RUBBER IN MALAYA
1876-1922
The Genesis of the Industry

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CONTENTS

Preface vii
Tables xiii
Statistical Appendixes xv
Plates xvi
Abbreviations xvii
Map of Malaya circa 1922 xx

1. A NEW RAW MATERIAL 1

2. THE EARLY SEEDS ARE SOWN: 1895–1905 14
   The Pre-Rubber Situation 14
   Pioneer Rubber Plantings: 1895–1903 19
   Development Quickens: 1903–1905 30
   Research: 1900–1905 42

3. FIRST FRUITS: 1906–1910 48
   Rapid Progress: 1906 48
   Organization Begins 52
   The First Depression: 1907–1908 57
   Prospects Unlimited: 1909–1910 61
   The Role of the Agency Houses 78
   Research 86

4. THE HARVEST GROWS: 1911–1914 93
   The Aftermath of the Boom: 1911–1912 93
   The Industry meets Depression: 1913–1914 106
   Research 118

5. SUPPLIES IN WAR-TIME: 1914–1918 123
   Adjustments to War: 1914–1916 123
   Voluntary Restriction: 1917–1918 138
   Research 150

   From Boom into Recession: 1919–1920 156
   The Restriction Debate Reopens: 1920–1921 162
CONTENTS
Self-Help for the Industry: 1921 171
The Stevenson Committee: 1921–1922 174
The Condition of the Industry 184
The Imposition of Restriction: 1922 192
Research 199

7. CONCLUSION 205

Statistical Appendixes 212
Glossary 231
Bibliography 233
Index 247
A NEW RAW MATERIAL

One of the major consequences of the progressive exploration of the world by the peoples of Western Europe from the fifteenth and sixteenth centuries was the discovery of many new commodities which could be introduced into the growing network of trade. The natural resources of numerous areas came under intensive exploitation and this did not consist merely of using them in situ. ‘As commercial connections between the various continents were formed, there began an interchange of domestic animals, fruit trees, and vegetable seeds that has continued to the present day....’

The practice of transference, conditions of soil and climate permitting, was thus early established. Moreover, as the West began to revolutionize its productive techniques in an ever-widening variety of directions from the second half of the eighteenth century, there arose a concomitant demand from industry for raw materials. Products such as cotton began to be cultivated on an estate basis to ensure adequacy and regularity of supplies.

However, it was not always possible to utilize a new commodity immediately following the initial discovery. In order to realise a commercial potential, it was first necessary to develop the appropriate manufacturing technology and for a range of economic uses to emerge. In the case of rubber this was a lengthy process. Thus the earliest European visitors to Central and South America in the late fifteenth century found the Indians there already able to extract latex from rubber-yielding trees, and to use it for waterproofing garments etc. But rubber in an untreated form was unable to retain its natural property of elasticity under changes of temperature, and although samples were sent to Europe in the seventeenth and eighteenth centuries, the earliest investigators could not find a satisfactory solution. Despite these drawbacks rubber was used by manufacturers for certain purposes such as inserting into garters, mittens and waistbands of clothing. Thomas Hancock had one such factory in London and in 1820 devised a ‘masticator’ for dealing with the scrap rubber.

This was followed by a decisive advance by Charles Goodyear in America,

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3See Glossary below, p.232.
who between 1839 and 1844 discovered and perfected the process of vulcanization, which prevented rubber from being affected by changes in temperature. In England, Hancock learnt of this invention and worked on it himself. In 1851 Goodyear listed over 600 articles which he felt could be made out of rubber, and by the mid-nineteenth century a rubber-manufacturing industry was beginning to emerge in Britain and America.

By this time, botanical observations in many tropical areas of the world were revealing an increasing number of plants and trees which yielded a liquid with rubber-like properties, some of these in South and South-East Asia. But the main source of raw rubber was South America, in particular Brazil. The trees were not cultivated, but were tapped wherever they occurred in the jungle. The method of extracting latex was the traditional Indian one of making numerous incisions in the bark with an axe. This technique, as was to become clear in due course, was wasteful since it destroyed relatively quickly the ability of the tree to yield latex and necessitated ever-longer journeys to seek fresh trees. As early as 1857, Thomas Hancock suggested the possibility of cultivating the best types in the East and West Indies, not only as a profitable plantation venture but also as insurance against interruption of the current sources of supply. However, he did not appear to envisage the actual transfer of plants between these areas. During the 1860s the consumption of rubber increased very noticeably, and new uses were discovered such as solid tyres for wheeled vehicles. In 1870 the United Kingdom imported 152,118 hundredweights (approximately 7,600 tons) of rubber from all sources, valued at nearly £1,600,000, a substantial proportion of which was re-exported to America.

The main initiative in the transfer of strains of rubber from South America to the East came from the India Office in London. A member of the staff, Sir Clements Markham, is generally credited with the original concept, having previously been concerned with a similar project for introducing the *cinchona* tree to India in the 1860s. In later years he wrote that, ‘After visiting the forests in South America and reflecting on the great demand, I came to the conclusion that the best caoutchouc yielding trees should be cultivated and ... introduced into our Eastern possessions’. Since little formal knowledge existed about the varieties of rubber-yielding trees, their preferred habitats, and the methods of extracting and coagulating the latex, James Collins, Curator of the Pharmaceutical Society Museum, was commissioned to collect information on these points. His

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2Babcock, op.cit. p.18, n.18.


‘Caoutchouc’ derived from the South American Indian term for rubber.
A NEW RAW MATERIAL 3

Report1 was published in 1872 and a copy sent by the India Office to Dr. (later Sir) Joseph Hooker, Director of the Royal Botanic Gardens at Kew, near London. Hooker replied that 'It appears ... very desirable to introduce into India the Hevea yielding the Para rubber which is stated to be the best commercial kind'.2 In June 1873 a shipment of 2,000 Hevea seeds procured by a Mr. Farris in Brazil arrived in England and were sent to Kew for germination. Twelve plants were raised from these, of which six were despatched to the Botanic Gardens at Calcutta in the same year, from where cuttings were later sent up to Sikkim, but the experiment was a failure largely due to climatic conditions.3

Shortly after the Farris consignment, Mr. Henry Wickham was asked to obtain further supplies of seed, but because of the seasonal nature of the seedfall and some bargaining over the price to be paid, it was early in 1876 before he was able to make a collecting expedition. In addition, the India Office had also decided to send Mr. Robert Cross to South America for the same purpose. Kew Gardens were advised that in view of the failure at Calcutta, the Government of India desired rubber plants to be sent to the Botanic Gardens at Peradeniya, Ceylon, which was to serve as a distribution centre for the west coast of India, Burma and Assam.4 Wickham gathered 70,000 seeds of the Hevea Brasiliensis variety,5 out of which Kew Gardens germinated about 2,700 plants. As the India Office wished, the bulk of these went to Ceylon, 1,919 being despatched there in August 1876, of which 90 per cent arrived in good condition. But fifty plants were also sent to the Botanic Gardens, Singapore, the reason given by Kew being that 'Dr. Hooker was anxious to give the Hevea plants an additional chance of becoming established in the East by sending a portion ... to the Straits Settlements'.6 Due to delay in payment of freight on this consignment, the plants were detained for a month in the Singapore docks. There is some doubt as to whether any survived permanently, but H. J. Murton, Superintendent of the Gardens there, reported that five were saved and flourishing a year later.7

Robert Cross made two visits to South America. In 1875 he brought back specimens of the Castilloa Elastica rubber tree, and in 1876 he obtained 1,000 Hevea plants together with a few of the Ceara (Manihot

2Letter to India Office, 15 May 1873, K. G. C.: Caoutchouc, Vol. 1 (1873–1905). The tree referred to was Hevea Brasiliensis, found in the Para district of Brazil. Hereafter referred to as Hevea(s).
4Sir C. Markham to Dr. J. Hooker, 1 April 1876, K.G.C.: Caoutchouc, Vol.1.
5 A recent researcher concludes that there is no substance in the story that Wickham had to smuggle these seeds out of Brazil. P. R. Wycherley, 'Introduction of Hevea to the Orient', The Planter (March 1968), pp.1-11.
7H. J. Murton to Dr. J. Hooker, 15 November 1876 and 6 September 1877, K.G.C., Vol.166.
Glaziovi) variety. The Castilloas and Cearas were successfully established at Kew, and subsequently distributed overseas, but division of opinion exists as to whether any of the Heveas survived the seedling stage to reach the East.\(^1\) The original records are conflicting,\(^2\) however the controversy is only of marginal relevance to the later development of the plantation industry. Whether from the Cross or Wickham collections, 22 Heveas were sent to Singapore in September 1877 and arrived in good condition. Cross advised that from his observations in South America, Hevea thrived best in low-lying areas subject to annual flooding, that the trees could not be over-tapped provided the inner wood below the bark was not penetrated, and that tapping should be confined to the dry season.\(^3\)

Once specimens of trees had been transferred safely to the East, the initiative in further investigations passed to the Botanic Gardens in Singapore and Ceylon. The first requirements were to observe the reaction to the new environment and to increase the stocks of trees. Since seeds would not be produced for a number of years, propagation by means of cuttings was tried. Both places reported initial success, but encountered increasing difficulty as the parent-trees became older. At Singapore, Murton had far fewer trees than Ceylon with which to experiment, and soon after the arrival of the second consignment of plants in 1877 he took specimens of each of the South American varieties to Perak. There they were planted in the Residency garden at Kuala Kangsar and subsequently supervised by the Resident, Hugh Low. The Heveas grew well but neither the Castilloas nor the Ceara were very successful. The growth of the Heveas at Singapore slowed down after they were transferred to low swampy ground in the new Economic Garden in 1878.\(^4\) Murton also started investigations of rubber-yielding plants indigenous to the Malay Peninsula. This work was continued by his successor, N. Cantley, who took over in 1880. In 1883 some of the Heveas were transferred back to better-drained ground, where they made quicker progress. But by 1885 Cantley held the view that their ultimate success was not certain and that indigenous varieties offered a more sure potential.\(^5\) A local paper commented that 'the exotics do not after all possess a very absorbing interest'.\(^6\)

During these years the possibility of commercial exploitation of the imported rubber trees had thus received rather desultory attention, in-

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5Ibid. 1885, p.11.
6Straits Times, 5 July 1886.
vestigations being conducted largely by men in official circles. In 1883 Frank Swettenham (later Resident-General and High Commissioner F.M.S.), then in Selangor, sent specimens of a latex-yielding creeper to Singapore, and later stated that the following year in Perak he planted out 400 *Hevea* seeds from the Kuala Kangsar trees, which had first seeded in 1881. Doubt exists as to the date of the first attempts at tapping in Malaya, but Hugh Low sent rubber samples to England in 1883, possibly from *Ceara* trees, which were not well-received. Indications of private interest in rubber are few. Martin Lister, who later joined the government service in Malaya, was anxious to obtain seeds in 1881 for Linsum Estate in Negri Sembilan. He was associated with a Mr. Hill, doubtless the prominent pioneer planter T. H. Hill, who put out some rubber trees on this estate and at Weld Hill in Selangor between 1883 and 1885, though his intention does not seem to have been an immediately commercial one. As the evidence relating to the transfer of rubber from South America has already indicated, the prime official purpose had been to set up only planting material supply-centres in Ceylon and the Straits Settlements for a rubber industry in the Indian sub-continent. The resources of the planting community in the Malay Peninsula were already engaged in other avenues of development. Beginning from the early nineteenth century, Chinese pepper and gambier-growers had progressively extended their interests from Singapore and Johore into Malacca, Negri Sembilan and Selangor. From about 1850, largely in Malacca and Negri Sembilan, they had also developed the tapioca industry. The earliest European planters had experimented with a number of crops but after the mid-1830s an increasing amount of attention was devoted to sugar-growing, concentrated in the Province Wellesley and north Perak areas; an industry which was also attracting substantial Chinese participation. These were the principal commercial crops at the time of the advent of rubber. Both labour and capital were in relatively short supply. The expansion of planting enterprise was further influenced by the political situation in the western parts of the Peninsula, which in the 1880s was in a state of transition. British influence had not long been formally extended to Perak and Selangor, and it was to be some years before conditions in these and neighbouring states, for example transport facilities and land regulations, could be made more attractive to commercial agriculturalists.

3 A. R. Perak, 1883, p.5.
5 Sir C. Markham to Sir J. Hooker, 6 July 1881, K.G.C., Vol.165.
7 Survey based on Jackson, op.cit. parts I and II.
Ceylon made slightly better progress with rubber up to 1887, allowing for the fact that it had a more numerous community of European planters, besides receiving the bulk of the plants distributed by Kew Gardens. Small numbers of Heveas and Cearas were given to planters there in 1879, and at first the latter had greater appeal because of their rapid growth and early seed production. In 1882 Dr. H. Trimen, Director of the Ceylon Botanical Gardens, made test tappings with both axes and knives on all three varieties of South American trees. Samples sent to England were valued at 4/- per lb. for the Hevea, and the others at 2/9d. to 3/-. These results encouraged Ceylon planters to take up Ceara and by 1883 it was estimated that nearly 1,000 acres had been planted. But further tappings on the Botanic Gardens Cearas gave low yields at uneconomic cost, and this work was discontinued after 1884. In 1887 a Ceylon planter reported poor results after five years of trials. Interest in this variety declined thereafter and affected adversely the willingness of planters to try other types. It is also very probable, in view of the personal contacts between planters, that this news reached Malaya and had a similar effect on opinion there. Dr. Trimen did not know how to dispose of the growing quantities of Hevea seeds, and the Director of Kew Gardens advised the Colonial Office that, 'I doubt whether it will ever pay as a private commercial venture to plant the trees. But ... there must be many places in our Eastern colonies where it might be worthwhile to try to naturalize so valuable a tree as a source of profit or extra revenue ...', and suggested, among other places, the Straits Settlements. This correspondence would seem to indicate that, after the early failures in India, the official design for a cultivated rubber industry in British territories had lost much impetus. However, Ceylon sent 11,500 seeds to Singapore in 1888, and a small number to Penang.

At the Singapore Gardens, little had been done thus far other than planting out seeds obtained locally and from Ceylon. There were about 1,100 Heveas of varying ages, heavily overgrown, and the Straits Government does not appear to have allotted any special funds for upkeep. But the situation changed with the appointment of H. N. Ridley as Director in 1888. He had discussed rubber with Sir Joseph Hooker before leaving for the East and visited Dr. Trimen in Ceylon on his outward journey. He soon suggested officially that, as planters preferred crops giving relatively quicker returns, Government might undertake large-scale planting of rubber. But in personal correspondence he expressed his views more strongly: 'There is one considerable difference between this place and

1Survey based on A.R. Royal Botanic Gardens Ceylon, 1876-84; Kew Bulletin, January/February 1898, pp.2-7.
3‘Naturalize’ probably meant planting as part of an official forest programme so that Heveas would become indigenous to an area.
Ceylon and that is the absence here of the planting interest ... the people ... don’t care about rubber or peppers or cultural products ... at present everything is commerce'.\(^1\) Clearly, he referred primarily to Europeans, and since as yet he had seen little outside Singapore, it is not surprising that he should have been impressed by the importance accorded to commerce.

Following his assumption of duties, Ridley widened the distribution of *Hevea* by plantings in the forest reserves of Singapore and Malacca (he was also Supervisor of the Straits Forest Department). In 1890 rubber samples from trial tappings in the Gardens were exhibited at the Singapore Horticultural Show and also sent to England where they were favourably received, though the valuation is not recorded. Ridley thus lost no time in commencing experiments, and in view of the importance of his work it would be extremely useful to have details of his methods and results in the years before planters became interested. But his Annual Reports on the Gardens, except for 1890, contain no mention of tapping the *Hevea* before 1897, nor does his private correspondence with the Director of Kew Gardens.\(^2\) He had many other projects competing for his attention, e.g. fibres, ramie and indigo, gutta-percha etc. In retrospect, however, he did record some facts about his initial work on rubber, though not accompanied by much exact chronological data.\(^3\) The first tappings were done in 1889 using the Brazilian axe-incision method which was found to spoil the trees. Later, chisels were adopted and tappings carried out at varying intervals of time, the aim being to find methods which would not lead to the rapid deterioration in the productivity of the trees which was an outstanding feature of the wild rubber industry. Latex was collected in a cigarette-tin at the base of the tree instead of being left to coagulate on the trunk, which facilitated harvesting. By way of background information we may note that Ridley’s position in the Government service up to the mid-1890s was by no means secure. Trade and monetary fluctuations affected official revenues, funds allotted to the Botanical Gardens were reduced, and at one stage Ridley feared that his post would be retrenched. High officials regarded him as too ‘scientific’ for their liking and his relations with such notable persons as Sir Frank Swettenham were not good. Swettenham is reported to have ordered the destruction of trees at Kuala Kangsar, possibly in 1889, following an unsuccessful

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\(^3\) H. N. Ridley Papers, ‘Malay Peninsula: Gardens and Agriculture (1906)’, pp.237–9. This manuscript appears to have been compiled over a period of some 40 years after the original date. Ridley states that each year he specialized in one or other plant of economic value ‘but rubber all the time’. Ibid. p.146.