

---

# Role of James Collins in the Development of Rubber Plantation Industry in the British India : A Historical Reappraisal

KURIAN K THOMAS

Rubber Research Institute of India, Kottayam, Kerala – 686 009, India

*The role of James Collins, the then Curator of the Museum of Royal Pharmaceutical Society (1868-72), London who later became the Government Botanist (1873-77), Singapore, in the historic domestication of Hevea rubber in the British India during 1870s was investigated. On the initiative of Clements Robert Markham and Sir Joseph D Hooker, Collins compiled the Report on the Caoutchouc of Commerce for the British in 1872. This became the first comprehensive documentation of the then information on rubber yielding plants, their location, climatic conditions favouring their growth, extraction methods etc. The report favoured cultivation of Hevea brasiliensis, Castilla elastica and Ficus elastica and recommended the acquisition of their seeds for experimental planting in British India. In the endorsement appended, Sir Dietrich Brandis, the then Inspector General of Forests, Government of India, recommended south-western coast of India and Burma coast for initiation of rubber cultivation. Collins' report and Brandis' endorsement, which provided Markham and Hooker with the necessary vital information for their rubber domestication scheme, became historically significant. Collins was also responsible for arranging the despatch of the first consignment of 2000 Hevea seeds from South America to Royal Botanic Garden (RBG), Kew, London during 1873 for further propagation and distribution to the colonies under British India. The first domestication attempt failed because of improper packing and forwarding, which resulted in germination of only 12 seeds and the British officials accused Collins of being responsible for the failure and loss to the Empire. Collins, who later became the Government Botanist and Librarian of the Raffles Library and Museum, Singapore, recommended in 1875 that Singapore and Malayan Peninsula were the best localities for rubber cultivation. A critical evaluation of Collins' contributions in domestication and introduction of natural rubber is attempted.*

**Keywords :** India, domestication, Hevea brasiliensis, history, James Collins, plantation industry.

The introduction of *Hevea* rubber plants from the rainforests of Amazon into the British India in 1870s ultimately resulted in the successful initiation of rubber plantation industry in the South East Asia (RBGK, 1898; Wycherley, 1959; 1968; Drabble, 1973; Dean, 1987; Baulkwill, 1989). The contributions of Sir Clements Robert Markham, an India Office functionary, the initiator and prime mover of the *Hevea* rubber introduction scheme

(Markham, 1876; Thomas, 2001), Sir. Henry A Wickham, a rubber planter and naturalist (Lane, 1953; 1954), Joseph D Hooker, the then Director, Royal Botanic Garden (RBG), Kew, London, and Henry Nicholas Ridley, the then Director, Singapore Botanic Garden (Baulkwill, 1989) in this process have already been documented. However, no serious attempts have so far been made to trace the role of James Collins, the then Curator of the Museum

---

(Email : rrii@vsnl.com)

of Royal Pharmaceutical Society (1868-72), London in the genesis of the rubber plantation in the East. This investigation aims at tracing the contributions of this farsighted pioneer.

### **BRITISH INITIATIVE TOWARDS DOMESTICATION**

During the 1850s, the raw rubber for the rapidly developing British rubber industries came from wild *Hevea*, *Ficus elastica* and *Castilla elastica* which were growing in Central and South America, India, Africa and Madagascar. With more and more uses being identified for this new industrial raw material, it was felt impossible to sustain the industry with the little available wild rubber alone. The British rubber industry was apprehensive of the exhaustion of wild rubber in the very near future because the trees were cut down for extraction of latex, in the absence of a systematic method for controlled wounding. During the early years, the British wild rubber had to travel more than 3000 miles from its forest habitats before it reached the ports for shipment and took at least one year to reach the rubber industries located in London. This had prompted Thomas Hancock, the father of British Rubber Manufacturing Industry, to suggest the initiation of rubber cultivation in the East as a profitable plantation enterprise as well as an insurance against interruption in supply (Hancock, 1857; Markham, 1876). This was the historical context in which the British Government through Clement Markham and Joseph Hooker, conceived the scheme for the introduction of wild rubber yielding plants from its native South America to the then British India (Wycherley, 1968; Thomas, 2000; 2001).

Among the numerous complexities relating to the domestication of rubber yielding plants, the most important were the identification of

wild plants and the comprehensive documentation of existing knowledge on their botany, planting practices, exploitation methods, products obtained and their properties. The botanical description of the Mexican rubber tree (*Castilla elastica*) was first documented in 1649 by Francisco Hernandez (Hernandez, 1649; Schurer, 1956) in a report on the natural resources of Mexico, conducted during 1570s. The history of botanical identification and description of *Hevea* began in 1775 with the publication of the description of *Hevea guianensis* (Aublet, 1775; Schules, 1970) and registered substantial progress through the works of Bentham (1854) and Spruce (1865). In 1798, William Rouxburg botanically identified *Ficus elastica*, also known as Assam Rubber.

During his tenure as Curator of the Museum of British Pharmaceutical Society of Great Britain, London between 1868 and 1872 (Morrison, 2001), Collins had shown his deep interest in different plant species through his publications in economic botany (Collins, 1872 a&b). Collins was particularly interested in rubber and its trade as a new industrial raw material. Fascinated with the reports of Amazon expedition and travels during that time, he corresponded with those who had participated in those tours (Dean, 1987) and frequently visited the London docks for getting acquainted with rubber and the different plant species that produced it. But there was no evidence that he ever visited South America.

Collins published his first article on wild rubber in 1868 in the *Hookers Journal of Botany* in which he documented all available information (Collins, 1868). His article in the *Journal of the Royal Society of Arts* published in the following year, provided more details on the subject and he requested for further information from the readers (Collins, 1869). This article, which paid due respect to

C R Markham for the successful introduction of cinchona plants from its native Peru to India, came to Markham's attention. He was confident that rubber yielding plants could also be successfully introduced to the East like cinchona plants (Markham, 1876; Williams, 1962). Thus on the initiative of Markham, Collins was appointed by the India Office for preparing a report on the feasibility of undertaking cultivation of various rubber yielding trees in British India. The objectives of the report was to take stock of all the existing knowledge on the rubber yielding plants and to ascertain whether any rubber yielding plants of South American origin like *Hevea*, and *Castilla* were superior in yield or in quality of rubber to the *Ficus elastica* grown in India.

#### COLLINS' REPORT

In 1872, James Collins' "Report on the Caoutchouc of Commerce, being information on the plants yielding it, their geographical distribution, climatic conditions and the possibility of their cultivation and acclimatisation in India" (Collins, 1872c) was published. Organised in two parts, other than the introduction, the report was of 54 pages with two maps and four plates of which the first plate is the floral morphology of *Hevea brasiliensis* (Figure 1). The introduction gave a list of all rubber yielding plants of which information was available. The first part of the report provided comprehensive information on all the known rubber yielding plants belong to several genera found in the forests of Africa, India, Madagascar, Mexico, Nicaragua and in South America. The rubber plants listed are *Ficus elastica* of India, *Hevea* and *Castilla* of South America, *Vahea* of Madagascar and *Landolphia* of Africa.

*Ficus elastica*, found in the forests of the

Brahmaputra valley of Assam in India, was described in detail. The outrageous destruction of *Ficus* trees by felling so as to render the tapping operations convenient, prompted Collins to suggest the establishment of plantations of *Ficus* in India and the collection of rubber from them under the supervision of government officials.

According to Collins' Report (1872), the most valuable tree, which produces the largest quantity of rubber was the *Hevea* of Amazon valley. He duly acknowledged Richard Spouce, the great naturalist and taxonomist as the principal authority on *Hevea*. He enumerated eight different species as *Hevea brasiliensis* (Mull. Arg.), *Hevea spruceana* (Mull. Arg.), *Hevea discolor* (Mull. Arg.), *Hevea pauciflora* (Mull. Arg.), *Hevea rigidiflora* (Mull. Arg.), *Hevea benthamiana* (Mull. Arg.), *Hevea lutea* (Mull. Arg.) and *Hevea guyanensis* (Aubl.), and detailed their natural habitats. Among the various species, *Hevea brasiliensis*, which prevailed around Para and the forests of the lower Amazon yielded most abundantly. *Hevea spruceana* was found round the north of the River Tapajos, Brazil and the other species were grown on the banks of the Rio Negro and Casiquiari. *Castilla elastica*, which grew over a much wider area of South and Central America, was next to *Hevea* in value and yield.

The part two of the report (Collins, 1872) dealt with the cultivation of rubber trees. With the fear of killing the trees by the injudicious native tapping methods followed in the Amazon basin involving slashing a series of cuts into the tree with an axe or hatchet (Manchadinho), the report recommended that the trees should not be tapped until it had 25 years of growth and then it should be tapped with yearly rest. The report provided illustrations of various forms of tapping including that of herring-bone





and short viability of *Hevea* seeds prompted Collins to caution the need for their speedy collection and despatch for planting.

Collins recommended immediate establishment of plantations of *Ficus elastica* in Assam under government control. As the rubber from *Hevea* and *Castilla* was superior to that from *Ficus*, he strongly suggested that those trees along with *Vahea* from Madagascar should be introduced to British India.

Collins sent his report to several experts in the field and a few responded. In an endorsement Sir Dietrich Brandis, Inspector General of Forests, Government of India, compared the climates of the Western Coasts of India and of Burma with that of rubber growing region of South America and recommended that Canara, Malabar, Travancore and the Burma Coast from Moulmein southwards offered the desired condition for successful cultivation of rubber. Brandis also pointed out that the evergreen forests at the foot of the Coorg Ghats in Malabar, the Attaran Valley and Tenasserim as localities where the temperature is very nearly the same as that of Para in South America. Although Brandis recommended planting rubber in Southern India and Burmese Coast, he considered Ceylon where the rain was less seasonal might be better (Watt, 1890). The memorandum of Brandis was also appended to the Collins' Report.

#### **DESPATCH OF *HEVEA* SEEDS FROM SOUTH AMERICA**

Since the publication of Collins' Report, the India Office had initiated attempts for the import of seeds of *Hevea* and other rubber yielding plants for initiating trial cultivation in British India, far away from its natural habitat. The

Foreign Office was asked to take steps through the Consul at Para, Brazil for obtaining a supply of rubber seeds for the Empire (Petch, 1914). It was also decided that RBG, Kew would receive the seeds from South America, initiate its propagation and arrange its transport to India. Markham initiated a series of shipments of planting materials of rubber yielding plants from Tropical America to London of which the first was by Collins (Anon, 1878; Petch, 1914; Drabble, 1973; Coates, 1987; Dean, 1987).

In the review of operations undertaken at RBG, Kew for propagation and distribution of planting materials to India, W T Thiselton Dyer, the then Assistant Director, RBG, Kew, who later became the Director, stated that Kew had received some hundred seeds from Collins on 04 June 1873 (Anon, 1878). Petch (1914) also observed that Markham through Collins obtained the seeds from a Farris, who brought them from Brazil.

Coates (1987) detailed how Collins had facilitated the delivery of 2000 seeds and shipped them at India Office expense to Kew, where they arrived in June 1873 (Pauline, 2001). Dean (1987) in a study on the struggle for rubber in Brazil provided a more detailed picture of the whole episode. In his extensive correspondences with experts in the field, James Collins requested not only for rubber seeds but also for information on rubber. On 02 June 1873, Collins informed Markham that Charles Farris, who was a resident of Cameta, a town about 100 km south of Belem, had come over to London with a collection of rubber seeds "quiet fresh and in a fit state for planting" (Dean, 1987). Markham authorised Collins to buy the seeds from Farris for £2/10 per thousand (RBGK, 1896; Petch, 1914) and the seeds were received at RBG Kew in the same month.

But contrary to the claims, the seeds

received at RBG Kew were not 'as fresh' and only 12 of them germinated. On 22 September these plants were taken to Calcutta Botanic Gardens, where they were planted. The experimental planting failed due to the unfavourable climatic conditions (Watt, 1890; Thomas, 2000). In the report, Collins had recommended the humid tropics for planting *Hevea*. But the first rubber seedlings were sent to Assam, where the cold climate proved unsuitable. He was disappointed as the first plants, in the acquisition of which he was instrumental, were not sent to places which he had suggested and that they did not survive in the places where they were planted (Wycherley, 1968). Thus the maiden attempt to grow rubber in the East failed and it was decided that further shipment of seeds should be sent to Botanical Gardens in Ceylon where the climate was warmer and more favourable for growing rubber.

#### **AS GOVERNMENT BOTANIST, SINGAPORE (1873-77)**

Raffles Library and Museum (RLM), Singapore, the ancestor Institution of the present Singapore Library Board, was set up with a committee of eight prominent citizens under Dr Robert Lee on 01 April 1874. James Collins was appointed the Government Economic Botanist, Librarian and Secretary to the Committee in May on the recommendations of Sir Joseph Hooker, who considered him as the ideal person with his known background, experience and expertise. The Library and Museum which occupied three rooms on the upper floor of the Town Hall were opened for public on 14 September 1874.

In 1874, Collins started publishing the Raffles Library Occasional Paper Series, the first being his own (Collins, 1874). The RLM

report for 1875, prepared by Collins, detailed the number of books, subscribers and visitors *etc.* (Collins, 1876). Finally, through the RLM report for 1876 Collins brought to the notice of all concerned, the need "for increasing the knowledge of, and the probable development of, the commercial capabilities of the Straits Settlements and the Malayan Peninsula". As there were constant enquiries as to "what capabilities of production of fibres, timber, gums, resins, drugs *etc.*, those countries possessed", he strongly suggested that the possession and development of such capabilities depended the opening up of such countries to the beneficial influences of commerce and civilisation (Collins, 1876).

More important is Collins' suggestion for the first time in the history of rubber for the introduction of rubber yielding plants to Singapore and further to Malaya. After referring to his Report on Caoutchouc of Commerce of 1872, Collins recommended that Singapore and Malayan Peninsula were the best localities for the cultivation of rubber yielding plants especially Gutta Susu (*Urceola elastica* Roxb), a native of the Straits. Further, he suggested that the other best commercial varieties of rubber yielding plants would perform well there if its seeds were obtained.

But contrary to the expectations of Hooker and others, Collins soon proved to be unfit for that post. This or other more serious personal reasons took him to drink (Wycherley, 1968). In 1877, he ceased to be in charge of the RLM, when 20-year-old Henry James Murton from England took his place. Collins was summarily dismissed for negligence. Finally, in 1878 the RLM was placed under the control of the government managed by a five-member committee (Dwor-Frecaut, 2001). Collins went back to London and died in poverty in about 1900 (Morrison, 2001). As Wycherley (1968)

has pointed out, "it was the sad end of a man with great writing skill, great competence and knowledge".

### **COLLINS : AN APPRAISAL**

James Collins, since his introduction by C R Markham and Joseph Hooker, has played a crucial role in the British project for the introduction of rubber in the East. His report on Caoutchouc of Commerce of 1872 is a milestone in the history of modern rubber plantation industry as it provided the British authorities with all the basic information about rubber yielding plants, their location, the climatic conditions of rubber growing areas in South America, latex extraction methods *etc.* The wealth of information and the botanical drawings of the various rubber yielding plants made the report comprehensive and authoritative. This report contained all that was known at that time on the subject. As there is no evidence that Collins visited South America, he might have drawn information on rubber yielding plants from the works of Bentham (1854) and Spruce (1865). He might have also made observations from the specimens in the Kew herbarium. Thus Markham and Hooker were supplied with the necessary background information for the rubber domestication project. In his appraisal, Ridley credited Collins for his foresight on the future rubber industry. He evaluated Collins' Report as "a compilation with original suggestions and invaluable in the early days of rubber cultivation" (Ridley, 1955).

Collins, who was the first in documenting the existing information on various rubber yielding plants, was never tagged among the great men behind the historic domestication project. The British authorities never recognised his role in this effort. Instead, he was humiliated. Though he was paid £80 for compiling the

report on rubber industry, his report was treated as "utterly worthless" (Collins, 1878; Dean, 1987). A record of Collins' name in the historic domestication of *Hevea* and its introduction into South East Asia existed only in the India Office records as he was never paid for the first despatch of rubber seeds from South America. When Collins submitted the bill for the 2000 seeds as per the original agreement, Sir Louis Mallet, the Under Secretary to Government of India rejected it charging Collins of a "gross attempt to impose on the Secretary of State". Mallet had also accused that Collins had already succeeded in obtaining £80 for an utterly "worthless report on Gatta Percha" (Dean, 1987).

In fact, the failure in the germination of seeds imported from South America in the endeavours of Collins, Wickham and Cross was due to the ignorance in proper packing and forwarding. The long slow trip from the Amazon to England proved detrimental to the viability of these seeds. Finally, H N Ridley devised the method of packing in 1907 when rubber seeds were successfully sent from Singapore to Guiana with 80 per cent germination after a long 53 days' travel (Ridley, 1955). Later studies in Malaysia revealed that the viability of seeds could be retained up to four months by storing seeds at 4°C in sealed polythene bags (Wycherley, 1971).

Thomas Petch, the authority of early rubber planting in India and Sri Lanka, also criticised Collins' Report that it contained little information likely to be of any practical use to the planters (Petch, 1914). This criticism was irrelevant as the objective of the Collins' Report itself was not to advise on practical planting, but documenting the existing information on rubber yielding plants.

In fact, Collins' Report of 1872 had its negative impact on the new born rubber

plantation industry, especially in India and Ceylon. The report had suggested that rubber trees should safely be tapped only at 25 years of age with yearly tapping rest. Based on this recommendation, Gustav Mann, the Conservator of Forests, Assam has advocated that two or three years must lapse before tapping for a second time. Such ideas had prompted planters and government officials to doubt the practical viability of rubber cultivation during its early days. Ridley has also underlined this (Ridley, 1955).

During his tenure (1873-77) as the Government Economic Botanist, Librarian and Secretary to the Committee of the RLM, Singapore, Collins organised the library and museum on scientific lines. His report of 1876 of the RLM was the first traced historical record of the pioneering recommendation that Singapore and Malayan Peninsula were the best localities for the cultivation of rubber yielding plants. Though he stressed the planting of native *Urceola elastica*, he suggested that other commercial varieties would also do better.

In 1876, the first set of 50 *Hevea* plants was introduced to Singapore Botanic Gardens, where J H Marton, the predecessor of Collins, was the Botanist. In 1877 a total of 22 plants were successfully established at Singapore Botanic Gardens by Marton (Wycherley, 1959; 1968) of which nine were planted in the Residency Gardens, Kuala Kangsar, Malaysia. Thus, instead of Collins young Marton was fortunate in initiating the cultivation of *Hevea brasiliensis* in the Singapore Botanic Gardens and at Kuala Kangsar, Malaysia. Surprisingly, it is a historical paradox that as in the case of the introduction of *Hevea* into the British India, Collins had to move from his position as Economic Botanist when the first rubber plants were introduced on his recommendations to Singapore and Malaya and planted there.

The few lines James Collins wrote (Collins, 1878; Dean, 1987) to Luis Mallet, when he was denied payment for the bill for the rubber seeds he had sent from South America, was a self assessment of Collins himself: "I would like to take this opportunity to place on official record that if any honour be due for being the first person through whose instrumentality, live plants of Para India rubber tree have been introduced into India, that honour is undoubtedly due to me".

#### ACKNOWLEDGEMENTS

The author is grateful to Dr N M Mathew, Director, Rubber Research Institute of India (RRII) for rendering facilities and support for this paper. The author wishes to thank Mr Roddy Morrison, Royal Pharmaceutical Society of Great Britain; Mr Gray Mource Dwor-Frecaut, National Reference Library, Singapore; Ms Pauline Phua Mei Chiang, National Archives, Singapore and Ms Christina Soh, Singapore Botanic Gardens, Singapore, for the information and assistance provided. Constructive criticisms and modifications suggested by Dr C Kuruvilla Jacob, Deputy Director (Plant Pathology) and Mr Sabu P Idicula, Plant Pathologist, RRII, are also gratefully acknowledged.

#### REFERENCES

- ANON. 1878. Introduction of rubber plants into India. *Indian Forester*, 42-47.
- AUBLET, J B C F. 1775. Historie des plantes de la Guiane Francarse, 2 : 871-873 (Cited in Schultes, 1970).
- BAULKWILL, W J. 1989. History of natural rubber production. In: *Rubber* (C C Webster and W J Baulkwill, eds). Longman Scientific and Technical, Essex. 1-56.
- BENTHAM, G. 1854. On the North Brazilian Euphorbiaceous in the collection of Mr. Spruce. *Hookers Journal of Botany*, 6 : 368-371.



- COATES, A. 1987. The commerce of rubber: The first 250 years. Oxford University Press, Singapore, Ch. 9.
- COLLINS, J. 1868. On the commercial kinds of India rubber or *Caoutchouc*. *Journal of Botany*, 6 : 2-22.
- COLLINS, J. 1869. On India-Rubber : Its history, commerce and supply. *Journal of the Royal Society of Arts*, 18 : 81-93.
- COLLINS, J. 1872a. The study of economic botany. *Journal of the Royal Society of Arts*: 21.
- COLLINS, J. 1872b. The signaloe-wood of Mexico. *Pharmaceutical Journal* (2<sup>nd</sup> series), 19(10): 590-593.
- COLLINS, J. 1872c. Report on the *Caoutchouc* of Commerce, being information on the plants yielding it, their geographical distribution, climatic conditions and the possibility of their cultivation and acclimatization in India Eyre and Spottiswoode, London, 54 p.
- COLLINS, J. 1874. Museums : Their commercial and scientific uses. Raffles Library and Museum, Singapore (Occasional Papers No.1).
- COLLINS, J. 1876. Report on the Raffles Library and Museum for the year 1875. Singapore, 3 p.
- COLLINS, J. 1878. Letter to Under Secretary of State for India, 13 May 1878 (Cited in Dean, 1987).
- DEAN, W. 1987. Brazil and the struggle for rubber: A study in environmental history. Cambridge University Press, Cambridge, 234 p.
- DWOR-FRECAUT, G M. 2001. Personal communication. National Library Board, Singapore. Letter dated 20<sup>th</sup> November 2001 (National Museum, In: *Guide to the Source of History in Singapore*, p. 45).
- DRABBLE, J.H. 1973. *Rubber in Malaya; 1876-1922: The genesis of the industry*. London, Oxford University Press. 1-47.
- HANCOCK, T.C. 1857. Personal narrative of the origin and progress of the *Caoutchouc* or India-rubber manufacture in England. Centenary edition, Longmans and Roberts, London, 1920. (Cited in Markham, 1876).
- HERNANDEZ, F. 1649. *Revum Mechcarum Novae Hispaniae*. The Saurus, Rome. 50-56 (Cited in Schurer, 1956).
- LANE, E V. 1953. The life and work of Sir Henry Wickham. *The India-Rubber Journal*, 125 : 962-965; 1076-1078; 1118-1120; 1149-1151.
- LANE, E V. 1954. The life and work of Sir Henry Wickham. *The India-Rubber Journal*, 126 : 25-27; 65-68; 95-98; 139-142; 177-180.
- MARKHAM, C R. 1876. The cultivation of *Caoutchouc* yielding trees in British India. *Journal of the Society of Arts*, 475-482.
- MORRISON, R. 2001. Personal communication. Royal Pharmaceutical Society of Great Britain, London. Letter dated 30 October 2001.
- PAULINE, P. 2001. Personal communication, National Archives, Singapore. Letter dated 21 November 2001.
- PETCH, T. 1914. Notes on the history of the plantation rubber industry in the east. *Annals of the Royal Botanic Gardens, Peradeniya*, 5 : 433-520.
- RBGK. 1898. Para rubber. *Bulletin of Miscellaneous Information*. Royal Botanic Gardens, Kew, 3 : 103-105.
- RIDLEY, H.N. 1955. Evolution of the rubber industry. *Proceedings of the Institution of the Rubber Industry*, 11 : 114-122.
- SCHULES, R.E. 1970. History of taxonomy studies in *Hevea*. *Botanic Review*, 36(3) : 197-276.
- SCHURER, H. 1956. The discovery of the rubber tree: Achievements of the 18<sup>th</sup> century explorations in America, Africa and Asia. *Rubber Journal*, 130 : 132-137.
- SPRUCE, R. 1865. Note on the India-rubber of the Amazon. *Hookers Journal of Botany*, 3, 7 : 117-121.
- THOMAS, K K. 2000. Indian rubber plantation industry : Genesis and early development. In: *Natural Rubber : Agromanagement and Crop Processing* (P J George and C Kuruvilla Jacob, eds). Rubber Research Institute of India, Kottayam. 1-17.
- THOMAS, K K. 2001. Role of Clements Robert Markham in the introduction of *Hevea* rubber into the British India. *The Planter*, 77 (902) : 287-292.
- WATT, G. 1890. India rubber, *Caoutchouc* or gum elastic. In : *A Dictionary of the Economic Products of India*. Vol.4. Cosmo Publications, Delhi. 337-382.
- WILLIAMS, D. 1962. Clements Robert Markham and the introduction of the cinchona trees into British India, 1861. *Geographical Journal*, 128 : 431-442.
- WYCHERLEY, P R. 1959. The Singapore Botanic Garden and rubber in Malaya. *Gardens Bulletin, Singapore*, 17(2) : 175-186.
- WYCHERLEY, P R. 1968. Introduction of *Hevea* to the Orient. *The Planter*, 44 (504) : 127-137.
- WYCHERLEY, P.R. 1971. *Hevea* seeds (Part III). *The Planter*, 47 (546) : 405-410.

---

## Did You Know?

**Market intervention.** The year just gone has been a great year for market intervention that saw one agreement to stabilise prices collapse and another being formed. The news of the date of official demise of the International Natural Rubber Organisation (INRO) opened 2001 and in December the creation of the International Tripartite Rubber Organisation (ITRO) saw the year close. The INRO had more or less cease to function as a body in 2000, but the buffer stock manager was charged with the duty of disposing of its 138 000 tonnes in stockpile by the end of July 2001 before its official closure could be made. The stockpile was quietly and efficiently disposed of couple of months before its deadline. The release of this extra rubber on to the market made no impact on the world rubber prices.

Almost immediately after the official closure of the INRO, the International Tripartite Rubber Organisation (ITRO) was established by Indonesia, Malaysia and Thailand. Its purpose is to stabilise the rubber prices at a desirable level by controlled exports and output. To this end the International Tripartite Rubber Council (ITRC), the governing body of the ITRO, was also established that would oversee the implementation of the ITRO plan. The ITRO plan was agreed upon during the Bali, Indonesia meeting in 10-11 December 2001, where 4% reduction in export and 10% cut in production in 2002 will be made by the member countries.

The level at which the ITRO seek to stabilise prices have been revealed to be 75 UScents/kg with a ceiling of 82.5 UScents/kg and a floor of 60 UScents/kg below which an intervention would be triggered. Under the proposed plan the potential maximum withdrawal of rubber from the market would

be 181 000 tonnes in production and 374 000 tonnes from export. Although the market was positive with the plan, it did not show any kind of enthusiasm. The market appears to be waiting for action before responding with a rising price and until supply is cut by the proposed margin, it would remain sceptical.

*Rubber Industry Report*

### **High-yielding oil palm variety for Africa.**

A new variety of oil palm is being planted in Africa by the FAO. The hybrid, planted in Costa Rica, is a cross between the dura planted in Africa and the high yielding tenera in Costa Rica. Trials conducted in Cameroon, Ethiopia, Kenya, Malawi and Zambia indicate that the hybrid grows well in high altitudes of 950 m and low temperatures (Ethiopia) and at 3 years it could produce fruits yielding 9 litres of oil and 20 to 30 litres at year six (Zambia). The local dura can be harvested only at year 8 and the oil yield is only half that of the new hybrid.

The FAO is introducing the hybrid in western Kenya. The region's oil consumption is about two-third more than what it produces thus the country has to spend about US\$140 million in imported edible oil. Western Kenya has a favourable climate like that of Malaysia which is suitable for oil palm cultivation. It is also located close to main trading routes. Industrial agricultural production for example cut flowers, selected green vegetables, pharmaceutical crops are attracting foreign investment.

The FAO is considering planting oil palm jointly with the Mumias Sugar Company, one of the largest agroindustrial producers in western Kenya. It also hopes to introduce the crop to smallholders, most of whom belong to