth centuries, the use of different types of grinders varied and coexisted as the sugar industry developed in those years. The single round stone was registered in one of the famous Theodore de Bry's engravings made in 1595. The two horizontal and the three vertical roller grinders were also in use but, as we will see below, the Portuguese apparently did not use the latter until 1608, although there are indications that it had been invented in the late XVth century.
- 6 Cf. Frederic Mauro, *Le Portugal et L'Atlantique* (Paris, 1960), p. 185, quoting Conde Giulio Landi, *La Descrittione de l'Isola de la Madera* (Plaisance, 1574).
- 7 *Brasil/Açucar. Coleção Canavieira Nº 8* (Rio de Janeiro, 1972), p. 32.
- 8 *Ibid.* p. 31. See also Raph Davis, *The Rise of the Atlantic Economies* (London, 1977), pp. 24-36 for the role of the Netherlands, specially Antwerp and Amsterdam in the commercialization of sugar and many other products throughout Europe. A much more lengthy discussion on this subject has been undertaken by Inmanuel Wallerstein. *The Modern World-System. Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century* (New York, 1976), chaps. 2 and 4.
- 9 Frederic Mauro, *Le Bresil du XV<sup>e</sup> a la Fin du XVIII<sup>e</sup> siecle* (Paris: 1977), p. 55.
- 10 Mauro, *Le Portugal et L'Atlantique*, p. 186, is not sure of what really happened in Madeira that could explain this evolution, but a technological change as well as the increase of land under cultivation may have been possible.
- 11 Mauro, *Le Portugal*, 190, says that in 1578-1579 the price of sugar in Lisbon was as follows: 2,400 reales that of Madeira, 1,400 reales that of Brazil, and only 660 reales that of São Tomé. The latter was, it must be said, that of the worst quality. These differences in prices can also be explained by a wide variety of factors including the tax structures of, each of the three producing areas as well as the differentials in labor, production and

- transportation costs. For another discussion on the prices of sugar in this period, Cf. Deerr, *The History of Sugar*, II, 524-533.
- 12 Deerr, *The History of Sugar*, I, 102-104. Cf. also *Brasil/Açúcar*, pp. 36-37, apparently following Deerr.
- 13 Cf. Simonsen, *Historia Economica do Brasil*, p. 96.
- 14 *Historia do Brasil* (Rio de Janeiro, 1963), II, 157.
- 15 On the *massapê* soil, see Alicia P. Canabrava, "A Grande Propriedade Rural", ed. Sergio Buarque de Holanda, *História Geral da Civilização Brasileira. A Época Colonial* (São Paulo, 1968), I, Nº 2, p. 202. On the role of the small rivers in the development of the sugar industry see Caio Prado, Jr., *The Colonial Back-grounds of Modern Brazil* (Berkeley, 1967), p. 456, n. 19, quoting Gilberto Freyre's chapter "Açúcar e Água" in his *Nordeste: Aspectos da Influência da Cana sobre a Vida e a Paisagem do Nordeste do Brasil* (Rio de Janeiro, 1937). Freyre is followed also by Aziz N. Ab'Saber, "Aspectos da Geografia econômica do Brasil", ed. Buarque de Holanda, *Op. Cit.*, p. 182.
- 15<sup>a</sup> In this respect, Gabriel Soares de Souza, *Tratado Descriptive do Brasil em 1587* (Rio de Janeiro, 1851), wrote: "E comecemos nas canas da acucar, cuja planta levaram a capitania de Ilheus das ilhas da Madeira e de Cabo Verde, as quais recebi esta terra de maneira em si, que as da maiores e melhores que nas ilhas e partes donde vieram a ela, e que em numhuna outra parte, que se saibe, se criam canas de acucar, porque na ilha de Madeira, Cabo Verde, Sao Tome, Trudente, Canarias, Valencia e na India nao se dao as canas, se nao regam os canaviais, como as hortas, e se lhes nao estercam as terras, e na Bahia plantam-se pelos altos e pelos baixos, se se estercar a terra, nem se regar, e como as canas sao de seis meses, logo acaman, e e forcoso corta-las, para plantar em outra parte, porque se dao compridas como lancas; e na terra baixa nao se faz acucar da primera novidade que preste para nada, porque acaman as canas e estao tao vicosas, que nao coalha o sumo delas, se as nao misturam com as canas velhas, e, como sao de quinze meses, logo fiam novidade as canas de plantas; e as de soca, como sao de ano, logo se cortam. Na ilha da Madeira e nas mais partes onde se faz acucar, as canas de planta de dois anos por diante, e a soca de tres anos, e ainda assim sao canas mui curtas, onde a terra nao da mais de duas novidades. E na Bahia ha muitos canaviais que ha trinta anos que dao canas; e ordinariamente as terras baixas nunca cansam, e as altas dao quatro ou cinco novidades e mais." Cf. *Brasil/Açúcar*, pp. 47-48.
- 16 Cf. Bradford E. Burns, *A History of Brazil* (New York, 1970), pp. 31, 36.
- 17 Aziz N. Ab'Saber, "O Problema da Mão-de-Obra: O Escravo Africano", ed. Buarque de Holanda, *Op. cit.*, p. 185.
- 18 Calmon, *Historia do Brasil*, II, 359
- 19 Mauro, *Le Portugal et L'Atlantique*, p. 1195.
- 20 C. R. Boxer, *The Portuguese Seaborne Empire 1600-1800* (London, 1969), p. 103.
- 21 Cf. Mauro, *Le Portugal*, pp. 147-181, for the XVth and XVIIth centuries, and Herbert Klein, *The Middle Passage* (Princeton, 1978), chaps. 2-5

- for the XVIII and XIX centuries.
- 22 Cf. Gilberto Freyre, *The Masters and the Slaves* (New York, 1946), chaps. IV-V.
  - 23 Cf. Stuart Schwartz, "Free Labor in a Slave Economy: The Lavradores de Cana of Colonial Bahia," ed. Dauril Alden, *Colonial Roots of Modern Brazil* (Berkeley, 1973), pp. 171-175.
  - 24 Rollie E. Poppino, *Brazil. The Land and the People* (New York, 1973), p. 120.
  - 25 Simonsen, *Historia Econômica do Brasil*, pp. 113-115.
  - 26 Cf. Wallerstein, *The Modern World System*, pp. 132-134.
  - 27 Celso Furtado, *The Economic Growth of Brazil. A Survey from Colonial to Modern Times* (Berkeley, 1971), pp. 7-9, quoting Deerr, *The History of Sugar*, II, 453.
  - 28 Canabrava, "A Grande Propriedade Rural," p. 204.
  - 29 Mauro, *Le Portugal et L'Atlantique*, pp. 186-188. See also Deerr, *The History of Sugar*, I, 101-102.
  - 30 Frank Moya Pons, *Historia Colonial de Santo Domingo* (Santiago de los Caballeros, 1973), pp. 87-88.
  - 31 Mauro, *Le Portugal*, pp. 189-190
  - 32 Moya Pons, *Historia Colonial*, pp. 143-144.
  - 33 Cf. Boxer, *The Portuguese Seaborne Empire*, pp. 106-120.
  - 34 C. R. Boxer, *The Dutch in Brazil 1624-1654* (Oxford, 1957), p. 20.
  - 35 Cf. Frederic Mauro, "A Economia Europeia e o Atlantico Sul nos Séculos XVII e XVIII (Brasil e Portugal)," *Nova Historia e Novo Mundo* (São Paulo, 1969), pp. 108-110.
  - 36 Boxer, *The Dutch Seaborne Empire*, p. 21
  - 37 Calmon, *Historia do Brasil*, II, 359.
  - 38 Mauro, *Le Portugal et L'Atlantique*, p. 195.
  - 39 Frei Vicente do Salvador, *Historia do Brasil, 1500-1627*, ed. João Capistrano de Abreu (São Paulo, 1931), pp. 420ss, as quoted by Mauro, *Le Portugal*, p. 204, and by others like Calmon, *Historia do Brasil*, II, 355.
  - 40 José Antonio Gonsalves de Mello, ed., *Diálogos das Grandezas do Brasil* (Recife, 1962), pp. 86-87.
  - 41 *Ibid.*, p. 79.
  - 42 Boxer, *The Dutch Seaborne Empire*, p. 21.
  - 43 Mauro, *Le Portugal et L'Atlantique*, p. 195.
  - 44 On the activities of the Dutch in the Caribbean at the end of the XVIth century and at the beginning of the XVIIth, cf. Engel Sluiter, "Dutch-Spanish Rivalry in the Caribbean Area, 1594-1609," *Hispanic American Historical Review* XXVIII (February, 1948), 165-196, and Cornelis Ch. Goslinga, *The Dutch in the Caribbean* (Gainsville, 1971), pp. 1-257.
  - 45 Cf. Hermann Watjen, *O Dominio Hollandez no Brasil. Um Capitulo da História Colonial do Século XVII* (São Paulo, 1938). 416ss.
  - 46 A description of the Reconcavo and its sugar industry through the story of one of its mills can be found in Wanderley Pinho, *História de um Engenho do Reconcavo, 1552-1944* (Rio de Janeiro, 1946), which contains an

- excellent collection of maps, charts and engravings of Bahia and its surrounding sugar districts.
- 47 Cf. Boxer, *The Dutch in Brazil*, pp. 1-39, and Watjen, *O Dominio Colonial Holandez*, pp. 94ss. Most of the information contained in the next pages about the Dutch occupation of Brazil has been extracted from Boxer and Watjen, unless otherwise indicated. Nevertheless, I will keep some relevant footnotes mentioning these sources for obvious reasons.
- 48 Boxer, *The Dutch in Brazil*, pp. 49-158, and Watjen, *O Dominio Holandez*, pp. 96-136
- 49 Cf. Watjen, *Ibid.*, pp. 415-422 for a most interesting account on how the war affected the development of the sugar industry in those years.
- 50 Boxer, *The Dutch in Brazil*, p. 60.
- 51 Cf. Watjen, *op. cit.*, pp. 149-154.
- 52 *Ibid.*, pp. 422-423. Cf., also, Boxer, *The Dutch in Brazil*, p. 74
- 53 Watjen, *op. cit.*, 448-474, discusses at length the economic life of Nova-Hollanda in Brazil, as related to the sugar industry and the very hot issue of monopoly vs. free trade in which the West India Company was involved against the colonists and *moradores*.
- 54 Boxer, *The Dutch in Brazil*, pp. 81-83.
- 55 *Ibid.*, pp. 133-134, 138-140, 149-150.
- 56 Cf. Pinho, *Historia de Um Engenho*, p. 81
- 57 Boxer, *The Dutch in Brazil*, pp. 99-100, quoting the instructions for this negotiation given by Maurits to the Dutch commissioners.
- 58 Boxer, *The Dutch in Brazil*, p. 173. For export figures, see *Ibid.*, p. 148, and Simonsen, *História Econômica do Brasil*, pp. 118-120. Both authors are very short in their information when compared with the excellent discussion and tables prepared by Watjen, *op. cit.*, 492-509, where he shows statistically: the evolution of sugar exports and trade between Brazil and the Netherlands from 1629 to 1651, both from the part of the Dutch West India Company, and from the free merchants of Pernambuco. Deerr, *The History of Sugar*, I, 105, 109-110, follows Watjen in this respect without making extensive use of his data. Judging from the sources I have examined for this paper, it seems to me that Watjen's work has been neglected by the historians who have dealt with this important period of Brazilian history.
- 59 Boxer, *The Dutch in Brazil*, pp. 201-202.
- 60 *Ibid.*, chaps. VI-VII, for details on the above. Cf., also, Watjen, *op. cit.*, pp. 222-291, for other details.
- 61 Cf. Burns, *A History of Brazil*, p. 48
- 62 Cf. Goslinga, *The Dutch in the Caribbean*, pp. 333-334.

On the establishment of the Dutch in the Caribbean after their expulsion from Brazil and the impact of this exodus on the Brazilian sugar industry, see Matthew Edel, "The Brazilian Sugar Cycle of the Seventeenth Century

- and the Rise of West Indian Competition," *Caribbean Studies*, IX, Nº 1 (April, 1969), and Alice P. Canabrava, "A Lavoura Canaveieira nas Antilhas e no Brasil," *Anais do 1º Congresso de Historia da Bahia*, IV (1950).
- 63 Cf. Arthur Percival Newton, *The European Nations in the West Indies* (New York, 1967), pp. 196-203, and Richard S. Dunn, *Sugar and Slaves. The Rise of the Planter Class in the English West Indies, 1624-1713* (New York, 1973), pp. 60-64.
- 64 Richard Pares, *Merchants and Planters* (New York, 1970), p. 79, n. 61.
- 65 *Ibid.*, p. 27. See, also, Dunn, *op. cit.*, p. 65.
- 66 Poppino, *op. cit.*, p. 123.

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