THE HISTORY OF

RUBBER REGULATION

1934—1943

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edited by

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for the

INTERNATIONAL RUBBER REGULATION COMMITTEE

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FOREWORD BY THE EDITOR

The major part of this work is a study of facts. It is, however, almost impossible, and doubtfully desirable, to eschew all interpretation ; the mere selection of facts and their arrangement may be a partial interpretation.

The Committee has been at pains to see that the selection of facts from its records should be objective. In so far as judgments are expressed they are the collective opinion of the members of the Committee only and not of the Governments whom they represented.

The work has mainly been compiled by members of the Committee and its staff, but help which is gratefully acknowledged has been received from outside sources. Use has also been made of Dr. George Rae's paper to the Royal Statistical Society on the " Statistics of the Rubber Industry," and of various publications of the U.S. Department of Commerce and of the Rubber Growers' Association (Incorporated) in obtaining some of the statistical and other general information.

A word may be added as to the arrangement of the book, which presented certain difficulties. Chapters V, VI and VII, contain material which could not well be omitted from this work, but they might be regarded as an interruption in the narrative by the general reader, who may find it easier to understand the subsequent history if he proceeds from the general outline of the Regulation Agreement in Chapter IV to the beginning of the historical matter in Chapter VIII.

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The International Rubber Regulation Agreement was signed in London on May 7, 1934, *and the Regulation Scheme, which came into force on June* 1, 1934, *was to remain in force until December* 31, 1938, *as a minimum period. The Agreement was renewed on October* 6, 1938, *until December* 31, 1943, *again as a minimum period. The Governments of the United Kingdom, the Kingdom of the Netherlands, and India, the remaining signatories, having decided to contiuue the International Rubber Regulation Agreement for a final period until April* 30, 1944, *the Regulation Scheme and the International Rubber Regulation Committee came to an end at that date.*

INTRODUCTION

It is a common but mistaken belief that schemes to control the price, production or marketing of raw materials or foodstuffs were the offspring of the great depression. The history of coffee control, which in the past has probably been the most uniformly unsuccessful of all commodity control schemes, goes back as far as 1917. Between the end of the Great War and the onset of depression in 1929 experiments had been made in the control of wheat, sugar, petroleum, copper and tin as well as coffee; and rubber had been the subject of more than one experiment in control.

The schemes of the twenties were for the most part the aftermath of the war, which had created new sources of supply or producing areas, in some cases because war required larger supplies than peace, in others because consumers were cut off from their normal sources of supply by the shortage of shipping. There was, therefore, in most of the above commodities excess production after the war—in the sense that the world was producing more than the world was at the moment organised to consume; it is at least doubtful whether more was being produced of any of the commodities in question than could have been consumed with profit to the world economy if the problem of distribution had been successfully solved.

The attempt of particular commodity producers to protect their own special interests by restrictive measures, rather than by allowing the adjustment of supply to demand to be effected by the slow and cruel play of market forces, was at least as natural and defensible as the attempt of manufacturers to deal with a similar problem of excess production of manufactured goods by new and better tariffs.

It may further be conjectured that commodity control was an answer, even though not a perfectly articulate or wholly conscious one, to the growing tendency of manufacturers who were the immediate consumers of the commodities to combine in monopolistic groups for the control of prices; successful operation by such groups or cartels generally, if not necessarily, meant a restriction of production and was therefore opposed to the interest of their raw material suppliers. Counter restriction commended itself as a measure of protection against protectionists and the users of devices in restraint both of international and domestic trade.

But if the great depression did not bring restrictive schemes to birth, it brought some of them to rebirth, and it greatly stimulated experiments in control. The same forces were operating as in the period immediately following the war, and with greater intensity. Once again more was being produced, or was capable of being produced, than could be consumed in a world in which effective demand was shrinking in an alarming degree and the whole machinery of international trade was threatened with almost complete paralysis. There was a serious danger that temporary surplus capacity in many commodities might become chronic, thanks to a general search for national security in self-sufficiency and the savage restriction of imports.

Primary producers were punished twice over. A falling demand unaccompanied by an immediate decrease in production inevitably meant falling prices and a serious inroad into profits. But the fall in prices was not merely an absolute and unpleasant factor in the situation ; the price level of primary commodities fell much more steeply than the price level of manufactured goods. The producer obtained less money for his product and had to spend much more to acquire the manufactured articles which he needed or desired. Part of the discrepant movement in price was certainly due to the fiscal protection which most manufacturers had been accorded and which was increased, both in area and degree, as depression deepened, and to the power freely exercised to enter into agreements for the avoidance of competition and the maintenance of prices. As in the twenties, therefore, commodity restriction commended itself as a defensive counter-measure.

In a *laissez faire* world the two blades of the scissors, raw material and manufactured article prices, would have tended to close by a fall in the latter to correspond with the precedent fall in the former. One blade was apparently fixed, and it was certainly immovable without wage changes which would have involved dangerous social friction ; the rigidity and maladjustment might be cured by a movement of the other blade, and it became commonly accepted policy, particularly in the United States but also in Great Britain and the Empire, to take action designed to raise the prices of primary products. An obvious way of attaining this object was to create an artificial scarcity.

There were various ways of producing scarcity. One was the physical destruction of the product, and the burning of coffee in Brazil is the most flagrant example of converting plenty into

scarcity. Another was to buy up and withhold stocks in the hope that they could be unloaded in time of shortage—the method of the stock-pile ; this had been tried, without success and at great cost, for Brazilian coffee before recourse was had to destruction. It was tried and abandoned by the U.S.A. for cotton and by Canada for wheat. A third method was to apply the remedy at an earlier stage by direct restriction of production, and it was systematically used by the U.S. Government, after trial of other methods, in the case of wheat, cotton and hogs ; farmers were paid *not* to grow. This method was successful in raising American prices but stimulated production, especially of cotton, in other areas.

Cuba had tried to deal alone with excess sugar production by restricting its own output, and had failed, between 1925 and 1930. The great depression gave birth in 1931 to an international scheme of quotas which came to an end in 1935 and was succeeded by a new international agreement in 1937.

Rubber was one of four major commodities which were internationally controlled and regulated at the outbreak of war in 1939, the other three being tin, tea and sugar. All the factors adversely affecting the price of other primary commodities were fully operative in the case of plantation rubber. Furthermore, excess production, actual and potential, was aggravated by two other factors not generally affecting other commodities at the beginning of last decade, though restriction, if its natural operation had not been changed by war and preparation for war, might in due course have produced them. The first was that the Stevenson Scheme had stimulated planting in areas where it had not operated, and particularly in the Netherlands East Indies. The second was that the high prices realised just before the breakdown of that scheme had stimulated research as well as planting, with the result that high yielding trees had been extensively planted, and one acre of good plantation land could be relied upon in the future to produce two and a half times the average good yield expected a few years earlier. The rubber grower was therefore faced not only with that kind of over-production which was involved in general slump conditions but by what might be called technological excess capacity. A new manufacturing process may quickly render existing machinery obsolete and so remove higher cost production ; the improvement in planting material and technique did not put the older plantings out of operation but merely hastened

the day when they would be replanted, with a further increase in productive capacity. The second burden might have been carried—indeed, would hardly have been a burden—under normal conditions, because it was accompanied by a corresponding decrease, in the replanted or newly planted areas, of the cost of production ; the synchronisation of general and special excess capacity, threatened to produce widespread distress and bankruptcy if no remedial measures were taken.

Some at least of those responsible for the institution and administration of rubber regulation have never regarded any form of restriction as better than a *pis aller*. It is plausibly contended that restriction can be no good for anything but a passing phase of overproduction, if only because it inevitably tends to maintain the high cost producer who ought to be eliminated, painlessly or painfully, by competition, and it has been pointed out that the various restriction schemes established or re-established after 1929 were nearly all in industries which were already suffering from excess capacity before the onset of the major depression.* That was admittedly the case in rubber, and natural forces might have corrected the situation without any special hardship to rubber growers had they been operating generally in the world in which the rubber grower had to live and maintain himself ; as things were what seemed good to those interested in protecting the producers of coffee, cotton, sugar, wheat, copper, tin and tea could not seem a nefarious practice when adopted by those interested in protecting one of the chief industries of Malaya, the Dutch East Indies and Ceylon.

Overproduction is, of course, a relative term. There can be no doubt that there was overproduction in rubber when the commodity was selling at less than 2d. a lb., as it did in 1932, for that is less than the cost of production. But overproduction in that limited sense was not confined at that unhappy period to rubber ; the tremendous fall in prices, and the widening gap in the scissors, stimulated production of many commodities because individual producers hoped to make up the loss in unit prices by an increase in the number of units sold.

The question of productive capacity related to absorptive capacity in the future is much more complicated. The question has to be posed in terms of the future, because a rubber tree

* (J. W. F. Rowe : " Markets and Men," Cambridge University Press, 1936.)

takes five to six years to come into bearing and a longer period before it is yielding its best. Production can be stepped up and down within the limits imposed by the existing planted acreage, but it is not possible, as it is in the case of annual crops and to some extent in the case of mineral extraction, to adjust it quickly in response to major changes in demand. There have in fact been pronounced shortages of rubber, and there have been pronounced gluts.

But demand is a good deal more elastic than supply. It would have been foolish in the extreme to attempt an estimation of reasonable production in the circumstances of the early thirties. The quantity of rubber which could be absorbed in the future depended on two factors—the price at which it could profitably be grown, making allowance in the price for the necessity of replanting as trees died or became obsolescent through improvement of the strain, and the future conduct of the world in its international commercial relations. The remunerative price had fallen; quite how far depended on the amount produced, that is on the second factor.

It may be conjectured that the continuance for several years of unregulated production in a depressed or shrinking world would have resulted in such a fall in productive capacity as to threaten a shortage if depression and restriction in trade generally were succeeded by boom and expansion. Some estates would have been liquidated and many more would have been neglected ; some would have been tapped to death in an effort to hold out for better days. There is no evidence to suggest that native production would have served to fill the gap ; it fell off more steeply than plantation production in the depth of the depression and would certainly not have been extended. And incidentally the excess capacity of the early thirties proved to be rather less than adequate for the requirements of a world at war less than ten years later.

Such briefly is the economic background against which the negotiations leading to the constitution of the I.R.R.C. and its nine years' history should be studied.

CHAPTER I

RUBBER AND THE RUBBER INDUSTRY

INTRODUCTORY.

When certain trees or plants are pricked they exude a milky liquid which is called LATEX. This latex consists of tiny particles of solid matter suspended in a liquid in much the same way as milk is composed of small particles of fat suspended in liquid. The tiny particles in some latices are particles of RUBBER and as milk forms a cream causing the fat particles to unite, so the latex can be made to coagulate, causing the rubber particles to form into a solid mass.

In most cases the latex is coagulated by the addition of a weak acid such as acetic acid, but in the case of latices from some trees coagulation may be effected by boiling.

The latices of rubber-bearing trees contain, besides the pure rubber hydrocarbon or CAOUTCHOUC, varying quantities of resins and other organic substances which pass into the solid rubber obtained by coagulation; the amount of Caoutchouc present in latex varies from genus to genus, species to species and tree to tree.

Of all known sources of rubber the latex of the *Hevea brasiliensis* gives the greatest amount of the pure hydrocarbon with the least amount of extraneous matter, and for this reason among others the *Hevea brasiliensis* has become the rubber tree of commerce. The composition of the latex of this species varies, but the dry solid coagulum usually contains about 95 per cent of the pure hydrocarbon. When the solid rubbery mass has been obtained by the coagulation of the latex, it is rolled and dried and placed on the market as crude rubber.

Crude rubber is an elastic solid with many interesting chemical and physical properties.

From the chemical viewpoint crude rubber is a mixture of a pure hydrocarbon with resins, proteins, etc. It is resistant to

most chemicals and is only soluble in a few substances, among which are petroleum and aromatic hydrocarbons.

The physical properties of rubber are well-known; among them may be mentioned its elasticity, resilience and impermeability to water. Of all rubber's properties, however, the one which is most important and, at the same time, most characteristic is its elasticity. By virtue of this property rubber can be stretched to many times its normal length but will always regain its normal size and shape.

The applications to which properties of rubber lend themselves are so varied that there is practically no phase of our modern civilization in which they are not used. Rubber is, in fact, an " indispensable."

HISTORICAL.

Rubber was first discovered by European civilization nearly 450 years ago and is a gift from the New World to the Old. The first European to become acquainted with this wonderful substance was Columbus, who, during his second voyage to America in 1493-1496, found the natives of Haiti playing with balls made from the gum of a tree. Although some of rubber's properties seem to have been known and appreciated by the early explorers—we read of the Spanish troops in Mexico, about a century after Columbus, using rubber to waterproof their garments—it was not until nearly 250 years after Columbus that Europe seemed to realise the remarkable properties of rubber and the uses to which it could be put.

The French were the pioneers in studying the properties of rubber and its manufacturing uses, and they brought the first samples of rubber to Europe just about 200 years ago. The real discoverer of rubber, then, may be regarded as Charles de la Condamine, the French scientist who, in an adventurous expedition along the course of the Amazon in the years 1736-1744, collected samples of rubber and sent them to France with a description of how they had been obtained and also of the rubber tree. Condamine also investigated the uses to which rubber was put by the Indians and their methods of working with it. He recognised some of the possibilities to which rubber could be put but he also realised the difficulties of applying native methods of manufacture to latex in Europe, as it would be impossible to transport liquid latex such great distances without coagulation.

The initial problem in rubber research therefore was to find either a means of dissolving the rubber formed by the coagulation of the latex, or alternatively a method of preventing the coagulation of the latex. The former alternative was the first to be discovered. Some twenty years after the first rubber reached Europe, Herissant and Macquer discovered that turpentine acted as a solvent, and some time later Macquer demonstrated that purified ether was an even better solvent. But it was not until about fifty years after Condamine's discovery that Fourcroy found that the coagulation of latex could be prevented by the addition of an alkali. It is interesting to note here that Fourcroy's discovery, like that of Thomson some fifty years later, was completely overlooked by later research workers ; and about forty years after he had made the discovery we find Hancock and Goodyear abandoning some of their experiments owing to their inability to obtain uncoagulated latex. In fact, it is only within the last thirty years or so that the preserving of latex by means of alkalis has been done on a commercial scale.

While this research work was being carried on in France, other European scientists had become interested, and by the beginning of the 19th century many of rubber's now well-known properties had been discovered. Botanists were also busy investigating the rubber-bearing trees of the New World, and looking for them too in the forests of the Old—not without success, for it was found that the *Ficus elastica* of the Malay Archipelago was also a rubber producing tree.

In passing it may be noted that Condamine called the new substance CAOUTCHOUC, which was the French pronunciation of the Indian name. This name or its variations is still used in practically every Continental country with the exception of Holland, where the English name RUBBER—given to the substance by Priestley on account of its pencil-erasing qualities—is used.

With the coming of the 19th century rubber-manufacturing passed from the laboratory stage to the workshop, and it was in England that the rubber industry was really founded, about five years after Waterloo. The man who can be regarded as the father of the industry was Thomas Hancock, who in 1820 applied for a patent to manufacture from rubber various articles of clothing. Shortly after Hancock had started manufacturing, a Scotsman,

Charles Macintosh, took out a patent in 1823 for the manufacture of rubber-proofed fabrics. This was followed in 1828 by the establishment by Hancock of a rubber factory in France; four years later, in 1832, the first American rubber factory was opened by Haskins and Chaffee.

An early manufacturing discovery by Hancock was the process of MASTICATION, in which crude rubber is passed between heated rollers and in this way becomes more plastic and workable. The discovery of this phenomenon was of great benefit to the early rubber manufacturers, but it was soon apparent to them that their raw material was a difficult one to work with. It had in fact two main defects:

(1) hot weather makes crude rubber soft and sticky;

(2) cold weather makes crude rubber hard and brittle.

These two defects were so serious that they threatened the whole commercial future of the industry, and many of the concerns which had commenced to manufacture rubber goods went bankrupt in a very short time. What may be termed the second fundamental problem in rubber research had to be solved, and research workers in both worlds were busy trying to overcome these two great defects.

This research work was crowned by success when in 1839 Charles Goodyear, in collaboration with Nathaniel Hayward, discovered in America the process of VULCANIZATION, a process which was also discovered two years later by Thomas Hancock in England.

In this process crude rubber and sulphur are mixed intimately together and heated to a certain temperature; an improved material is then obtained which is stronger, more elastic and better able to withstand heat and cold than the original crude rubber. By varying the proportion of sulphur added it is possible to obtain various ranges of elasticity.

The combination of these two processes revolutionized the rubber industry. It was soon discovered that by sprinkling powdered sulphur over the scraps of rubber during the process of mastication the rubber and sulphur were more intimately mixed for the purpose of vulcanization.

After the discovery of vulcanization the rubber industry was firmly established in America and England. Although its growth

was slow at the beginning it expanded steadily, especially after the turn of the century. It had yet to receive the fillip which was to make it into one of the world's greatest industries: the pneumatic tyre, the greatest user of rubber, was invented in 1888 by a Scottish veterinary surgeon called Dunlop, who had his practice in Belfast.*

Dunlop's invention has probably done more to develop the rubber industry than any other event with the exception of Goodyear's discovery of vulcanization. The pneumatic tyre was an instant success and contributed greatly to the comfort and the development of cycling; within a few years every bicycle was fitted with the new tyres. The motor-car was in its infancy, and here again was a new market for the pneumatic tyre—a market which was soon to be rubber's greatest. The first car fitted with pneumatic tyres was put on the road in 1895.

The tyre industry started in Dublin, but in a few years time the citizens of that city objected to the obnoxious smell of the rubber factory, with the result that the Dunlop Company moved across the Irish Sea and established itself at first in Coventry and later in Birmingham. Meanwhile the patents had been acquired in America, where the rubber manufacturing firms were soon turning out the new tyres to be fitted to American cycles and automobiles, and as the automobile industry has grown in the U.S.A. so has the rubber tyre industry.

THE RUBBER GROWING INDUSTRY.

We have up to now been considering the development of the rubber manufacturing industry, but there was also as striking a development in rubber production—again the birth of a new industry, and this will be considered below.

Wild Rubber.

As we have seen above rubber was first discovered by Columbus in Haiti and used by the Spaniards in their campaigns in Mexico, while commercial rubber was first obtained from the Amazon Valley, where Condamine discovered it in his voyage across the South American continent.

Attention has also been drawn to the importance of the *Hevea brasiliensis* as a rubber bearing tree and mention has been made of the *Ficus elastica*. There are of course many rubber

* The pneumatic tyre had been invented in 1845 by another Scotsman called Thomson, but the idea was before its time and fell into oblivion. The "cycling age" was the reason of Dunlop's patent receiving its due recognition.

producing plants and the most important of these, with their natural habitats, are given below :

Plant.	Description.	Habitat.
Hevea brasiliensis (Para) ...	Tree	Amazon Valley.
Castilloa elastica	Tree	Central & South America.
Manihot glaziovii (Ceara) ...	Tree	North East Brazil.
Ficus elastica	Tree	South East Asia.
Funtumia elastica	Tree	Africa.
Landolphia spp.	Vine	Africa.
Clitandra spp.	Vine	Africa.
Cryptostegia grandiflora ...	Shrub	Madagascar.
Parthenium argentatum (Guayule)	Shrub	Mexico.
Kok-saghyz taraxacum ...	Herb	U.S.S.R.

With the exception of the last two, namely guayule and the Russian rubber plant, it will be observed that all the rubber bearing plants of commerce are found within a belt 28 degrees north and south of the equator.

Until the rubber plantation industry started at the end of the 19th century, the entire rubber supplies of the world came from wild sources, and the rubber which reached the world's markets was prepared in the primitive native fashion. As will be seen from the above geographical distribution, practically all the world's rubber came from South America and Africa ; and in fact until the introduction of the pneumatic tyre with its attendant increase in rubber consumption South America alone provided most of the world's requirements.

The introduction of the pneumatic tyre and the coming of the motor-car created a very large demand for rubber, and the existing wild sources could not satisfy it. This is not surprising when it is realised that in the Amazon Valley, for instance, although there are millions of *Hevea* rubber trees they are widely scattered in most inaccessible forests, so that there may be only three or four trees in an acre of forest. A tapper in the Amazon Valley can therefore only tap relatively few trees in his day's round, and as the number of available tappers is limited production cannot be rapidly increased.

In spite of all the efforts made the " wild " rubber producing areas were unable to produce sufficient rubber to satisfy world

demand, and the rubber manufacturing industry was thus faced with a lack of raw material; the situation was saved by the progressive arrival on the world market of rubber from the Far Eastern plantations.

Plantation Rubber.

It is said that the first suggestion to introduce the American rubber bearing trees into the Far East was made at the end of the 18th century, and in 1855 Hancock seems to have suggested the possibility of developing sources of rubber in various parts of the world. But it was not until 1872 that anything was done in the matter. In that year reports on the possibility of cultivating rubber in the East, which had been made at his request, were submitted to Sir Clements Markham of the India Office. Markham, who had previously been responsible for establishing the cinchona industry in India, at once arranged for seeds of the various South American rubber trees to be obtained.

The first result of Markham's activity was the delivery by a Mr. Farris of 2,000 *Hevea* rubber seeds which were sent to Kew in the summer of 1873. Of these seeds only about a dozen germinated, but six of these were shipped to India in the autumn of 1873 and arrived safely in Calcutta, where they were planted in the Royal Botanic Gardens.

Markham realised that six plants of the same species were inadequate to start a large scale industry, and proceeded to obtain more *Hevea* rubber stock and also specimens of other types of exotic rubber producing plants, besides experimenting with the native *Ficus elastica.*

At his instigation two more expeditions were sent out to obtain specimens, under the leadership of Cross and Wickham. Cross was sent to Panama, and in 1875 he delivered some 134 *Castilloa* seedlings to Kew; he was then sent to Brazil, and in 1876 he delivered over 1,000 *Hevea* and 42 Ceara seedlings to Kew. Although Cross's expeditions were far from being failures, it was Wickham who was the more successful, and it is his name which will always be associated with the great rubber plantation industry of the Far East.

The story of Wickham's successful expedition is well-known. What is perhaps not so well known is that he did not, as is popularly supposed, smuggle the rubber seeds out of Brazil. The proof for this assertion is contained in a memorandum

issued on the 7th June, 1939 by the Commercial Museum at Belem, extracts from which appeared in the Rubber News Letter of the U.S. Department of Commerce on the 31st January 1940. After stating that in Wickham's time there was no law prohibiting the export of rubber seed from Brazil because " no one was thinking of the possibility of acclimatizing *Hevea* in other regions for the purpose of competing with the rubber from the Amazon," the memorandum goes on to say " . . there grew up little by little a legend in which Sir Henry A. Wickham was pictured as a common adventurer who audaciously and surreptitiously stole seeds of the rubber tree, carrying them hidden in a fantasy ship after having lessened the zeal of the high officials of the customs of Belem (Para) by a banquet which he gave on board at the time of sailing. The truth is that Sir Henry A. Wickham transported the boxes of seed after despatching them as he would any other merchandise. Inasmuch as there was no illegality in this—and the best proof of this is the fact that there were shipped in this same period many hundreds of young stalks of *Hevea* that there were no means of hiding when they were carried on board. Perhaps there might be a means of finding in the archives of the customs some record of these shipments. It was in relatively recent times that the exportation of the *Hevea* seeds was prohibited in the State of Para, and years afterwards in the State of Amazonas, a measure totally useless since none was adopted either in the State of Matto Grosso or in Bolivia where the richest rubber stands are found."

In the summer of 1876, Wickham delivered to Kew Gardens a consignment of some 70,000 *Hevea* seeds. Although only three or four per cent. of these seeds germinated it was possible in the autumn of the same year to ship some 2,000 plants to the East. Most of these plants went to Ceylon but some were sent on to Malaya. In both places the plants thrived beyond all expectations and the foundations of the rubber plantation industry in the Far East were firmly established. But although greater numbers of *Hevea* seedlings had been sent to the Far East than those of any other species of rubber tree, there was still much experimenting required to discover which of the several varieties was the most suitable for plantation purposes. These experiments continued through the '80's and on into the '90's, but about 1895 the superiority of the *Hevea brasiliensis* seems to have been firmly established in the East. The three main points in favour of the *Hevea* tree were that it

grew better than other varieties in plantations, it yielded more rubber, and the rubber was of better quality.

The new plantation industry had come at the right moment ; during its infancy in the '80's there was no great demand for rubber, but the year which saw the superiority of the *Hevea* established also saw the advent of the first pneumatic automobile tyres and rubber's future was assured. By 1900, however, only some 5,000 acres had been planted in the East, and total exports of plantation rubber were small. The demand for rubber for the new pneumatic tyres soon caused the price of rubber to reach a figure which made rubber planting profitable. The following rubber prices at the beginning of this century are of interest :

(Prices are only approximate.)

	per lb.		*per lb.*		*per lb.*
1890	4s. 0d.	1899	4s. 0d.	1907	5s. 0d.
1893	3s. 0d.	1900	4s. 0d.	1908	4s. 3d.
1895	3s. 0d.	1905	5s. 0d.	1909	7s. 0d.
1896	3s. 3d.	1906	5s. 0d.	1910	9s. 0d.

During the first decade of this century plantations were being started by private enterprise in Ceylon and Malaya, but until 1905 capital for these enterprises was difficult to obtain, and it was not in fact until the " boom " in 1910 that large amounts of capital were invested in the industry and planting was rapidly expanded.

A total planted acreage of about 5,000 acres in 1900 had increased to nearly 150,000 acres by 1905 and to 1,000,000 acres by 1910 ; as a result of the " boom " by 1911 there were over 1,500,000 acres under cultivation.

While all this planting was being carried out in the Far East mainly by British and Dutch enterprise in their colonies, attempts by other nations to establish rubber plantations in other parts of the world were being made. Among these other plantation experiments may be mentioned those undertaken by Brazil and those undertaken by Germany in Africa ; there were also attempts in other African territories, in Oceania and in Mexico, but not on the same scale. The Brazilian plantations were started after the " boom " in 1910 on bad soil ; it was found, amazingly enough, that the growth of the *Hevea* tree in Brazil, its native soil, was much slower than in the East ; there were also great labour difficulties to be overcome in Brazil, and in the result all the plantations were failures.

The German plantations were in their West African colonies; the Germans were firmly convinced that the native *Funtumia* tree would naturally give better results than any other species, and they stocked their estates with this variety; they did plant some *Hevea*, but it was not until just before the outbreak of the 1914-1918 war that they seem to have realised that the *Hevea* was the better variety. In German East Africa the tree favoured was the *Manihot glaziovii*, which yields ceara rubber, and at the end of 1912 there were over 112,000 acres planted with this species. Whether the Germans could eventually have made a success of these plantations will never be known, but it is most unlikely, since according to tests carried out by them the yield of a mature ceara rubber tree was only about one third that of a mature *Hevea* tree in the East. The other attempts at rubber plantations made at the beginning of this century were also more or less unsuccessful, and although some estates in Africa and Oceania have managed to exist until the present time they have never seriously competed with those of the Far East.

The general reasons for the establishment and growth of the rubber plantation industry in the Far East, were as follows:

(1) all the early experimental work on rubber planting was carried out in the East;

(2) the countries in which the plantation industry was begun were either British or Dutch Colonies, and they had stable Governments with good administration;

(3) there was plenty of good land suitable for planting;

(4) climatic conditions were favourable, there being adequate rainfall fairly evenly distributed, and suitable temperature;

(5) there were no great transport difficulties, all the territories having a long coastline in proportion to their areas;

(6) there was plenty of efficient and suitable labour either within the territories themselves or adjacent to them, e.g., in India and China.

Although the British were the pioneers in rubber planting in the Far East, notably in Malaya and Ceylon, they were soon followed by the Dutch, who have developed the industry in the N.E.I. in characteristic manner.

The French have also been active in developing the industry in Indo-China at a later stage, and rubber has proved a blessing to Siam. The Far Eastern rubber plantation industry is divided among the following territories: Malaya, the N.E.I., Ceylon, India, Burma, the State of North Borneo, Sarawak, Siam, French Indo-China and the Philippines, all of which (with the exception of the last named, which is insignificant as a producer) were parties to the International Rubber Regulation Agreement.

The rubber plantation industry of the East, unlike many other tropical enterprises, has not come about by the exploitation of an established native industry by European capitalists, but was in fact brought to the East and established there, to the very material benefit of the natives, by European enterprise. In fact, in the rubber plantation industry we have an example of a European industry which has been adopted by Asiatics, so successfully that rubber production is now roughly equally divided between the two types of producers.

The native rubber industry commenced very early in the present century and its growth has been even more striking than the earlier established estate industry. In all of the rubber producing countries of the East there is a large proportion of native producers and in two of the territories, Siam and Sarawak, the industry is practically all in the hands of the natives.

The following table gives a fairly concise picture of the developments which have taken place in both the estate and native industry in S. E. Asia:

	Estate.		Native.	
	Acreage	Production.	Acreage.	Production.
	acres	*tons*	*acres*	*tons*
1909	425,000	5,500	75,000	—
1920	2,545,000	250,000	1,650,000	65,000
1930	4,020,000	465,000	3,930,000	335,000
1940	4,588,000	765,000	4,275,000	610,000

Although the rubber plantation industry is mainly in the Far East, and although it has been shown that the attempts to establish rubber plantations in other parts of the world at the beginning of this century were failures, there have been other attempts of more recent date which have been more successful,

and it is perhaps appropriate to look at these other rubber plantations for a moment.

By far the most successful of these plantations is the Firestone Company's plantations in Liberia, which were commenced in 1924. Although the development of these plantations was slow in the beginning, and is believed to have been costly, recent reports issued by the Firestone Company state that the development "is progressing very satisfactorily." The plantations consisted in 1940 of some 70,000 acres of *Hevea* rubber trees, of which some 30,000 acres were in production. The output of the plantations goes to the Firestone Company in the U.S.A. and a great proportion of it is shipped in the form of latex; in 1941 over 8,000 tons were exported, of which about 4,000 tons were latex.

The most talked of rubber plantations of recent times are the Ford Plantations in Brazil, but so far these have not been highly successful. It was in 1927 that Ford obtained a concession of some 2,500,000 acres from the Brazilian Government and commenced his planting operations. Progress was slow, as much virgin forest had to be cleared, and by 1934 only some 8,400 acres had been planted, Subsequently, some 2,000 acres of this area were condemned, so that in his original concession Ford had at the end of 1934 only some 6,500 acres, containing some 839,000 *Hevea* trees. In 1934, however, some 700,000 acres of the original concession were exchanged for an equal amount nearer to the Amazon, and since that time it is this new concession, called Belterra, which has been exploited. In 1940 it was estimated that there were over 12,000 acres under rubber in Belterra, representing over 2,500,000 *Hevea* trees, and production was scheduled to commence in 1943 on a small area of some 400 acres. It will be seen, therefore, that judged by the result of fifteen years experience, the Ford Plantations in Brazil could only have been developed by a company possessing immense financial resources.

Other plantations of interest are those in Nigeria, of the United Africa Company, who had some 8,500 acres under *Hevea* in 1940, and those in the Belgian Congo, where at the end of 1937 some 18,000 acres of *Hevea* had been planted. It was also reported in 1940 that a new company was being floated to take over a concession of about 50,000 acres in the Belgian Congo for the purpose of establishing *Hevea* plantations,

and some years ago the Belgian Government had a scheme on foot to plant some 37,000 acres of *Hevea* for their natives in the Congo ; nothing further has been heard of either of these schemes.

Rubber plantations have also been established in parts of French Africa, and in Papua. The Goodyear Company have plantations in Costa Rica and Panama still more or less in the experimental stage.

Under a scheme fostered in 1939 by the U.S. Department of Agriculture an attempt is being made to commence rubber plantations in various parts of the Western Hemisphere, and experimental stations have been set up in different American Republics to obtain planting material for this purpose. Up to the end of 1941 it was estimated that some 15,000,000 rubber trees had been planted under this scheme in Latin America. In Haiti, which also comes under this scheme, it is planned to plant eventually some 70,000 acres of *Hevea*, but for a beginning only some 7,500 acres are to be planted.

Besides these attempts in recent years to commence *Hevea* plantations in various parts of the world, mention may also be made of the Russian attempt to grow her own crude rubber requirements on her collective farms from such plants as *Kok-saghyz, Tau-saghyz, Krim-saghyz* and guayule. It is believed that some 64,000 acres of *Kok-saghyz* were sown in 1939 and it was planned to increase the acreage to some 600,000 acres in 1942. *Kok-saghyz*, which is a perennial herbaceous plant, is the most important of the Russian rubber bearing plants ; rubber is obtained from it during its second year's growth, but yields are small—about 100 lb. of rubber to the acre.

The above survey, although sketchy, gives the main developments in the rubber plantation industry up to the outbreak of hostilities in the Far East.

We shall now look for a moment at the growth of rubber consumption during the last forty years or so, and then examine the relationship between supply and demand in this period.

Rubber Consumption.

It has been pointed out earlier in this chapter that the rubber industry, or more correctly the rubber manufacturing industry, was really founded by Hancock in England. (Actually the French were making rubber articles on a commercial scale

about twenty years before Hancock, and the world's first rubber factory was established in Austria about ten years before Hancock established his ; but both these early projects were unimportant, and can hardly be considered as claiming precedence.) Thereafter it spread first to France and then to the U.S.A., Germany, and the Netherlands in quick succession, so that by 1835, i.e., fifteen years after Hancock started the British industry, there were rubber industries in all these countries. During the next twenty years the rubber industry sprang up in Russia, Spain and Belgium and by 1900 it had been established in most European countries. In 1883 the first Japanese rubber factory was established, and in 1890 the Australian rubber industry was founded.

The development of the rubber manufacturing industry in the various countries can be seen by studying the tables of net imports of rubber in Appendix ix.

Except in the case of the U.S.A. and the U.K., where large stocks are normally held, the net import figures may be taken as being roughly equivalent to the absorption figures, i.e., the quantity of rubber turned into manufactured goods.

Based on the ten years 1929-1938, the world absorption of rubber may be divided among the various countries as follows :

	per cent.
U.S.A.	52.0
U.K.	10.0
Germany	7.0
France	6.5
Japan	6.0
U.S.S.R.	3.5
Canada	3.0
Italy	2.0
Australia	1.5
Rest of World	8.5
Total	100.0

It will be seen that the U.S.A. has been far and away the greatest single consumer of rubber, accounting approximately for one half of all the rubber consumed in the world. This is due in no small part to the fact that practically three quarters of the world's motor vehicles are to be found in the U.S.A.

In attempting to study the past and the potential development of rubber consumption it is found that, except in the case of the U.S.A., there is practically no information regarding the relative amounts of rubber absorbed in different uses. In the case of the U.S.A. however, fairly complete information is available, and for this reason special attention will be paid to the U.S.A. in the following survey. By taking America as our guide we shall not be overlooking any outside developments, since any new uses originating in other countries are applied practically simultaneously in America.

As already stated the discovery of the pneumatic tyre led to the greatest demand for rubber and it is perhaps strange that from the time of that discovery until quite recently no other great use for rubber has been discovered. There have of course been many refinements in the manufacture of tyres, but broadly speaking many of the other uses for rubber are developments of those known prior to Dunlop's invention.

Possibly the greatest use for rubber will be roadmaking, but owing to heavy initial expenditure development has been so slow that this use can hardly be counted important at present. Disregarding the use of rubber in roads, probably the greatest new use for rubber is in upholstery, which promises to rival the pneumatic tyre as a potential consumer of rubber.

Other recent important developments are the use of rubber for reducing vibration and noise in both moving and stationary machinery and vehicles, the use of rubber in automobile wings, and the use of rubber in tank and tractor treads. Another use is in hard rubber goods such as ebonite, but these are now being largely replaced by synthetic resins and plastics. A recent development in rubber consumption has been the use of latex, which is more suitable for making some goods than sheet rubber. Already research workers have discovered many different uses for latex either by itself or in combination with other materials, and it is hoped that when the days of peace return there will be an increasing new demand for rubber in the liquid form.

To return to the use of rubber in the automobile industry, although in previous years the rubber absorbed in that industry was almost exclusively used in tyres and tubes, in more recent times there has also been a very large demand for rubber for other uses in motor transport. According to information published by the U.S. Department of Commerce in 1939, it was reported that one of the 1936 automobile models had 160 parts of rubber, 92 of which were distinct and separate items, using in all 103.8 pounds of rubber crude and reclaim. The tyres and tubes contained only one-half the rubber of the entire car.

The rubber content of tyres and tubes has increased considerably in the last twenty years, but so also has their length of life. Whereas in 1910 a tyre lasted for 3,000—4,000 miles at speeds of 30-40 m.p.h., to-day a first grade tyre will last for 25,000—30,000 miles at speeds of 50-75 m.p.h. This difference in the life of tyres is due to better technical knowledge of how to finish rubber and how to build tyres. Any diminution in the rubber demand for automobiles owing to this longer tyre life has been off-set by the increased rubber content of the tyres and tubes, by other uses for rubber in automobiles and, above all, by the greater demand for automobiles owing to the reduction in costs of upkeep made possible by the longer life of the tyres.

Besides the demand for rubber from the automobile industry, there has been in recent years, and will continue to be, a growing demand for rubber from the aircraft industry. This demand will come, not only for tyres and tubes, but more especially for other purposes such as de-icers, cushioning, etc.

Another great field for rubber consumption which was expanding rapidly before the war, is the application of rubber to agriculture, e.g., pneumatic tyres for carts and tractors. The rubber-tyred tractor has been demonstrated to be more efficient than the old steel-shod type, and as illustrative of its growing popularity it is interesting to note that by 1939 roughly 90 per cent. of all tractors manufactured in the U.S.A., U.K., and Germany were being fitted with pneumatic tyres.

In regard to pneumatic tyres for carts, which were also rapidly superseding the old-fashioned types in the West, there is undoubtedly a great potential market for rubber for this purpose all over the world, particularly perhaps in India and China, where motor and railway transport are still more or less undeveloped.

The following table from the U.S. Census of Manufactures 1939 illustrates the consumption of rubber for different uses in the United States:

Item	*long tons*	*per cent. of total*
Pneumatic casings	357,221	63.4
Inner tubes	51,731	9.2
Solid and cushion tyres	1,570	0.3
Boots and shoes	15,970	2.8
Heels, soles and slab soling	22,642	4.0
Rubberized fabrics, rubberized clothing (finished), and bathing caps and bathing suits	9,291	1.6
Mechanical rubber goods, rubber flooring, rubber mats and matting	47,472	8.4
Hard-rubber goods	3,328	0.6
Rubber thread, cement, and gloves	9,296	1.7
Tyre sundries, repair materials, rebuilt or retreaded tyres, and camelback...	16,973	3.0
Other products, including drug and medical sundries, balloons, stationers' bands, erasers, golf and tennis balls, toys, and sponge-rubber products (upholstery) ...	28,216	5.0
TOTAL ...	563,710	100.0

Growth of new uses in recent years is best shown by a comparison of statistics published by the Rubber Manufacturers' Association of America. Taking the period from 1929 to 1940 it is interesting to note that the rubber used for other than tyre purposes had increased from 15 per cent. of the total reported in 1929 to 25 per cent in 1940. It is also interesting to note that during the great depression, while the consumption of rubber for tyres fell steeply, its consumption for other uses showed hardly any recession.

In 1929 mechanical rubber goods absorbed only 5 per cent of the total rubber reported, whereas in 1940 they absorbed roughly 10 per cent. The demand for rubber for cables doubled itself in the same period.

The large potential demand for rubber in agriculture is indicated by a figure of 10,486 tons, in 1940, for "Farm tractor tyres and tubes," i.e., over 2 per cent. of the total reported consumption. The demand for foamed latex goods is also clearly indicated, and consumption under this heading represented more than 2 per cent. of the total reported consumption in 1940, against less than 1 per cent as recently as 1937.

Unfortunately the statistics available do not represent the entire American rubber industry, being more complete for tyres and tyre products than for other rubber goods. In spite of this they show that the consumption of rubber in non-tyre products has been increasing rapidly; the increase is probably even greater than the R.M.A. statistics indicate, for we find that the returns furnished to the R.M.A., which are mostly from tyre manufacturers, only represented about 70 per cent. of the total rubber consumption in 1940, compared with over 90 per cent. in 1929.

In addition to this increasing demand for rubber for other purposes, there is still a very large potential "new" demand for tyres. This might be shown by many illustrations of which the following table gives one:

Year 1937	Road Mileage.	Automobiles.	Automobiles per mile.	Rubber consumed in Tyres.
U.S.A. ...	3,065,000	28,500,000	9.3	385,000 tons.
Rest of World	7,000,000	12,000,000	1.7	?

It will be seen by the figures that if motor transportation in other parts of the world were developed only on existing highways to the same extent as in the U.S.A. there would be a world demand for automobile tyres and tubes alone of well over a million tons of rubber. If post-war transport development proceeds as we have a right to expect, the potential demand for rubber for this purpose alone is very great, and if other uses for rubber are taken into account it seems reasonable to expect that there will be a very large post-war demand for rubber.

Against this estimated big demand for rubber there will be the produce of the new synthetic plants and also the increased production of the rubber plantations where, owing to intensive research, the possibilities of increasing yields from 400 or 500 pounds per acre to 2,000 or more pounds per acre is not a mere dream. Having now considered both the supply and demand sides of the rubber situation we may perhaps usefully examine how these sides have adjusted themselves to each other in the past.

SUPPLY AND DEMAND POSITION OF RUBBER.

It will be remembered that up to the introduction of the pneumatic tyre and the automobile, or in other words up to the beginning of the present century, the world demand for rubber was small, and was adequately supplied by wild rubber sources. The pre-1900 demand is difficult to estimate for the world as a whole, but the following gross import figures are available for the U.S.A. and the U.K., which were then, as now, the two principal rubber consuming countries :

YEAR	U.S.A.	U.K.	AVERAGE DECLARED VALUE OF U.K. IMPORTS*
	tons	*tons*	*s. d.*
1830	...	23	1 3 per lb
1840	...	307	1 3 ,,
1850	...	385	1 6 ,,
1860	750	2,152	2 0 ,,
1870	4,296	7,656	2 0 ,,
1880	8,109	8,479	2 6 ,,
1890	15,336	13,200	2 3 ,,
1895	18,646	17,078	2 0 ,,
1900	22,026	25,664	2 6 ,,

Figures in regard to supply prior to 1900 are even more difficult to find, but the following figures for exports from Brazil—the principal source of rubber—and from various African territories, are available :

YEAR	BRAZIL	GOLD COAST	NIGERIA	SIERRA LEONE	BELGIAN CONGO
	tons	*tons*	*tons*	*tons*	*tons*
1878	†	—	—	223	—
1880	†	½	—	450	—
1888	†	392	—	750 (1884)	135
1890	†	1,500	—	450	200
1895	27,355	1,796	2,322	625	670
1898	20,883	2,672	2,054	275	2,150
1900	23,918	1,541	1,271	123	5,511

* It will be noted that the declared values of the U.K. imports differ considerably from the prices given earlier in this chapter. The prices given are the market quotations for fine hard para, whereas the imports represent all grades and types of rubber.

† The average exports throughout each decade from 1830 were as follow :— 1831/40, 227 tons ; 1841/50, 462 tons ; 1851/60, 1,907 tons ; 1861/70, 3,658 tons ; 1871/80, 5,928 tons ; 1881/90, 10,831 tons.

The plantations were also coming into bearing, and in 1896 Ceylon exported 4 tons of rubber; by 1900 total exports of plantation rubber from the Far East had risen to 821 tons.

It can be seen even from the above incomplete figures that by 1900 supplies were becoming tight and the price was rising. After 1900 statistics are more complete and the following comparison for the period 1900 to 1910 has been compiled:

Year.	Supply.	Demand.	Average declared value of U.K. imports
	tons	*tons*	*s. d.*
1900	44,000	53,000	2 6 per lb.
1901	45,000	52,000	2 3 ,,
1902	42,000	50,000	2 3 ,,
1903	49,000	57,000	2 6 ,,
1904	53,000	64,000	2 9 ,,
1905	56,000	70,000	3 0 ,,
1906	63,000	74,000	3 0 ,,
1907	74,000	77,000	3 0 ,,
1908	70,000	74,000	2 6 ,,
1909	78,000	86,000	3 6 ,,
1910	94,000	99,000	5 3 ,,

The figures given for supply and demand represent the net exports and net imports respectively and have been taken from "Rubber Statistics—1900-1937," published by the U.S. Department of Commerce.

It will be observed that the net imports in all cases exceed the net exports, and as no more rubber could be imported than was originally exported, the discrepancy is probably explained by partial duplication and by the inclusion of waste rubber and related gums such as gutta-percha in the demand figures. Moreover no allowance is made for moisture and other impurities, which in those years were considerable. It is known that the U.K. import figures cover waste and reclaimed rubber prior to the year 1915.

It should also be noted that normally net imports do not represent demand, but rather absorption together with additions to stocks; separate figures for absorption are not available, but during the period under review it may be taken that there was no abnormal accumulation of stocks, and that net imports did in fact approximate to absorption.

Bearing these points in mind the high prices ruling indicate that rubber was definitely in short supply during the period; the effect of these abnormally high prices in stimulating the great expansion in rubber planting after the year 1905 has already been noticed.

During the next 10-year period, from 1911 to 1920, the first world war greatly influenced the rubber position, and it was in this period that America definitely became the greatest rubber consuming country. Before 1914 the U.S.A., although the greatest single consumer of rubber, absorbed less than half the rubber used, whereas by 1922 America was accounting for practically three quarters of the world's total consumption.

The over-all picture during the period may be given as follows:

Year	Supply	Demand	Price* (Average London Price)	
	tons	*tons*	*s. d.*	
1911	94,000	99,000	5 6	per lb.
1912	114,000	121,000	4 9	,,
1913	120,000	130,000	3 0	,,
1914	123,000	121,000	2 3	,,
1915	171,000	160,000	2 6	,,
1916	214,000	188,000	2 9	,,
1917	278,000	250,000	2 9	,,
1918	220,000	216,000	2 3	,,
1919	400,000	344,000	2 0	,,
1920	342,000	373,000	1 9	,,

Here again the figures given for supply and demand represent net exports and net imports respectively.

It will be observed that the net import figures again exceed the net export figures until 1914, and probably for the same reasons as previously.

During the war average annual prices remained more or less stationary around the half-crown level, but in 1918 there was a downward movement which was maintained in the two succeeding years. It will also be observed that in 1919 there was a huge increase—over 80 per cent.—in exports, and also a large export surplus; the increase in supply was due to the fact that in 1917 and 1918, owing to a shortage of freight, there

* The prices given are for standard crêpe from 1911-1917 and thereafter are for standard quality ribbed smoked sheet; they have only been given to the nearest threepence.

had been a large accumulation of stocks in the East which came out when freight was plentiful again after the war. The position would probably have been worse if the Rubber Growers' Association, foreseeing the danger, had not introduced a voluntary scheme among its members which reduced production in 1918 by a considerable amount; more will be said of this scheme in the next chapter.

A further complication which also upset the supply-demand equilibrium at the end of the period under review was the increase in N.E.I. native exports in 1919. It was, however, in the next 10-year period, from 1921-1930, that the rubber problem became really acute. The position during this decade may be given as follows:

Year	Supply	Demand	Stocks	Price. (Average London Price)
	tons	*tons*	*tons*	
1921	302,000	278,000	...	9-9/16d. per lb.
1922	403,000	403,000	...	9-5/16d. ,,
1923	405,000	446,000	233,000	1/3-5/16d. ,,
1924	423,000	464,000	165,000	1/1⅞d. ,,
1925	529,000	553,000	148,000	2/11-1/16d. ,,
1926	624,000	543,000	234,000	1/11¾d. ,,
1927	610,000	595,000	264,000	1/6-7/16d. ,,
1928	656,000	684,000	247,000	10¾d. ,,
1929	869,000	804,000	332,000	10¼d. ,,
1930	825,000	709,000	453,000	5-15/16d. ,,

As before the figures given for supply represent net exports, but in the case of demand the figures given represent absorption in the U.S.A. and the U.K. and net imports in other countries. It will be seen that during 1921 and 1922 supply again exceeded demand, and the decline in prices seemed to threaten the young plantation industry with disaster. It became evident that some corrective measures would have to be taken, and at the end of 1920 the Rubber Growers' Association, in conjunction with the corresponding Association in the Netherlands, re-introduced their voluntary scheme. This helped to alleviate matters for a time, but it was not comprehensive enough to effect a permanent improvement, and it came to an end at the end of 1921.

In 1922 the position was becoming so serious that the British Government stepped in and the Stevenson Scheme (which regulated exports from Malaya and Ceylon compulsorily, and

exports from most of the British owned estates in the N.E.I. voluntarily) came into force on the 1st November, 1922. As can be seen from the figures given, the Stevenson Scheme succeeded at the beginning by severe restriction in raising the price once more above the shilling level. It remained in force until near the end of 1928, and its withdrawal was followed within a year by the beginning of the world depression. The result of these factors was that at the end of 1930 stocks of rubber had grown to nearly half a million tons, and the average price for that year had dropped to below 6d. per lb.

Worse days were in store for the rubber industry, as is shown by the following table, giving statistics for the years 1931 to 1933:

Year	Supply	Demand	Stocks	Price. (Average London Price)
	tons.	*tons*	*tons*	
1931	801,000	680,000	589,000	3⅛d. per lb.
1932	710,000	689,000	589,000	2 5/16d. ,,
1933	851,000	821,000	616,000	3¼d. ,,

The supply and demand figures represent the net exports and absorption, as in the case of the previous period. The stock figures, as in the previous period, represent the total of the stocks awaiting shipment and afloat and those in public warehouses in the U.K. and those in the hands of manufacturers, dealers, and importers in the U.S.A.; they do not include stocks in the hands of British manufacturers.

It will be seen that within five years from the withdrawal of the Stevenson Scheme stocks of rubber had been more than doubled, while the price of rubber had dropped to very low levels. The low price—for periods in 1932 it was just over a penny per pound—and high stocks threatened disaster anew, and it became evident that corrective action would again have to be taken.

Negotiations between British and Dutch producers, which had first taken place shortly after the end of the Stevenson Scheme, were renewed with representatives of the interested Governments, and eventually after prolonged discussions the International Rubber Regulation Agreement was signed on the 7th May, 1934.

CHAPTER II

PREVIOUS RUBBER CONTROL SCHEMES

As already mentioned in the first chapter, there had been, prior to the International Rubber Regulation Agreement, several schemes, both national and international, to adjust rubber supplies to demand. Some of these schemes were never put into practice at all, and of the others the only one of any real significance was the Stevenson Scheme, which operated from 1st November, 1922, until 1st November, 1928.

The first to be considered is the Brazilian Scheme, which was an attempt not so much to adjust supply to demand as to protect Brazilian rubber-producing interests and assist them in their competition with other rubber producing areas. In 1903 the Brazilian Government issued a decree to permit the organization of syndicates in agricultural industries for the defence of their interests; the Government undertook to co-operate with these syndicates, which were to be formed by Brazilians, and to grant them certain favours, among which was the foundation of credit banks. In 1908 the State of Para approved a proposal to extend the provisions of the Federal decree to the rubber industry and authorised the formation of syndicates of rubber producers. The Banco do Brasil established agencies in the two principal rubber centres—Para and Manaos—and made large advances to Brazilian rubber producers and dealers enabling them to hold substantial quantities of rubber. During the next two years rubber prices soared, reaching their peak in April, 1910, and under these optimistic market conditions credits were widely extended. Unfortunately for Brazil, however, the inflated price structure collapsed abruptly in April, 1910, and the Brazilian rubber industry, with credits over-extended in the apparent belief that the high prices would continue, was faced with disaster. In their plight the rubber interests applied for aid to the Federal Government.

The Brazilian Government's first step to help the rubber industry took the form of a plan which had already been tried in connection with coffee and which was known as " valorization ": the Banco do Brasil was entrusted in 1911 with the task of accumulating a large stock of rubber and withholding it from the market in order to stabilize the price—a rudimentary buffer stock. This scheme, which would possibly have worked if Brazil had held as dominant a place as a rubber producer as she had

done a decade earlier, was practically still-born owing to the influx of rubber from the Far Eastern plantations. The valorization plan failed completely in its efforts to bolster prices, and the Banco do Brasil lost heavily in trying to carry it out.

Meanwhile, the Brazilian Government was investigating a much more promising scheme for the protection of their rubber industry, one which had the long-term interests of the country and the rubber industry at heart, and did not in any way seek to influence the price of rubber. This scheme was announced early in 1912 under the name of Defesa da Borracha (Defence of Rubber) and among its principal provisions were the following :

(1) exemption from import duties of tools and materials used in the rubber industry ;

(2) premiums for the planting of rubber trees ;

(3) establishment of experimental stations throughout the country ;

(4) premiums for the establishment of factories for refining and standardizing rubber for shipment and for the manufacture of rubber goods ;

(5) erection of immigrant hotels and hospitals at various centres ;

(6) improvements in transportation facilities by rail and river ;

(7) promotion of food production in the Amazon Valley ;

(8) proposed rubber industry exhibition once every three years in Rio de Janeiro.

This plan to organize the Brazilian rubber industry was excellent in its purpose but was, unfortunately for Brazil, doomed to failure. It was in fact another example of shutting the stable door after the steed had been stolen. In the first place the output of the Far Eastern plantations was definitely surpassing that of the Amazon Valley and plantation rubber was coming on the market at a much cheaper price. Secondly, the scheme envisaged was too ambitious to be carried out quickly and fully. The credits voted by Government to put the plan in action, although large, were quite inadequate, and the supply of skilled administrators capable of carrying out the programme was insufficient. The result of these difficulties was that very little of real value was accomplished, and by the end of 1913 most of the enterprises started had ceased operations.

The Federal Government's belated attempt to retain rubber supremacy had failed, and except for occasional attempts by various Brazilian States to encourage native rubber production the rubber industry of Brazil was left to its own devices. In 1927, however, the Brazilian Government, by granting vast concessions of land for rubber cultivation to the Ford Company, showed renewed interest in the future of its rubber industry. In more recent years there has been some attempt at reorganizing the Defesa da Borracha in Brazil.

During the three years prior to the first world war, the production of the Far Eastern plantations was steadily increasing and surpassing the output from South America. Already in 1913 the question of possible over-supply of rubber was envisaged by some of the leaders of the plantation industry, and it was recognised that the most practical step to avert such a possibility was to encourage the development of new uses for rubber. Various international rubber exhibitions had been held from 1908 onwards and these were a valuable means of demonstrating the merits of plantation rubber. In addition, British rubber growers were giving increasing encouragement to research and propaganda under the auspices of the Rubber Growers' Association.

The extraordinary growth of motor transport which developed during the first world war postponed for some years the advent of an actual over-supply of rubber. At the end of 1917, however, the shortage of shipping owing to the war necessitated a reduction in the consumption of all sea-borne commodities to a minimum, with the result that rubber producers in the Far East were accumulating large stocks. In order to correct what otherwise might have been an embarrassing situation, the Council of the Rubber Growers' Association propounded the first scheme for bringing about by co-ordinated action an adjustment between supply and demand.

The scheme was a simple one—a voluntary agreement to reduce the production of rubber for the year 1918 to 80 per cent. of each producer's output in 1917 or in any previous year showing a greater yield, with a minimum during 1918 of 200 lb. per acre in bearing. Rubber interests representing roughly 75 per cent. of the acreage owned by members of the Rubber Growers' Association accepted the scheme proposed by the Council, but a large proportion of the local producers in Malaya and Ceylon, and of producers in the N.E.I. who were not members of the Rubber Growers' Association, not only declined to take similar

action, but in many cases actually increased their production. In spite of its lack of comprehensiveness the scheme was a means of keeping considerable quantities of rubber off the market.

In the middle of 1918 Malayan rubber growers opened negotiations with their Government with a view to the establishment of a definite legislative scheme for regulating compulsorily the production of plantation rubber, coupled with the fixing of prices at a level which would enable the industry to carry on. As a result of these negotiations the Malayan Government was induced to appoint a commission to draft a compulsory scheme and to discuss it with the Dutch Government. The end of the war in 1918 with its resultant release of shipping in 1919 relieved the situation, however, and the entire plan was abandoned. Thus the first attempt at an international rubber regulation scheme was stillborn.

A short-lived post-war boom was followed by a general price collapse and rubber prices suffered in common with those of other raw materials. The decline in absorption of rubber was accentuated by the introduction of the cord tyre, which gave a much greater mileage per pound of rubber than the earlier fabric tyres. In September, 1920, the Rubber Growers' Association issued a circular to all producers of plantation rubber. The circular drew attention not only to the rapid fall in price to a figure very near the average cost of production, but also to the large estimated over-production in 1920, and to the fact that unless world conditions materially altered for the better, the unwanted surplus would be further increased in 1921. It was also pointed out that owing to the diversity of nationalities and races among rubber growers any voluntary scheme to alleviate the situation could scarcely ever be worked effectively.

In spite of this warning against the ineffectiveness of voluntary control schemes, the Rubber Growers' Association's second scheme, which came into operation on the 1st November, 1920, was a voluntary scheme. It took the form of a voluntary reduction of each producer's output to 75 per cent. of the estimated normal monthly output. The introduction of the scheme was to be dependent on 70 per cent. of the producing area represented by members of the Association agreeing, and the need for this co-operative action was so widely appreciated that in fact over 95 per cent. of European members of the Association agreed. Further, the Dutch rubber growers' organization (the Internationale Vereeniging voor de Rubber-

cultuur), secured the agreement of over 70 per cent. of its members ; the local proprietors in Ceylon, and a large proportion of the members of the Rubber Planters' Association of Malaya and of the Japanese Planters' Association of Malaya also supported the scheme.

The effect of this second voluntary scheme, which was really the first experiment in international rubber control, was to reduce the output of plantation rubber for 1921 by over 25 per cent., but no doubt it was aided in achieving this large reduction by the steadily falling price of rubber. In spite of the large reduction achieved in supplies the scheme did not succeed in adjusting supply to demand ; during 1921 stocks of crude rubber were increased by some 20,000 tons, which at that time represented about one month's requirements. Three other causes contributed to its comparative failure : a drastic decline in absorption, an increase in native production, and the failure of some estates to adhere completely to voluntary restriction.

The small producers, who had gone in for " all-out " production, were mostly domiciled in Malaya, and in order to secure the best advice as to how to deal with the situation, which was becoming critical, the Malayan Government appointed a Committee to study the question. This Committee reported in favour of compulsory restriction at the end of December, 1920, and as a result the Malayan rubber planters early in 1921 requested their Government to control rubber output. The Government refused this request on the ground that the industry should work out its own salvation.

Throughout 1921, during the period of the voluntary international scheme, various other schemes came up for consideration, the most important being that of the Rubber Growers' Association to form a Producers' Corporation to regulate output and control price. None of these schemes succeeded in obtaining the necessary support, and a short-lived rise in price at the end of 1921 was responsible for preventing the renewal of the voluntary scheme. Thereafter each producer settled his own output policy ; many continued to restrict their output, but financial necessity compelled a large number to produce to the utmost of their capacity. More rubber was again being produced than the world could absorb and the price fell to a new low level of 6¾d. per lb. in August 1922. Meanwhile, following representations which had been made to the British and Malayan Governments,

a Committee had been appointed in October, 1921, by the Secretary for the Colonies (at that time Mr. Winston Churchill) to investigate and report on the rubber situation in British Colonies and Protectorates, and to advise what remedial measures should be taken to improve the existing position. This Committee, which was under the Chairmanship of Sir James (afterwards Lord) Stevenson, made its report about the end of 1921. In the report the Committee stated that it had examined the problem from four points of view :

(*a*) the stimulation of new and extended uses of rubber ;

(*b*) voluntary restriction ;

(*c*) the *laissez faire* argument ;

(*d*) Government action.

(*a*) was naturally to be encouraged in every possible way, but could not provide an immediate solution to the problem ; (*b*) had already broken down.

In regard to (*c*) it was observed that the advocates of this policy desired to see a survival of the fittest in the hope that they themselves would be among the survivors. In doing so they showed a total disregard of the hardships which would be sure to fall on many thousands of European and Asiatic owners and dependents if the industry was allowed to drift along unprofitably until the weakest had been eliminated. Moreover even though estates and holdings had to be abandoned the rubber trees would remain a potential source of rubber to be brought into production again by someone else as soon as they could be profitably worked. In these circumstances the Stevenson Committee advised against the leaving of things in their " present unsatisfactory state unless all efforts to find a positive solution of the problem fail."

With regard to (*d*) the report stated that the Committee was fully aware of the difficulties and objections involved, and it was with reluctance that it had agreed to consider a measure of compulsory restriction as an alternative to what seemed to be worse evils. In stating this the Committee also expressed its conviction that no scheme of restriction, either voluntary or compulsory, could be useful unless it was simultaneously applied in all countries producing rubber on a large scale. In particular the Committee drew attention to the importance of the inclusion of the Dutch East Indies in any scheme that might be adopted.

As indicating the relative importance of different plantation rubber-producing countries at the time, the following approximate percentages were given :

	per cent. of total production.
Malaya	57.5
Ceylon	12.5
India and Burma	2.0
N.E.I.	25.5
Other Countries	2.5
TOTAL ...	100.0

The Committee therefore recommended that a scheme should be enforced uniformly and simultaneously in Malaya, Ceylon and the Netherlands East Indies. On receipt of the Stevenson Committee's report the British Government entered into negotiations with the Dutch Government with a view to obtaining its participation in a joint scheme, but in August, 1922, the Dutch Government decided not to co-operate. By the time the Dutch Government's refusal to participate had been announced there were clear indications that rubber consumption was increasing more rapidly than had been anticipated, and this fact, together with the promise of voluntary adherence to the scheme by nearly 90 per cent. of the British Estates in the N.E.I., caused the Stevenson Committee to believe that its scheme stood a fair chance of success if enforced only in Malaya and Ceylon. Accordingly the Committee issued a supplementary report in October, 1922, recommending such enforcement. This supplementary report was adopted and immediately acted upon by the British Government, and the so-called " Stevenson Scheme " came into force in Malaya and Ceylon on the 1st November, 1922. The fundamental lines of the scheme were :

(1) that the productive capacity of each estate and holding should be assessed and this assessment should be called its Standard Production ;

(2) that exports should be restricted by the imposition of export duties which would become prohibitive immediately exports exceeded the amount permitted at the minimum rate of duty;

(3) that the percentage of the standard production allowed to be exported at the minimum rate of duty should be governed by the price of standard quality ribbed smoked sheet on the London market.

With reference to the pivotal price of 1s. 3d. per lb. it was stated that "the Committee arrived at what it believed to be a figure which would ensure a satisfactory margin of profit, notwithstanding the somewhat higher cost of a restricted crop. At the same time, the manufacturers of rubber goods should be able to obtain their supplies of crude rubber at a reasonable price with much less risk of the violent fluctuations which have been such a drawback in the past, and should thus have every encouragement to develop new uses of rubber. . . . ."

The method of regulating exports, as originally designed, worked as follows.

(1) The restriction year started on the 1st November, and was divided into four quarters, namely: November-January; February-April; May-July; August-October.

(2) The percentage of the standard production allowed to be exported for the first quarter of the scheme (November 1922-January 1923) was fixed at 60, corresponding to a minimum rate of export duty of ½d. per lb.

(3) If during that quarter or any subsequent quarter t average price of ribbed smoked sheet on the Lon market reached 1s. 3d. per lb. but was less than 1s per lb., the percentage exportable at the minimur of export duty would be raised automatically b the next succeeding quarter, but if the average the quarter reached or exceeded 1s. 6d. pe percentage was to be increased by 10.

(4) If during any quarter the price averaged per lb. but was less than 1s. 3d. per lb centage exportable at the minimum rate stood at 65 or over, that percentage was 5 during the next succeeding quarter

percentage should not fall below 60, unless the price had averaged below 1s. per lb. for one quarter. Once the percentage got below 60 it was to go on contracting by 5 for each quarter in which the price averaged less than 1s. 3d. per lb.

(5) If for any quarter the price averaged less than 1s. per lb., the percentage exportable at the minimum rate of export duty was to drop to 55 in the next succeeding quarter, no matter what it had stood at during the previous quarter.

The scheme dealt with exports only and made no attempt to regulate output. An estate could produce as much as it chose, but directly its exports exceeded the quota authorised under the scheme the sliding scale of export duties inflicted a prohibitive duty on the excess exports.

The introduction of the legislation in Ceylon and Malaya was hailed with relief by producers and in a wave of enthusiasm the price of rubber was carried up to nearly 1s. 7d. per lb. in January, 1923. Thereafter the price gradually fell away but averaged over 1s. 3d. per lb. in the February-April, 1923, quarter, so that the rate of export for the May-July, 1923, quarter was raised automatically under the terms of the scheme to 65 per cent. The price then subsided and the export percentage for the last quarter of the first restriction year was down again at 60.

During the third quarter of the second restriction year the price averaged less than 1s. per lb. and the percentage for the ·st quarter automatically dropped to 55. In the last quarter e price improved slightly but remained below 1s. 3d. per lb. the quarter, which meant that the third restriction year ed with the export percentage at 50.

e price improved during the first quarter of the third on year and the quarterly average came to 1s. 5.998d. hich meant that owing to the rigid automatic working me the percentage of export was only increased to 55 60, which a price of 1s. 6d. per lb. would have given. tter of only 0.002d. per lb an additional 5 per cent. from the world market, although it was realised s were at a very low level and that trade demand pidly owing to the adoption of the low pressure

The next quarter saw the price cross the 1s. 6d. per lb. level with a corresponding increase in the export percentage to 65, but it was now too late. Consumption was increasing at a greater rate than expected and was running at a much higher rate than permitted supplies, and American stocks at the end of June 1925, were little more than one month's requirements. The result was little short of chaos, and during the third quarter of the third restriction year the price averaged over 3s. per lb.

The hands of the Stevenson Committee were tied by the automatic nature of the releases under the scheme and for two more quarters the price topped the 3s. 6d. per lb. level.

The peak price of 4s. 8d. per lb. was reached about midway through the first quarter of the fourth restriction year, when a real shortage in productive capacity was thought to be inevitable and to meet the situation the export rate for the immediately following quarter was increased by 15 per cent. to 100 per cent. During this quarter February-April, 1926, the average price dropped to just over 2s. 4d. per lb.

At the end of April, 1926, the Government made further alterations in the scheme to provide greater elasticity:

(1) the pivotal price was raised from 1s. 3d. per lb. to 1s. 9d. per lb.;

(2) the exportable percentage for the May-July 1926 period was maintained at 100 per cent., but if the price during this quarter averaged less than the new pivotal price of 1s. 9d. per lb., the percentage would be lowered to 80 for the August-October, 1926, quarter.

It is believed that one reason for the increase in the pivotal price was a desire to satisfy manufacturers, who besides holding stocks of raw rubber and finished goods had also large high-priced forward commitments; any substantial fall in the value of rubber was therefore a serious matter for them.

The price of rubber continued to drop and during the last quarter of the fourth restriction year it averaged less than the pivotal level so that the percentage for the first quarter of the fifth restriction year was automatically fixed at 80. In October, 1926, however, the British Government announced new regulations governing the releases and contractions in the exportable

percentage. These revisions, which came into force on the 1st November, 1926, may be summarised as follows:

Average price for quarter.	Export percentage in immediately succeeding quarter:
Over 3s. 0d. per lb.	100
2s. 0d. per lb. or over	Increased by 10, or if 80 increased to 100.
1s. 9d. per lb. or over, but less than 2s. 0d. per lb.	No change until such average has been recorded for three successive quarters, when export percentage increased by 10.
1s. 3d. per lb. or over, but less than 1s. 9d. per lb.	Reduced by 10, or if 100 reduced to 80.
Less than 1s. 3d. per lb.	60.

In no circumstances could the export percentage be increased above 100 or reduced below 60.

These alterations were designed to increase the elasticity of the scheme but the fundamental centre of rigidity—the pivotal price system combined with the automatic releases—was still maintained.

Throughout the fifth restriction year the price remained consistently below the new pivot and the export percentage came down to 60 during the third quarter of the period.

During the first quarter of the sixth restriction year there was a slight recovery in price, but the average for the quarter remained well below the 1s. 9d. per lb. level, so that the percentage remained unchanged at 60.

In February, 1928, it was officially announced that the British Government had ordered an independent investigation into the working of the scheme, and in April it was announced that the Stevenson Scheme would come to an end on the 1st November, 1928. Immediately the latter announcement was made, the price of rubber collapsed to just over 8d. per lb., but improved slightly later and eventually settled between 8½d.—9½d. per lb. during the last two quarters of the last restriction year, the export percentage remaining at 60.

There has been much controversy in the past over the Stevenson Scheme and there is no advantage in reviving it, but the scheme has an important place in the history of rubber regulation and some attempt must be made to consider very shortly its merits and defects, and in particular its permanent effects on the rubber industry. The main object of the scheme was to assist the British rubber industry by securing a reasonable price for producers, and incidentally a fairly stable price for manufacturers. Viewing the scheme as a whole it gave over the whole period of six years a profitable price to producers (sometimes far too profitable) but it failed completely to give price stability. The chief reason for its failure to give price stability was the lack of elasticity in the scheme, due to the mechanical and mathematical formula which automatically governed the rates of release. While failing in this respect the Stevenson Scheme, although not comprehensive, demonstrated that it was practicable to control the export of rubber from producing countries and the machinery used in the working of the scheme, e.g., standard assessments, export licences, etc., was again adopted in the present scheme. Protagonists of the scheme consider that it saved the British rubber plantation industry at a critical period in its history, and to whatever extent this is true of the British industry, it must be equally true of the rubber plantation industry as a whole, since other producers benefited to an even greater extent. On the other side there can be no doubt that the scheme deeply antagonised American opinion, and, owing to violent fluctuations in the price level, grave difficulties were created in the rubber manufacturing industry.

As there was no control of new planting high prices, particularly during 1925 and 1926, had the further result of encouraging a great extension of rubber planting, expecially in the Netherlands East Indies, just as some years later the restriction of cotton growing in the U.S.A. stimulated a large increase in South American cotton production. The resultant increase in production created problems for the producing industry which the Regulation Scheme has been helping to solve.

CHAPTER III

THE NEGOTIATIONS LEADING UP TO THE FORMULATION OF THE INTERNATIONAL RUBBER REGULATION AGREEMENT

The fears entertained by the industry regarding the consequences of the decision to terminate the Stevenson Scheme in November, 1928, and to withdraw all restrictions on the production and export of rubber were, happily, not immediately realised. 1929 was a year of good trade in which the rubber industry had its full share. Consumption of rubber showed a marked increase over that of any preceding year and this, coupled with the level to which stocks had been reduced by the operation of that scheme, served to maintain the price at a profitable level. The highest price of the year was 1s. 1⅜d. per lb. and the lowest was 7⅝d. per lb. ; the average for the year was 10¼d. per lb., a price high enough to give a profit even on the higher costs then current.

The statistics for the first full year of freedom from restriction, i.e. 1929, revealed some interesting facts. Exports from Malaya increased by as much as 55 per cent., whilst from the Netherlands East Indies they increased by only 12 per cent., and from other territories by 18 per cent. These figures demonstrated clearly which territory had carried the main burden of restriction under the Stevenson Scheme. More significant in its long term consequences was the fact that in the years 1925-1928 the planted acreage in the Netherlands East Indies was increased by over a million and a quarter acres (it was subsequently claimed that the increase was far greater), whilst in Malaya the increase was little more than a quarter of that figure. A realisation of these facts and all that they implied served to confirm the views of those who had opposed a partial scheme of restriction and to strengthen them in the determination to refuse under any circumstances to be a consenting party to the re-imposition of any scheme so fundamentally defective. Those who held steadfastly to this view throughout the difficult and testing years that followed exercised a salutary influence in helping to bring about a comprehensively based regulation scheme under which restraints and advantages were fairly shared by all the territories and which was not in danger of being undermined by competition from any territory outside the scheme.

Towards the end of 1929 it became evident that the peak of an upward trade curve had been passed. Rubber, peculiarly sensitive to trade fluctuations, underwent a decline in price. Although at the time it was not foreseen that this was but the beginning of a long downward trend, the industry regarded with apprehension the unfavourable symptoms of a falling price and a growing disparity between supply and demand and in January, 1930, they appointed a British-Dutch Liaison Committee to examine the rubber situation and to report thereon to their respective trade associations.

The Committee promoted and won considerable support for measures directed to alleviating the situation, such as the observance of what was termed a " tapping holiday " of one month's duration, and the adoption of more rational methods of tapping under which the most economic areas would be tapped and others would be rested. But these measures had little or no effect on a situation which called for far more radical treatment. The British-Dutch Liaison Committee reached its findings in July, 1930, and the essence of its report was as follows.

(*a*) It is impossible to devise any scheme on a voluntary basis which can effectively meet the present critical situation.

(*b*) A comprehensive scheme of regulating the output of rubber, including native production, is essential to save serious disorganisation and widespread distress.

(*c*) It is desirable to ascertain as speedily as possible from the Governments concerned whether they are prepared to introduce legislation for the regulation of the production or the exportation of rubber.

(*d*) The Governments concerned should, as far as possible, discourage any extensions to the area planted with rubber.

The condition of the plantation industry and the measures to be taken for its alleviation became the subject of not infrequent Questions and Answers in the House of Commons, and in March, 1931, the then Under Secretary of State for the Colonies stated that the attitude of H.M. Government was that it was aware of the extremely depressed state of the rubber industry and of the deplorable effects on those engaged in it, that he had consulted the High Commissioner of the Malay States on the subject, but he regretted that the Government could not see its way to

initiate any scheme. He did go on to say, however, that if producers in all the countries concerned could agree on a scheme which provided for a practical planning of aggregate production in correspondence with world demand then H.M. Government would be prepared to give it careful consideration.

On the Dutch side, however, there was still less promise of official support for any scheme of regulation. When visiting Java in August, 1930, the then Governor of the Straits Settlements endeavoured to ascertain if the Dutch authorities were willing to take steps to restrict production. The reply of the Governor-General of the Netherlands East Indies was that voluntary co-operation from the native side was not to be expected and there were strong objections against forcible intervention by the Dutch authorities. In other words, any restraint over production was at that time considered by the Netherlands East Indies Government contrary to policy and it was further stated that in practice it would be very difficult and " scarcely possible " to regulate native production. But on the Dutch side opposition to any scheme of regulation was not confined to official quarters. There was an influential body of estate owners in Holland who were opposed to intervention and who declined to participate in the discussions of the Anglo-Dutch Liaison Committee. This body of opinion was, no doubt, impressed by the official view to which reference has just been made, but its opposition to intervention was probably based more on traditional belief in freedom of trade, and that belief was in no sense diminished by the recollection of the benefits of the freedom they had enjoyed under the Stevenson Scheme as compared with the restrictions and restraints to which their competitors in Malaya were subject in the years 1922-1928.

Despite these discouragements, however, the search for a remedy for a situation which was rapidly deteriorating still went on. To overcome the objections expressed by the Governor-General of the Netherlands East Indies that restriction over native production would be very difficult and scarcely possible, considerable ingenuity was exercised in evolving schemes designed to adjust supply to demand by a process of selection and compensation which left the choice between continued production and abstention to each producer. On the principle, no doubt, that desperate ills called for desperate remedies a scheme for the destruction of surplus exports at the port of shipment was advocated in Malaya and gained some support in London. This

scheme was the subject of advocacy and commendation in letters to *The Times* in August, 1931. But that there was no unanimous opinion in favour of such desperate remedies was made evident by a letter in opposition which appeared at a later date in *The Times*. The author of one of the many alternative schemes for indirect control took the enterprising course of seeking out the dissident minority in Holland with a view to ascertaining from them by direct discussion whether they could see their way to give support to his or any other scheme for adjusting supply to demand. To this visit there was a surprising sequel.

The Dutch Government addressed a Note to the British Government suggesting a conference to consider whether a practical scheme could be formulated for the alleviation of the serious rubber position. In the course of this Note mention was made of the scheme referred to above. Such gratification as the author may have derived from this development was, however, considerably modified on learning that the reference to his scheme was couched in such terms as to suggest that the provision made for its termination was the scheme's attractive feature. After some preliminary discussions the British Government agreed to the setting up of an informal conference consisting of three industrial representatives each from the British and Dutch sides, presided over by a British Government official.

At the first meeting the Conference proceeded to examine the various schemes which had been submitted, directed to the one common purpose of bringing the supply of rubber into closer conformity with demand. It was agreed that, whatever might be the merits of alternative schemes, for administrative and political reasons a scheme under which a definite quota was assigned to each producing territory and which could be administered by the Governments concerned, according to the varying conditions existing in their territories, was likely to prove most practical and least open to political objection. This conclusion was reached subject to one reservation, namely, that the practicability of applying this scheme to native rubber in the Netherlands East Indies was a question reserved for special discussion when it was hoped that a representative of the Government of that territory would be able to attend. Whilst awaiting the presence of a representative from the Netherlands East Indies Government the Conference continued its study of the problem with a view to formulating in greater detail the provisions of a quota scheme and agreeing upon the quotas to

be allotted to respective territories, and on these matters substantial agreement was reached. Three months after the first meeting a representative of the Economic Department of the Netherlands East Indies Government attended, when he informed the Conference that the Netherlands East Indies could not effectively apply to native rubber in the Netherlands East Indies any scheme enforcing effective and close control over exports, nor could they put a check on new plantings. In the opinion of the Conference these objections were fundamental to any effective scheme. This conclusion was concurred in by the British and Dutch Governments and under their authority a communique was issued on 19th March, 1932, in the following terms :

> "Under present conditions it is impossible to frame and operate an international scheme which would guarantee the effective regulation of the production or export of rubber."

That announcement was a grievous disappointment to the industry. The price of rubber, which, under the weight of accumulating stocks, was showing a continuing downward tendency was hastened in its headlong flight until in June of that year it fell to the derisory level of 1⅝d. per lb. delivered London. At such a level of price no producer of any class could operate without loss. It necessitated resort to measures which involved unemployment for many, a level of wage so near to bare subsistence level as to be only defensible as an alternative to more widespread unemployment, the adoption of methods which were agriculturally unsound, and it aggravated throughout the producing territories all the harsh concomitants of a serious trade depression. In these circumstances it was not to be expected that the industry would accept as final the findings of the Conference as announced in the preceding paragraph, and the search for a remedy was renewed with more desperate vigour than ever. And perhaps as matter of historical fact it should here be noted that the demand for remedial measures was more unqualified and certainly no less insistent from the small estate owner who had not to bear the overhead expenses which appertain to the bigger and more highly organised joint stock company in this country. Although the low price level exercised a considerable influence on production, which for 1932 was 100,000 tons less than that of the preceding year, and although there was a slight rise in price from the lowest point touched, the industry was still operating at a loss and there was nothing in the general trade outlook to give fresh hope or the promise of relief from the

burdens and distresses of a much depressed industry. In these circumstances it was inevitable that the demand for a remedy became less qualified and less discriminating and there was a tendency to contrast the disastrous state of affairs then existing with the prosperous conditions under the Stevenson Scheme. That sentiment found expression in too oft repeated statements to the effect that any scheme, whatever its shortcomings, was better than none.

The danger of such expressions, particularly from the British side, was that it would encourage the dissident Dutch minority in their views, sustain the Netherlands East Indies Government in its opinion that the native producer must be excluded from any restraints on production, and in the end might be productive of another plan with the faults and errors of the Stevenson Scheme which, although bringing immediate relief to the situation, would in the long run be ruinous to those who participated. To avert this danger, occasion was taken to express some views from the British side to the effect that the barrier to the formulation and acceptance of a scheme was the authoritative statement on the Dutch side that any plan involving restraint on production and planting was impossible of application to the native rubber in the Netherlands East Indies. But an industry grown weary in its struggle against long adversity and impatient for a quick remedy was, for the most part, in no mood to appreciate the tactical judgment underlying such statement and was concerned only to know whether one was "for" or "against" restriction. But this public and perhaps forceful expression of realism, although in the circumstances by no means popular, made its mark and had its influence on the subsequent course of events.

The trade depression in the meantime had grown both in scope and in intensity and its baneful influence had by then extended to other commodities besides rubber in which the Netherlands East Indies were interested as large producers, and this was having a serious effect on the economy of the Dutch territories in Asia. In April, 1933, the Dutch Minister for the Colonies stated that he considered "compulsory restriction of the production of rubber to be in every way desirable as soon as there is a practical scheme of restriction available, the execution of which is suitable for consideration with regard also to native cultivation and which could also be accepted by the British Government." Influenced no doubt by this official statement, but no doubt also now convinced that this time the British

producer would not be committed to unilateral action, the dissident minority in Holland indicated very soon thereafter that they were willing to reconsider the attitude which they had hitherto taken up in the matter of regulating rubber supplies and were ready to join their British friends in their discussions. The fresh hope that was rekindled by this event was greatly strengthened when in July of the same year there was issued under the authority of the World Economic Conference a statement that :

> " In order to assist in the restoration of world prosperity, it is essential to increase the purchasing power of the producers of primary products by raising the wholesale prices of such products to a reasonable level."

This was interpreted, and rightly so, as a signal that any well-conceived practical scheme which had as its object the raising of the price to a reasonable level of such an important product as rubber would receive sympathetic consideration in the highest quarters.

The course was now clear for a more united and hopeful approach to the industry's problems. And if any further stimulus to action was required, it was provided by the statement issued under the high authority of a World Economic Conference which clearly implied that not only were the readjustment of supply to demand and the raising of the prices of primary products matters that concerned the producing industries but also the world at large—a world distressed and distracted by an unprecedented trade depression and searching anxiously for the restoration of a prosperity which had made such a mysterious and bewildering departure four years ago.

Under the aegis of the Rubber Growers' Association a new Committee was formed fairly respresentative of the various shades of opinion. This Committee was charged, in conjunction with representatives of planting interests in the Netherlands East Indies and French Indo-China, and, if practicable, with representatives of Sarawak and Siam, with the task of formulating a scheme for the regulation of rubber supplies from the territories of Malaya, Netherlands East Indies, Ceylon, India, Burma, Sarawak, North Borneo, Siam and French Indo-China. Whilst concentrating on the formulation of the scheme the main Committee remitted to sub-committees or to selected individuals the task of fixing the quota to be allotted to each of the territories.

The settlement of territorial quotas was no easy task. The basis laid down for their calculation was past performances as expressed in exports over a period free from restriction, plus allowances according to an accepted scale for partially mature and immature planted areas. Since the significance of a particular quota could only be judged in relation to the others and the lesser rubber territory would wish to see how it stood as compared with its bigger partners, it was decided to proceed first to calculate and endeavour to agree upon the quotas for Malaya and the Netherlands East Indies. Except in respect of native rubber in the latter territory, fairly full and reliable statistical data were available for those two countries. Accepting what was considered to be the best estimate then available of the productive capacity of native rubber in the Netherlands East Indies, and making some allowance for what might be termed the imponderables, the quotas for these two major countries were speedily calculated and agreed. In the settlement of quotas for other territories there were two outstanding difficulties. First, under conditions of unrestricted competition at low prices exports of rubber had fallen in some cases to wholly negligible figures, and, second, statistical data relating to planted areas and the years of planting were generally deficient or almost wholly lacking. Without departing too widely from the factual basis laid down, it was considered inadvisable to apply too closely the test of past performances in exports and to regard with anything but an illiberal outlook the claims made in respect of partially mature and immature areas. To have relied on the pressure of hard economic fact for a uniform acceptance of a rigid application of the formula would have been unwise. To have done so would almost certainly have sown the seeds of future discord. Whatever initial advantage, therefore, the major producing territories may have appeared to have derived from their better statistical services was amply offset by the scope given to other territories for hard bargaining from a position of factual uncertainty over claims which, although they could not be proved, could not demonstrably be disproved. In an earlier stage of the discussions Indo-China had stated that her participation in any regulation scheme must be conditional on the acceptance of the principle that she should be free to export up to the limit of the consumption of France. Although this was a marked departure from the formula by which all other claims were tested, it was felt that as the earlier and separate

discussions with the representative of that country had been advanced to a stage that implied some commitment, this provisional settlement should be accepted. Owing to the absence of a representative authorised to negotiate it had not been possible at that time to fix the quota for Siam.

With that one exception the difficult and delicate task of settling quotas had been accomplished. That it was accomplished in so short a time was due largely to the prevailing will to agree and was a testimony to the skill and practical wisdom exercised throughout the conduct of negotiations. In the final analysis quotas were made up of an amalgam of fact, estimate and conjecture. It was deemed expedient to make certain additions to the quotas originally fixed for India and Burma. But since neither of these territories ranked as exporters of rubber in quantities which were important in relation to the total of exports, these adjustments were of little significance to the scheme as a whole. After the test of practical experience it was found necessary to make only one significant change. That was in respect of native rubber in the Netherlands East Indies, the assessment of which had been very much a matter of conjecture. With these minor adjustments and with that one significant change, the subsequent gradual accumulation of fuller and more reliable statistics pointed to the gratifying conclusion that, despite all the difficulties inseparable from an accurate assessment of productive capacity, a remarkable approximation to equity had been achieved. If perchance it seemed that advantage had been gained by one territory or another it was not of such consequence as to constitute a blemish on the scheme in its most important provision. It was not until some months afterwards that the quota for Siam was finally settled and then only after a Government had been defeated on that issue and another appointed with a mandate to negotiate for better terms—an example, albeit an extreme one, of the importance which rubber politics sometimes acquire.

The British and Dutch Governments, without whose final assent no scheme could be applied, were kept advised of the course of negotiations and gave valuable assistance and guidance where it was required. As soon as it was evident that real progress was being made in the crucial matter of quotas, the British Secretary of State for the Colonies suggested that a plan for the practical administration of the scheme in British territories should be drawn up for the early consideration of Colonial

Governments. This work was remitted to sub-committees in London constituted on a territorial basis. The Malayan sub-committee produced the first report, which was adopted by the other sub-committees with modifications judged suitable to the varying conditions under which it would have to be applied. The main features of these administrative proposals were: that in the division of national quotas as between big estates and small holders the division should be on the side of generosity to the latter; that where any doubt arose on this matter it should be resolved in favour of the "little man"; that individual assessments should in so far as practicable be settled along the lines taken for arriving at national quotas; that assessments should be subject to annual review and revision in the light of acquired knowledge and experience; that a Government official of proved capacity should be appointed Rubber Controller in charge of all such administration, and that he should be assisted by a Central Committee fairly representative of all classes of producers and supported by District Committees similarly comprised; that the general machinery evolved during the years of the Stevenson Scheme, with its system of coupons, export licences, etc., should be brought up to date and adopted and that, to facilitate the concentration of production from the more economic areas, the sale and transfer of export licences should be permitted. After some exchange of views with local committees, whose opinions on this matter had a specially strong claim to consideration, these proposals, with some modification in detail, were approved. To a large extent they formed the basis for the practical plan of administration which was subsequently applied. Here it is perhaps appropriate to state that no plan of the nature contemplated could have worked without the willing and active collaboration of Eastern Governments. Its smooth working is to be attributed to honesty in administration, skill in organisation, unremitting and conscientious attention to immense detail, and the public-spirited work of the unofficials serving on committees.

In February, 1934, the main Committee was able to submit and secure the approval of the Council of the Rubber Growers' Association to a scheme to which the representatives of all the territories, except Siam, had signified their approval. But the hard core of the problem, namely, the practical application of any such measures to native rubber in the Netherlands East Indies, was still unresolved, and it became evident that this was

a matter which could only be discussed effectively and solved, if at all, by the two main Governments, the British and the Dutch. Whilst both the Government at the Hague and in the Netherlands East Indies were by this time convinced of the need for remedial action and were prepared to approve the scheme, the latter still regarded with misgivings its practical application to native-owned rubber areas. It was not unnatural that the Netherlands East Indies Government directly responsible for its administration should recoil from the hard and seemingly impossible task of endeavouring to apply measures which required strict control over production and export of rubber from immense territories the rubber areas of which had never been surveyed accurately, where individual ownership had not been registered and, in some cases, was extremely difficult of identification. Time for discussion between the two Governments immediately concerned, assisted by the harsh realities of economic circumstances, was necessary to reconcile the Netherlands East Indies Government to a full acceptance of the scheme with all the responsibilities it entailed.

But the industry generally and what is termed " the market " were either unaware of the formidable nature of the difficulties still outstanding, or alternatively they refused to regard too seriously the one remaining obstacle to the realisation of their long deferred hopes. From a confident, but not too well-founded, belief in the certainty of the acceptance of a scheme for regulation there developed a considerable speculative movement in rubber and rubber securities which, in its turn, reacted on the producing territories to stimulate production and to neutralise the restraints and checks to which it had been subject under the influence of low prices. Had such a situation been allowed to continue to develop and the hopes upon which it was based finally disappointed, the financial consequences might very well have been disastrous and the last state of the industry aggravated beyond repair.

With a realisation of the dangers inherent in such a situation, which did not permit of further halting between two opinions, an emissary proceeded to the Hague with instructions from the British Government to seek a final conclusion. His responsible task was greatly facilitated by the representative of the Dutch Government, who was animated by an equal desire to reach a conclusion based on an acute appreciation of the whole situation. As a result of that meeting the British representative was able

to report to his Government that, although the Dutch could not at that stage set out in detail the manner in which the Scheme would be applied to native-owned rubber, they were prepared to give a formal acceptance to the scheme and to fulfil all its conditions. Whatever lingering doubts might have been engendered by the absence of information regarding the administrative steps to be taken to render the scheme effective, these could not weigh against the acceptance of an undertaking given with all the authority of a Government which was deservedly renowned for its scrupulous fulfilment of all its obligations. All Governments concerned were now aligned in agreement and on 28th April 1934, an official communique was issued announcing that negotiations for the regulation of rubber supplies had been concluded and complete agreement reached. A formal Treaty embodying the agreement was signed by the Governments on 7th May, 1934. Plans for the administration of the agreement in Eastern territories had been prepared in advance and the Scheme came into operation on 1st June, 1934.

Thus there was finally evolved, after more than four years of discussion and negotiation, with all their accompanying hopes and fears, the first comprehensive scheme for the regulation of rubber supplies, which was to exercise a dominant influence over the fortunes of the industry until eight years afterwards when its operations were abruptly terminated by the cataclysm of war in which most of the producing territories were engulfed. But there has never been any general realisation of how finely balanced, up to the very last, was the issue in the minds of those upon whom lay the ultimate responsibility for a decision to adopt a scheme so unprecedented in its scope and its detailed control, with all the knowledge they possessed of the risks entailed in its practical application to the peculiar and difficult circumstances of some of the territories. It was only some time after the event that the Dutch representative disclosed to his British *vis-a-vis* that, still doubtful of a favourable outcome, he had prepared in advance and brought with him to their final meeting at the Hague the draft of a communique to the effect that no agreement had been reached in negotiations for a practical scheme for regulating rubber supplies. Happily, these last doubts were resolved; the draft communique was not presented. Final failure was averted.

CHAPTER IV

PRINCIPAL PROVISIONS OF THE REGULATION AND THEIR APPLICATION

The mandates under which the Committee worked were the Agreements signed on the 7th May, 1934 and the 6th October, 1938, (Command papers 4583 and 5901 respectively). The former covered the period from the 1st June, 1934 to the 31st December, 1938; the latter continued "the Regulation"—defined in Article 3 of the Agreement of the 6th October, 1938, as the regulation and control of the production, export, and import of rubber, as laid down in Articles 4, 5, 6, 8, 9, 10, 11, 12 and 13 of that Agreement—until the 31st December, 1943, "as a minimum period." The articles cited dealt with the basic quotas, the limitations upon the net exports of rubber, the special provisions applicable to French Indo-China, the requirements of certificates of origin for exports and imports from or into the territories covered by the Agreement, the limitations upon the stocks which might be held within these territories, the conditions upon which the planting of rubber might be undertaken, and the prohibition of the export of rubber plants from these territories to areas to which the Agreement did not apply. "The Regulation" was the heart of the Agreements; and the effect of what appears at first sight to be perhaps a rather cumbrous procedure was to continue the control scheme, without any hiatus or legal lacuna, uninterruptedly from the 1st June, 1934 to the 31st December, 1943:—again "as a minimum period."

The two Agreements did not differ in any essentials. The later Agreement was based on, and followed closely, the former Agreement; the essential features of the original plan were all retained; the framework and the machinery were identical; the wording was, for the greater part, the same; but the opportunity was taken to introduce various changes which experience and the march of events had indicated as desirable or necessary. It is not proposed to examine in detail the changes which were made; we need concern ourselves only with differences between the two Agreements which materially affected the Committee's decisions or actions, and these will be indicated as occasion requires in the course of the subsequent survey. References in what follows are, unless the contrary is stated, limited to the second Agreement. (Appendix i.)

This Agreement was a treaty between the signatory Governments. It derived from, and was a continuation of, the original Agreement signed at London on the 7th May, 1934, by plenipotentiaries duly authorised to that effect by the Governments of the French Republic, the United Kingdom of Great Britain and Northern Ireland, the Government of India (which then included Burma also for the purposes at present in question), the Government of the Kingdom of the Netherlands, and the Government of the Kingdom of Siam. Article 1 stated the areas to which the Agreement applied: they included all the rubber producing areas in French Indo-China, Burma, Ceylon, the Federated Malay States, the Unfederated Malay States, the Straits Settlements, the State of North Borneo, Brunei, Sarawak, India, the Netherlands Indies, and Siam. These areas cover practically all the chief rubber producing areas, and they accounted for 97 per cent. of the total world production in the year 1941. The comprehensiveness of the control system is thus apparent—a practical point of the greatest importance. This was the first link in the chain—the acceptance by the Governments of practically all the main producing areas of the control scheme, on a treaty basis. The second link was supplied by the obligation undertaken by these Governments, under Article 3 of the Agreement, " to take such measures as may be necessary to maintain and enforce in their respective territories as defined in Article 1 the regulation and control of the production, export, and import of rubber as laid down in " the Agreement. This obligation was scrupulously fulfilled. As explained elsewhere, initial difficulties were experienced in the Netherlands Indies in carrying out the requirements of the control scheme ; but these were overcome as rapidly as administrative conditions there permitted ; and the actual working over a term of years proved that the detailed administrative arrangements which the control scheme necessitated and provided for worked smoothly throughout the area.

The provisions of Article 3 imposed a very heavy task and a large measure of responsibility on the Administrations concerned. The magnitude of that task may be inferred from the fact that the 1939 Edition of the Ceylon Handbook on Rubber Control Legislation runs to three hundred and seventy-six pages. Local legislation had to be enacted, conforming in all respects with the Agreement ; this had to be supplemented by detailed rules, having the force of law, and governing every single detail of a multitude of transactions, often minor in themselves, but essential

to the smooth working of the scheme. The successful working of this complicated and intricate administrative machine is apparent from the statistics which the Committee published monthly until war prevented their continuance. The quota changes directed by the Committee produced their effect smoothly and quickly; exports from all the territories ran close to the permitted amounts, in general; and, over a long series of years, the annual exports followed the decisions of the Committee with remarkable accuracy. The whole complicated mechanism worked with a minimum of friction.

The root idea of the control scheme was to regulate export to the world's markets, in accordance with the estimated effective demand for rubber. The object was, in the words of the preamble, to keep "world stocks at a normal figure, and to adjust in an orderly manner supply to demand while at the same time making available all the rubber that may be required, and maintaining a fair and equitable price level which will be reasonably remunerative to efficient producers." The other chapters of this survey attempt to estimate to what extent these declared objectives were attained.

It will be noticed that, apart from the reference to "a fair and equitable price level which will be reasonably remunerative to efficient producers" in the preamble to the Agreement, it contained no further reference to price, nor did it include any machinery by which prices could be directly affected. The Committee's only effective weapon was the power conferred on them by Article 4 (*c*) to fix, from time to time, the permissible exportable amount for each territory. (Siam and French Indo-China were outside this arrangement; and their cases were governed by special provisions).* Control over new planting was necessarily, considering how long rubber trees take to mature, a measure of a long-term character; and the provisions as regards stocks held within the controlled area, though important, had also a delayed action—though the effect upon prices of these local stocks was always appreciable.

* French Indo-China obtained the right to unrestricted export, subject to the delivery to the Committee of a percentage of the rubber exported above a certain free amount—30,000 tons in the first period and 60,000 tons in the second period. During the course of regulation proceeds of the sale of rubber delivered to the Committee by French Indo-China under the above arrangement provided more than half a million pounds sterling, which was divided among the three National Research Institutes set up under the Agreement.

Siam was guaranteed firstly the right to a minimum annual export rising from 30,000 tons in 1935 to 40,000 tons in 1938 and 41,000 tons throughout the period 1939 to 1943; secondly, the right to plant 31,000 acres in the first period, when new planting in the other regulation territories was prohibited, and a similar minimum area in the second period.

In order that the Committee might do its best to carry out the objectives mentioned in the preamble, it created an extensive and elaborate costing system, and a very complete fabric of statistics. Details as regards the costing system, and references to the price fluctuations following the various quota decisions and the varying levels of stocks, are given in other chapters of this work; all that need here be added is that the existence of reliable costing data, and of a mass of statistical information presented in a readily accessible form and based on sources which experience had shown to be reliable, coupled with the life-long experience and profound knowledge which many members of the Committee possessed as regards all questions affecting rubber, enabled it to take decisions which, in intention at least, were invariably directed towards the realisation of the objective so succinctly stated in the preamble. It is for others to judge how far its efforts have been successful. It can at least be affirmed that neither effort, nor goodwill, nor essential honesty, nor a readiness to compromise where compromise appeared desirable, were ever lacking.

The main difficulty, as the experience of over eight years has shown, was to estimate accurately the absorption of the world at different times and under varying conditions. The fluctuations and the variations which no one, either producer or consumer, suspected as probable were of suprisingly large extent : they sometimes came with catastrophic suddenness. Political conditions had their disturbing influence, and changes in the stock policy of the main consuming countries from time to time added to the difficulties of the Committee.

The control scheme was worked by the Committee. Its constitution and powers are stated in Article 15 of the Agreement. Normally, that is apart from the effects of the war, the Committee consisted of nine delegations representing Malaya, Netherlands India, Ceylon, French Indo-China, India, Burma, the State of North Borneo, Sarawak, and Siam. The largest delegations were those of Malaya and Netherlands India, with four members each ; Ceylon and French Indo-China had each two members ; the others one each. The total was seventeen. Eleven substitute members were provided for. The delegations were appointed to represent the territories stated, and intimations as to their appointments were made by the contracting Governments concerned. The consumer Panel sat with the Committee. Each delegation voted as a unit, and the member

entitled to exercise the vote was named by the appointing authority. This member could, in case of absence, nominate another member of the delegation to act for him. The voting power was based on the basic quotas, one vote being granted for each complete thousand tons of the basic quota for the time being in force. French Indo-China was deemed to have a basic quota of 80,000 tons. Four delegations present were required for a quorum, and there were the usual provisions to permit of an adjourned meeting, if no quorum were present ; at such an adjourned meeting, the delegations present formed a quorum. A quorum was in fact always present. Decisions were taken by a majority of the votes cast, but it was provided that, as regards important matters, a three-fourths majority of the total votes which could be cast by all the delegations entitled to vote was required. These matters were :

(i) amendments recommended to the Agreement ;
(ii) fixing or varying the permissible exportable percentage of the basic quotas ;
(iii) fixing the percentage of the permissible new planting area ;
(iv) limiting replanting ;
(v) making, modifying, or abrogating the rules of procedure.

More important perhaps than the formal regulations governing these matters was the manner in which they were applied, and their actual working in practice. The rules were never rigidly insisted upon. The governing idea was to allow the utmost freedom of discussion. If that seemed desirable, individual delegations were accompanied, from time to time by persons not entitled to be present ; and this applied not only to the delegations, but to the Advisory Panel also. Nor was any limitation imposed upon these persons taking part in the discussions. The desire of the Committee was always that there should be the fullest and freest discussion of the question under consideration ; if the work of the Committee appeared likely to be facilitated by the admission of persons with special knowledge, or in special positions of authority, their presence was welcomed, and they were accorded every privilege which it was in the power of the Committee to grant. The voting power was always there, but it was kept markedly in the background. Not more than three votes were taken during the 58 meetings held, over a period of approximately nine years. In the early days, while the Committee was feeling its way,

there was a natural tendency to adhere somewhat rigidly to the provisions of the Agreement in all matters, including procedure. Gradually, however, as experience was acquired, and as something that may not inappropriately be termed a Committee consciousness developed, the procedure became more flexible. The Committee's aim was that its decisions should be taken, after the fullest and freest discussion in the light of all the most recent ascertainable facts, unhampered by anything which might limit the powers of the delegations to base their final decisions upon debates round the council table, and fortified by all the knowledge and experience which they could obtain—even if, in special cases, some of this knowledge came from sources other than the formally constituted delegations and Advisory Panel. Naturally, however, the Committee was cautious and prudent in admitting outside persons to its discussions. Such admissions were made only when it was satisfied that this was desirable in the interests of its work, and there can be little doubt that this flexibility proved advantageous. It can also safely be said that the privilege, when accorded, was never abused.

Another important practical point, ancillary to the governing idea alluded to above, was that the delegations did not normally come to the council table pledged or bound to any particular course of action. In the early days that was not always the case, but even in these early days the delegations were seldom rigidly tied by hard and fast instructions. They could and in fact not infrequently did depart from their instructions, when convinced that the circumstances required such action; and, if they had no option in the matter, they were always willing to refer the question again to their Governments, and to do all that lay in their power to support the view which they had formed after discussion with their colleagues. In practice little delay was usually involved, and in no case was it found impracticable to arrive at a reasonable solution. It is believed that the delegations, in recent years, came to the meetings, in general, unhampered by instructions: in the case of one of the largest delegations, it is known that they were left almost entirely free, from the beginning of regulation. Cases sometimes arose where major questions of policy were involved, transcending all technical or statistical considerations, and raising issues of political importance. When this was so the delegations, naturally and rightly, sought instructions from their Governments, and

followed the instructions which their Governments gave. But such cases were rare; and it is broadly correct to say that the decisions of the Committee, apart from questions which involved political issues, or questions of an importance transcending all normal technical considerations, were based solely on the fullest discussion of all the latest relevant facts, as elucidated and scrutinised in a full and free debate by individuals who possessed not only a knowledge of the practical working of control, but also in most cases a life-long experience of the production, distribution, marketing, and manufacture of rubber.

In connection with the voting provisions, it should be noted that one member only of the nine voting members sitting on the Committee could be regarded primarily as a producer. The voting members of the Malayan, Netherlands Indian, Ceylon, Indian, Sarawak, and Siamese delegations were, until quite recently, all officials. The voting member of the Malayan delegation was appointed to the Committee by the Secretary of State for the Colonies, and was for the whole period of control, until April, 1942, an official at the Colonial Office. The three-fourths majority which was required for important decisions was throughout the control period obtainable if, but only if, the Malayan and Netherlands Indian delegations were in agreement. The governmental character of the Committee, so far as effective major decisions were concerned, is apparent.

Article 18 governed the position of the Advisory Panel. As explained above, this should under the Agreement consist of four members, two representing "consumers of rubber in America," and two others, representing consumers elsewhere. The actual choice of the two latter was most carefully made, after consultation with all the authorities concerned. After America, the United Kingdom and Germany were the leading consuming countries and it was therefore decided that the non-American members of the Panel should be representative of consumers in these countries; it was further arranged that the German member should, through his contacts with European rubber manufacturers and other consumers, also represent, so far as that was practically possible, European consumers generally, in addition to his more immediate representation of German consuming interests.

As regards the appointment of a second American representative, unexpected difficulties were encountered. The provision increasing the number of the American members of the Panel from one to two had been inserted in the Agreement (in a

mandatory form) at the request of the authorities in America. When that Government was approached on the subject, they readily agreed to the Committee's suggestion that Mr. Viles, President of the Rubber Manufacturers' Association of America, who had been the American representative during the first period of regulation, should continue as one of the Panel members. But after some discussion, during which the desirability of the appointment of a second American representative was strongly urged, it was eventually intimated that the Government of the United States did not desire to nominate a second American representative to serve on the Panel.

The outbreak of war dislocated the Panel arrangements. Herr Otto Friedrich, the German member, could no longer attend the meetings, and Mr. Viles, the American member, owing to the important government work in which he was engaged, found it impracticable to come to London. He did everything he could, by correspondence, by cables, and by telephoning, to maintain as close contact as possible with the Committee; but these make-shift arrangements could not, and did not, effectively replace that personal contact which had over a long period of time been found so fructuous and valuable. The Committee made repeated efforts to strengthen the American representation on the Advisory Panel, but all proved ineffective. This was the more to be regretted as it will be apparent from later chapters that the relations of the Committee with America were particularly important, and raised questions of unusual complexity and difficulty during the period from the outbreak of the war until the time of the occupation by Japan of the producing territories in the Far East. There seems little doubt that, had the close, the frequent, and the sympathetic and understanding contacts of pre-war days been continued effectively throughout the initial period of the war until the time when the United States entered the war, the work of the Committee would have been materially facilitated; and misunderstandings which in fact occurred, and which seriously prejudiced the cause and the influence of the Committee, would have been avoided.

In the early days of control, when the Committee was feeling its way and had no experience to fall back on, when personal contacts were slowly being formed, and when confidence based on such contacts was still incomplete, the Committee—as has already been explained—tended to adhere rigidly to the precise letter of the Agreement. There was some difference of opinion

among the members on the point, but it was eventually decided that consultation with the Advisory Panel should be limited to the specific requirements of Article 18, that is, to obtaining its advice as to world stocks, the fixation of the current quota, and "cognate matters affecting the interests of rubber manufacturers."

The Committee, however, soon came to regard the Panel as a welcome collaborator; it fully appreciated the value of its assistance; it established close personal relations with it; and it was desirous of removing, finally and effectively, any plausible grounds for the suggestions which had not unnaturally been made in certain quarters that the Advisory Panel was treated as a subordinate body, and that the Committee, in private session, arrived at definite decisions on all the questions in issue before the Panel had an opportunity to give its advice. There was never any basis for these suggestions, but they were freely made, and they were widely listened to.

For most of the life of the Committee the Panel was on precisely the same footing as any delegation to the Committee, except that it had no vote. It always had the fullest opportunities for tendering advice; it was present throughout all the discussions, whether relevant or irrelevant to its special duties; and it received copies of the full minutes of the meeting, and of all papers circulated, at the same time as the members. It was, it can be said with complete confidence, satisfied with the treatment it received; was appreciative of the welcome it invariably had from the Committee, and of the intimate character of its relations with it; and was ready to acknowledge that it had the fullest opportunity to represent, at all times, what it regarded as the consumer point of view.

There is another point as regards the practical operation of the Committee which deserves mention. Every effort was always made to secure the preparation, as soon as possible after each meeting, of minutes which sought to reflect impartially, fully, and accurately, the whole course of the discussions. These minutes were issued, in provisional form, to the members a few days after each meeting. The minutes when corrected were circulated, and copies were sent to the signatory Governments for their information. It was always considered important that the signatory Governments should be placed in a position to follow, in the closest possible manner, the proceedings of the Committee, and to understand the real basis on which its decisions rested. This they were able to do, from the commencement of

control until its conclusion, and it is not improbable that the special care and attention which were devoted to this matter were responsible for the fact already noted, that the delegations were, broadly speaking, left free themselves to conduct their business on the Committee.

One last point relative to the practical conduct of the work of the Committee should be noticed. The essential basis for sound decisions as regards the control over rubber production, distribution, and export, and the most difficult task of estimating future absorption, depend to a very large extent on the availability of accurate, up-to-date, and complete statistics. The Committee addressed itself to this important matter from the beginning of its work ; and, as has been explained elsewhere, it gradually elaborated, and published monthly, a compilation of statistical information which came to be regarded as the most complete and authoritative available to the industry. In this it was helped most materially by the Governments and governmental authorities concerned, including many who were not signatory to the Agreement; by the Rubber Manufacturers' Association of America, whose statistics were more complete than any other compilation on a national basis; by the Rubber Growers' Association in the United Kingdom, and by the statisticians working with some of the principal agencies in this country. As a result, the Committee always had before it a mass of recent information and a conspectus of the general position which were invaluable, and without which its work could not possibly have been efficient. Wherever possible the information placed before the Committee was derived directly from the best informed and most reliable sources ; and experience has proved its general accuracy. Errors were made—as the event proved, sometimes serious errors—in the estimation of the probable future absorption, but these were errors incidental to the position ; they were not the result of any bias tending towards securing the acceptance of this or that view favourable to the authority responsible for the estimate. The information supplied was invariably given on a purely objective basis, and it was accepted by the Committee as such. Not infrequently it felt averse from accepting such estimates, and it did occasionally make modifications, based upon its own survey of the position in its widest aspects. But broadly it accepted the estimates given by the authorities who were in the closest contact with the position, and framed its policy, and based its decisions, on them.

CHAPTER V

THE PLANTING OF RUBBER

The evolution of rubber growing and the commercial uses of rubber have been sketched in Chapter I, where reference has been made to the phenomenal extension of cultivation which followed on the invention of the pneumatic tyre and the growth of the motor car industry. It will be recalled that the area under rubber in the Far East had grown from 5,000 acres in 1900 to roughly one million in 1910; the corresponding figure for 1920 was 4,000,000 and for 1930 8,000,000. The great bulk of this phenomenal expansion had taken place in British Malaya and the N.E.I. Except for Java, those areas were sparsely inhabited. The surface was covered either by primeval jungle, as in Malaya, where the natives lived on the sea coast or the banks of rivers, or with secondary growth, where, as in Sumatra, the natives practised a shifting cultivation of hill rice. These inhabitants were quite unsusceptible to the economic advantages of settled employment. It was accordingly necessary for intending planters to import labour and China, Java and India were all drawn upon. Many of the Chinese remained as settlers, but the Javanese and Indians usually preferred to return home when they had made enough money for their modest needs, and the supply of labour is even now the major preoccupation of the manager of a rubber estate; the maintenance of an efficient labour force and adequate safeguards to maintain their health have always been imperative requirements. Malaria in particular has always entailed the utmost vigilance, but medical science has indicated the procedure for dealing with the malaria-carrying mosquito, and if due precautions are taken it is only occasionally that malarial epidemics occur. The measures evolved to minimise the scourge of malaria and other tropical diseases from these areas are directly due to the development of the plantation rubber industry, and in this respect the industry has left a permanent mark for good in the countries where it is established. Otherwise living conditions for both Europeans and Asiatics have been made attractive. In Ceylon and Southern India considerable planting took place as a subsidiary extension of existing tea plantations;

elsewhere planting was mostly by native smallholders, except in French Indo-China, where a late effort was made by French capitalists to plant enough to supply French requirements for rubber.

That the planted area was extended so greatly and so quickly, in spite of all the labour and health difficulties, is evidence that the rubber tree, i.e., the *Hevea brasiliensis*, is easy to grow. In its native habitat it survives the fiercest competition, and under plantation conditions with a suitable climate, warm and moist, it thrives on all but the poorest soil below 2,000 feet above sea level; it is also immune from the attacks of serious pests and diseases. In form it is a large tree of soft wood growing straight with high branching limbs and smooth dark green oval leaves pointed at the ends, eight inches in length, growing in clusters. Although trees have been known to grow to a height of over 100 ft. with a trunk more than 18 ft. in circumference, the average plantation tree is probably not more than 40ft. to 50ft. tall. Both male and female flowers are found in the same inflorescence. The flowers are pale green in colour with yellow centres, and are only about a quarter of an inch across when fully opened. Few of the female flowers set to form mature fruit—probably not more than 2 to 3%.

The fruit of the rubber tree is not unlike that of the horse chestnut except that there are no spikes. Inside the pod there are three chambers each containing one seed about the size of a pigeon's egg. The seeds are brownish in colour with black mottling. Under ordinary estate conditions a rubber tree from 8 to 15 years old will bear about 150 seeds annually.

The leaves are shed once a year when the trees are said to be "wintering." All the trees are, however, never devoid of leaf at the same time and during the wintering periods there is a combination of gold and brown dying leaves and bright green new leaves.

"Wintering" varies with geographical location; for example,

Amazon valley	March to June.
Ceylon	December to February.
Malaya, Northern Sumatra	February to April
Java	July to October.
Southern Sumatra	August to October.

It takes at least five years from planting for a tree to reach a sufficient stage of maturity to be capable of yielding enough

at recent prices to cover the cost of tapping and manufacture. The density of planting has varied according to prevailing opinion, but a fair average stand at maturity is now considered to be about 100 trees an acre. By natural causes a decrease to 70 trees or thereabout takes place over a period of years; a stand of less tends to be considered uneconomic. On native holdings stands are commonly of higher and in some areas of the N.E.I. much higher density.

Long before the advent of plantation rubber, merchant houses had been established throughout the East and the cultivation of other plants, such as coffee and tea, had been carried on in plantations. The first ventures in rubber were undertaken under the auspices of these houses and many of the practices tested by experience in tea, such as the limitation of the area under one management to a few hundred acres, operated to reinforce the caution naturally felt in launching out on a speculative enterprise which could not mature for at least five years. Obviously the capital resources available from such sources were insufficient to finance the spectacular increase which began in the area planted with rubber during the first decade of the century, and an appeal to the British and Continental investor resulted in the speedy flotation of many rubber plantation companies with small capital resources, usually to buy and extend an existing plantation. Investors were naturally anxious to secure the protection afforded by association with a firm long established in the territory and reputed for integrity and ability, and it was usually arranged that such a firm should become the Agent of the Company, and thus exercise an oversight over at least the financial implications of the planting operations undertaken by the manager. This was the genesis of the Agency system which has gone as far to confer on the rubber plantation industry the benefits of large scale enterprise as is consistent with the existence of small separate financial units. Few of the large plantation companies opened up their estates from jungle as one unit on a preconceived plan. Most grew by purchasing estates as opportunity offered, very often from Chinamen who had planted rubber among their tapioca and sold the property as a rubber estate as soon as possible.

The native inhabitants became gradually aware of the potentialities of rubber as a cash crop, and the N.E.I. Government actively propagated the idea in the most backward areas of

its territory. It had the disadvantage of the long wait from planting to maturity, but thereafter it promised an income greater in relation to the work involved than any alternative. The long wait was not a serious deterrent in the areas of shifting cultivation, since in effect the planting of rubber after one rice harvest meant the finding of a mature estate on the next return to the same area seven years later. Unfortunately the practice was overdone and eventually large native areas became almost entirely dependent on rubber for their subsistence.

Rubber planting, which had become popular around 1910, continued on a somewhat diminishing scale throughout the period of the first world war. In the 1920's however, the rise in rubber prices due to the Stevenson Scheme resulted in extensive planting being carried out both by estates and natives. The result was that when the International Rubber Regulation Agreement came into force on the 1st June, 1934, there were some 8,306,400 acres under rubber in the regulating territories.

The International Rubber Regulation Agreement recognised three agricultural operations—new planting, replanting and supplying—and in its practical application three qualities of planting material were admitted, bud-grafted rubber, high yielding clonal seed and seedling rubber.

NEW PLANTING.

After 1st June, 1934, new planting was prohibited except as follows :

(*a*) By Article 12 of the first Agreement Siam was permitted to plant an additional 31,000 acres and each participating territory was allowed to plant for exclusively experimental purposes an area not exceeding in total one quarter of 1 per cent. of the territory's ascertained total area planted at the date of commencement of the Regulation.

(*b*) By Article 12 of the second Agreement new planting in each territory was authorised during the period to 31st December, 1940, to an extent not greater than 5 per cent. of the total planted area in that territory as set out in that Article. During the said period the Committee had discretion to authorise new planting equal to a further 1 per cent. of the total planted area of all territories but this power was not exercised. (Every territory, except Burma, utilised its new planting

rights.) The Committee had discretion to authorise further new plantings after 31st December, 1940, to an unlimited extent and granted a further 5% to India and Ceylon, with the promise of more if required before 31st December, 1943. Siam again secured the right to new plant an additional 31,000 acres, but the full extent to which this had been done prior to the Japanese occupation is not known.

In the second Agreement there was no provision for planting rights for exclusively experimental purposes, as it was considered that each territory should appropriate from its new planting rights such rights as it thought necessary for experimental purposes before allocating the territory's rights to individual producers; but under the powers conferred on the Committee by the terms of Article 12 (*c*) of the Agreement it was unanimously agreed, in order to give facilities for the continuation of experimental planting during the prohibition of commercial new planting after 1st January, 1941, " to permit each of the participating territories to plant up during the currency of the present Agreement an area equivalent to 1/16th of 1% of each territory's assessed acreage as set out in Article 12 (*e*) or 300 acres whichever may be the greater." This was equivalent to authorising the planting of a further 6,233 acres.

REPLANTING.

This process was defined in the International Agreement as planting during the period of the Regulation more than thirty plants on any acre already planted and is thus linked up with the definition of supplying. By Article 12 (*c*) (ii) of the first Agreement an owner was forbidden to replant more than 20 per cent. of his holding during the currency of the Agreement, but in the second Agreement replanting was permitted unconditionally, subject to the right of the Committee to impose a limit after 31st December, 1940. This power was not exercised. It should be noted that planting an area not planted at 1st June, 1934, in exchange for the cutting down of an area planted at 1st June, 1934, was prohibited; " replanting " was strictly interpreted to mean planting again on the same ground. There was considerable chafing at this, especially from representatives

of native areas, but the Committee refused to countenance any plea for relaxation, which would have given a marked advantage to territories and estates with large resources of undeveloped land.

For a long time prior to the prohibition of new planting it had been evident that large areas of rubber were past their prime and going downhill rapidly, but very little replanting had been attempted. There were two main reasons for this.

(*a*) When an area is cut down for replanting income from it usually ceases and there is a wait of at least five years before the replants give any return; as long as land was available there was therefore a strong inducement to let the old rubber remain and plant up new areas in time to produce an income before the old area became finally unprofitable.

(*b*) The areas which were most in need of replanting were frequently not the oldest but those where the soil had deteriorated or disease was most prevalent; there was therefore good reason to doubt the success of any replanting operation undertaken on such areas.

When new planting was forbidden it was expected that there would be a great extension of replanting and it was for that reason that a limit was imposed in the first Agreement. The result was, however, quite different and little replanting was done, thanks to the poverty of the companies, the doubts of success, and the loss of export rights entailed. Gradually poverty disappeared, knowledge of replanting technique on impoverished soils was gathered, and local enactments were altered to provide that cutting down did not result in loss of export rights if actual replanting were embarked upon within one year after cutting down. The result was a progressive increase in replanting until it was checked by shortage of labour in 1941. Very little of these replantings had been brought into production before the Japanese occupation of the major producing territories, but reports on growth and appearance were generally favourable and there is no reason to suppose that with adequate manuring they will not yield up to expectation. As the planting material was either budgrafts from approved clones or high yielding clonal seed it can be concluded that each acre replanted will yield the equivalent of at least four acres of the impoverished rubber which was cut down.

SUPPLYING.

Though the rubber tree is easy to grow and hardy, there are naturally some trees which die at all ages. Casualities of this category occur mainly amongst young plantings and are met by " supplying, " i.e. by planting new trees in the place of those which have died.. The International Agreement limited " supplying " to not more than thirty rubber trees on any planted acre during the currency of the Regulation. Supplying vacancies in older plantings is of doubtful value, as the supplies tend to be suppressed by the older trees unless the vacancies occur as a patch.

In relation to the size of the industry the importance of supplying is negligible.

SEEDLING RUBBER.

The overwhelming bulk of the area planted with rubber consists of seedling rubber. This means that it was planted with seeds from unknown parents. No principle of selection other than the planter's experienced knowledge was applied—an unscientific procedure which was understandable in a new industry expanding at a phenomenal pace; the planter had innumerable pressing practical problems which called for his attention much more urgently, and during the period when the first great expansion took place profits were so high that there was no economic pressure to search for ways and means of making them higher still. A little later when there was a certain surplus of seed, a primitive form of selection was practised by collecting seed from areas of healthy and well grown trees which were giving a comparatively high yield of rubber. This procedure ignored the probability that many of the poorest yielding trees in the area were the most prolific seed bearers; therefore, quite apart from genetical consideration, it did not follow that such a selection would transmit the high yielding quality of the area to the progeny, and it also ignored the important influence of soil on output.

One planting operation which experience soon recommended was the thinning out of the stand of trees per acre to allow the remaining trees to grow better. As a preliminary to this thinning process a test of the output of individual trees became customary, and it was then established that very often a high proportion, say 30 per cent., of the output of an acre came from a much smaller proportion, say 10 per cent., of the trees on that acre.

Full effect to this discovery could not be given by thinning out, as it is desirable to keep a fairly even stand and the distribution of high yielders was capricious; this led to a demand for some means of establishing a supply of planting material with a reasonable certainty of giving a high yield at maturity.

There appeared to be two methods of ensuring that the stand planted on any area would contain a big proportion of high yielding trees, viz:

(*a*) vegetative reproduction by budding a graft from a high yielding tree on to a suitable seedling, which gives "budgrafted rubber," and

(*b*) selection of seed from known high yielders,

and investigations into both methods were begun by research workers in the N.E.I.

As a rule the two investigations were pursued independently and much more attention was paid to the former method than to the latter. There were sound practical reasons for this; budding and grafting are widely practised in all kinds of crops from apples or roses to cinchona and have given predictable results in countless cases, and they are also simple operations to carry out.

The seedling on to which the bud is grafted is known as the STOCK, the sprout from the bud is called the SCION, and the high-yielding tree from which the bud is taken is called the MOTHER-TREE. A CLONE is a family of individuals all of identical vegetative origin, i.e., all budded from one mother-tree or vegetative descendants of one mother-tree.

It is possible that the scion may be affected by the inherent qualities of the stock, but apart from this at present undetermined possibility all the trees in a clone budded from one mother-tree should very closely resemble the mother-tree in all characteristics. In these circumstances the odds are all in favour of getting from the bud-grafts something very similar to the results of the original mother-tree, unless external influences such as uneven soil conditions or disease are introduced.

It is quite otherwise in regard to the second method of seed selection. The rubber tree is not normally self-fertilising and seeds obtained by self-fertilisation are in most cases of inferior stamina. Thus the normal seed has two parents and is therefore dissimilar from either of its parents. There is no means of determining whether the high yielding quality of one or both

parents has been transmitted to all, some, or none of the children, other than planting the seed and testing the result when the tree is mature. The odds are all against any " marriage " producing all high yielding progeny, so that the selection of pure lines of high yielding seed is a very lengthy, laborious and complicated proceeding. The method now adopted is to make use of high-yielding CLONAL SEED, that is, seed of which both parents are members of proved clones.

BUDGRAFTED RUBBER.

The first efforts at budding rubber were made from 1910 to 1913 by van Helten in the Cultuurtuin at Buitenzorg, Java. They were resumed in 1916 and the first account of the work was published in 1918. About the same time experiments began on Pasir Waringin Estate, Java, Bodjong Datar Estate, Java, the H.A.P.M. estates in Sumatra and in the A.V.R.O.S. experimental station at Medan. Preliminary investigations were begun about a year later at the Royal Botanical Gardens, Peradeniya, Ceylon, and in Malaya under the auspices of the Department of Agriculture. In 1921 the first handbook on the technique of budding was produced by the head administrator of Pasir Waringin. In May, 1922, H.A.P.M. published the first tapping results of 10 acres planted in 1918 and towards the end of 1922 the results of the first tappings on Pasir Waringin were published. By the end of 1927 budwood was being advertised for sale and the new method had been launched on a commercial scale.

The tapping results of the first buddings were often disappointing, due mainly to the high yielding qualities of many mother trees not being intrinsic but derived from some accidental external influence such as soil or disease. Nevertheless, whether good or bad, they showed a very high degree of uniformity throughout the clone. Somewhat later it was found that many of the buddings which had inherited the high yielding quality of the mother tree showed undesirable characteristics, such as susceptibility to wind-break, uneven bark renewal or disease. There remained nevertheless a residue of high yielding buddings with no serious disabilities, which could be and were recommended by scientific bodies such as A.V.R.O.S. as suitable for general use; these came to be known as Proved Clones, but it should be remembered that approval can never be final, and it happens that some clones which have stood the test for years fall out of the list for defects which have become evident late in life.

There was considerable prejudice against the new method in some planting circles, which the unfortunate experience of certain of the pioneers in budgrafting considerably strengthened, but bearing in mind that most planters were salaried employees who did not benefit substantially by increased profits but had all the trouble involved in trying out new methods the progress made was more rapid than might have been expected.

By the time the preliminary negotiations which resulted in the International Rubber Regulation Agreement got under way in 1933 there was a sufficient area planted with budded rubber in the N.E.I. and in Malaya to make it necessary to recognise, in computing additions to the basic quotas in respect of immature rubber, that there were two different kinds of rubber to which it would be inequitable to apply the same standard of estimated output. There was even then little evidence of actual output from budded rubber tapped under estate conditions, and there was, both in the preliminary negotiations and later when settling the rules for computing assessments of individual estates, considerable controversy between those with budded and those with seedling rubber. The scientific associations such as A.V.R.O.S. and the R.R.I. were strong supporters of the different scales, and eventually the contest resulted in two scales being used in computing international quotas, and in estates budded with proved clones being given assessments in respect of their immature rubber which corresponded fairly closely to the International scale. Thus the seal of official approval was given to the claims made for budded rubber and those estate owners who had taken the risk received in most instances a fair reward. The two scales used in the negotiations for the International Agreement were :

Age	*Seedling. pounds per acre*	*Budded. pounds per acre*
5 years	60	400
6 ,, ...	180	600
7 ,, ...	400	1,000
8 ,, ...	500	1,200

It was assumed that such young rubber as was old enough had been tapped in the years chosen for computing the basic quotas, and the above scale allowances were not added in full but only to the extent of the difference between the presumed output capacity in the basic years and the increased productive capacity which comes with fuller maturity.

It is probably necessary to say a few words about what is implied in the term " a proved clone." We have already defined a " clone," and a " proved " one is a clone which has stood up to the test of commercial tapping for at least five years and has not subsequently had its approval cancelled owing to the development of unfavourable secondary characteristics. Many of the present outstanding clones were among the first to be proved, but a far greater number of clones of which high hopes were held at one time have since been discarded, and only the fact that many numbers are missing from the clonal sequences of the various suppliers serves to remind one that those remaining are the cream of the cream. To gain official approval for a clone it is necessary to submit the data to the scrutiny of a recognised scientific station, such as the R.R.I. or A.V.R.O.S.; these stations produce their own proved clones as well as grant approval to the clones of individuals who grow budwood commercially.

The advantages of rubber budded with proved clones are :

(*a*) Its dependability; some clones do better in particular circumstances than in others, but such peculiarities are known, and if used in accordance with directions proved clones can be depended on to give the results expected.

(*b*) Its uniformity; the variation between members of a clone is much less than in an equivalent number of seedlings, which enables the planter to thin out evenly all over the area.

(*c*) Its higher yield; expectations of yield have not been entirely fulfilled, but budded rubber under estate conditions has given twice to thrice the yield of good ordinary seedlings.

(*a*) disadvantages are :

(*b*) Longer period to maturity; the operation of grafting sets the plant back about two years.

Slower bark renewal; this objection is not fully proved.

There is no doubt that on the whole the advantages greatly predominate, and from 1930 onwards until recently, when high yielding clone, and from 1930 onwards until recently, when high estate planting and replanting as has taken place has been done mainly with budded rubber. Supplies of budwood were made available to small holders under Government auspices and technical instruction given, so that they too shared in the benefits.

HIGH YIELDING CLONAL SEED.

While this progress was taking place in the use of budded rubber, a few investigators continued their searches for a pure strain of high yielding seed. The small percentage of rubber flowers which produced seed has already been mentioned and this, in conjunction with the difficulty of hand pollinating a forest tree, makes uneconomic the production of seed of which the father and the mother are both known. But by means of budded rubber it is possible to plant up areas isolated from other rubber trees with one or more clones, which means that the parents are known within narrow limits. By trial, it has been proved that the crossing of certain clones produces seed which normally contains a high percentage of trees yielding more and often much more than the average or ordinary seedling rubber, though there is still a wide variation between the children of any such marriage. Considerable quantities of such seed from areas planted solely with such clones and isolated from other rubber by a distance sufficient to exclude all risk of pollination from other trees were appearing on the market of recent years. Scientific stations are still chary of giving their blessing to such unions, but planting opinion is almost unanimous in preferring seedlings to budded rubber, and when the Japanese broke in was tending more and more to take whatever risk be involved in planting with such high yielding clonal seed instead of budgrafting with proved clones. There is no doubt that yields equivalent to the best yields expected from budded rubber (1,000/1,200 lb. an acre) are being obtained from areas planted with clonal seed, though as yet only from small areas. Informed but conservative planting opinion is now at the stage of recommending planting with from half to two-thirds buddings and the remainder with high yielding clonal seed. The next stage may well be the evolution of still better proved clones from the best high yielding clonal seedlings, which will restore the ascendancy of budded rubber until these better clones are again displaced by clonal seedlings of equivalent quality and so on.

So far there has been no special scale used internationally or within producing territories for computing quotas or assessments of high yielding clonal seedlings, which got an assessment only at the seedling scale until they proved their capacity to yield more. This was felt to be a handicap by the champions of high yielding clonal seed, and the difficulty will have to be faced and settled if the problem of computation recurs.

GENERAL.

The control of planting was an essential part of the regulation scheme.

During the first period, 1934-1938, new planting was expressly forbidden except for nurseries and experimental purposes, because in the early years of regulation not only were world stocks very high, but world productive capacity was believed to be much greater than any likely consumption demand within the next decade. Doubts as to the continued excess of world productive capacity over consumption arose in 1937 and it became clear that power to allow new planting must be given to the Committee if regulation was continued.

During 1938, when the continuation of the rubber scheme was under consideration, the whole question was examined with the greatest thoroughness and care by a sub-Committee. The difficulty of the problem is well illustrated by the following quotation from their report :

> " The sub-Committee appreciate the very great importance of any decision which may eventually be taken in regard to new planting ; and they have been guided, throughout their deliberations, by the consideration that all possible care must be taken to secure that the supplies of rubber, which world demand may require, are at all times likely to be forthcoming. They have also had in mind that it would not be acceptable to the Governments in the producing areas, and to the industry as a whole, if new planting were undertaken on a scale which did in fact result in a large excess of productive capacity over world demand.
>
> " No satisfactory or adequate statistical basis exists, or can be evolved, which would lead to reasonable certainty in this matter. The producing capacity at any given datum point is not accurately known ; the extent to which replanting will be resorted to is a matter of conjecture ; world productive capacity nine or ten years ahead cannot be estimated with accuracy ; and the probable absorptive demand at that time is clearly a matter of individual opinion. Indices, of varying value, can be obtained as regards some of these points ; but, when it is remembered that the figures which are of special importance here represent the differences between very large and

incalculable amounts, it will be appreciated that any attempt to settle this question solely or mainly by statistical methods must fail."

Eventually it was decided to allow 5 per cent. new planting in the years 1939 and 1940, equivalent to some 400,000 acres, and to give the Committee a free hand to decide the amount of new planting, if any, that should be allowed in the three subsequent years of the continued period of regulation 1941-1943. During 1939 and 1940 better statistics and greater knowledge convinced the Committee that productive capacity was still far in excess of demand and that no new planting in the near future was required. This was the Committee's view up to the time of the Japanese invasion of Malaya and the Dutch East Indies.

It has already been stated that the control of planting is essential to regulation. The quotation from the report of the sub-Committee gives some idea of the difficulty of regulating, in order to meet satisfactorily an unknown future demand, the planting of a tree which takes five or six years to come into production and which may remain in production for 30 or 40 years.

The problem is to provide a satisfactory relation between two unknown quantities; future productive capacity and future consumption demand. Regulation by its improvement of statistical knowledge was helping to provide the data for a reasonable estimate of future productive capacity, but future demand must always remain largely an unknown quantity. Various new factors, such as the growth of the synthetic rubber industry and the expansion of rubber growing in the Americas and Africa, are going to add to the complications of a problem the practical solution of which is of vital importance to producer and consumer alike.

CHAPTER VI

RESEARCH AND STATISTICS

1. RESEARCH.

No history of the International Rubber Regulation Scheme would be complete without an account of the provision which it made for research. The rubber growing industry had not been backward in initiating and supporting research into problems of production, and modern research and experimental stations had long been established in Malaya, Ceylon and the N.E.I. ; the results in the shape of high yielding rubber trees were outstanding. At the same time research into problems affecting the use of rubber had been prosecuted in the U.S.A., the U.K., Holland, and elsewhere, some of it under Government auspices but most of it pioneer work initiated by manufacturers.

In a sense these two lines of research were the reverse of complementary ; while the rubber grower was making 1,000 lb. of rubber grow where 500 lb. used to grow, the manufacturer was making 500 lb. do the work which used to be done by 1,000 lb. In fact, of course, on balance an immense advantage accrued to producers from consumers' research ; it was only the striking improvement in the quality and reliability of rubber goods which brought motoring within the reach of millions and thus vastly extended the market for raw rubber.

At the same time there was room for further research designed to improve neither the productivity of plantations nor the quality of existing commercial rubber articles, but to find new uses for rubber and thus to secure a still further extension of the market. Moreover, with all the research which had been conducted into rubber for the best part of a generation many basic physical and chemical problems remained unsolved. The framers of the Agreement in providing for research showed themselves conscious of the view now generally accepted that scientific knowledge acquired for its own sake may prove in application of untold benefit to the world of commerce and is often the origin of revolutionary inventions and processes ; technology is in fact the off-spring of pure and apparently " useless " science.

The original Article 19 of the inter-governmental Agreement which provided for research read as follows:

> "The contracting Governments, recognising that a natural balancing of production and consumption can be hastened by research with a view to developing new applications and by propaganda, declare that they will consider the possibility of (i) levying and collecting a uniform cess on the net exports from their respective territories during the period of the Regulation for the purpose of supporting such research and propaganda, and (ii) co-operating in the constitution of an International Rubber Research Board to plan the research and propaganda."

It will be observed that the article is permissive and not mandatory, but little time was lost in implementing the promise to explore possibilities. In May, 1934, the Committee invited the Rubber Growers' Association and its opposite number in Holland, the Internationale Vereeniging voor de Rubbercultuur, commonly called the International Association, to consider the article and make recommendations; both of these bodies were already conducting consumption research and propaganda. In the joint report which they submitted the two associations acknowledged the need for greater research and extended propaganda and suggested that a cess of 1d. per 100 lb. annually on exports of rubber from the regulating areas would provide sufficient funds. They proposed that the responsibility for new developments should be entrusted to their associations, which would expand their respective organisations within the limits of the cess income which would accrue to each of them from national sources, and would co-ordinate their work. It was indicated in this joint report that the French growers would support the proposals and would ask the R.G.A. to administer the funds obtained from the cess in French territory.

The Committee further sought the advice of Sir Frank Smith, who was then Secretary of the Department of Scientific and Industrial Research; the gist of the report which he made was as follows. The income of any scheme of research of the magnitude contemplated should be guaranteed for a period of not less than ten years, that is for a period extending beyond the life of the existing International Agreement, and the annual expenditure could usefully be of the order of £100,000. As regards the distribution of work, while it was obviously economical to

strengthen the researches of existing bodies rather than to duplicate them, the policy of "farming out" if carried out injudiciously or too extensively tended to confusion of effort and therefore to its stultification. Sir Frank Smith's conclusion was that: "Well directed work in a central establishment under the immediate control of a good Director gives him a better opportunity of co-ordinating effort and of supplying the drive necessary to produce effective results." Considerable emphasis was laid on the extent to which the success of a research organisation or institution depended on the appointment of a competent full-time principal officer, in whom scientific qualifications were not the only ones desirable: "The Director of a considerable research undertaking must of necessity be a man of affairs and one who can exercise sound judgment on matters of policy as distinct from those requiring only scientific determination."

Further, there would be need of a strong central authority. Such an authority in the form of an International Rubber Research (and Propaganda) Board as contemplated by the Regulation Agreement would necessarily have to be representative of the contributing Governments, but it was to be hoped that its members would serve as individuals exercising their own unfettered judgment rather than as representatives speaking to instructions. A plea was expressed for the greatest possible amount of freedom, unhampered by reference to the various Governments interested, for any Research Board which might be instituted.

With the joint report to which reference has been made above and Sir Frank Smith's recommendations before them the Regulation Committee set up a sub-Committee * "... to consider the joint report of the Rubber Growers' Association and the International Association, Holland, the note by Sir Frank Smith, the opinions expressed by members ... to prepare a scheme for research and propaganda as contemplated in Article 19 of the Agreement which in their view the Committee would be justified in recommending to the different Governments."

In its report, which was presented within two months of their appointment, the sub-Committee drew attention to the implication contained in Article 19 of the Agreement that any

* THE SUB-COMMITTEE WAS CONSTITUTED AS FOLLOWS:
Sir Andrew McFadyean, *Chairman.*
Messrs. D. Bolderhey, L.P. le Cosquino de Bussy, J. G. Hay, H. Eric Miller.

funds raised by a uniform cess should be administered by an International Rubber Research Board. It was forced to the conclusion that this degree of centralisation would have to be rejected as impossible of attainment. It had been made clear to it that revenues derived from Dutch territory in the Far East would have to remain under Dutch control, and it appeared politically impossible to hand over funds which would in effect be the produce of taxes imposed in British territory to an international organisation operating abroad. Fortunately it did not follow that the constitution of an International Rubber Research Board was thereby rendered impossible; it merely suggested a larger measure of decentralisation than had been originally contemplated.

The detailed recommendations of the sub-Committee were as follows.

1. Since it would be impossible to recruit the scientific staff required unless the scheme provided some reasonable security of employment, the signatory Governments should bind themselves irrespective of the fate of the Agreement to provide between them over a term of years the funds required for the salaries of the permanent members of the staff of the institute and its standing charges. In the first instance the uniform cess should be at the rate of 1d. per 100 lb. of rubber exported; it was calculated that such a cess would provide at the time when the report was made £70,000 with a 70 per cent. quota or £75,000 with a 75 per cent. quota. The amount likely to be obtained was thus below that generally regarded as necessary for a thorough research and propaganda scheme, but attention was drawn to the fact that the funds ought to be available for some time before full expenditure could be incurred and that a margin would thus be provided for capital expenditure and possibly for some small reserve.

2. If the funds raised in Dutch territory were administered by a Dutch Rubber Research Institute and the funds raised in British territory (including if the French Government so desired funds raised in French territory) by a British Institute, the governing bodies in those two institutes should meet at regular intervals to constitute an International Rubber Research Board, the functions of which would be firstly to co-ordinate by a distribution of research the programmes of the two institutes, and secondly to effect an exchange of all information and results obtained. The Committee expressed its opinion that if

collaboration on those lines could be achieved—and it was not aware of any obstacle to that achievement—the purpose contemplated by Article 19 of the International Agreement would be substantially fulfilled.

The British members of the Committee added their own recommendations regarding a British Research unit. They unreservedly endorsed the views of Sir Frank Smith which have been quoted above, and recommended the immediate appointment of a suitable director at an adequate salary for a term of years. As regards the governing body, its character had to be determined by the fact that it would represent the territories which provided the funds and be responsible for the efficient working of the institute as a scientific body. They expressed their belief that the efficiency of the scientific work would be advanced and responsibility for the expenditure of public funds safeguarded if the governing body consisted of four members appointed by the Colonial Office, with the consent of and on behalf of the contributing Governments, and two members of the Rubber Growers' Association. It was suggested that the members appointed by the Colonial Office should include two persons conversant with physical and chemical problems from a scientific point of view, and one conversant with the administration of scientific research schemes, the remaining member being preferably someone possessed of admitted business and administrative capacity and experience.

It would be the duty of the director of the British Institute to maintain continuous contact with the director of the Dutch Institute, while the governing bodies of the two institutes should meet for the same purpose at least once a year as an International Rubber Research Board. One of the duties of this latter board would be to present through the intermediary of the Rubber Regulation Committee a joint report of the past year's operations, together with a comprehensive budget for the coming year.

The above deals with research, which was undoubtedly the principal preoccupation both of the Regulation Committee and its sub-Committee. The question of international propaganda, however, was also within their terms of reference. It was clear to the sub-Committee that research and propaganda though linked in the inter-governmental Agreement and financed from the same sources, were activities so diverse in character that

separate organisations were required. While it was agreed that all cess monies deriving from British, Dutch and French territories must remain under the control of their respective national authorities, the sub-Committee recommended that the International Research Board should be asked to determine once in each year what proportions of the proceeds of these cess monies should be devoted to propaganda by each national authority; they tentatively suggested that one-fifth of the total funds available should be earmarked for this latter purpose. For the purpose of co-ordinating the direction of propaganda activities an International Propaganda Committee was suggested consisting of a Chairman appointed by the International Rubber Research Board, two members nominated by the R.G.A., two by the Dutch Research Board and one by the French Government.

The report of the sub-Committee was accepted by the Rubber Regulation Committee and sent to the signatory Governments with a recommendation that the cess should be instituted as from 1st October, 1936. By the 26th January, 1937, the Governments of Malaya, N.E.I., North Borneo and Ceylon had accepted the recommendations in the report and had undertaken to collect the cess: "so long as the export of rubber is regulated," and the Government of India and Burma "for the period of the present agreement only," that is up to the 31st December, 1938.

Later, when the Agreement was prolonged to the end of 1943, India and Burma continued their cess payments and Siam and Sarawak agreed to contribute their share—the cess paid by Siam being retained for research work in Siam. This extension of the Agreement to the 31st December, 1943, guaranteed an income from the cess for a period of 7 years and three months, since the undertaking to collect the cess on exports had effect as from 1st October, 1936. The scheme was therefore launched on that financial basis, the International Rubber Research Board having the responsibility of advising the subscribing Governments through the Regulation Committee if any adjustment in the rate of the cess appeared necessary. In fact no occasion for adjustment arose, the financial position of the national research and propaganda organisations being strengthened by the receipt of substantial sums voted to them by the International Rubber Regulation Committee from money accruing to the Committee from French Indo-China under Article 6 of the intergovernmental Agreement.

During the 5¼ years period from the 1st October, 1936 to the 31st December, 1941, the total income accruing to the British organisations from cess collections and from monies received under Article 6 of the inter-governmental Agreement was well over half a million pounds, while the incomes of the Dutch and French organisations were £400,000 and £60,000 respectively. It will be seen therefore that the total annual income was nearly double that recommended by Sir Frank Smith. Unfortunately owing to the occupation by the Japanese of most of the regulated areas the only sources of income remaining are the cess collections from Ceylon and India, which are paid to the British organisations.

As soon as the recommendations of the Committee had been accepted by the Governments the members of the British Rubber Research Board were appointed and a director of research was then chosen by the Board. Shortly afterwards the research activities of the Rubber Growers' Association were absorbed by the new Board and the new British research organisation became known as the British Rubber Producers' Research Association. Propaganda was carried on by a Committee of the Rubber Growers' Association, which was constituted in 1938 as the British Rubber Publicity Association.

On the Dutch side the International Association re-organised their research department under the name of the Rubber-Stichting, separating it into two divisions, a technical research division to deal with laboratory research and a technico-commercial division to disseminate the results of research work and deal with propaganda. At the same time the French set up an organisation on similar lines, embracing both research and propaganda activities, which was named the Institut Français du Caoutchouc.

The International Rubber Research Board, consisting of three members of the British and Dutch research institutions and two members of the French institution, began its work of co-ordination in the summer of 1937. The directors of the respective Research organisations were entitled to attend meetings of the Board. About the same time an International Rubber Propaganda Committee, consisting as recommended of an independent chairman chosen by the International Rubber Research Board, two members of the British and Dutch propaganda units and one member of the French unit, was set up to co-ordinate propaganda activities.

The main task of the International Research Board was to mould the national programmes in their relationship one to another in order to eliminate avoidable duplication while at the same time maintaining the national preference as to lines of investigation. In particular in regard to research on synthetic rubbers, the Rubber-Stichting included in its programme direct investigations into the technique of manufacturing known synthetic substitutes for rubber, while the British Rubber Producers' Research Association included in its programme an indirect attack on the problem by attempting to isolate the hydrocarbon polymers and other constituents of natural rubber with a view to relating chemical composition, molecular structure and physical properties. Similarly the Institut Français du Caoutchouc concentrated on special aspects of this work.

The British Rubber Producers' Research Association made plans for the erection of laboratories contiguous to new ones projected by the Research Association of British Rubber Manufacturers, but the outbreak of war prevented the fulfilment of these plans, and the B.R.P.R.A. were obliged to equip temporary premises at Welwyn Garden City, Herts. Besides doing useful work in helping various Government Departments to deal with urgent service problems, the B.R.P.R.A. team of research workers is there carrying on a programme of fundamental research. Much important work has been accomplished, and substantial contributions have been made to the knowledge of the molecular structure and reactivity of rubber. The scientists at Welwyn Garden City are also engaged on problems of applied research and have uncovered some possible new industrial applications for the material.

Unfortunately owing to the calamitous events of May and June, 1940, very little is known of the development of the research programmes undertaken by the Dutch and French organisations, but prior to the war the Rubber-Stichting had made plans to rebuild and re-equip their laboratories in Amsterdam, and the Institut Français du Caoutchouc, with the financial help of the British and Dutch organisations, had become installed in well-equipped laboratories in Paris.

The Rubber-Stichting had, up to the invasion of the Netherlands, continued its programme of research which, owing to the fact that the International Board had only been functioning for a comparatively short time, duplicated to some extent the

programme pursued by the B.R.P.R.A. In the field of applied research, however, the Dutch had been engaged on somewhat different problems, including powdered rubbers and the problem of the adhesion of rubber to iron, cement, wood, etc. The Dutch were also greatly interested, as already pointed out, in synthetic rubbers, and the Director of the Rubber-Stichting visited the Soviet Union in order to investigate the manufacture and properties of the Russian synthetics.

Besides the work carried out in Holland, further researches financed from cess monies were carried out in the N.E.I. at the West Java Proefstation. In 1941, after further collaboration with Holland was impossible, the Royal Netherlands Government then in London sequestrated the Rubber-Stichting and re-constituted it as the Netherlands Indies Rubber Experiment Station, Batavia, absorbing into this new organisation the Rubber Department of the West Java Proefstation. In this way the fabric of Anglo-Dutch collaboration was maintained until March, 1942, when the Japanese invaded Java.

The Institut Français du Caoutchouc, which was perhaps owing to its much smaller financial resources less ambitious in its programme of research, was nevertheless doing work of high quality and prior to the fall of France had recorded progress. Among other problems studied by the French was that of the direct use of coagulum with a view to eliminating processing and vulcanization. Promising work had also been carried out on the problems of rubber ageing and oxidation,

While the British, Dutch and French research units were tackling their problems the national propaganda units were not idle, and in the short time at their disposal before the war disrupted their plans they had shown considerable activity.

The British Rubber Publicity Association in particular confined its activities to work in the U.K., the Colonies, the Dominions and the U.S.A. A special representative was appointed to undertake propaganda activities in the U.S.A. to increase the utilisation of rubber, and in spite of the short time that elapsed before the outbreak of war terminated his appointment he had made considerable progress, especially in regard to furthering the use of rubber in agriculture. An agricultural liaison officer was also appointed with gratifying results to carry out work in the U.K. and the Dominions. Apart from agriculture appreciable sums were allocated to extend the use of rubber in

buildings, in engineering and in the home. The Publicity Association was also responsible for an impressive Rubber Pavilion at the Empire Exhibition in Glasgow in 1938.

The propaganda branch of the Rubber-Stichting confined its activities to work in the Netherlands and Colonies, Scandinavia, Germany and the countries of Central Europe, as well as South America. The work carried out by the Netherlands unit was very similar to that carried out by the British, and although no representative was appointed to work in South America tours of instruction were carried out in many European countries. The Rubber-Stichting had a stand at the VIIIth International Road Congress Exhibition at the Hague in 1938.

The scope of work of the propaganda department of the Institut Français du Caoutchouc was confined to France and her Colonies, Italy and Spain. Although this organisation only came into being at the beginning of 1938, the French delegate to the International Propaganda Committee had been conducting propaganda work single-handed, and at the "Exposition Internationale des Arts et Techniques" in Paris in 1937 he had participated in the construction and installation of the "Palais du Caoutchouc" in collaboration with the British and Dutch organisations and with financial help from the International Rubber Regulation Committee. Owing to the limited funds at its disposal the French unit was unable to formulate such ambitious plans as its sister organisations, but during the short time prior to the war it had carried out valuable work, especially at various exhibitions throughout France and by taking part in the production of documentary films on rubber.

This brief account of the work being carried out by the research and propaganda units set up under the aegis of the International Rubber Regulation Committee does not in any way give a proper assessment of the importance of this work, but it does perhaps indicate how such work has been commenced and how it is hoped it may be continued when peace returns.

At present, so far as is known, only the British research unit is operating, but fortunately a partial preservation of the international character of the scheme was made possible by the close contact which the Board of the British Rubber Producers' Research Association has been able to maintain with the scientific officers of the Royal Netherlands Government in London, and by the attendance of an officer of that Government at their meetings.

At the end of the period covered by this report the cessation of rubber supplies from the Far East resulted in an insistent drive in the U.S.A. for the mass-production of synthetic substitutes for rubber, carrying with it the mobilization of possibly the greatest concentration of research talent on any single problem in industrial science. What may emerge therefrom directly or indirectly effecting the plantation industry remains to be seen. The British unit accepts these added responsibilities and it is also keeping in view the time when the plantation rubber areas now under Japanese domination will again be freed, and when international co-operation can be resumed to further the work for which the research organisations were established.

2. Statistics.

The rapid development of the plantation rubber industry during the first decade of the present century necessitated some comprehensive statistical measure of its more important features. This was early recognised by the Rubber Growers' Association, which amongst its permanent committees appointed one to deal with statistics. This committee began to function about 1914, and although its activities were necessarily curtailed by the war, it did a considerable amount of useful work during that period. Nevertheless at the end of the war it was difficult to get a correct statistical picture of the industry. Acreage data for estates were unreliable and only the haziest ideas then existed of the area under native rubber. The R.G.A. Statistical Committee took much more vigorous action after the war, and for many years it took every opportunity of pressing for new data, and of suggesting improvements in the collection of existing data, to the Governments of the various rubber producing countries. The adoption of the Stevenson Scheme necessitated the collection of statistics for administrative purposes, and the data for Malaya and Ceylon became more extensive and more complete. In 1924 the Netherlands Indies Government adopted the sensible procedure of imposing a small *ad valorem* cess on the value of all exports and imports for the purpose of establishing a properly equipped statistical and intelligence department, and thereafter there was a rapid improvement in the extent and accuracy of their published data on rubber. But even as late

as the outbreak of the present war, the total area under native rubber in the Netherlands Indies was not accurately known.*

From 1920 until 1934 most of the important current statistics were published in a Bulletin issued by the Rubber Growers' Association, and circulated monthly to its members.

In 1930 the Rubber Growers' Association decided to enlarge the scope of the work of its Statistical Committee, and set up a Commercial Research and Statistical Department under a permanent *ad hoc* Committee. Statistics continued to be published in its Bulletin but a new Contributory Statistical Service was initiated.

When the international regulation scheme came into force, the International Rubber Regulation Committee set up a department for the collection and collation of the statistics of the industry, primarily to furnish data and reports for its deliberations. It also decided to publish its own monthly Bulletin, which first appeared in 1935 and continued until it was suspended " for the duration " in December, 1941. The statistical data accumulated by the R.G.A. were put at its disposal and the *Bulletin* was planned on a comprehensive scale. It gave *ad hoc* statistics of the exports from and stocks in regulating countries, and also included fairly complete data on world exports, imports, absorption, stocks and prices as well as data on collateral activities like automobile and tyre production. The *Bulletin* was welcomed by the industry and was very favourably commented on by the press. The semi-official status of the International Committee and its connection with various

*The figure of 1,806,516 acres given in Appendix ix (Table 1) is the estimated area given by the N.E.I. Government at the end of 1940 and is based on a tree count undertaken as a result of regulation and completed in 1936. The N.E.I. Government in determining its total acreage figure for the purposes of Article 12 of the Agreement (Appendix i) used the estimated acreage figure derived from the 1936 tree count.

After this history had been prepared, and was in the press, the delegation of the N.E.I. on the International Rubber Regulation Committee informed the Committee that, as a result of a survey of the native rubber areas begun in 1938 in connection with regulation in these territories, it was now estimated that the area under native rubber was about 3,200,000 acres. This estimate is provisional and tentative, but it is believed by the N.E.I. delegation to approximate to the truth. The investigation was, it adds, practically completed when the Japanese invasion took place. The Committee has considered it desirable to publish this information ; but it accepts no responsibility for it ; and it desires to emphasise that the position is such that it is quite impossible for the Committee to examine this estimate critically, or to form any opinion as to its accuracy ; at present no details are, or can be made, available.

governments and trade associations made it clear that the *Bulletin* would become the recognised statistical service for all interested in the industry.

The publication of the *Bulletin* was, of course, only part of the activities of the Statistical Section of the Secretariat of the International Committee. The most important function of this Section was to build up, maintain, and interpret for the Committee, the whole body of statistical and other data pertaining to the industry. Much of the data is confidential ; much is too detailed or otherwise unsuitable for insertion in a general bulletin ; some of it, e.g., data on planting and replanting, is made available only at the end of each year. If the war had not intervened, it is possible that an annual supplement would have been issued which would have summarised and extended the information given in the monthly bulletin. There is, of course, a limit to the amount of information that can usefully be made available to the public. On the other hand the Committee was in a position to obtain from its Statistical Section a considered and informed opinion on many of the matters it was called upon to discuss and decide, as the Statistical Section had at its disposal the information and experience of the whole industry, which was always readily given.

The statistical and other data which the Statistical Section collected and arranged were the most complete and up-to-date record in existence, but gaps remained to be filled and the Secretariat from time to time brought to the notice of various Governments and Associations the deficiencies in their published statistics and made suggestions for their improvement. International uniformity in the method of collection and of publication of statistics is of great and obvious importance for a number of purposes and it is to be hoped that this particular side of the Committee's activities will be continued and extended by its successor or another international agency.

CHAPTER VII

STOCKS OF RUBBER

I

As was made clear in a preceding chapter, one of the primary and direct purposes of the Rubber Regulation was to control stocks, and before we proceed with a historical survey of the Committee's work it is desirable that we should make clear in rather more detail the stocks which were controlled and the way in which they were affected by the provisions of the Agreement.

Stocks of rubber may be divided into the following three categories, which must be separately considered: stocks in producing countries, stocks afloat, and stocks in consuming countries.

1. STOCKS IN PRODUCING COUNTRIES.

These may again be sub-divided into two classes: (*a*) stocks inside the regulated areas, and (*b*) stocks outside the regulated areas.

(*a*) *Stocks inside the regulated areas.*—Stocks inside the regulated areas consisted of stocks on estates and stocks in the hands of dealers. Under the provisions of the International Agreement the amount of stocks held within the regulated areas was limited. This limitation applied both to stocks held by growers and those in the hands of dealers and others. For most territories a definite common limit was laid down but in certain territories, viz. French Indo-China, India (including Burma), the islands of Singapore and Penang, Sarawak and Siam, no definite limit was stipulated, except that in India (including Burma), Sarawak and Siam stocks were to be "limited to normal proportions having regard to the amount of rubber internally consumed." Estate stocks were limited to not more than 20 per cent. of the quantity of rubber wholly grown and produced and removed from the estate during the preceding twelve months, or alternatively a quantity equivalent to twice the amount allowed to be exported from the estate during any month. The total of all other stocks in a territory was limited to not more than 12½ per cent. of its permissible exportable amount for the control year.

When the Agreement was renewed on 6th October, 1938, the stock provisions were slightly altered so as to allow for the holding of larger stocks by producers in the regulated areas. The limit for large estates of not less than 100 acres was raised to one quarter of the total standard production of the estate in the preceding control year; as regards estates of less than 100 acres, it was stipulated that stocks should be kept "within normal limits." This alteration was due to the lesson learned at the beginning of 1937, when, in spite of the Committee's action in raising the rate of release, supplies did not come out rapidly enough to prevent a sharp rise in price. The Committee felt that if larger stocks could be built up inside the regulated areas, they could be quickly utilised if supplies were needed urgently, and rapid increases in the rate of release could then be followed by equivalent exports from the regulated areas.

Although this provision to hold larger stocks did not technically come into use until the beginning of 1939, the contracting governments at the Committee's request allowed its application at the end of 1938. Owing to the depression in America in that year, it had been necessary for the Committee to cut the rate of release drastically—to 45 per cent. during the last half-year—and the accumulation of stocks on estates helped to solve a very difficult labour position.

It was usually estimated that under normal conditions total stocks inside the regulated areas amounted roughly to 1¼ to 1½ months' current exports, and showed only seasonal fluctuations from year to year.

(*b*) *Stocks outside regulated areas.*—The most important stocks in this category were those held in Singapore and Penang,* stocks under Customs' control, and stocks in Para and Manaos. There were of course stocks awaiting shipment in other non-regulated countries but these were relatively insignificant and no record was kept of them up to the end of 1941.

As regards stocks in regulated areas under Customs' control, the Committee made provision in the early days of regulation for territories wishing to do so to credit rubber which had not been shipped before midnight on the 31st December in any control year but had been placed under Customs' control as

* Although Singapore and Penang were actually inside the regulated areas provision was made in the Agreement to regard the entry of rubber into these places from the rest of Malaya as an export, so that technically both places were regarded as being outside the regulated areas.

an export under the Scheme during that control year; thus lack of shipping did not prevent total permissible exports being realised. Many of the regulating territories took advantage of this provision.

Taking into consideration the stocks both inside and outside regulated areas, it was usually estimated that under normal conditions the total stocks inside producing countries were roughly 1½ to 2 months' current exports.

2. Stocks Afloat.

These stocks represent the rubber which has been declared an export by the exporting country, but not declared as an import by the importing country.

The most accurate method of determining the amounts, by cabling departures and arrivals of shipping, was too laborious and costly, and more approximate methods had to be adopted. Up to the beginning of the war the generally accepted estimate for stocks afloat was 1.1/3rd months' shipments, i.e., one month's shipment plus one-third of the previous month's shipment. In statistical work this estimate gave satisfactory results.

When war broke out the average length of voyage was considerably increased and the previous method of calculating afloats at 1.1/3rd months' shipments was useless. A new method based on exports by destinations from producing territories corrected for imports into consuming territories was devised by the Committee's statisticians, and the estimates made in this way gave even better results in statistical work than those under the old method had done. The new method was made possible by the speedier transmission of information from exporting countries.

3. Stocks in consuming countries.

The only stocks about which reliable information has been available in the past were those in the U.K. and U.S.A. Some information was obtained from time to time about stocks in other countries, e.g., Japan, Germany, the Netherlands, France and Canada, but these figures were very incomplete and only available intermittently and were therefore not included in world stocks.

Most of the U.K. stocks were held by dealers in warehouses in London and Liverpool. These warehouse stocks were the normal source of supply for part of the requirements of the U.K.

manufacturers and of other European countries, though latterly most important European countries with the exception of Russia were importing direct from producing territories. Figures of these warehouse stocks have been available since 1913; further, the majority of U.K. manufacturers began furnishing figures of their own separate stocks to the Committee at the beginning of 1935. During 1940 the British Government commenced to build up an emergency stock in addition to the stocks held by the manufacturers and in warehouses.

U.S.A. stocks were held by manufacturers, importers, dealers and private speculators, the greatest part being held by members of the Rubber Manufacturers' Association. The R.M.A. issued monthly estimates of the total U.S. stocks based on the returns received from its members, and at the end of the year the U.S. Department of Commerce made an independent survey. On the results of this survey the R.M.A. estimates were revised so that the final figures should be reasonably accurate. The R.M.A. gave a quarterly division between the stocks in the hands of its manufacturers members and those in the hands of its dealer and importer members. The Department of Commerce gave an annual estimate of the stocks in the hands of manufacturers and those in the hands of dealers and others. In addition to these "normal" U.S. stocks, the American Government in 1939 began to accumulate a special emergency stock of rubber which had been obtained from the British Government in exchange for cotton—the so-called "barter" stock. In 1940 the American Government began to accumulate an additional emergency stock of rubber through the Rubber Reserve Company—the so-called "reserve" stock.

It was clearly important in view of the terms of the International Agreement that the Committee should decide in its own mind what constituted a normal stock.

The history of the rubber producing industry had been so chequered, exposed as it had been from infancy onwards to abnormal conditions, that past experience was no infallible guide; no statistical or mathematical solution presented itself. A stock equivalent to a certain number of months' current consumption at one period might represent a normal stock, whereas a similar stock at another juncture might be either too large or too small. Various factors determined whether a given number of months' consumption was adequate or excessive, and not the least important of them was what

might be termed market psychology. That in its turn was dependent on future prospects such as consumption trends, which are largely conjectural, and on the speed at which supplies could be increased or decreased; this latter factor was of very considerable importance during the early period when the capacity of the Committee to regulate production efficiently was being tested.

Even when truth is hard to establish in any particular question it does not follow that falsity is beyond detection, and while, owing to the difficulty of assessing the relative importance of the various factors involved, it was impossible to find any hard and fast definition of normality in stocks, the abnormal on either side of the normal was at times very easily detected.

The Committee was in fact during the course of regulation forced to proceed by trial and error, basing its decisions on the best information available; to an increasing extent it relied on the prevailing price and the trend of the market as a barometer of stock normality.

II

A word should be added regarding the Committee's consideration of the buffer stock problem.

As early as September, 1934* the Dutch delegation suggested the formation of a buffer stock, primarily with the object of reducing the price then prevailing. As will become evident in the next chapter, the Dutch Government was extremely anxious on administrative grounds to maintain the price of rubber at 4d. per lb. (gold), that is 6½d. per lb. sterling, any higher price being at that period liable to make native exports uncontrollable.

The proposal, which was really more a tentative suggestion than a seriously considered scheme, was discussed by the Committee and the Advisory Panel, One obvious difficulty was that to create an additional stock, and that was the purpose of the suggestion, at a time when stocks were excessive and required reducing, would be contrary to the Committee's mandate. Further it was generally admitted that the effect of the creation

* Recently some publicity has been given to the idea that buffer stock proposals were put before the Committee at an early date by Mr. Wm. de Krafft of the United States Rubber Company. This was not the case; Mr. de Krafft's buffer stock scheme was suggested by him as an alternative to the International Rubber Regulation Scheme, and was put forward before the Committee came into being.

of a buffer stock might be to increase rather than lower prices; a price movement of this character had recently been experienced in the case of tin. The upshot of the discussion was that no decision could be taken for the time being and that no action was required.

The next proposal before the Committee for the formation of a buffer stock came from the Rubber Manufacturers' Association of America through its representative on the Advisory Panel. This proposal, which was submitted on the 7th January, 1935, suggested " . . . that there should be established a reserve stock of crude rubber under the control of the International Rubber Regulation Committee, to be used for the purpose of preventing a speculative market, such reserve stock to be operated in a manner similar to that effective in connection with the control of the production of tin."

This proposal was down for consideration at the Committee's ninth meeting on the 26th February, 1935, but at that meeting Colonel Townsend,* said that since notifying the Committee of the proposal he had discussed the question privately with several members of the Committee, and had come to the conclusion that it was not an opportune time to pursue the suggestion. He therefore proposed that the matter should be left to the consideration of the Committee, and that it might be reported on at some subsequent date. The Committee agreed that the question should be kept in mind, and that the Chairman should be authorised to make such arrangements as he thought desirable to revive consideration of the proposal when it seemed opportune.

There was no further mention of a buffer stock scheme until the beginning of 1938 when Herr Otto Friedrich, the German representative on the Advisory Panel, mentioned the formation of a buffer stock as a possible means of improving the elasticity of the scheme. This suggestion was contained in a memorandum, presented by Herr Friedrich after consultation with the German rubber industry, with regard to the renewal of the Regulation Agreement.

About the same time Mr. Viles, the then American representative on the Advisory Panel, in discussing the renewal of the Agreement with a special sub-Committee, submitted a rough project of a scheme for the creation of a buffer stock. The American Government during the renewal negotiations also

* The United States representative on the Advisory Panel.

expressed the view " . . . . that confidence in the adequacy and stability of supply would be greatly increased if the proposed Agreement made provision for holding substantial stocks of rubber in or near the principal consuming areas, available for prompt release at any time—the so-called buffer stock idea."

At a meeting of the full Committee on the 29th March, 1938, Mr. Viles said that his Association had come to the decision that it would be wise to make provisions for a buffer stock proposal in the Agreement ; he did not ask for the adoption of his particular plan, but hoped that it would stimulate enough interest to enable the Committee to arrive at a more detailed project. During subsequent discussion Mr. Viles said that on reading a recent report on raw materials issued by the League of Nations* he had noted that the only imperfection found in the rubber regulation scheme was the absence of a buffer stock scheme. He said that his Association was thinking of some closer collaboration between producers and consumers, and that he intended to work out a more complete plan for a buffer stock which he would offer to the Committee later.

On the 26th July, 1938, Mr. Viles recurred to the question and presented a memorandum on the subject from the Board of the American Rubber Manufacturers' Association. A sub-Committee of the Association had considered the matter and had realised that, in order to be successful, buffer stocks must be controlled and managed by the Committee or by some body designated by it, and that they must be worked in conjunction with the fixation of the permissible exportable amounts. They appreciated that the Committee had controlled exports as efficiently as was possible in the circumstances, and that the administrative machinery of regulation had greatly improved ; but there was always the drawback of a certain time-lag between the fixation of a permissible exportable amount and the appearance of that rubber effectively on the market. He hoped that the Committee would carefully examine the proposals he had submitted, or any alternative method for coping with this time-lag.

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* Report of the League of Nations' Committee for the Study of the Problem of Raw Materials, 1937. Professor van Gelderen, Head of the Dutch delegation to the I.R.R.C. and Vice-Chairman of the I.R.R.C. at that date, was a Vice-Chairman of this League of Nations' Committee and one of the two members who drew up Annex II (On Buffer Stocks) to the Report.

The preamble to the Rubber Manufacturers' Association's recommendations stated :

> " Although it is believed that regulation of production and exports of crude rubber under the International Agreement has been carefully administered during the past five years, and that the Committee has endeavoured at all times to consider the welfare of producers and consumers based upon available information, there is always a period between the time when decision is taken and the actual effect that shortages or surpluses of rubber occur, and during this ' time-lag ' opportunity is afforded speculative interests to create market conditions detrimental to consumers and producers, which are not intended by by the Committee."

The memorandum went on to propose that, in order to minimise the adverse speculative activities due to this time-lag a reserve stock of crude rubber should be acquired. It was suggested that these stocks should be purchased at a time of low consumption and low prices and that releases should be made from them when consumption was increasing and prices were tending to increase above a reasonable figure. The buying and selling price limits should be definitely agreed upon between the Committee and the consumers and limits which might be considered might well be from 6d. to 8d. per lb. The stocks should consist of not less than 100,000 tons, of which 50 per cent. should be held in the U.S.A. and a like amount in the U.K. and the Continent of Europe. The stocks should be controlled by the Committee through a small management committee to be selected by it, and the financing of the stocks should be carried out by the countries signatory to the Agreement. To prevent deterioration of the rubber, it was suggested that 35 per cent. of the stocks should be turned over at least once a year.

The American recommendations had been received too near the date of the meeting for members to consider them carefully and it was agreed that the matter should be discussed fully at a later meeting. It was pointed out, however, that the proposals indicated an initial expenditure by signatory Governments of some £4,000,000, and it was suggested that members should ascertain the opinion of their Government before discussing the matter further.

The question was again discussed at the meeting held on the 15th November, 1938, and it was then apparent that the Government of North Borneo was the only one which had expressed its views on the R.M.A. proposal, and that these were unfavourable, both on financial and general grounds.

Mr. Viles again emphasised that he did not wish the Committee to consider only the R.M.A. proposals, but hoped it would investigate any devices which could be used to secure a more stable price for rubber.

It was suggested that the whole subject should be fully examined by the Secretariat, and the Chairman of the Netherlands delegation offered to prepare a memorandum giving the views of his delegation in order to stimulate discussion at a subsequent meeting. After further discussion it was agreed to consider the question at the next meeting and in the meantime to invite members to give their opinions in writing.

Before the next meeting, however, a letter was received from Mr. Viles asking that discussion on buffer stocks should be postponed until such time as his Association could present a plan that would be " more definite and designed to operate in a more normal economic world than exists at the present time." The item was then removed from the agenda, and in the absence of the promised plan no further Committee discussions on buffer stocks took place.

CHAPTER VIII

THE WORKING OF REGULATION 1934 & 1935

I

It will be easier to follow the ensuing narrative if the exportable percentages which were in force during the period under review are first set out in the following table. The bracketed figures refer to percentages which were fixed but revised before they came into force :

1934.	*per cent.*	1935.	*per cent.*
June/July ...	100	1st Quarter ...	75
Aug./Sept. ...	90	2nd ,, ...	(75) 70
Oct./Nov. ...	80	3rd ,, ...	(70) 65
December ...	70	4th ,, ...	(65) 60

1936.	*per cent.*
1st Quarter ...	60

This chapter deals with the work of the Committee from the commencement of Regulation in June, 1934, to the end of 1935, the running-in period. The Committee had to lubricate, set in motion, and adjust the machinery of regulation. It was faced with many difficult problems which it overcame successfully; by the end of 1935 the Regulation Scheme had been well tested, and was showing signs of working in a manner satisfactory to the Committee, the Advisory Panel, the producing territories and the general public.

The Agreement was signed on the 7th May, 1934. Siam had not yet joined the Regulation Scheme and in September, 1934, was insisting on a very large increase in the basic tonnages on which provisional agreement had previously been reached; further, the Government of India, who had signed the Agreement on behalf of India and Burma subject to certain reservations, put forward a claim in February, 1935, for increased basic tonnages for both countries for 1935 to 1938. In order to get these countries within the Regulation Scheme it was necessary to come to terms with them as soon as possible, and after negotiations and discussions extending over some months the Committee agreed to the basic tonnages demanded by both Governments.

For the remaining years of the first regulation period 1935 to 1938 inclusive Siam received an addition of 25,000 tons per annum, and India approximately 4,000 tons per annum. Burma received an increase of 1,250 tons for 1935 plus 500 tons for 1936; her basic tonnages for 1937 and 1938 remained unaltered. Siam retained in addition the special privilege conceded in the preliminary negotiations when her basic tonnages were provisionally fixed at 15,000 tons per annum, which guaranteed that, irrespective of the rate of release fixed for the other regulating territories, she should be allowed to export not less than 75 per cent. of her basic tonnages in 1935, 85 per cent. in 1936, 90 per cent. in 1937 and 100 per cent. in 1938.

An initial difficulty in the practical operation of the Regulation Scheme was the method of controlling native exports from the Netherlands East Indies. The absence of any detailed and precise information regarding the extent and ownership of native rubber gardens made it impossible to regulate native rubber exports by the method of individual control which was applied to estates in the Netherlands East Indies, and to estates and native holdings in most of the other regulating territories.

The Government of the Netherlands East Indies had therefore decided to regulate native exports by means of a variable export tax, designed to adjust the price received by the natives to whatever level might be necessary from time to time to bring their exports within the permissible exportable amount; the whole proceeds of the export tax were devoted to the benefit of the population in the rubber producing areas.

The difficulty of regulating native exports by this method was aggravated by the fact that, as the price rose in the months prior to the introduction of regulation from below 4d. per lb. to 6d. per lb., native exports increased to a level greatly in excess of their monthly share of the basic tonnage, even at 100 per cent rate of release. From the beginning of regulation, therefore, the Netherlands East Indies Government had to impose a heavy tax in order to bring native exports within their share of the basic tonnage; any rise in price and any reduction in the rate of release below 100 per cent. necessitated a still heavier tax.

The Government was reluctant to raise the export tax to very high levels and so reduce the price received by the native producer below a certain point, because, owing to the fall in

the value of other cash crops, an increasing number of natives were becoming dependent on the sale of rubber for obtaining the bare necessities of life.

It was also difficult to devise projects on which to spend for the benefit of the native population the very large sums accruing from the tax, and so compensate for the growing disparity between the world price received by estates and the price received by the native producers.

For these reasons the attitude of the Netherlands Government to regulation was determined at this stage by its desire to maintain a price at which it could control native exports by a relatively low export tax; it became known later that the maximum price level which, in its view, would meet this condition was 6½d per lb.

During 1934 and 1935 it became obvious that the system of controlling native exports was impeding the proper working of the regulation scheme, and that the scheme could only be worked as intended if the difficulties of the Netherlands East Indies Government were eased by a substantial increase in the Netherlands East Indies basic tonnages, in consideration for the replacement of the export tax at an early date by a system of individual control.

As the result of negotiations during 1935 the basic tonnages for the Netherlands East Indies were increased for the remaining years of the scheme by some 55,000 tons per annum, and the Netherlands East Indies Government gave the Committee an assurance that with these increases added to the native share of the basic tonnage, and with any additional internal adjustment that might prove necessary, it could work the regulation scheme effectively until such time as individual control for all its native producers could be introduced; it did in fact come into force as from the 1st January, 1937.

When considering the work of the Committee during 1934 and 1935, it is important to bear in mind this major difficulty, and to realise that the problem of controlling native exports determined to a very large extent the attitude of the Dutch delegation in the fixing of the rates of release during the period.

The Committee's mandate as laid down in the preamble to the Regulation Scheme was " to regulate the production and export of rubber in and from producing countries with the

object of reducing existing world stocks to a normal figure and adjusting in an orderly manner supply to demand and maintaining a fair and equitable price level which will be reasonably remunerative to efficient producers."

In its task of regulating exports by fixing periodically the permissible exportable percentage, the Committee was faced from the outset with many difficult problems of which the following were the more important; the reduction of world stocks in a manner acceptable both to producers and consumers; consideration of what would constitute in any given period (1) a normal world stock of rubber (2) a fair and equitable price level reasonably remunerative to the efficient producer; the building of an efficient statistical service essential to the working of regulation.

This chapter will show how the Committee discharged during the period under review its main function of determining from time to time the permissible exportable percentages. After a brief review of other important work carried out by the Committee, the chapter will end with an attempt to sum up and assess the work accomplished during this period.

II

When regulation came into force on the 1st June, 1934, world stocks of rubber indicated by the figures available were 735,000 tons divided as follows:

Stocks outside regulated areas in producing countries	110,000 tons
Stocks in U.K. warehouses	96,000 ,,
Stocks with U.K. manufacturers (est.) ...	32,000 ,,
Stocks in the U.S.A.	355,000 ,,
Stocks afloat	142,000 ,,

Expressed in terms of current absorption 735,000 tons represented 9½ months' requirements, and U.S. stocks represented 8½ months' current U.S. requirements.

The Committee determined to reduce exports gradually, and that for several reasons. It was anxious, especially in the absence of the Advisory Panel, who had not yet been appointed, to allay any anxiety felt by consumers, and to show them that the Committee had no intention of acting drastically in disregard of their interests. It was necessary also to allow

the regulating territories time to organise and adjust the machinery of regulation; the Netherlands East Indies Government in particular needed time to gain control of native exports.

The Committee decided to introduce regulation of exports as from the 1st June, the earliest practical date for enforcement, by fixing the following percentages for the remainder of 1934:

	per cent.
June/July ...	100
Aug./Sept. ...	90
Oct./Nov.	80
December ...	70

Any monthly deficiencies or excesses were to be adjusted at any time during the period.

This decision was equivalent to a release of 87.1/7 per cent for the seven months' period, but had the advantage of bringing the rate of release down to 70 per cent at the end of 1934, with the idea that this rate of release could be continued if desirable in 1935. The effect was to limit exports for the seven months' period to an amount which, it was estimated, would approximately equal world absorption during the same period.

The policy pursued by the Committee was in fact so cautious that by the end of the year world stocks had only been reduced by 9,000 tons to 726,000 tons divided as follows:

Stocks outside regulated areas in producing countries	67,000 tons
Stocks in U.K. warehouses	135,000 ,,
Stocks with U.K. manufacturers	43,000 ,,
Stocks with U.S. manufacturers	244,000 ,,
Stocks with U.S. dealers, etc.	111,000 ,,
Stocks afloat	126,000 ,,

Total world stocks were still equivalent to 9½ months' current absorption, while those in the U.S.A. had increased relatively to over 9 months' current absorption, although remaining at the same actual figure of 355,000 tons; stocks in the U.K. had increased considerably. One of the factors which had contributed to heavy stocks had been forestalling exports made immediately before the Agreement came into force.

In these circumstances the maintenance of the 70 per cent. rate of release for the first quarter of 1935 seemed imperative, but both the Advisory Panel and the Dutch delegation were for different reasons anxious for an increase. The former were plainly apprehensive at this stage as to the effectiveness of the Committee's machinery ; the latter were faced with the difficulty, to which reference was made above, of controlling the exports of native rubber if the price level was maintained at a higher figure than 6½d. ; the price when the decision was taken was about 6⅝d. and there was some reason to suppose that a decrease in production would raise it.

It was these considerations, and particularly the difficulties of the Netherlands Government, which induced the Committee to raise the exportable percentage for the first two quarters of 1935 to 75 per cent. It was evident, however, that regulation on this basis was in the long run unworkable ; it in fact meant that exports were regulated not by reference to the fair and equitable price level reasonably remunerative to efficient producers, but by the level at which the Dutch could control their native exports. There was no reason *prima facie* why the price level at which an export tax on native rubber in the Netherlands East Indies could be successfully operated, which was determined by one set of circumstances, should coincide with the equitable price level for the efficient producer, which was determined by an entirely different set of circumstances.

When fixing the second quarter's percentage the Committee had announced a reduction to 70 per cent for the third quarter in the hope and expectation that the prospective reduction in supplies would serve to maintain the price ; in fact the price sagged to 5¼d., and permissible exports for the second quarter were, with the full agreement of the Dutch delegation, reduced to 70 per cent., the figure for the third and fourth quarters being fixed at the same time at 65 per cent.

It may be noted that this marks the first occasion when the Committee acted to vary a decision which had already been taken and announced ; its power to do so was one of the flexible elements of the scheme and its readiness to exercise it was a signal to the markets of its determination to carry out its mandate. In the course of the year it became clear that unless the decision regarding the last quarter were varied it was extremely unlikely that there would be a reduction over

the whole year of 100,000 tons in the stocks, a target which the Advisory Panel had accepted as reasonable. Declared stocks in the U.S. and United Kingdom had actually increased between 1st May, 1934, and 1st May, 1935, by over 60,000 tons, while the price had fallen by 2d. to a figure at which it was certainly unremunerative to the efficient grower. The rate for the last quarter was accordingly revised and fixed at 60 per cent.

In 1935 the Committee was largely but not completely successful in its effort to reduce world stocks at the rate of 100,000 tons per annum until a normal stock was achieved. As the following figures show, stocks at the end of the year had been reduced by another 80,000 tons to 645,000 tons, divided as follows :

Stocks outside regulated areas in producing countries	38,000 tons
Stocks in U.K. warehouses	164,000 ,,
Stocks with U.K. manufacturers	45,000 ,,
Stocks with U.S. manufacturers	180,000 ,,
Stocks with U.S. dealers, etc.	132,000 ,,
Stocks afloat	86,000 ,,

Expressed in terms of current consumption world stocks represented about 8¼ months' requirements, while those in the U.S. had dropped to roughly 7½ months' U.S. requirements. Two facts are outstanding in the above stock figures. Firstly, it will be observed that the reduction in U.S. stocks took place only in those held by the manufacturers—possibly a reflection of their confidence in the Committee. Secondly, it will be noted that warehouse stocks in the U.K. had greatly increased. This was an indication that there was still too much rubber on the market, as it was to the U.K. warehouses—the world's ultimate reserve of crude rubber—that rubber gravitated when there was no purchaser elsewhere. It will also be noted from the above figures that stocks awaiting shipment and stocks afloat had been greatly reduced, the natural result of the reduced rates of release.

Before the year finished it was, of course, necessary to consider the rates of release for 1936 and it is convenient at this point to record the decision taken since it rounded off the work accomplished by the Committee in the period under review.

The decision for the first quarter of 1936 was taken with the knowledge that there would be increases in the basic tonnages assigned to the Netherlands East Indies large enough to facilitate the control of native exports. A disturbing factor was thus removed and it was possible to concentrate on the systematic reduction of stocks. A figure of 60 per cent. was fixed for the first six months of 1936 with the full concurrence of the Advisory Panel, subject to the usual proviso that the decision could be revised at any time if desirable; this rate was equivalent to 67½ per cent. of the 1935 basic quotas.

III

Before we attempt to assess the work of the Committee during the period under review in its main task of fixing the exportable percentages, a brief reference should be made to other important work which it performed.

The settlement of new basic tonnages for Siam, India and Burma to secure their adherence to the regulation scheme, and the revision of the Netherlands East Indies basic tonnages, have already been mentioned. In addition the Committee examined and rejected claims for revision of the basic tonnages for North Borneo and Ceylon.

At the request of the Committee a formula for determining the costs of production on estates was devised by an expert Committee of the Rubber Growers' Association, and was agreed by the Dutch Association (Internationale Vereeniging voor de Rubbercultuur). It was discussed on several occasions by the Committee and the Advisory Panel, and with some slight alterations was accepted by both parties. From 1935 onwards monthly or quarterly returns were received from a large percentage of the estates in the producing territories. When the formula was devised no one could know how the costs would work out, nor could anyone question the accuracy of the returns. There was, however, room for difference of opinion as to the cost level of the efficient estate and as to what influence native costs exercised in determining the level of efficient producers as a whole. These points formed the subject of discussion from time to time, and no precise decision was ever taken by the Committee as to what constituted at any given time a price level reasonably remunerative to the efficient producer—a difficult theoretical question to which more extended reference will be made in the concluding chapter. But allowing for some difference of opinion

as to interpretation, these costs of production figures were accepted as significant indicators, and from 1936 onwards the views of the Committee and the Advisory Panel on a reasonable price level were influenced by them to an increasing degree. Appendix iii gives the formula under which the cost returns were presented to the Committee.

A plan for an international rubber research scheme, linking national research institutes in England, France and Holland, was put forward in accordance with Article 19 of the Agreement, and accepted by the signatory Governments. The history of this very important development is recorded in Chapter VI.

The organisation of an efficient statistical service and the publication of a statistical bulletin were two of the earliest tasks undertaken by the Committee, and were essential to its work.

In considering the work of the Committee in the period here reviewed it may be stated with some confidence that it was undoubtedly right to bring the necessary regulation into effect by gradual stages and that it showed considerable skill and prudence in its original decision, which maintained a high rate of release for the first seven months of regulation and yet reduced the theoretical rate of release to 70 per cent. by December, 1934.

During 1935 the work of the Committee was seriously impeded by the difficulties of the Netherlands East Indies Government. If the Committee had not been hampered by this difficulty it would undoubtedly have begun the year with a 70 per cent. rate of release, and would have been able to make its subsequent decisions without the revisions that characterised the period. The attitude of the Advisory Panel underwent a considerable change as experience was gained. In October, 1934, it was nervous regarding the working of regulation and its effect on price, and unwilling to advise any reduction in the very heavy world stocks. In 1935 it showed much greater confidence in the working of the scheme ; it accepted the necessity for reducing world stocks, and itself suggested a reduction of 100,000 tons a year as a reasonable objective. Its advice as regards the rates of release at the earlier meetings in 1935 was based to some extent on an estimate of absorption that was not realised ; the final total for the year fell half way between its early optimistic estimates and later pessimistic ones. Towards the end of the year its views approached much nearer to those of the Committee.

In general, it may be said that in the period under review the Committee had overcome some major difficulties and had shown that it exercised full control over exports. It had made some progress in its first objective of reducing existing world stocks to a normal figure. It had made clear its intention to work the scheme in accordance with its mandate, it had gained the confidence of the Advisory Panel by its prudent policy, and it had discouraged speculation by the moderation of its decisions. It had in fact proved that the machinery of the Regulation Scheme could be worked successfully and had demonstrated its desire to work it with moderation. It must be admitted that it was greatly assisted by the general improvement in business conditions, and by the relative stability of consumption at a yearly figure some 100,000 tons in excess of 1933 absorption, and 250,000 tons above absorption in 1931 and 1932; but for these conditions lower rates of release would have been necessary, and the rise in the price level would have been much slower.

CHAPTER IX

THE WORKING OF REGULATION 1936 TO 1938

I

The exportable percentages in force during this period were as follows :

1936.		*per cent.*	1937.		*per cent.*
1st quarter	...	60	1st quarter	...	(70) 75
2nd ,,	...	60	2nd ,,	...	(70) 80
3rd ,,	...	65	3rd ,,	...	(85) 90
4th ,,	...	65	4th ,,	...	90
1938		*per cent.*	1939		*per cent.*
1st quarter	...	70	1st quarter	...	50
2nd ,,	...	60			
3rd ,,	...	45			
4th ,,	...	45			

It should be emphasised at the outset that since the basic tonnages of 1936 were considerably higher than those of 1935 the 60 per cent. fixed for the first quarter of 1936 represented the production of considerably more rubber than 60 per cent. in 1935. The Committee, in maintaining the 60 per cent. rate, had in fact decided that the output should be larger ; the equivalent rate of release applied to 1935 tonnages would have been 67½ per cent.

By the end of 1935 the running-in period had ended and the next three years, which contained every variety of economic weather, tested the machinery of regulation to the utmost. A period of growing prosperity during 1936 rose to a sharp and short-lived boom in 1937 and was followed with unexpected suddenness by an acute depression in 1938, which again began to lift towards the end of the year.

It will be remembered that at the end of 1935 world stocks were equivalent to rather more than eight months' requirements. The price, which had not budged far from the sixpenny level, was too low to be generally remunerative—a fact admitted by the Advisory Panel. It began to rise in 1936 and it was 7½d. when in April the Committee fixed the quota for the second half of the year on the advice of the Advisory Panel at 65 per cent.

It was estimated that on this basis stocks would be reduced by a further 125,000 tons by the end of the year; the Advisory Panel gave an assurance that manufacturers would support the existing price level.

Actually absorption greatly exceeded estimates, and the reduction in stocks at the agreed rates of release was far greater than anticipated. At the end of 1936 world stocks were down to 464,000 tons, a decrease in the year of 181,000 tons. These stocks were divided as follows:

Stocks outside regulated areas in producing countries	35,000 tons
Stocks in U.K. warehouses	79,000 ,,
Stocks with U.K. manufacturers	24,000 ,,
Stocks with U.S. manufacturers	157,000 ,,
Stocks with U.S. dealers, etc.	66,000 ,,
Stocks afloat	103,000 ,,

Total world stocks now represented only 5½ months' current requirements while those in America were just 4½ months' current U.S. absorption. Stocks in U.K., both warehouses' and manufacturers', and stocks with U.S. dealers, etc., had been halved, while other stocks remained at about the same levels as at the end of 1935.

There was no reason to envisage so considerable a reduction in stocks when the decision was taken to fix 70 per cent. for the first six months of 1937, but stringency began to develop during November and December and the Committee found it expedient to reconsider its decision in the middle of December, by which time the price had risen to 9¼d. per lb. It was already estimated that stocks at the end of the year would prove to be 40,000 tons below the estimate accepted when the 70 per cent. quota was fixed. The Advisory Panel were of the opinion that these stocks, representing five months' requirements of the estimated absorption in 1937, were too low and recommended an 80 per cent. quota for the first two quarters of 1937, which was calculated to produce a small increase in stocks.

The Committee was not anxious to see a further rise in the price level and was prepared to go far to meet the wishes of the Advisory Panel. There was ground for thinking, however, that a rise from the 65 per cent. in force at the moment to 80 per cent. was too steep, especially in view of the fact that once again the basic tonnages were higher in the succeeding year, and that 80 per cent. in 1937 corresponded to 83 per cent.

in 1936. While there was no reason to suppose that the basic tonnages exaggerated productive capacity, there were practical difficulties in stepping up production too quickly, and as the first quarter was a poor yielding one, owing to wintering conditions, there was reason to be afraid that 80 per cent. could not be produced at such short notice.

The Advisory Panel appreciated the force of these suggestions and expressed itself as satisfied with a decision to fix 75 per cent. for the first quarter and 80 per cent. for the second.

With the price varying between 10¼d. and 11d. and the exercise of pressure by the U.S. Government to secure an upward revision of the rates of release, the Committee reviewed the situation towards the end of January, 1937. The Advisory Panel recommended a quota of 90 per cent. for the second and third quarters of 1937 and suggested that the Committee should make a public statement to the effect that it intended to keep stocks at all times at a level sufficient for business needs, that it viewed with great disfavour speculative movements designed to hinder this object, and that it would do everything in its power to achieve it.

The Committee was strongly opposed to so steep a rate of increase in so short a period; a rate of 90 per cent. would demand the production of nearly half as much again as was being produced three months earlier. There was a serious danger that this would entail disorganisation owing to competition for a limited supply of labour in the territories, and the final result might be the production of less rather than more rubber. Tapping, it may be observed, is a highly skilled operation and the supply of tappers can only be gradually augmented.

In the circumstances the Committee decided to make no change for the second quarter but to raise the quota to 85 per cent. for the third quarter. In announcing its decision it attempted to meet the views of the Advisory Panel by expanding its usual communique and reaffirming its desire to maintain at all times a supply of rubber adequate to consumers' needs.

By the middle of March the price was 11¾d. per lb. and world stocks had fallen by 30,000 tons since the beginning of the year; they were still equivalent to nearly five months' requirements. Unfortunately a general rise in all commodity prices was being encouraged by speculative activity, and this was producing a shortage of spot rubber supplies.

The Advisory Panel expressed great concern at the position ; it asked that the quota for the third and fourth quarters should be fixed at 90 per cent. and that the producing territories should have every encouragement and facility to export the permitted amounts at the earliest possible dates. Its recommendation was based on the assumption, which might prove too conservative, that absorption in 1937 would not exceed 1,100,000 tons. It informed the Committee that the present shortage had arisen in spite of the fact that manufacturers had as far as possible kept off the market ; its main concern was that there should be an early increase in supplies.

As has been observed above, there was a general rise in commodity prices and the rise in rubber was not out of proportion, all things being considered, to the rise which was taking place in such representative commodities as wheat, lead, copper and zinc ; further, the supply situation had been aggravated by shipping difficulties in the Far East. It was obvious, however, that some remedial action had to be taken in a situation which threatened to become out of hand, and the Advisory Panel's wish was met by a decision in favour of 90 per cent. for each of the last two quarters, a rate calculated to add 70,000 tons to world stocks in the course of 1937.

In the course of the summer a change began to set in, though neither its direction nor extent could be clearly discerned until later in the year. The price which had touched what eventually proved to be its highest point in the " boomlet " of 1s. 1¼d. per lb. on the 30th March, had fallen to 9d. by July, by which time world stocks, which approximated to 4½ months' current absorption, had ceased to decrease and were likely to increase by 80,000 tons by the end of the year. The Advisory Panel would have welcomed an increase in production, but there was nothing either in the known facts or in accepted and responsible estimates for the future which suggested to the Committee the advisability of increasing the 90 per cent. quota for the second half of the year.

If the picture had begun to alter in the summer its principal features had been changed almost out of recognition by the end of November, when the quota for the 1st quarter of 1938 was fixed at 70 per cent. Perhaps the most striking evidence of the change in the general economic situation was the

drop in the American index of steel activity from 80 per cent. at the end of August to 29.6 per cent. at the end of November. The absorption of rubber, so far from having been underestimated, appeared in the light of the latest figures to have been over-estimated by some 50,000 tons, and it was expected that by the end of the year stocks would be equivalent to nearly six months' requirements at the lower level of activity expected in 1938. The quota of 70 per cent. was calculated to equate supply to demand without affecting stocks; it was the rate suggested by the Advisory Panel and accepted by the Committee with misgivings, which turned out to be well founded, as to the reliability of the estimates of absorption on which it was based.

The actual stock figures at the end of 1937 were 532,000 tons, divided as follows:

Stocks outside regulated areas in producing countries	55,000 tons
Stocks in U.K. warehouses	58,000 ,,
Stocks with U.K. manufacturers	22,000 ,,
Stocks with U.S. manufacturers ...	167,000 ,,
Stocks with U.S. dealers, etc.	95,000 ,,
Stocks afloat	135,000 ,,

Expressed in terms of current consumption world stocks were equivalent to over 5¾ months' requirements, while stocks in the U.S.A. had also risen to 5¾ months' current U.S. absorption. The large increase in afloats and in stocks awaiting shipment caused by the higher rates of release will be noted, and this increase was reflected in the U.K. warehouse stocks later on.

These figures were before the Committee when it met at the end of January, 1938, to fix the quota for the second quarter. The Advisory Panel, while admitting the continued uncertainty of the situation, professed to detect signs that the depression in America was lifting. It was true that the price was unremunerative—it was then 7¾d.—and that one incentive to speculation had disappeared with the demonstration that the producing territories could produce 90 per cent., and probably more than 90 per cent. if required. At the same time it was nervous lest a further lowering of the rate of release might coincide with the return of prosperity and recreate the situation which faced the Committee at the end of 1936 and the beginning

of 1937. While it had cut down its estimate of American absorption from 291,000 tons to 248,000 tons for the first half of the year, it fully expected that the lower estimate would be realised.* On all these grounds it recommended that the 70 per cent. quota should be maintained for the second quarter.

Once again the Committee's judgment was at variance with that of the Advisory Panel. There was unanimous agreement that world stocks were rising to undesirable heights and would have to be reduced; the only question was whether a 65 per cent. or 60 per cent. quota should be fixed for the second quarter and the lower figure was ultimately chosen.

The further course of events confirmed the wisdom of the Committee's decision. Two months later, when it met to fix the quota for the third quarter, the price had fallen by 1d. to 6¾d. World stocks at 565,000 tons were equal to 7½ months' absorption, if absorption were taken at 900,000 tons; it was in fact estimated at a maximum of 920,000 tons and a minimum of 870,000 tons.

The Advisory Panel was now as convinced as the Committee that improvement in the price level was desirable and a considerable reduction in the rate of release necessary. Its only anxiety was that the cut should not be so large as to make it difficult to raise the rate of production rapidly if and when the depression lifted.

In spite of the difficulties and hardships which would be inflicted on all the producing territories by so drastic a reduction, there was considerable support for a rate of 40 per cent. for the third quarter. Surplus labour, it was hoped, could be largely retained and employed in replanting and preparing the ground for new planting in 1939. On the other hand some members, and the Dutch delegation specially, thought that the possible increase in price and rapid reduction in stocks would not compensate for the great administrative difficulties which so sharp a reduction would cause. In particular it would necessitate the repatriation of large labour forces from Sumatra and make the return to higher production at short notice appreciably more difficult. With alternative suggestions based on these two sets of considerations of 40 per cent. and 50 per cent., the Committee finally agreed on 45 per cent. for the third quarter.

* In fact even the lower figure proved to be about 70,000 tons too high.

In the course of the summer the price recovered to 7¾d. and there were definite signs of an improvement in business conditions in America. When the Committee met in September to consider the fourth quarter's quota, stocks had fallen by some 27,000 tons, but were still equivalent to seven months' requirements. Somewhat surprisingly, estimates for absorption in America in the last quarter had been reduced and the total absorption for the year was not expected to reach 900,000 tons, which was the figure expected as probable when the quota for the third quarter was fixed. The Advisory Panel recommended an increase in the quota to 50 per cent., but the Committee felt that the Panel's belief in improving business conditions was unsupported by any convincing figures and difficult to reconcile with the Panel's own estimate of a reduction in American absorption ; it was unanimous in its view that the quota should remain unaltered at 45 per cent. for the fourth quarter.

When towards the end of the year the Committee met to fix the rate of release for the first quarter of 1939 the price was 8¼d., and it was estimated that world stocks at the end of the year would be equivalent to roughly six months' current requirements.

The Advisory Panel was inclined to be optimistic regarding the immediate future and apprehensive regarding any further fall in stocks. On its own estimates of absorption it considered that a balance would be struck by a quota between 55 per cent. and 60 per cent. and it strongly recommended that the rate of release should be raised accordingly.

It is important to bear in mind once again that in 1939 the basic tonnages rose, on this occasion by 200,000 tons, with the result that an unchanged quota would in itself have produced an additional 90,000 tons.

The Committee could accept the view that there were definite signs that the bottom of the depression had been passed, and that there were solid grounds for expecting further improvement, but was not persuaded that world stocks had been reduced to a dangerous level. It was, however, anxious on all grounds to raise the quota in spite of some nervousness as to the effect this might have on the price level, and it accordingly fixed the rate of 50 per cent. for the first quarter of 1939, which was calculated to produce the same amount of rubber as 56 per cent. would have produced in 1938 ; in fact, the rate for the first quarter of 1939 was 11 points higher than that for the last quarter of 1938.

The history of the year 1938 is reflected in the stock figures. Starting from 532,000 tons at the end of 1937 they reached a maximum of 568,000 tons by the end of April. By that time the drastic reduction in the rate of release had begun to take effect and stocks moved downward. By the end of December they had been reduced over the year by 67,000 tons to 465,000 tons, divided as follows :

Stocks outside regulated areas in producing countries	38,000 tons
Stocks in U.K. warehouses	87,000 ,,
Stocks with U.K. manufacturers	19,000 ,,
Stocks with U.S. manufacturers	112,000 ,,
Stocks with U.S. dealers, etc.	119,000 ,,
Stocks afloat	90,000 ,,

The total stocks of 465,000 tons were equivalent to six months' current absorption while stocks in America represented nearly 6½ months' current U.S. absorption. It will be noted that while stocks in U.K. warehouses increased during the period stocks in the hands of U.S. manufacturers dropped considerably.

The drop in the figure of stocks with the U.S. manufacturers from 167,000 tons at the end of 1937 to 112,000 tons at the end of 1938 was in part attributable to the fact that the manufacturers used their stocks of rubber to satisfy part of their current requirements in spite of the fact that the price was low. The task of adjusting supply to demand was proportionately aggravated. The Committee, who would have been glad to increase the low rate of release in the second half of the year, more than once drew attention to this factor in the situation, and suggested that if manufacturers would increase their stocks the export percentage could be raised more rapidly.

It may also be noted that stocks inside regulated areas increased by over 20,000 tons, or by 20 per cent, in the course of the year, which may be attributed to a recommendation by the Committee that larger stocks should be held in this form in order to mitigate the burden which the sharp reduction in the rate of release placed on producers. The fall in stocks awaiting shipment and stocks afloat was a natural result of the lower rates of release prevailing.

II

During part of the period under review the Committee devoted much time to its recommendations for the continuation of regulation after 31st December, 1938.

It also paid considerable attention to examination of the costs of production returns. Costs were, of course, influenced to a greater or lesser degree by the rate of production, and other unstable factors; they varied accordingly from time to time, but during the period under review the general level of average costs over a whole year seldom varied by more than ¼d. up or down. It has already been noted that the examination of these cost returns exercised an increasing influence on the Committee's view regarding a reasonable price level. The extent of this influence is shown by the fact that the Advisory Panel in July, 1937, referred to a price between 8d. and 10d. as the level which had been indicated as reasonably remunerative for the efficient producer.

The costing formula will be given in Appendix iii and it is fair to say that returns received from 1935 onwards indicated a price round about 6d. to 6½d. as the average cost of estate producers in Malaya; costs in Ceylon were somewhat higher, and in the Netherlands East Indies and French Indo-China after devaluation of the guilder and the franc somewhat lower. Assuming a modest return for tropical enterprises of 7½ per cent. on invested capital, a price level of over 8d. was indicated as the lowest reasonably remunerative level for the average estate.

It is important to bear this point in mind when considering the work of the Committee during this period. Although the Committee based its decisions mainly on the stock position in relation to estimated consumption, the price level was a barometer which it watched with close attention and which influenced its decisions from time to time. At times of very low prices or when prices were rising too rapidly as in 1937, the price level tended to become the dominant factor.

At the beginning of the period the Advisory Panel as well as the Committee was agreed on the necessity for a further considerable reduction in world stocks, and with rising absorption and a 60 per cent. quota a rapid reduction of stocks was in full swing by the end of 1935 and during the first half of 1936. Later it became clear that the reduction in stocks in 1935 had been greater than anticipated, and on the advice of the Advisory Panel the rate of release was raised for the second half of 1936, but with absorption still rising the rapid reduction in stocks continued. However, in spite of the fact that the fall in stocks

was greater and faster than was expected, the price remained round the 7½d. level from February till October and did not reach 8d. till the end of that month. Probably the position in 1937 would have been eased to some extent if the quota for the last quarter of 1936 had been raised. It is, however, very doubtful whether any action which could reasonably have been taken by the Committee would have averted the sudden steep rise in price from 7¾d. in October, 1936, to 1s. 1¾d. in March, 1937.

In the circumstances existing in 1936 the Committee was bound to follow a policy of stock reduction and could not have raised the quota for the last quarter higher than 70 per cent. This contention is strengthened by the fact that even at the end of October the Advisory Panel accepted 70 per cent. as a reasonable rate of release for the first quarter of 1937. The subsequent price rise was due not so much to rising absorption and falling stocks as to a sudden wave of speculation which affected all commodities. In the case of rubber this wave of speculation was stimulated by various causes, of which perhaps the most important was the idea which gained widespread currency that some of the territories could not produce the permitted amounts. Other causes were the failure of native exports from the Netherlands East Indies in the early months of the year to reach their quota due to the change over from the export tax system to the system of individual quotas, and a shipping strike in America which delayed the arrival of rubber from the producing territories.

By raising the quota to 75 per cent. and 80 per cent. for the first two quarters and 90 per cent. for the last half of 1937 the Committee showed its determination to defeat speculation and maintain ample supplies and a moderate price policy. The Committee rejected the advice of the Advisory Panel to grant still higher quotas because it feared that a too sudden expansion might lead to labour difficulties, less rubber, more speculation, and higher prices. It was, however, quite as anxious as the Advisory Panel to get out the largest possible quantities of rubber in the shortest possible time.

When in March the 90 per cent. quota was fixed for the second half of the year, consumption for 1937 was expected to exceed 1,100,000 tons and to reach a still higher level in 1938. No one at that time, or even as late as September, foresaw, or could possibly have foreseen, a drop in absorption during 1938 of some 200,000 to 300,000 tons below the then expected level.

The high rate of absorption continued till September and the price remained at or above the 9d. level. It was only in the last quarter of 1937 that falling absorption and rapidly rising stocks heralded a fall in price to the 7d. level. Even then the extent of the depression was not realised and estimates for 1938 absorption at the end of November were still round the 1,100,000 tons level, as compared with actual absorption of 934,000 tons.

The difficulty of forecasting the future in times of exceptional trade depression was well illustrated by the fact that at the end of November, 1937, the Committee was advised that American absorption for the first two quarters of 1938 could be calculated at 291,000 tons while the realised figure was 181,000 tons.

During this period the Committee was not unnaturally quicker than the Advisory Panel to see the necessity for a rapid reduction in the rate of release in spite of the too optimistic estimates of absorption given in the earlier part of the year. As always when the production tap was rapidly opened or closed, some months elapsed before the effect of a decision was felt, and the rise in stocks continued till April. In May the price touched 5½d. Gradually, however, as the stock position improved the price rose again to 7½d. By the end of the year the trough of the depression had been passed, absorption was rising and the price had passed the 8d. level.

In summing up the work of the Committee during this period it may be said (1) that the quotas fixed for 1936 were reasonable in the circumstances (2) that a higher quota for the last quarter of 1936 would have been beneficial but would probably have made little or no difference to the price rise in 1937 (3) that given the price rise and the prevailing market and consumer psychology, the Committee had no alternative to raising the quotas in 1937 as it did, and may claim some credit for not being forced to even higher levels, and (4) that the depression at the end of 1937 and in 1938 came so suddenly and unexpectedly on top of the 1937 boom that there was no escape from a drastic reduction of the quotas; perhaps if estimates of absorption in 1938 had been less optimistic the earlier reductions would have been even greater and a rate as low as 45 per cent. might then have been avoided.

CHAPTER X

THE WORKING OF REGULATION— JANUARY 1939 TO MAY 1940

I.

The exportable percentages in force during this period were as follows :

1939	*per cent.*	1940	*per cent.*
1st quarter ...	50	1st quarter ...	80
2nd ,, ...	50	2nd ,, ...	80
3rd ,, ...	(55) 60		
4th ,, ...	(60) (70) 75		

With this period we are beginning to move into war conditions. While war was nowhere thought inevitable, except perhaps in countries which were bent upon it, preparation for war in the shape of heightened armament programmes was gradually becoming feverish. Rubber was no more immune than any other raw material from the repercussions of rearmament.

Within the period the practice and technique of regulation was influenced to a considerable extent by the experiences of 1937 and 1938, which have just been described. The high 1937 releases had proved that the capacity of the producing industry was much greater than had at one time been generally believed and that the demands of the consuming industry could be met even at levels of absorption far above the 1937 level. The 1939 basic quotas were some 200,000 tons higher than in 1938 and no less than 450,000 tons higher than in 1935 ; whereas in 1937 doubts had been entertained regarding the ability of the industry to produce 1,100,000 tons, it was now generally accepted that 1,500,000 tons was well within its capacity..

Recent events had again demonstrated the great variations in absorption that might occur between one year and another, and the difficulty of maintaining, in the face of violent fluctuations in demand, that relative stability of price which was as much desired by manufacturers as by producers. The influence of these experiences may be traced in the changing stock policy of manufacturers and in the more cautious release policy of the Committee.

At the end of 1937 and during the first half of 1938 manufacturers built up their stocks to a high level, but during the latter part of 1938 and up to the outbreak of war, against the advice of the Committee, they steadily reduced their stock holdings although prices remained around the 8d. level. At the same time by increasing their forward purchases they indicated their confidence that, provided their future requirements were sufficiently covered, they would be safeguarded from any danger of shortage by the fresh supplies of rubber that would be made available by the Committee to meet any increased demand. This policy meant that world stocks could now fall with little, if any, effect on price to a level well below that which in 1937 created alarm and a steep rise in price.

It seems probable that had war not intervened the carrying of relatively low world stocks, equal to perhaps four months' absorption, would have become characteristic in the industry under regulation. In these circumstances, and particularly having regard to the fact that the average price throughout the period of regulation from May, 1934, to the end of 1938 was only 7½d. per lb. (15½ U.S. cents per lb.), it was natural that the Committee should adopt a more cautious release policy.

The first half of the year 1939 was uneventful; there was no pronounced change in economic conditions but some considerable uncertainty as to probable demands for rubber owing to sporadic strikes in the motor car factories of U.S. In spite of a plea from the Advisory Panel, supported by a message to the British and Dutch delegations from the U.S. Government, for a somewhat higher quota the Committee maintained through the second quarter the rate of 50 per cent. which had been fixed for the first quarter.

Without any very pronounced indication of such a change in market conditions as would justify the production of increased supplies, the Committee raised the quota to 55 per cent. for the third quarter. It was influenced to a considerable extent by the fact that stocks in America had fallen by 80,000 tons in the preceding ten months and that the Advisory Panel felt that the stock position had thereby been corrected. It also gave some weight to the expectation that there would be a great increase in demand for latex for the manufacture of sponge rubber upholstery if the price of rubber remained reasonably stable at about 8d. Incidentally, at the meeting at which the third quarter's quota was fixed the American member of the

Advisory Panel commented favourably on the high degree of efficiency obtained by the Committee in regulating supplies, and on the remarkable stability of price which had been maintained for a long period. The latter phenomenon he attributed largely to the new buying policy adopted by American manufacturers of maintaining lower stocks in their possession, while increasing their holdings of afloat and forward rubber. He considered it doubtful whether under these conditions dealers and brokers would ever again carry large stocks as a speculation on a future rise in price.

The second half of the year found the Committee involved in the first of those special wartime stock purchases which were thenceforth, until the outbreak of the Japanese war, to be almost the exclusive object of its activities and its main anxiety.

A few days before the Committee meeting to fix the quota for the fourth quarter it was officially informed that an agreement had been signed between the Governments of the U.K. and U.S. for the exchange of cotton and rubber; this agreement came to be known as the "barter" agreement. The Committee had no prior knowledge of it and was not consulted as to its terms. Its full text is printed in Appendix iv and the following are the main points which concerned the Committee.

(1) 600,000 bales of cotton were to be exchanged for an equivalent value of rubber originally estimated at 85,000 tons, and ultimately revised to 90,000.

(2) The rubber was to be made available for inspection and acceptance within a period of six months from a date to be agreed upon by the two Governments.

(3) If either Government found that delivery was likely to restrict supplies available to commercial markets unduly, or to stimulate undue price increases, the two Governments would consult with a view to postponing delivery, or taking such other action as might be necessary.

(4) The intention of the two Governments was to acquire reserve stocks of cotton and rubber respectively against the contingency of a major war. Each Government undertook not to dispose of its stocks (otherwise than for the purpose of replacing such stocks to prevent deterioration) for a period of seven years, except in the event of such a major war emergency.

(5) The Government of the United Kingdom would do its best to secure release under the regulation scheme of the amount of " barter " rubber required in addition to the amount released for current consumption and other needs.

As the legislation necessary to implement the agreement had not yet been passed in either country the Committee decided to confine itself at the moment to fixing the rate of release required to satisfy commercial demands, with the intention of raising the rate to such a figure as might be necessary to satisfy " barter " requirements when the British Board of Trade should have completed its arrangements.

As regards the purely commercial quota, the factors in the situation were that the price was firmer at 8¼d., that stocks at the middle of the year were equivalent to less than four and a half months' requirements, and that at the higher rate of absorption which was expected stocks would probably not exceed four months' requirements by the end of the third quarter. The Advisory Panel felt that stocks were reaching a dangerously low level and advocated either 60 per cent. for the third quarter and 60 per cent. for the fourth quarter, or a quota of 65 per cent. for the fourth quarter if it were felt that no change could be made in the third quarter.

Political and economic conditions were so uncertain that the Committee had inevitable difficulty in deciding the course to follow. There was still labour trouble in the American motor car industry, and its duration was uncertain. If the political situation deteriorated it was impossible to foretell whether this would produce a temporary cessation of buying or stimulate it to the verge of panic. Though conscious of the need for caution and of the administrative difficulties which would be involved by a retroactive decision, especially among native producers in the Netherlands East Indies, the Committee eventually decided to accept the advice of the Advisory Panel, raised the quota for the third quarter from 55 per cent. to 60 per cent., and fixed the quota for the fourth quarter at 60 per cent.

Just before the outbreak of war the Board of Trade formally approached the Committee with a request that sufficient rubber should be released to enable them to purchase 85,000 tons to implement the " barter " agreement ; purchase for shipment was to commence on the 1st October, 1939, and to be completed

within six months. The Committee decided accordingly to raise the quota for the last quarter from 60 per cent. to 70 per cent., the increase being calculated to produce an additional 36,000 tons in that quarter.

The first meeting after the outbreak of war was held on the 21st September; the Dutch delegates were unable to attend and it was possible to take only tentative decisions, later confirmed at a meeting held on the 2nd October. The American member of the Advisory Panel was also unable to make the journey, but cabled requesting that the quota for the last quarter should be increased by a further 10 per cent. to 80 per cent. to meet commercial needs. This request was supported by the American Government, who were anxious that manufacturers should build up their stocks and that a stop should be put to speculative activities. In this connection a statement had, on the advice of the Committee, been issued on the 12th September by the Rubber Manufacturers' Association of America, assuring American manufacturers that ample supplies of rubber would be made available to meet all their requirements ; it had some effect in calming the market and preventing speculation. The price had risen above 10d. on the outbreak of war but it had fallen back to 9½d.

In discussing the rate of release at this meeting the Committee was uncertain whether under the terms of the agreement the " barter " rubber stock would continue to be held in reserve now that war had broken out, or would become available for immediate use. They acted on the assumption that the " barter " stock would remain frozen and that assumption was subsequently confirmed before the next meeting. The American Government, although " the contingency of a major war " had arisen, and although they were therefore free under the terms of the agreement to use the stock, proposed to hold it unless and until supplies were interrupted and it proved impossible to meet current requirements by imports.

Sir George Beharrell, representing the Advisory Panel, stressed the difficulty of estimating consumption in wartime, but thought it probable that the decrease in the civilian use of rubber in the United Kingdom would be compensated by an increased demand for war purposes, and that in America both civilian and war demand would increase. He pointed to the

very low level of stocks in America and the United Kingdom, and recommended an increase in the quota for the last quarter from 70 per cent. to 80 per cent. provided it could be obtained without upsetting the producing industry.

Although the statistical position as presented to the Committee did not appear to justify an increase to 80 per cent. some members of the Committee were in favour of raising the quota to this level because of the low level of stocks and the psychological importance of such a decision in checking any undesirable speculative activities. They were impressed by the probable increase in American demand, and by the political importance of meeting the views of the American Government. Other members were doubtful if an 80 per cent. quota for the last quarter could be reached at such short notice—an increase in production equivalent to nearly 50 per cent. since July, when the quota was at 55 per cent. They feared that in the absence of statistical justification the suggested increase might be followed by a steep fall in the rate of release for 1940 and create further difficulties in the producing territories. The balance of the argument was held to lie with them and the quota for the last quarter was increased to 75 per cent. It may here be mentioned that the absorption estimates which the Committee had before it in arriving at this decision proved to be no less than 70,000 tons too low, the increase in absorption being distributable equally between America and the rest of the world.

Early in November the American Government requested an increase in the current quota from 75 per cent. to 85 per cent. and the fixation of an 85 per cent. quota for the first quarter of 1940 to meet current consumption and complete the purchase of the " barter " rubber within the agreed period of six months. The Committee was supported by Sir George Beharrell, the British member of the Advisory Panel, in deciding against an increase in the current quota, which would have involved almost insuperable practical difficulties. It further decided to defer a decision regarding the rate of release for the ensuing quarter until the views of the American Government regarding an extension of the period for purchasing the " barter " rubber could be ascertained. Such a postponement in accordance with Clause 3 of the "barter" agreement (see page 208) should make it possible to obtain the stock in a more orderly manner and without undue effect on prices.

By the 15th November, when the Committee met again, the American Government had agreed to the completion of the " barter " purchases being postponed for three months on condition that the Committee co-operated by increasing the quota. The British Ministry of Supply also requested an increase in the quota, to 85 per cent., for the next quarter.

Sir George Beharrell emphasised the high rate of current absorption in America and the lowness of the stocks. Another factor which should be taken into account was that it took longer in wartime to transport rubber from producing to consuming countries. The advantage to be obtained from the extension of the period for the purchase of the " barter " rubber was counter-balanced by the higher rate of commercial consumption and he recommended an 85 per cent. quota.

The Committee was now faced with three separate demands ; firstly current absorption, secondly the "barter" rubber, thirdly additions to commercial stocks. It was anxious to meet the first demand generously, the second demand had now been eased by the extension of the buying period, the third appeared less urgent and susceptible of correction by gradual replenishment.

In spite of high figures for recent consumption the expectation for consumption in 1940 remained unaltered at about one million tons, and the estimate given for consumption in America for 1940 was still below the 1939 figure. A quota of 85 per cent. meant raising production to an annual level of 1,423,000 tons against an absorption estimate of one million tons plus 90,000 for " barter " rubber, leaving a surplus over the year of 330,000 tons for increase of commercial stocks ; even 80 per cent. was calculated to give a surplus of 250,000 tons.

Members were impressed by the demand for some increase in commercial stocks, and by the need for an increase in the quota to meet the extra length of voyage required to bring rubber from producing territories. They were, however, still mindful of the position created in 1938 by very high rates of release given in 1937 to meet a short-lived emergency ; they were therefore nervous of the position which would be created by raising production to very high levels to meet an immediate demand for " barter " purchase and stock increases to be followed in all probability by a steep fall in the rate of release. They noted that the rise in the price of rubber was occasioned by higher costs due to the war and followed the general trend of prices, the rise in fact being small in comparison with the increase in price of other raw materials.

It was after weighing these various considerations that the Committee fixed 80 per cent. for the first quarter of 1940.

The effect of the year's decisions is illustrated by the following figures of stocks as at the end of 1939. Total stocks were 359,000 tons divided as follows :

Stocks outside regulated areas in producing countries	29,000 tons.
Stocks in U.K. warehouses	28,000 ,,
Stocks with U.K. manufacturers	24,000 ,,
Stocks with U.S. manufacturers	90,500 ,,
Stocks with U.S. dealers, etc.	34,000 ,,
Stocks of " barter " rubber in U.S.A. ...	1,500 ,,
Stocks afloat	152,000 ,,

During the early part of 1939 stocks were being reduced in spite of the Committee's suggestion to the contrary. When later in the year political events caused a change in the policy of stock reduction it came too late for the immediate replenishment of stocks in the consuming countries and the higher exports of the last half year were partly nullified by the longer length of voyage ; stocks afloat at 152,000 tons were over 60,000 tons in excess of the corresponding figure at the end of 1938. In terms of current absorption world stocks were equivalent to about four months' requirements, which might have been regarded as normal had the times been normal. Stocks in the U.S.A. amounted to no more than 2½ months' requirements, but they had increased by 20,000 tons in December and a further 12,000 tons was added to them in the following month.

The Committee held its next meeting on the 20th February, 1940. Estimates of absorption for the first half of 1940 were agreed at 520,000 tons, and it was estimated that on the existing basis stocks in the first quarter would increase by 70,000 tons, of which some 23,000 tons had already been purchased for " barter " rubber at the time of the meeting. No member of the Advisory Panel was able to attend the meeting, but the American representative had asked for a continuation of the 80 per cent. quota for the second quarter. He had indicated that manufacturers in America would continue buying at the prices then in force and that they had increased their forward commitments. Buying for commercial needs and for " barter " rubber would take care of all the rubber released under an 80 per cent. quota in the first half of the year, and the position in the second half of the year could be considered later.

In discussion it was pointed out that the 80 per cent. rate of release could not be maintained after the " barter " rubber had been bought and the demand for increase in commercial stocks had been satisfied, and that the rate of release would probably have to be reduced to 60 per cent. in 1941. The Dutch delegation favoured a 75 per cent. quota in order to secure a more gradual reduction to the lower rates of release which seemed inevitable in the future. British members agreed that the rates of release would have to be reduced later, but thought that stocks were too low, especially in the United Kingdom, and that it was in the national interest that stocks should be increased as soon as possible. They were therefore in favour of retaining the 80 per cent. rate of release.

During the meeting it became known that the American Government had agreed further to extend until the end of September the date for the completion of " barter " rubber purchases ; up to date the British Government had bought on this account only some 40,000 tons, including forward purchases. This information assisted the Committee to decide in favour of an 80 per cent. quota for the second quarter.

The American estimates for absorption for the first and second quarters of 1940 given at this meeting proved remarkably accurate, but estimates for the rest of the world for the same period were exceeded by over 50,000 tons, due mainly to increased absorption in Europe—124,000 tons as compared with an estimate of 80,000 tons. This was attributable to very large imports by France, Russia and Italy in the early part of the year.

II.

When the period under review opened the rate of release was low, stocks were high in relation to demand, and the price was well below the level shown by the estate cost returns during previous years as reasonably remunerative to the average estate producer.

The Committee, which in 1938 had raised the rate of release for the first quarter of 1939 from 45 per cent. to 50 per cent. (equivalent to 56 per cent of the 1938 basic quotas) had sound reasons for refusing the advice of the American Government and the Advisory Panel and for continuing its policy of stock reduction by maintaining the 50 per cent. quota for another quarter.

In May, the Committee, in spite of the fact that price, the barometer for stocks, gave no indication whatever that stocks were reaching too low a level, accepted the advice of the Advisory Panel and raised the quota for the third quarter—it hesitated between 55 per cent and 60 per cent. and chose the former ; no doubt 60 per cent. would have been a wiser decision, but in the circumstances and with the knowledge at its disposal 55 per cent. was not an unreasonable choice.

Its subsequent decision in July to revise the quota for the third quarter and raise it retroactively to 60 per cent. and to fix 60 per cent. for the fourth quarter was taken in full agreement with the Advisory Panel and in the circumstances seemed a correct decision, which would have provided adequate rubber for commercial needs had the war not intervened.

The outbreak of war with its unpredictable effect on absorption coupled with the " barter " rubber purchase made the task of the Committee extremely difficult. Its revision of the quota in September from 60 per cent. to 75 per cent for the last quarter of 1939 represented a very considerable increase in production at short notice, but probably it would have been wise to have accepted the advice of the American Government and the Advisory Panel and raised the quota to 80 per cent. The last quarter is the best producing quarter, and probably 80 per cent. could have been exported, and at the same time sufficient stocks could have been built up inside producing territories to maintain the flow of rubber in the first quarter of 1940. Indeed there can be little doubt that if the Committee had known that absorption would unexpectedly exceed all estimates submitted to it by some 70,000 tons, it would have raised the quota to the higher level.

In November, 1939, the Committee had excellent reasons for refusing to put the quota for the first quarter of 1940 above 80 per cent. and so raise production to a height which, so far as could be seen, could not be maintained and for which there was then no long-term need. Early in 1940 it became clear that both the American Government and the Advisory Panel, who had wanted 85 per cent., were satisfied with the 80 per cent. level of production provided it was maintained for the second quarter. By the spring of 1940 the American member of the Advisory Panel was contemplating a reduction of the quota to 70 per cent. or 75 per cent. for the third quarter.

This tentative proposal first made in March by the American manufacturers to lower the quota for the third quarter to 70 per cent. deserves something more than passing notice. It is a clear indication that American manufacturers were not, even at this time, intending to build up their stocks in America, and that they were still maintaining their policy of holding relatively small stocks in hand and covering their requirements by forward purchases.

It is, in fact, a complete justification of the Committee's refusal to raise the rate of release to 85 per cent. for the first quarter of 1940 in the absence of any stock building policy by the American and British Governments other than the half completed and relatively insignificant " barter " stock.

A careful examination of the records of this period shows that even at the 80 per cent. rate the industrial and commercial demands and the outstanding part of the " barter " rubber could not have continued to take up the rubber which was being released in 1940, and that a reduction of the quota was already in sight in May 1940. The sudden intensification of the war, culminating in the fall of France, altered the whole position and determined the future policy of the United States and other Governments in building up adequate stocks. Looking back it was unfortunate that at the time when war broke out the successful operation of regulation had led manufacturers and others to reduce their stocks. The policy of holding smaller stocks in consuming countries, which would probably have become a permanent feature of regulation, was carried out against the wishes of the Committee and made it difficult for it to release more rubber so long as the price remained low. In such circumstances the release of more rubber in the first half of 1939 could only have led to a further fall in price. The Committee cannot therefore be blamed for the low stocks held at the outbreak of war. It may perhaps be criticised for not releasing rubber more rapidly immediately after the outbreak of war, but the 15 per cent. which they gave was a large increase in one quarter and put a heavy strain on the producing industry.

Its refusal to raise the quota above 80 per cent. in the first quarter of 1940 was the natural consequence of its experience in 1937, and there is good reason to believe that its fear of a steep fall in the rate of release before the end of 1940 would have been realised but for the disastrous events which completely changed the outlook of Governments.

Before coming to the next chapter, which deals mainly with the accumulation of reserve stocks by the U.S. Government, it may be mentioned that the " barter " stock was not finally completed and stored in the United States till the autumn of 1941, although an amount equivalent to the required total had been purchased by the British Government by the third quarter of 1940. The main reasons for the delay in purchase were :

1. the restriction of the grade of rubber to No. 1-X ribbed smoked sheet, the highest grade of plantation rubber, of which the supply was not unlimited ;
2. the great increase in commercial absorption during this period ;
3. the desire to purchase the rubber without any undue effect on price.

The further delay which took place between the purchase of the rubber and the constitution of the stock in America was due partly to the increased length of the wartime voyage, but mainly to American insistence on a very high standard. 23 per cent of the total amount purchased to meet American requirements was rejected as below standard, thus creating a replacement demand which had to be met later at a time when reserve stocks were being acquired, and this entailed further delay. Incidentally, ordinary commercial stocks benefited automatically by the rejected " barter " rubber.

CHAPTER XI

THE WORKING OF REGULATION—

MAY 1940 to DECEMBER 1941

This chapter is almost exclusively devoted to the history of the constitution of stocks for war purposes, mainly in the U.S. but also in the U.K. and in Canada. It is to be regretted that currency has been given to distorted accounts of the Committee's actions and motives ; the events of the period will therefore be recounted in some detail.

The exportable percentages in force during this period were as follows :

1940	*per cent.*	1941	*per cent.*
1st quarter ...	80	1st quarter ...	100
2nd ,, ...	80	2nd ,, ...	100
3rd ,, ...	(80) 85	3rd ,, ...	100
4th ,, ...	(80) (85) 90	4th ,, ...	120

On the 6th May Mr. Viles, the American member of the Advisory Panel, telephoned that his Board (the Rubber Manufacturers' Association of America) favoured a temporary lowering of the quota to 70 per cent. for the 3rd quarter owing to the large supplies arriving in America. He emphasised that this was a very tentative opinion, and that the final view of his Board would be given just before the Committee next met.

On the 18th May a further telephone message was received saying that the American industry would be satisfied with a 75 per cent. rate of release for the 3rd quarter for normal business requirements, but that the American Government was developing a plan for acquiring additional reserve stocks and would ask for 90 per cent. He suggested consideration of a 75 per cent. release for commercial stocks and a special 15 per cent. release for building up reserve Government stocks in America.

In preliminary discussions with the British Colonial Office and the American Embassy it was agreed that, pending definite knowledge of the requirements of the American Government, the Committee should be asked to agree to an 80 per cent.

release for the 3rd and 4th quarters and to recommend the early issue of export permits covering the whole of this period; and that in the meantime, Sir John Hay, on behalf of the Committee and with the support of the British Government, should proceed immediately to America to discuss with the American Government plans for the purchase of a reserve stock. Mr. Viles was informed of this proposal by the U.S.A. State Department and on 20th May telephoned that this solution appeared to him and his colleagues much more satisfactory than the one proposed in his previous message.

When the Committee met on the 21st May it had information to the effect that some 64,000 tons of the " barter " rubber had been purchased up to the end of the third quarter, and that in addition to the 20,000 to 25,000 tons of " barter " rubber still to be purchased, a further 20,000 tons for the United Kingdom stocks was required above normal absorption demands. These requirements were additional to whatever stocks the U.S. Government might decide to accumulate. The Committee decided accordingly on an 80 per cent. quota for the last half of 1940, and with a view to accelerating the export of rubber from the producing territories it recommended that export permits should be issued forthwith covering the whole period. The quota decision was, of course, subject to review as soon as negotiations with America regarding the accumulation of a reserve stock were completed and the stock objective was known. The Committee formally appointed Sir John Hay as its representative to proceed at once to America with plenipotentiary powers " to discuss the question of rubber supplies to the United States of America and to negotiate and settle the terms which should govern the acquisition, retention, use and liquidation of any emergency stock." It recorded specially in the minutes of the discussion its desire to assist the American Government as far as it possibly could in attaining its stock objective. At the same time it emphasised its anxiety regarding the stock position in the United Kingdom, to which British members had previously drawn attention by writing to the Ministry of Shipping to urge that every possible facility should be provided for expediting shipments of rubber, particularly to the United Kingdom.

Sir John Hay arrived in Washington on the 13th June, just over three weeks after the U.S. Government had first notified the Committee of its desire to purchase a reserve stock,

and sixteen days later he signed the first stock agreement. Its terms are set out in Appendix v ; its main points may be summarised as follows :

(1) A company called the Rubber Reserve Company was formed to act on behalf of the U.S. Government and to purchase for shipment prior to 31st December, 1940, a quantity of rubber of not less than 100,000 tons nor more than 150,000 tons.

(2) The rubber was to be purchased at not less than 18 nor more than 20 U.S. dollar cents a pound standard smoked sheet, c.i.f. New York, with the usual price differentials for other qualities or types of purchase.

(3) It was to be held intact as a Government reserve stock until 31st December, 1943, unless it was required by the U.S. Government for its defence programme or normal supplies were interrupted by hostilities. If the reserve stock was still intact at 31st December, 1943, it was to be liquidated thereafter at the rate of not more than 100,000 tons per annum, and in such manner as least to disturb the world price of rubber.

(4) During the acquisition of this reserve stock American rubber manufacturers were to purchase their current requirements for absorption and stock within the agreed price range and to maintain a normal trade stock of 150,000 tons ; if manufacturers failed to maintain a normal trade stock of this size, the Rubber Reserve Company was to increase its stock purchases by the amount of the difference.

(5) The Committee agreed to make the necessary releases to meet these stock requirements in addition to all other known demands and to encourage producers to be ready sellers of their rubber within the agreed price range.

It should be remembered that the dates mentioned in this and subsequent agreements for completion of purchase refer specifically to purchase for shipment and not to rubber landed in the United States. This point has sometimes been forgotten and critics have compared the amount of landed stock at a particular date with the amounts which were to be purchased for shipment at that date. A moment's reflection will show that the Committee's task was fully performed when it made arrange-

ments under which the rubber would be produced and offered for sale; it was not, and could not be, in any degree responsible for the movement of the rubber from the producing areas.

The Committee met on the 5th July to consider the agreement and decide on the rate of release. By this time 47,000 tons of the "barter" rubber had been acquired and the remaining 40,000 tons had been purchased for shipment in the 3rd quarter. It was estimated that an 85 per cent. quota for the last half of the year would produce 712,000 tons and that, allowing 300,000 tons for absorption in America and 235,000 tons for other known demands, including another 25,000 tons for stocks in the U.K., some 177,000 tons would be available to cover the outstanding 40,000 tons of "barter" rubber already bought forward, and to provide 137,000 tons for the American stock requirement, midway between the 100,000 ton minimum and the 150,000 ton maximum set out in the agreement. Sir John Hay, who was still in the U.S., was consulted by telephone and informed the Committee that he agreed with the proposal to raise the quota for the last half of the year to 85 per cent.; it was understood that Mr. Viles was also in agreement with this quota. The Committee accordingly revised the rate of release from 80 per cent. to 85 per cent. for the last half of 1940. It is interesting to note that the calculations on which the Committee based its decision proved substantially correct. Requirements for the last six months outside America, including additions to stocks, totalled some 227,000 tons as against 235,000 tons estimated and the remainder, apart from the small portion of afloats destined for other countries, was available for American absorption and for the "barter," reserve, and commercial stocks. The Committee again drew attention to the urgent necessity for increasing stocks in the United Kingdom.

On the 20th August the Committee was informed that a second stock agreement had been concluded. This agreement, the terms of which are given in Appendix vi, fixed 150,000 tons as the definite objective of the first agreement for purchase by the 31st December, 1940, and contracted for the purchase of a further 180,000 tons during 1941. The 180,000 tons was to be purchased as far as possible in graduated steps—70,000 tons in the 1st quarter, 50,000 tons in the 2nd quarter, 35,000 tons in the 3rd quarter, and 25,000 tons in the 4th quarter. The price range remained the same, but was expressed in f.o.b. terms in the place of c.i.f., the adjusted price being not less

than 17 nor more than 18½ U.S. cents per pound. The other provisions were similar to those in the first agreement, except that an additional clause provided for consultation between the Rubber Reserve Company and the Committee in regard to the rates of release and the progress of the purchases; particular attention was to be given to changes in conditions which would suggest the desirability of modifying the rate of purchase at any time. The two agreements thus contemplated a total stock of 330,000 tons to be *purchased for shipment* before the end of 1941.

The Committee met again on the 27th August. Information had been received that the British Government wished to purchase another 20,000 tons for stocks before the end of the year. It was decided to increase the quota to 90 per cent. for the last quarter, thereby providing a further 20,000 tons of rubber to meet the new British demand without making any inroad into the supplies which it had been estimated would be required to complete the stock purchases covered by the first American agreement.

In October Sir John Hay negotiated an agreement with the Government of Canada to acquire a reserve stock of 18,000 tons within the same price limits as in the case of the agreements with America. About this time private telegrams from Sir John Hay, who was still in America, indicated that the Rubber Reserve Company was finding difficulty in buying rubber within the agreed price range and was getting anxious as to the adequacy of supplies. It was also expressing a desire to purchase its reserve stocks more quickly than was laid down in the agreements. Sir John made the suggestion that the producing territories should be encouraged to make use of their right under the international agreement to exceed their permitted exports for the year by 5 per cent. This suggestion was cabled to Malaya and Ceylon, but not to the other producing territories as their delegations were not in favour of the proposal.

On the 8th November Sir John Hay telephoned officially that the American Government was anxious to secure the release of rubber in quantities sufficient to permit the accumulation of stocks within the United States at a greater rate than had been stipulated in the two agreements, and in order to mitigate the consequences in the producing countries of an abrupt and severe drop in production as soon as the reserve stock of 330,000

tons had been accumulated, it was willing to purchase an additional 100,000 tons. Sir John Hay suggested again that producing territories should be encouraged to make use of their right to exceed permissible exports by 5 per cent., and asked the Committee to consider raising the rate of release to 100 per cent. for the first quarter of 1941.

Mr. Viles, who had been appointed chairman of the Rubber Reserve Company's buying committee, telegraphed supporting these proposals, but suggesting that a decision on the quota should await Sir John Hay's return.

The Committee met on the 22nd November and decided to encourage the regulating Governments to issue 1941 export licences for use in 1940 as soon as the quota for the first quarter of 1941 was fixed. This meant that the rubber would be exported in 1940 on 1941 licences, but would be credited statistically against 1941 exports. This method, which gave the same result, was adopted in preference to encouraging the producing territories to use their right to exceed 1940 exports by 5 per cent.; this right could still be exercised.

The Committee met again on the 28th November, immediately after Sir John Hay's return from America. He stressed the desire of the American Government to purchase the reserve stock of 330,000 tons more quickly and explained that it had agreed to purchase a further 100,000 tons at the option of the Committee to enable the latter to taper down the rates of release gradually so soon as the main stock pile had been purchased. Although there was, in his view, no statistical justification for a 100 per cent. quota, it was very important to meet the wishes of the American Government in this matter and to allow full production. The American Government had guaranteed the purchase of the reserve stocks within the price limits stipulated in the agreements and the same price guarantee would apply to the additional " cushion " of 100,000 tons if the Committee decided to ask the American Government to purchase.

The Committee, relying on the assurance that the American Government would be a ready buyer of all available rubber within the price range laid down in the agreements, decided on a quota of 100 per cent. for the first quarter of 1941. At the same time it advised the American Government that it would hold in reserve the offer to purchase a further 100,000 tons, and would utilise it later to the extent that might seem advisable

to taper off exports in order to obviate the abrupt and steep decline in the exportable percentage which would otherwise be necessary when the rubber reserve stocks had been accumulated.

The Committee held its next meeting on the 25th February, 1941. At this time difficulty was being experienced in providing the necessary shipping to lift the rubber from the Far East. The Committee was informed by the British Ministry of Shipping that there was no possibility in the near future of any increase in the amount of British shipping available for carrying rubber from the Far East to U.S.A., but that on the contrary a diminution was probable.

A cable was received from Mr. Jesse Jones, the American Minister of Commerce, asking the Committee to continue the 100 per cent. quota for the second quarter and stating his confidence that additional shipping would be provided sufficient to relieve the shortage. A telegram was also received from Mr. Viles saying that the shipping situation would be fully relieved and stressing the great importance of maintaining 100 per cent. for the second quarter.

At the time of the meeting the " barter " stock was now more or less complete, and 110,000 tons of the reserve stock had been purchased for shipment up to the end of March. Commercial stocks had increased by 50,000 tons since the end of June, and were 25,000 tons above the datum line of 150,000 tons fixed in the agreements. World absorption in 1941 was estimated at 1,025,000 tons. On the available estimates it was calculated that a continuation of the 100 per cent. for the 2nd quarter would provide enough rubber to enable the American Government to complete its purchase of the reserve stock of 330,000 tons and take up some part of the 100,000 tons of the " cushion " reserve. The correctness of this calculation depended on three factors: on the ability of the producing territories to export 100 per cent. during the poor yielding " wintering " months, which was considered highly improbable, on no further increase in the commercial stocks, and on the estimates for consumption not being exceeded. In fact exports in the first half of the year fell short of the permissible amount by some 80,000 tons and absorption in America exceeded estimates by 100,000 tons, the net result being a gap of no less than 180,000 tons between calculated estimates and actual results.

The Committee decided to continue the 100 per cent quota for the second quarter, and in order to accelerate the flow of rubber

supplies asked producing territories to issue export licences for the second quarter immediately. It further decided to request the American Government to purchase the additional 100,000 tons "cushion" rubber as soon as it had acquired its reserve stock of 330,000 tons, on the same terms in regard to price, liquidation of stock, etc., as in the previous agreements. A formal agreement covering this additional purchase was signed shortly afterwards.*

During March there were frequent exchanges by telegram and telephone between Sir John Hay, on behalf of the Committee, and Mr. Viles, on behalf of the Rubber Reserve Company, regarding the provision of adequate shipping, but it was not till April that the American Government was able to make arrangements for the necessary shipping to carry the reserve rubber stocks. About this time the Reserve Company, who had omitted to purchase forward for the reserve stock pending the completion of adequate shipping arrangements, was finding difficulty in purchasing rubber for its reserve stocks and was complaining of the unwillingness of producers to sell within the agreed price range. It was urged by Sir John Hay to pursue a more active buying policy and to purchase on ex-godown terms so as to relieve sellers of all responsibility for transport and shipping which they were no longer in a position to undertake. He also urged it to extend its forward purchases several months ahead in accordance with normal trade practice in order to insure possession of the necessary rubber to fill its future shipping tonnage.

At the same time the Committee and the British and Dutch Governments impressed on all producers the absolute necessity of being ready sellers of all available rubber within the agreed price range. It was becoming obvious that the enormous and increasing demands in America for current absorption and the short fall in exports from the producing territories were limiting the supplies available for stocks and making it increasingly difficult for the Rubber Reserve Company to purchase sufficient reserve stocks on a short-term buying policy.

During April the American Government approached both the Committee and the British Government with regard to making sufficient rubber available to enable it to purchase its reserve stocks in accordance with the terms of the agreements. It wanted to purchase the full 430,000 tons covered by the

* See Appendix vii.

three agreements before the end of 1941, but up to that date the Reserve Company had only been able to purchase 150,000 tons of rubber and, allowing for the increase in trade stocks above the agreed datum line, it was still short of 22,500 tons on the buying schedule laid down in the agreements, whereas it had hoped to purchase ahead of the schedule. It also stated that it was finding difficulty in buying rubber even at the top limit of the agreed price range.

In reply the Committee stated that releases could only be based on known demands as laid down in the agreements, and the satisfaction of these demands was limited by the amount of rubber that could be produced and transported within a specified time. American demand covered (1) the amount of 330,000 tons laid down in the agreements, (2) trade stocks for which a datum line of 150,000 tons had been fixed, and (3) current absorption. The first demand had not varied in amount, except for the 100,000 tons "cushion" stock, trade stocks were 60,000 tons above the datum line, and absorption had consistently and substantially exceeded the estimates given by the American representative upon which the Committee had relied. It did not question the right of the American industry to hold larger stocks or consume more rubber, but these increases represented a very large subtraction from the rubber that would otherwise have been available for the reserve Government Stocks. The position had been aggravated by the shortage of shipping, and by the fact that the Rubber Reserve Company had subordinated its buying policy to the unpredicted needs of the manufacturers.

The Committee considered that, but for these occurrences, the Rubber Reserve Company could have obtained all the rubber required within the period specified. It noted that the rates of release had been fixed in agreement with the American representative and that since January 1st the rate of release had been fixed at 100 per cent., which, having regard to the season and war conditions, represented full production ; over the last six months exports had greatly exceeded anything ever before attained by the producing industry within a similar period.

It drew attention to its previous suggestions for improving the buying policy of the Rubber Reserve Company and expressed its readiness to consider any practical suggestions for improving the position which might be made.

At the next meeting of the Committee, which was held on the 20th May, Sir John Hay summed up the points which had been covered in the previous exchange of cables and telephone messages with Mr. Viles. The following were the three main points which had been under discussion.

(1) *The basis of delivery of the rubber.* He had pointed out that under present conditions sellers could no longer carry out normal contracts f.o.b. or c.i.f., but could only sell on a go-down basis where their responsibility ended with delivery of the rubber to a go-down.

(2) *The period over which the Rubber Reserve Company extended their buying operations.* The Company had been reluctant to buy forward in accordance with long established custom and had therefore experienced difficulty in relating freight to available stocks of purchased rubber; he had emphasised the importance of an active forward buying policy.

(3) *The transport of rubber to America.* This was being solved by the provision of additional shipping by American lines.

It was noted that during the course of the exchanges a suggestion had again been made to the American authorities that, happy as members of the Committee were to take part in discussions by telephone and cable, the method was not entirely satisfactory to either party and the absence of a representative from America who could speak with authority was a great handicap. The Committee felt that it would be a great help towards a satisfactory solution of difficulties arising from time to time if someone from America with the necessary authority could come over to discuss the position with it.

Absorption in 1941 was now expected to exceed 1,100,000 tons; American absorption estimates for the year had been increased to 700,000 tons, but in view of the great excess of actual over estimated absorption in America during the three preceding quarters it was thought that even this estimate was probably too low. Doubts were expressed regarding the ability of some of the territories to produce 100 per cent. in the third quarter owing to labour difficulties and the military training duties of the supervisory staff; failure to reach 100 per cent. in the third quarter would mean a further addition to the already large short-fall in exports below the permissible amount.

The Committee then decided to continue the 100 per cent. quota for the third quarter, no suggestion having been made from any quarter that the quota should be increased above that figure. About this time discussions with the British and Dutch Governments and with the Committee were initiated by the American Government with a view to setting up a single buying agency to purchase all American rubber requirements whether for the trade or for the Government. The proposal received the immediate support of the British and Dutch Governments and of the Committee. Arrangements were made with the producing territories to ensure that as soon as the single agency purchase scheme came into operation all rubber destined for America should be sold to it within the agreed price range.

The American Government further decided to restrict the commercial absorption of rubber in America to 300,000 tons for the second half of 1941 and to buy forward to cover the remaining months of 1941; it would be its policy thereafter to buy up to six months ahead. It agreed that trade stocks should be limited to 150,000 tons, and that any stock above this amount should form part of the Government reserve stocks. It also promised to make use of London market facilities whenever possible. The single buying agency scheme came into operation on 23rd June and by August the position regarding the purchase of the American Government's reserve stock began to improve rapidly.

Towards the end of July the Rubber Reserve Company complained that the situation was serious, and that a substantial amount of freight had to be cancelled in July owing to lack of rubber. It asked for a higher quota in order to enable all producing elements which could exceed their 100 per cent. quota to produce to capacity. This request received strong support from the American authorities. On the 5th August the Committee cabled a memorandum to the producing territories calling their attention to the short-fall in exports of 80,000 tons up to the end of June, and asking them to do their utmost to make good the deficit. It pointed out that at the end of June the Rubber Reserve Company had only purchased 175,000 tons of the 430,000 tons stock which it required. It also enquired whether production could be increased by such means as re-distribution, if necessary, of internal export licences and the use of the 5 per cent. permitted excess.

In a telephone conversation on the 18th of August Mr. Viles reported that the position in regard to purchases for the reserve stock had greatly improved, the Rubber Reserve having increased its purchases from 175,000 tons at the end of June to 288,000 tons. This improvement had been brought about by the single buyer arrangement, as the bulk of the rubber purchased by the Rubber Reserve Company had been allocated to reserve stocks and manufacturers had been limited largely to using rubber arriving from their previous forward contracts. The Reserve Company was now buying up two months ahead from the 15th of each month. Mr. Viles emphasised the wish of the American Government to complete the purchase of all the reserve stock as soon as possible, and asked the Committee to co-operate in obtaining the highest possible rubber production during the remainder of the year. He mentioned for the confidential information of the Committee that his Government was contemplating increasing its reserve stocks and would certainly buy all the rubber that could be purchased.

It was again suggested to Mr. Viles that the buying policy of the Rubber Reserve Company should be extended further forward to cover at least November and December.

The Committee met on the 19th August and with a view to releasing any surplus capacity that might exist decided, not without misgivings, on a quota of 120 per cent. for the last quarter of 1941. It would, of course, have been simpler to fix no percentage and thus allow complete freedom of production, but the Committee had no power under its mandate to take such a decision. Since it was impossible that any significant acreage could produce more than 120 per cent. of its normal capacity, a quota of 120 per cent. was in fact permission to tap to capacity. Both a quota of 120 per cent. and unrestricted production were open to the objection that by encouraging fierce competition for a limited supply of skilled labour they would disrupt estate arrangements, with the possible result that less rubber would be produced than would have been forthcoming with a quota of 100 per cent. In fact, in certain territories small holders offered such terms for tappers that estates were seriously handicapped and their yield was affected.

The Committee was therefore at some pains to make it plain that its decision was an earnest of its anxiety to take every step in a difficult situation, even against its better judgment, which the American authorities thought might release surplus

capacity; the British and Dutch Governments informed the U.S. Government that exports corresponding to 120 per cent. of capacity were not to be expected. The U.S. Government expressed its appreciation of the Committee's action, by which in that Government's opinion the utmost productive capacity would be made available.

A further step which the Committee took to remove everything which might inhibit full production was to decide that no deficiencies or surpluses should be carried forward to 1942, and that if any territory was able to produce more than 120 per cent. of its quota the surplus production would be covered by raising the quota retroactively.

In spite of the fact that American absorption, even under Government control, continued to exceed the stipulated amounts by a substantial margin and that trade stocks were some 90,000 tons above the agreed datum line, the Rubber Reserve Company had by the end of September purchased 407,000 tons, that is the full amount of 330,000 tons contemplated in the first two agreements, plus 77,000 tons of the 100,000 tons originally included as a " cushion " for the producing industry but since April an integral part of the American purchasing programme.

On the 14th October Mr. Viles informed the Committee that the American Government contemplated increasing its reserve stock by a further 370,000 tons to a total of some 800,000 tons. When it had acquired its stock pile it would remove the restraint on commercial absorption and would continue to take in rubber at the rate of 100,000 tons a month for some time afterwards.

The Committee held its next meeting on the 16th October. According to the latest information received at the time of the meeting the Rubber Reserve Company had now completed purchase of the 430,000 tons under the three agreements.

In view of the recently expressed desire of the American Government to accumulate further reserve stocks, the Committee again appointed Sir John Hay as its representative to visit the United States of America and, if necessary, Canada with plenipotentiary powers " to discuss, negotiate, and settle the terms which should govern future supplies of rubber required for the U.S.A. and for Canada whether for stock, trade requirements, or any other purposes." As soon as a passage could be obtained Sir John Hay proceeded to America, arriving there early in November.

In discussion with Sir John Hay the Rubber Reserve Company, on behalf of the American Government, stated its intention to increase its reserve stocks to 800,000 tons, and to take in rubber at an average of 100,000 tons a month throughout 1942 at the top of the agreed price range, 18½ U.S. cents f.o.b.

Discussion took place over a price guarantee to cover some part of the post-war period when the U.S. Government would probably be unloading its large reserve stocks. The Committee felt that the possession of such enormous stocks of rubber would give the American Government power to dictate post-war rubber prices and that it was only just and reasonable that producers who were supplying the rubber at a controlled price should receive in return some guarantee against a steep fall in prices immediately after the war.

The U.S. Government agreed to meet the views of the Committee on the question of giving some support to the price level during the period of stock liquidation, and the Committee, before any agreement had been signed, decided to continue the 120 per cent. quota for the first quarter of 1942 in order to maintain the greatest possible flow of rubber to America. It also requested the authorities to arrange that any producer who could produce more than 120 per cent. of his assessment should be permitted to do so.

The actual agreement was signed on 13th December and, though the entry of Japan into the war on the 7th December prevented its operation, the terms of this fourth agreement are set out in Appendix viii. The main points of interest are (1) supersession of the three previous agreements by the new one; (2) the increase of the reserve stock from 430,000 tons to 800,000; (3) the expression of the U.S. Government's intention to purchase 100,000 tons of rubber a month throughout 1942 at 18½ U.S. cents per lb. f.o.b.; (4) the undertaking that there should be no liquidation prior to January 1944, and then at a maximum annual rate of 200,000 tons subject to the right of the U.S. Government, during the continuance of hostilities, to use the stocks for defence purposes or war emergencies and, after the cessation of hostilities, for maintaining trade stocks at a normal level; (5) the recognition by the two parties that it was desirable that a stable market should be maintained during both the purchase and the liquidation of the reserve stocks, with which end in view (*a*) the Committee was allowed, to the extent that general circum-

gradually, but only after prior consultation with the Reserve Company; (*b*) the Reserve Company agreed to co-operate in maintaining a reasonably stable world market for rubber at a level reasonably profitable to producers.

It should be noted that during the period while these negotiations were going on maximum supplies of rubber were coming forward under the 120 per cent. quota, and were being bought up by the Rubber Reserve Company as fast as they became available. At the time of Pearl Harbour and before the new agreement was signed, the Rubber Reserve Company had already purchased stocks greatly in excess of the 430,000 tons laid down in the three original agreements.

In summing up the work of the Committee during this period the following general picture may be drawn. The U.S. Government first indicated its intention to build up a reserve stock (in addition to the " barter " stock) in the middle of May, 1940. The Committee, supported by the British and Dutch Governments, acted with great promptness in sending out Sir John Hay to negotiate, and the first agreement was concluded with exemplary speed by the 29th June. This agreement indicates that the U.S. Government was at that time contemplating only a small reserve stock of 100,000 to 150,000 tons. The view of the American Government regarding an adequate reserve stock expanded rapidly and by August it was contemplating a reserve stock of 330,000 tons, and Sir John Hay, who had remained in the U.S., was on the spot to conclude a second agreement.

The fact that the additional 180,000 tons was to be purchased for shipment in gradually decreasing amounts throughout 1941 indicates clearly that there was still no great sense of urgency in regard to the acquisition of the full stock pile. This sense of urgency developed later in the year, and the U.S. Government offered to purchase a further 100,000 tons simply in order to expedite the accumulation of the original 330,000 tons. The additional 100,000 tons was to act as a cushion for lowering the rate of release when the original stock pile had been purchased, and so encourage the Committee to provide the rubber for the 330,000 ton stock as rapidly as possible.

By April, 1941, the U.S. Government no longer considered the 100,000 tons simply as a cushion, but was anxious to purchase the whole 430,000 tons by the end of 1941 or sooner if possible.

In August it indicated unofficially its intention to take up all available rubber and increase its stock pile still further. In October, the Committee was officially informed of the U.S. Government's desire to conclude a further stock agreement and with the same promptness as before the Committee arranged for Sir John Hay to proceed to America and conclude a fourth agreement.

It will be seen how the stock pile objective and the sense of urgency regarding its acquisition increased as the danger of war in the Far East came nearer.

The decisions of the Committee on the rate of release must be judged in the light of these developments. The rates of release fixed for the second half of 1940 were in the light of such knowledge as was available amply sufficient to meet requirements.

In 1941 the Committee released all available rubber and the main impediments to the rapid accumulation of the reserve stocks were the lack of shipping in the early part of the year, the unprecedented increase in commercial absorption in America, the subordination of the reserve stock buying to commercial needs, and the short-fall in exports.

The rapid accumulation of the reserve stock in the second half of the year was due not to the 120 per cent. quota but to the seasonal expansion in production, the Government control of commercial absorption in America, and the single buying agency.

The fact that the full stock pile of 430,000 tons had been purchased for shipment within the agreed price range by the beginning of November is proof that the Committee had fulfilled all its agreements in spite of earlier difficulties and delays. It seems probable that, but for the entry of Japan into the war, the stock pile purchased for shipment by the Reserve Company up to the end of December would have exceeded the agreed amount of 430,000 tons by some 200,000 tons.

From July, 1940, when the first reserve stock agreement was signed, to the end of November, 1941, 2,150,000 tons were made available for export, and of this amount no less than 1,440,000 tons went to the United States. The greatest amount of rubber taken in by America in any similar previous period was 825,000 tons. All this rubber was supplied within the price range laid down in the agreements.

It may well be doubted if those huge reserve stocks could have been acquired so quickly without the aid of the Committee and the machinery of regulation. It is quite certain that without the regulation scheme a much higher price would have been paid for them.

It is in the light of the above facts that certain accusations, made in evidence before a congressional committee known as the Truman Committee and implicitly accepted by that Committee, must be judged. The principal reproaches made were three in number and it is desirable that each of them should be briefly examined.

In the first place it was suggested that negotiations for the purchase of the American stocks were unduly lengthened by the desire of the International Rubber Regulation Committee to protect its interests by insisting upon conditions which should regulate the ultimate disposal of the stocks to be acquired for emergency purposes. The answer to this accusation is twofold; negotiations were not unduly prolonged; the first stock agreement, the terms of which governed the later ones, was signed within three weeks of the arrival of the Committee's plenipotentiary in the United States and within two days of the enactment of the legislation which empowered the American Department concerned to enter into the arrangements. Further, the Committee would have been failing in its manifest duty to the Governments of which it was the mandatory if it had failed to take all reasonable precautions against the price and market difficulties which would have been inevitable if a totally abnormal stock of rubber had been liquidated after the war in a manner which disregarded the interests of the producing territories. The United Nations Conference on Food and Agriculture recommends, with reference to "commodity arrangements," that provision should be made when applicable for the orderly disposal of surpluses. The emergency stocks supplied to the United States were, of course, surpluses unless they were required for war purposes. So evident was the need for securing an orderly liquidation of emergency stocks that provision was made for it by the British and U.S. Governments in the "barter" agreement which they negotiated without any prior consultation with any member of the Committee; that agreement, be it noted, was concerned to protect the interests of the cotton as well as the rubber producer.

The second reproach is that the Committee were slow to take action from time to time to enable the producing territories to provide the rubber required to meet American needs. The facts recounted in this chapter are sufficient answer to the accusation. At all times and without any avoidable delay the Committee fixed rates of release which were calculated to produce all the rubber required both for emergency stocks and commercial consumption as estimated by the competent American authorities. It was no fault of the Committee that consumption in America constantly outstripped all forecasts ; that was due in the words of the Truman Committee Report " to the unprecedented sky-rocketing of consumption by the public for non-defence purposes, principally automobiles, through 1941, culminating in the all-time high rate of over 900,000 tons per year during the second quarter of 1941 " and " at a rate which reached in June of 1941 a new high of over a million tons per year."

The third reproach, which is implied rather than specifically made, is that producers " being no different from people in the United States and all wanting to make a profit " were demanding an exorbitant price for their raw material. The short answer to this suggestion is that the increase in the price of rubber from the outbreak of the European war to the end of November 1941 was 34 per cent., while the increase in the price of raw materials in general, indicated by the United States Department of Labour Index, was slightly over 35 per cent. It may be noted that rubber had commanded higher prices than those fixed in the various agreements before they were made. Since the outbreak of the Japanese war it has proved necessary in order to obtain adequate supplies from Ceylon, the only considerable unoccupied producing territory, to offer appreciably higher prices. Finally, the fact should not be overlooked that so far as the British producers were concerned the production of rubber on the scale required and the price to be received for it were from the commercial point of view matters of complete indifference. The incidence of taxation was such that not one penny of profit was retained from production beyond a rate far below capacity, and any rubber produced in excess of that rate represented a dead loss to the British estate producer, and was produced for none other than patriotic motives.

CHAPTER XII

RETROSPECTIVE

Wartime experience and reconstruction plans have aroused public interest in the regulation of raw materials, and the theory and practice of rubber regulation may contribute something to the discussion of the subject. Technically, it may be claimed, the scheme which has been examined in previous chapters worked and has therefore a pragmatical sanction, but it should be recognised that it worked in spite of serious theoretical difficulties inherent in the terms of the Committee's mandate.

The Committee's function was " to adjust in an orderly manner supply to demand and maintain a fair and equitable price level which will be reasonably remunerative to efficient producers," and an initial difficulty at once arises from the fact that " efficient producer " cannot in this context have its ordinary and accepted economic meaning. An efficient producer, in common parlance, is one who can produce a saleable commodity and sell his output at a price which will cover all his costs, including depreciation, and leave him a margin of profit. Further, the usual conception of economic efficiency implies ability to sell at a profit *in a free market*; it may be doubted whether the term is applicable in the case of a regulated market, and apparently the Committee was required by the terms of its mandate to argue in a circle or assume what it had to establish. Efficient production is production at a reasonable profit; but profitability depends on price and the duty of the Committee was to aim at a price level which was to be established by the efficient producer.

This fundamental difficulty may be expressed in another way. Supply was to be adjusted at a figure which would produce a price remunerative to efficient producers; this implies that it is possible to arrive at an appreciation of efficiency which is not dependent on market price and ability to sell profitably, but if the price is not a free market price but an artificial one (as it is

ex hypothesi) there will always be some producers who can sell at that price and make a profit ; which those producers are cannot be ascertained until the price is determined. On the other hand it is impossible to define a price which will remunerate efficient producers until it is known what efficient production means. The Committee was therefore required to define efficient production in terms of price and to determine price in terms of efficient production.

Nor does this constitute the whole of the dilemma. A given price in the regulated market is remunerative to one set of producers when they are allowed to produce a given percentage of their potential output. If consumption at that price increases and outstrips the regulated production, one of two things must happen ; either production is not increased and prices rise as stocks fall, or production is increased and costs fall ; whichever happens the circle of efficient producers is enlarged. If, on the other hand, consumption at that price decreases and the percentage of permitted production is not effectively sold, either the price will fall as stocks increase or production must be further diminished ; in either case the circle of efficient producers is restricted. In other words remunerative production—to drop the word " efficient " for the moment—depends on two factors, price and quantity, which vary in degrees which are not susceptible of exact scientific control.

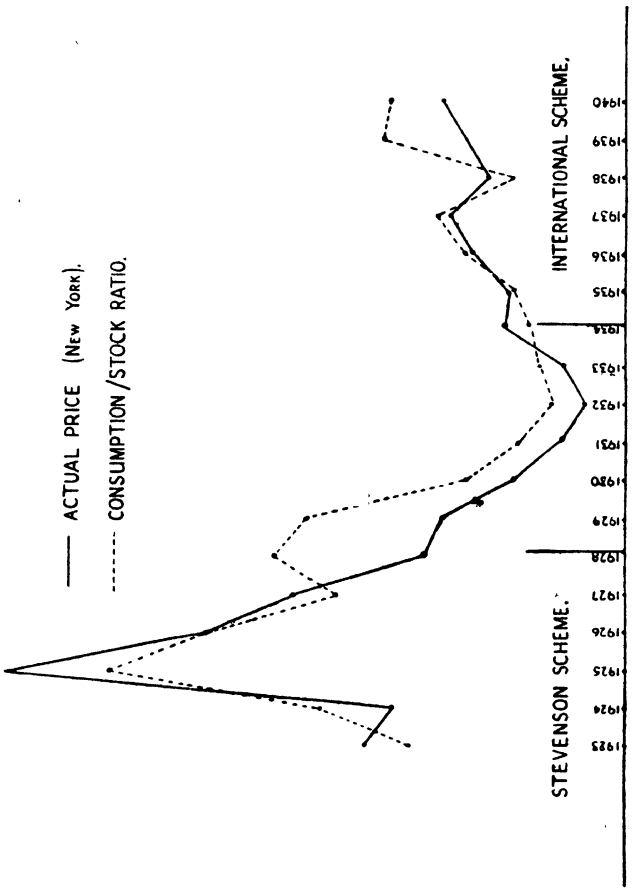
It may be suggested that the above difficulties of theory could be surmounted by taking the cost of a new rubber estate efficiently managed and calculating therefrom the price per pound which the owner will require to obtain in order to make a " reasonable " profit. Apart from the fact that native rubber is ignored in such a calculation, it is obvious that the basic figure of the cost of land must depend to a large extent on a certain expectation as to the price of rubber ; rubber land and rubber plantations can be brought more cheaply when rubber is 3d. per pound than when it is 7d. per pound. Secondly, production costs, and therefore the amount of profit, vary considerably with the rate of production ; to assume a specific permitted quota makes the whole calculation artificial. Thirdly, there are three factors in production, variations in which can only be disregarded in the short term and under static conditions, namely the productivity of a plantation, the cost of money and the scale of wages.

These difficulties are formidable in theory, but within limits they were soluble in practice. The Committee surmounted the price difficulty by concentrating on the stock and production side of its task. No attempt was made to control the price of rubber, and by and large that price followed the general movement of commodity prices determined by industrial activity in the world at large. At the same time it used the prevailing price as a barometer; while a "fair" price was difficult if not impossible to define precisely, a price which was too low to be remunerative or so high as to produce excessive profits was within limits easy to detect, and an excessive departure on either side from a presumed norm was regarded as a danger signal, demanding re-examination of the stock and production position.

Undoubtedly by controlling the absolute and relative stock of rubber the Committee was indirectly influencing the price. This connection between the price of rubber and the relative stock position is shown by a graph printed overleaf of the actual price of rubber in the U.S.A. during the period 1923 to 1940 and the reciprocal U.S. stock/consumption ratio during the same period. It will be seen that there is a close relationship between the two curves, except that during the Stevenson Scheme the price of rubber increased more rapidly than the stock/consumption ratio, and after the withdrawal of the Stevenson Scheme the price decreased more rapidly in the depression. It will also be seen that, taking a long-term view, regulation has tended to keep the price from going very high when the stock/consumption ratio was low, and from going very low when the stock/consumption ratio was high. But it would be disingenuous to conceal the fact that the practical policy of concentrating on stocks and leaving price to find its own level does not solve one of the main difficulties confronting the controllers of such a commodity as rubber—the long run adjustment of supply to demand. The price of an individual commodity often does and should, while moving with the general price level, have another movement of its own; to cater exclusively for existing demands at the price level of the moment would prevent, or an any rate sensibly diminish, the expansion of demand which might be the result of expanded supply at a lower but still remunerative price. Restricted production at a given price is by no means so desirable, either for the producer or consumer, as full production at a considerably lower price which encourages new uses.

GRAPH OF ACTUAL PRICES OF CRUDE RUBBER IN THE U.S.A. IN THE PERIOD 1923 TO 1940 AS COMPARED WITH THE CONSUMPTION/STOCK RATIO THERE DURING THE SAME PERIOD.

(1926 = 100)



The Committee did in fact recognise this by deliberately fixing on one occasion a larger export percentage than the known and established demands could justify in order to encourage the use of rubber in upholstery. But the course of events prevented the development of a technique for the encouragement of new uses, since the rearmament demand took charge of the situation, and it remains a problem which the administrators of commodity arrangements must face. It may be suggested that its solution will be easier if the administrators regard themselves as a public monopoly, pledged to safeguard the legitimate interests of the consumer as well as the producer and bent upon ensuring, so far as is in their power, that the ruling price (1) is such as to secure the production of normal requirements and the upkeep of land and equipment; (2) is not such as to discourage normal consumption, but rather to encourage new uses.

Commodity control schemes are not uncommonly criticised on the ground that they protect the inefficient producer—in which respect they do not, of course, differ from other forms of protection. The above considerations suggest that they obscure the difference between the efficient and inefficient producer and make a criterion of efficiency hard to establish. But just as the difficulty of defining normal stocks does not prevent a clear recognition of abnormality when it is sufficiently pronounced, and just as the difficulty of defining a fair price does not obscure recognition of a ruinous or extortionate price, so the difficulty of defining efficiency does not entirely prevent us from recognising marked degrees of inefficiency. Did the rubber regulation scheme in effect protect inefficient production—if we may overlook the theoretical difficulties already discussed?

Judged by one test, general efficiency was not impaired; ample supplies of rubber were available at prices which were not out of line with prices in general. It did not, in any degree which was important to consumers, protect territories which were inefficient rubber producers; there is no reason to suppose that costs in the two important producing centres, Malaya and the N.E.I., differed so appreciably that the consumer would have gained substantially if a new price level had been established as a result of full competitive production.

There is certainly a wider range of efficiency among individual producers within a territory than among territories. But there is a very real check on the protection of inefficiency within a

territory, since marked inefficiency would impair the ability of a territory to provide its quota, which would sooner or later be lowered ; its deficiency could in any case be corrected by a slight rise in the general rate of release. Some, if not all, producing territories weighed efficiency as well as straight productive capacity in assessing individual estates. And, of course, profits were, as always, a continuing incentive to individual efficiency.

Again it may be observed that figures relating to production costs which were at the disposal of the Committee, while they were not a precise guide to a fair and equitable price, showed the costs of the average producer and could therefore form the basis for an inference as to the price which in any given conditions would enable the average producer to make a profit. And the figures showed in general that while there was a small number of specially efficient and of obviously inefficient producers the bulk of the supplies came from those whose costs did not diverge widely from the average.

There are other respects in which efficiency, on a wider interpretation of the term, was not impaired. Rubber producers in general, when they began to earn profits after a long struggle to maintain their estates, devoted large sums to the improvement of their plantations. In particular it will be found in the future that the extensive replanting which the relative prosperity enjoyed in the regulation period made possible has very appreciably increased productivity ; the replacement of poor yielding trees by budded rubber and selected clonal stock will over large areas mean an increase in the yield from 400 lb. or less to 1,000 lb. or more per acre. A more lavish expenditure on fertilisers to maintain the yield of old areas is also an increase in efficiency.

Secondly, efficient production should create an improvement in the standard of living of the labour force engaged upon it. There was a general rise in the rate of wages payable to estate tappers and other labourers, and most estates took advantage of returning prosperity to accelerate the provision of better housing and medical attention ; many of them were devoting special attention to the nutrition and education of the children of the labour staff.

There can be little doubt that progress in these directions will be resumed if and when prosperity returns with peace. But it may perhaps be observed parenthetically that there is a limit to the rate of progress in raising the standard of living

which can be expected from an increase of wages. A labour force with few wants easily satisfied has a ceiling to its desire for money and beyond a point a rise in wages will be used to acquire more leisure rather than more possessions or services; there were occasions after the outbreak of war when for this reason higher wage rates threatened to result in lower production. The point, however, at which higher rates do not result in higher earnings is not a fixed one, and should move upwards as new wants are created by a process of education, especially in the coming generation.

Finally, as explained in an earlier chapter, the rubber regulation scheme was instrumental in improving the long term prospects of the industry and its future efficiency by the provision of sums for research not incommensurate with the importance of the problems calling for investigation.

Another criticism of commodity control schemes is, as has been noted in the Introduction, that they cannot deal with excess capacity which is not purely temporary; the difficulty of defining excess capacity has also already been indicated. In any case experience abundantly proved that the world's productive capacity in rubber was not in the circumstances one ton in excess of what was required by the United Nations for the purpose of waging total war. It would be a sorry world in which capacity was maintained at a height which would provide the tremendous margin of reserves required for war purposes. That problem can be met by the establishment of strategical reserves of raw materials built up from production from normal capacity; the existence of synthetic plants, which could be maintained in readiness even if the price of their product was non-competitive, would furnish an additional reserve. It may be added that there is a special reason for maintaining a considerable reserve capacity in the case of rubber, to wit the huge fluctuations in demand seen against the background of the seven year period required to grow the rubber tree; the natural and cheap storage capacity of the tree itself, and its long period of productivity and ability to survive neglect ease the problem. But fortunately there is no ground for supposing that the existing productive capacity of rubber areas is excessive in peace time if full employment, the maximum and optimum use of resources, and the free exchange of commodities and manufactured articles are to be the objects of

the world's economic policy. In an expanding world with a gradually rising standard of living there is vast room for the increased use of motor transport, and it is not improbable in the circumstances contemplated that any regulating authority would be more pre-occupied with the problem of deciding how fast productive capacity should be increased than with that of deciding how excess capacity is to be liquidated.

The United Nations conference on Food and Agriculture held at Hot Springs, Virginia, in the summer of 1943 recommended that " commodity arrangements " should provide for the effective representation of consumers as well as of producers. As the words are generally used the " representation of the consumer " sometimes conceals an ambiguity. Who is the consumer? The main primary consumer of rubber is the tyre manufacturer, as the main primary consumer of tyres is the motor car manufacturer; the ultimate consumer whom they both exist to serve is the motor car user. When the public are encouraged to hope that consumers will be protected they think that they are the consumers in question; in fact it is the primary consumer who is both vocal and interested and tends to secure protection. It is hardly necessary to point out that the protection of the tyre manufacturer against a rapacious producer of rubber is no guarantee at all that the motor car user will be protected against extortion on the part of the manufacturers of either tyres or cars. These manufacturers, as was pointed out earlier, were in all industrial countries protected by tariffs; there could be no guarantee that any concession by the rubber producer would be passed on to the ultimate consumer, who had no representation at any stage in the market process, rather than enure to the sole benefit of the manufacturer, who has been consistently more successful in securing protection than has the producer of the raw material.

If the narrower meaning of consumer is taken the Rubber Regulation Committee can claim to have been a pioneer in seeking the aid of the consumer in regulating a commodity and to have been eminently successful in establishing co-operation between producer and consumer. Enough has been said in earlier chapters to show that the consumers of rubber were satisfied that the machinery of regulation was effective and that its use was governed by principles which both parties accepted; such

differences as arose between them were differences of judgment and appreciation, and neither party could claim infallibility or a record of consistent rightness.

Incidentally it may be remarked that where a conflict of interest arises between the producer and the manufacturer consumer it need not be due to the desire of the former for a high price and the latter for a low one. If extremes are left out of account what the manufacturer desires above all is a stable price, which enables him to avoid changes both in the size of his stock and its balance sheet value; this desire for stability might actually in certain circumstances conflict with a desire on the part of the producer for a lower price suggested as desirable by the need for adjustment to changing economic conditions.

That the Committee was conscious of the fact that the consumer was not fully represented was evident from the readiness with which it accepted a suggestion made by the American Government that the consumer's panel should be increased from three to four, of whom two should be representative of rubber consumers, not specifically described as manufacturers, in America, and it was a matter of regret that the U.S. Government never took advantage of a provision made at its express request. But it may be doubted how far the ultimate consumer can be protected by his power to voice an opinion on matters which will affect the supply, and may affect the price, of a material which is but one of the constituents, even if an important one, of the manufactured product which interests him; and obvious difficulties will confront anyone who wishes to find a "representative" consumer. In practice his interests must be protected by Government representation for that specific purpose and by full publicity.

In the case of the Rubber Regulation Committee, constituted by an inter-governmental treaty, its members were appointed by and responsible to governments; they were in every sense Government representatives and the voting members were—and this was a matter of deliberate policy—not themselves primarily interested in the production of rubber. Further the scheme, and its working, have throughout been given very full publicity. The Agreements were published, in full, at the earliest possible dates; all major decisions of the Committee were published immediately they were taken; and the statistical bulletin was

designed to enable, and did in fact enable, the public generally and all interested parties to form their own appreciation of the background against which decisions were taken, and to appreciate the statistical reasons which actuated these decisions.

Whatever judgment may be passed on the theoretical basis of the scheme of rubber regulation which the Committee was called upon to administer it can be claimed with assurance that it was technically and practically workable. Just how efficiently it worked in regulating production may be seen from the following figures comparing permissible with actual exports :—

	(1) Permissible exports. tons	(2) Actual exports. tons	Percentage excess or deficiency of (2).
1934 (June/Dec.) ...	498,928	487,045	—2.4
1935 ...	769,870	780,704	+1.4
1936 ...	800,651	797,737	—0.4
1937 ...	1,092,907	1,088,360	—0.4
1938 ...	756,935	779,190	+2.9
1939 ...	879,139	887,522	+1.0
1940 ...	1,282,665	1,285,739	+0.2
TOTAL	6,081,095	6,106,297	+0.4
1941 (Jan./Nov.) ...	1,473,376	1,328,890	—9.8

The close correlation between the two sets of figures from 1934 to 1940 is striking, and the experience of that period is not invalidated by the wide discrepancy between permitted and actual exports in 1941, when the permissible export allowance was, for reasons explained in the last chapter, fixed at a figure which could not possibly be attained by the generality of producers. But it should be pointed out that the table, covering yearly periods, obscures two factors which constantly tended to disturb the correlation of permissible and actual exports over shorter periods.

These were firstly, definite though debatable limits to the speed at which exports could be increased or decreased, especially at rates of release so high or so low as to necessitate the importation or repatriation of immigrant labour ; secondly the seasonal flow of rubber meant that supplies could be increased more quickly in the second half of the year than in the first. And it should be added that there was a lag due to preparation

and transport of two to three months between production and delivery in the main consuming countries, with a corresponding lag in the increase or decrease of effectively available supplies.

Again, the following figures show that the scheme worked efficiently in providing large supplies of rubber at a price which certainly yielded no excessive profits.

	Exports	Absorption	End year Stocks		Price
			Actual	Relative in months' absorption.	d. per lb.
	tons.	tons.	tons.		
1934 (June/Dec.) ...	521,000	503,000	726,000	9½	6-13/16
1935 ...	830,000	936,000	645,000	8¼	6
1936 ...	866,000	1,038,000	464,000	5½	7⅝
1937 ...	1,166,000	1,095,000	532,000	5¾	9½
1938 ...	872,000	934,000	465,000	6	7-7/32
1939 ...	990,000	1,097,000	359,000	4	9
1940 ...	1,395,000	1,085,000	668,000	7½	12-1/16
1941 (Jan./Nov.) ...	1,415,000	1,130,000	950,000	9½	13-9/16

From this table it will be seen that the Committee provided during the 7½ years of regulation for exports of more than 8 million tons, a total which compares with exports of less than 6 million tons in the 7½ years immediately preceding regulation. A careful study of the preceding chapters will show also that these 8 million tons of rubber not only covered all absorption requirements to the general satisfaction of the rubber manufacturers, but in addition provided sufficient rubber for the U.S.A. to have in its possession at the outbreak of war in the Pacific "the largest stock pile of rubber ever accumulated at any time anywhere in the world"; and this in spite of the fact that stocks were exceptionally low at the outbreak of war, largely owing to the confidence of consumers in the technical efficiency of regulation, which absolved them from the necessity of carrying large stocks for themselves.

The steadiness of the price is illustrated by the fact that the average price throughout the pre-war period of regulation was 7.35d. per lb.; this is to a decimal point the price which prevailed when the agreement was signed in May, 1934. The establishment of that price was obviously influenced by impending regulation, but the fact that a member of the Advisory Panel in July, 1937, throught a price range of 8d. to 10d. was fair and reasonable suggests that it was not excessive, and it may be observed that in no year before the outbreak of war did the average price exceed the upper limit of this range and that in four years out of the six it was well below the lower limit.

The members of the International Rubber Regulation Committee have throughout the period of regulation been conscious of their responsibility as trustees for a great industry and those dependent on it, without overlooking their duties to the consumer.

The size of the industry may be judged from the fact that the amount of capital invested in the rubber plantations of Malaya and the Dutch East Indies, which between them produce about 90 per cent. of all plantation rubber, may be roughly estimated at £250,000,000. But this is less than half the story; it omits the estate production of Indo-China, Ceylon, Siam and other smaller territories; it takes no account of the capital, which is of course less per acre, invested in small native holdings, which account for approximately half the world's production.

The importance of the industry is however not fully disclosed in terms of capital investment, stock values and dividends. In the Dutch East Indies above 715,000 small holders were registered as rubber producers in 1936; if those of other territories are added well over a million native growers and their families must be wholly or partly dependent on the prosperity of the rubber producing industry for the bare necessities of life. To this figure must be added the multitude of non-Europeans normally and directly employed on estates as tappers, field labourers and factory workers, and indirectly employed in moving it from the plantations to the sea board, whence it has been shipped to the four corners of the world and provided a raw material which has revolutionised transport.

Nor have the benefits derived from the rubber producing industry been confined to the populations of the producing areas; exports of rubber have been an important element in the foreign trade of both the U.K. and Holland. Their importance may be illustrated by the fact that in the year 1937, when U.K. imports from the U.S. were valued at £106,000,000 and U.K. exports to the U.S. at £42,000,000, exports of rubber from Malaya to the U.S. amounted to £31,000,000; and if rubber exports from other British territories are added the total exports from this one industry must have nearly equalled in value the total exports to the U.S. of all the industries of the home country.

Some portion therefore, of the capacity of the U.K., Holland and France to balance their accounts with the outside world and in particular to purchase from America has been drawn

from their interests in rubber production. But what is important above all is that millions of natives, to whose advancement civilisation is now formally pledged, depend on rubber for even the maintenance of their existing standard of living ; they must long continue to do so, for the demand for other tropical products is not so elastic that a change of cultivation could be effected in a short period. Most rubber land has been reclaimed from the jungle and would revert to it if rubber either failed to stand up to legitimate competition or was ousted from the market artificially.

Revised Text, as recommended by the International Rubber Regulation Committee, of the Agreement between the Governments of France, the United Kingdom, India, the Netherlands and Siam to Regulate Production and Export of Rubber, signed in London, May 7, 1934, as amended by the Protocols of June 27, 1935, May 22, 1936, and February 5, 1937. (Treaty Series No. 74 (1938).)

LONDON, OCTOBER 6, 1938.

THE Governments of the French Republic, the United Kingdom of Great Britain and Northern Ireland (hereinafter referred to as the Government of the United Kingdom), India, the Kingdom of the Netherlands, and the Kingdom of Siam :

Considering that it is necessary and advisable that steps should be taken to regulate the production and export of rubber in and from producing countries with the object of keeping world stocks at a normal figure and adjusting in an orderly manner supply to demand, while at the same time making available all the rubber that may be required and maintaining a fair and equitable price level which will be reasonably remunerative to efficient producers, and being desirous of concluding an Agreement for this purpose :

Have accordingly agreed as follows :—

ARTICLE 1.

The obligations under this Agreement of the Government of the French Republic apply to French Indo-China ; those of the Government of the United Kingdom to Burma, Ceylon, the Federated Malay States, the Unfederated Malay States, the Straits Settlements, the State of North Borneo, Brunei and Sarawak ; those of the Government of India to India ; those of the Government of the Kingdom of the Netherlands to the Netherlands Indies ; and those of the Government of the Kingdom of Siam to Siam.

ARTICLE 2.

For the purposes of this Agreement—

(*a*) " Basic quotas " means the quotas referred to in Article 4 (*a*).

(*b*) " International Rubber Regulation Committee " means the Committee referred to in Article 15.

(*c*) " Control Year " means any calendar year during the continuance of this Agreement, or, in the case of the year 1934, the portion of that year between the date of the coming into force of the regulation under Article 3 (*b*) and the 31st December, 1934.

(*d*) " Rubber plant " means and includes plants, trees, shrubs or vines, and any leaves, flowers, seeds, buds, twigs, branches, roots or any living portion of them that may be used to propagate any of the following :—

(A) Hevea Braziliensis (Para Rubber).

(B) Manihot Glaziovii (Ceara Rubber).

(C) Castilloa elastica.

(D) Ficus elastica (Rambong).

(E) Any other plant, tree, shrub or vine which the International Rubber Regulation Committee may decide is a rubber plant for the purpose of this Regulation.

(*e*) " Rubber " means (1) crude rubber, that is to say, rubber prepared from the leaves, bark or latex of any rubber plant, and the latex of any rubber plant, whether fluid or coagulated, in any stage of the treatment to which it is subjected during the process of conversion into rubber, and latex in any state of concentration ; and (2) for the purposes of paragraph (*i*) of this Article and Articles 4, 5 and 6 includes the raw rubber content of all articles and things manufactured wholly or partly from crude rubber within a territory to which the present Agreement applies, which manufactured articles had not been previously imported.

(*f*) " New planting " means planting during the period of the Regulation rubber seeds or plants on an area which has not since the 7th May, 1934, borne such plants. If in an area already bearing two (or more) cultivations or other growths, one of which consists of rubber plants, the other cultivation(s) or growth(s) are being wholly or partly substituted by rubber plants, this substitution will also be regarded as new planting.

(*g*) " Replanting " or " replant " means planting during the period of the Regulation more than thirty plants on any acre (or more than seventy-five rubber plants on any hectare) of any area carrying rubber plants on the 7th May, 1934, so far as such planting cannot be considered to be new planting as defined under (*f*) of this Article.

(*h*) " Supplying " or " supply " means planting during the period of the Regulation thirty rubber plants or less on any acre, or seventy-five rubber plants or less on any hectare of any area carrying rubber plants on the 7th May, 1934, so far as such planting cannot be considered to be new planting as defined under (*f*) of this Article.

(*i*) " Net exports " means the difference between the total exports of rubber from a territory during a period, and the total imports of crude rubber into that territory during the same period.

(*j*) " Owner " means and includes the proprietor, occupier or person in the possession or in charge of a holding, or such person as is, in the opinion of the Government concerned, the Manager or Agent of or entitled to act for or on behalf of such proprietor, occupier or person.

(*k*) " Holding " means land on which rubber plants are grown which is in the ownership, possession or occupation, or is being worked by or under the control of the owner.

(*l*) " Person," unless the context otherwise requires, includes a company, corporation, partnership or other body whether corporate or not.

(*m*) " Standard production " means the amount fixed by the Government of each territory or group of territories as the standard production of rubber of a holding for any control year.

ARTICLE 3.

(*a*) The contracting Governments undertake to take such measures as may be necessary to maintain and enforce in their respective territories, as defined in Article 1, the regulation and control of the production, export and import of rubber as laid down in Articles 4, 5, 6, 8, 9, 10, 11, 12 and 13 of this Agreement, hereinafter referred to as " the Regulation."

(*b*) The said Regulation shall come into operation on the 1st June, 1934, and shall remain in force until the 31st December, 1943, as a minimum period.

(*c*) Not less than twelve calendar months prior to the 31st December, 1943, the International Rubber Regulation Committee shall make a recommendation to the contracting Governments as

to the continuation or otherwise of the Regulation. The recommendation, if in favour of continuation, may suggest amendments to the Regulation and include proposals relating to the other provisions of this Agreement.

(*d*) Each contracting Government shall signify to the International Rubber Regulation Committee its acceptance or rejection of the recommendation referred to in the immediately preceding paragraph within three calendar months after the date of the receipt of such recommendation.

(*e*) If the said recommendation is accepted by all the contracting Governments, the contracting Governments undertake to take such measures as may be necessary to carry out the said recommendation. The International Rubber Regulation Committee shall inform the Government of the United Kingdom, which shall draw up a declaration certifying the terms of the said recommendation and its acceptance by all the contracting Governments, and the present Agreement shall be deemed to be amended in accordance with this declaration as from the date specified in that declaration. A certified copy of the declaration, together with a certified copy of the Agreement as amended, shall be communicated to all the other contracting Governments.

(*f*) If the said recommendation is not accepted by all the contracting Governments, the International Rubber Regulation Committee shall decide as soon as possible whether they desire to submit to the contracting Governments an amended recommendation. If the International Rubber Regulation Committee submits an amended recommendation, each contracting Government shall signify to the International Rubber Regulation Committee its acceptance or rejection of the amended recommendation within one month after the date of its receipt. If the amended recommendation is accepted by all the contracting Governments the provisions of paragraph (*e*) above shall apply.

(*g*) If the International Rubber Regulation Committee decides not to submit an amended recommendation, or if its amended recommendation is not accepted by all the contracting Governments, the International Rubber Regulation Committee shall so inform the Government of the United Kingdom which may of its own accord, and shall, if requested by any other contracting Government, convoke a conference of the contracting Governments to consider the situation.

(*h*) Unless a recommendation to continue the regulation is accepted under paragraphs (*d*), (*e*) and (*f*) above, or unless an agreement for continuation is concluded between the contracting Governments at the conference referred to in paragraph (*g*) above, the regulation and all the obligations arising out of this Agreement shall terminate on the 31st December, 1943. If at the conference referred to in paragraph (*g*) above an agreement for continuation is concluded between some but not all of the contracting Governments, the Regulation and all the obligations arising out of this Agreement shall terminate on the 31st December, 1943, in respect of any contracting Government not a party to the Agreement for continuation.

(*i*) Without prejudice to the provisions of paragraph (*c*) of this Article the International Rubber Regulation Committee may at any time make a recommendation to the contracting Governments for the amendment of any part of the Regulation or any of the other provisions of the present Agreement except the provisions of Articles 4 and 6 and of paragraphs (*l*) or (*n*) of Article 15. The recommendations of the Committee under this paragraph may include a recommendation that the present Agreement should be made open to the accession of a non-signatory Government, and proposals for such additions and amendments to the present Agreement (including additions to Article 4 and paragraph (*l*) or (*n*) of Article 15) as may be necessary to determine the conditions of the participation of such Government. The provisions of paragraphs (*d*) and (*e*) of this Article shall apply as regards any recommendation made under the provisions of this paragraph. Recommendations under this paragraph, if not accepted and put into force under paragraphs (*d*) and (*e*), shall fall, but without prejudice to the power of the International Rubber Regulation Committee to present all or any of them again under paragraph (*c*) at the appropriate time.

ARTICLE 4.

In the case of the Straits Settlements, the Federated Malay States, and the Unfederated Malay States and Brunei (which shall be deemed to constitute a single group of territories for this purpose), and of the Netherlands Indies, Ceylon, India, Burma, the State of North Borneo, Sarawak and Siam, the exports of rubber from the territory shall be regulated in accordance with the following provisions :—

(*a*) The following annual quantities in tons of 2,240 English pounds dry rubber shall be adopted as basic quotas for each territory or group of territories for the control years specified :—

Table of Basic Quotas (*Long Tons*).

1934-1938.

——	1934.	1935.	1936.	1937.	1938.
Straits Settlements, F.M.S., U.M.S. and Brunei	$\frac{7}{12}$ of 504,000	538,000	569,000	589,000	602,000
Netherlands India ...	352,000	400,000	500,000	520,000	540,000
Ceylon	77,500	79,000	80,000	81,000	82,500
India...	6,850	12,500	12,500	12,500	13,000
Burma	5,150	8,000	8,500	9,000	9,250
State of N. Borneo...	12,000	13,000	14,000	15,500	16,500
Sarawak	24,000	28,000	30,000	31,500	32,000
Siam	15,000	40,000	40,000	40,000	40,000
Total	996,500	1,118,500	1,254,000	1,298,500	1,335,250

Table of Basic Quotas (*Long Tons*).

1939-1943.

——	1939.	1940.	1941.	1942.	1943.
Straits Settlements, F.M.S., U.M.S. and Brunei	632,000	642,500	648,000	651,000	651,500
Netherlands India ...	631,500	640,000	645,500	650,000	651,000
Ceylon	106,000	107,500	109,000	109,500	110,000
India...	17,500	17,750	17,750	17,750	17,750
Burma	13,500	13,750	13,750	13,750	13,750
State of N. Borneo...	21,000	21,000	21,000	21,000	21,000
Sarawak	43,000	43,750	44,000	44,000	44,000
Siam	54,500	55,300	55,700	56,000	60,000
Total ...	1,519,000	1,541,550	1,554,700	1,563,000	1,569,000

(*b*) Burma shall be permitted to export rubber to India without debiting such exports against her " permissible exportable amount " as defined in paragraph (*d*) below and in paragraphs (1) and (2) of Article 5, so long as such exports are permitted by the Governments of India and Burma. In the event of such exports being absolutely prohibited, an addition at the rate of 3,000 tons per annum shall be made to the basic quotas allotted to Burma in paragraph (*a*) of this Article. If such exports are limited and the amount so limited is less than 3,000 tons, then an addition shall be made to the basic quotas for Burma at a rate per annum

equivalent to the difference between such permitted annual exports and 3,000 tons, and if the amount permitted is equal to or greater than 3,000 tons, no addition shall be made to the basic quotas. An addition to the basic quotas made under the provisions of this paragraph at any time during a control year shall bear the same relation to the addition permitted for a full year as the remaining part of the control year calculated from the date on which the prohibition or limitation came into force bears to the whole control year. Such exports of rubber imported into India from Burma shall be deemed to be excluded from India's " total imports of crude rubber " and from Burma's " total exports of rubber " for the purposes of Article 2 (*i*).

(*c*) The International Rubber Regulation Committee shall fix from time to time for each territory or group of territories a percentage of the basic quota. The percentage of the basic quota fixed by the International Rubber Regulation Committee shall be the same for each territory or group of territories. In the case of Siam, the percentage of the basic quota for that territory shall not be less than 50 per cent. for the year 1934, than 75 per cent. for the year 1935, than 85 per cent. for the year 1936, than 90 per cent. for the year 1937, and 100 per cent. for the year 1938.

(*d*) In each control year the quantity of rubber, which is equivalent to the percentage so fixed of the basic quotas of each territory or group of territories, constitutes for that territory or group of territories the " permissible exportable amount " for such territory or group of territories. Provided that in the case of Siam the " permissible exportable amount " so constituted for that territory shall not in any of the control years 1939 to 1943 be less than 41,000 tons (of 2,240 English pounds).

ARTICLE 5.

The net exports of rubber from each territory or group of territories shall be limited to the " permissible exportable amount " :

Provided that (1) in any control year the net exports may be permitted to exceed the " permissible exportable amount " by a quantity not greater than 5 per cent. of that amount, but, if the " permissible exportable amount " is exceeded in any year, the net exports for the immediately following control year shall be limited to the " permissible exportable amount " for such year less the amount of such excess for the previous year.

(2) If any territory or group of territories has exported in any control year less than its " permissible exportable amount," the net exports from such territory or group of territories for the immediately following year may be permitted to exceed the " permissible exportable amount " for such year by an amount equal to the deficiency below the " permissible exportable amount" for the previous year if such deficiency was not more than 10 per cent. of such " permissible exportable amount," or equal to 10 per cent. of such " permissible exportable amount " if the deficiency exceeded 10 per cent.

(3) In the case of the group of territories comprising the Straits Settlements, the Federated Malay States and the Unfederated Malay States and Brunei, the obligations arising under this Article may be executed (*a*) by controlling the actual production of rubber on the islands of Singapore and Penang (parts of the Straits Settlements), and (*b*) by controlling the exports of rubber from the remainder of this group of territories in such a manner that the total of the production of rubber during the control year in question in Singapore and Penang, together with the net exports of rubber during the said year from the remainder of the group of territories, shall not exceed the amount of the " permissible exportable amount " for the whole group of territories.

(4) For the purpose of the preceding proviso and of the provisions of Articles 9, 10 and 13 below, the entry of rubber from the remainder of the group into Singapore or Penang, or into such rubber storage places within the remainder of the group as may from time to time be sanctioned by the International Rubber Regulation Committee, or *vice versa*, shall be deemed to be an export or import as the case may be.

ARTICLE 6.

In the case of Indo-China, the Administration (1) shall maintain a complete record of all rubber leaving the territory and will establish such control as is necessary for this purpose, and (2) on the happening of the events specified in paragraph (*a*) below, shall cause the quantities of rubber specified in that paragraph to be delivered to the order of the International RubberRegulation

Committee in accordance with the provisions of paragraph (*b*) below :—

(*a*) If in any control year the total quantity of rubber leaving French Indo-China for any part of the world shall exceed 60,000 tons (of 2,240 English pounds), and the permissible exportable amounts for the territories specified in Article 4 are less than the basic quotas, a quantity of rubber shall be delivered equal to a percentage of the amount by which the total quantity of rubber leaving French Indo-China exceeds 60,000 tons, such percentage being the average percentage of reduction of basic quotas which shall have been applied in that year in the territories specified in Article 4.

(*b*) The quantities of rubber referred to in paragraph (*a*) above shall be notified to and agreed with the International Rubber Regulation Committee, and delivered free of cost and all charges at warehouses in the United Kingdom or in France in the form of London standard quality sheets or London standard quality crepe, to the order of the International Rubber Regulation Committee, within six months after the expiration of the control year in question.

ARTICLE 7.

The International Rubber Regulation Committee may dispose of all rubber delivered in accordance with the provisions of the preceding Article in such manner as it shall deem to be most beneficial to the objects which are envisaged in the provisions of the present Agreement.

ARTICLE 8.

The provisions of Articles 9, 10, 11, 12, 13 and 14 below apply to all the territories specified in Article 1 unless the contrary is expressly stated.

ARTICLE 9.

The exportation of rubber from a territory or group of territories shall be prohibited under penalties that will be effectively deterrent, unless such rubber is accompanied by a certificate of origin duly authenticated by an official duly empowered for this purpose by the Administration of the territory or group. The penalties which may be imposed for this offence shall include

(*a*) the destruction, and (*b*) the confiscation of the rubber. This Article does not apply to the islands of Singapore and Penang or to such rubber storage places as may be sanctioned by the International Rubber Regulation Committee under Article 5 hereof.

ARTICLE 10.

The importation of rubber into a territory or group of territories shall be prohibited, under penalties that will be effectively deterrent, unless such rubber is accompanied by a certificate of origin duly authenticated by a competent official of the Administration of the territory or group of origin. The penalties which may be imposed for this offence shall include (*a*) the destruction, and (*b*) the confiscation of the rubber.

ARTICLE 11.

(*a*) Every owner of a rubber estate not less than 100 acres in area shall be prohibited under penalties that shall be effectively deterrent from having in his possession at any time stocks of rubber exceeding one-quarter of the amount of the total standard production of that estate for the preceding Control Year.

(*b*) So far as estates of less than 100 acres and small holdings are concerned, the Governments of each of the territories or group of territories will ensure that the total of the stocks maintained by the owners of these estates and small holdings shall be kept within normal limits.

(*c*) The total of all other stocks of rubber in the territory shall be limited to a quantity not exceeding 12½ per cent. of its " permissible exportable amount " for the preceding control year.

(*d*) The preceding provisions of this Article do not apply to India, Burma, the islands of Singapore or Penang, Siam, or to the storage places sanctioned by the International Rubber Regulation Committee under paragraph 4 of Article 5, but in India, Burma and Siam the stocks of rubber shall be limited to normal proportions having regard to the amount of rubber internally consumed.

ARTICLE 12.

(*a*) Except as provided in the subsequent paragraphs of this Article, the planting of rubber plants during the period of the

Regulation shall be prohibited under penalties that shall be effectively deterrent, such penalties including the compulsory eradication and destruction of the plants so planted at the expense of the owner.

(*b*) New planting shall be permitted during the period the 1st January, 1939, to the 31st December, 1940, in each territory or group of territories on an area not greater than 5 per cent. of the total planted area of that territory or group as specified in paragraph (*e*) of this Article. The International Rubber Regulation Committee shall have the power to, and may, if it so decides, permit additional new planting, during this period, on an area up to a maximum of 1 per cent. of the total planted area of all territories as specified in paragraph (*e*) of this Article. The Committee shall have the right to allocate all or part of this additional area among all or to any of the territories or group of territories specified in paragraph (*e*) of this Article in such a manner as it deems appropriate.

(*c*)—(1) New planting shall be permitted after the 31st December, 1940, in each territory or group of territories on areas not greater than the percentages of the total planted area of that territory or group which the International Rubber Regulation Committee shall fix from time to time for such periods as it shall determine. (2) The Committee shall have the power to, and may, if it so decides, permit additional new planting during the period the 1st January, 1941, to the 31st December, 1943, on an area up to a maximum of one-fifth of the area permitted to be new planted under sub-paragraph (1) of this paragraph. The Committee shall have the right to allocate all or part of this additional area among all or to any of the territories or group of territories specified in paragraph (*e*) of this Article in such a manner as it deems appropriate.

(*d*) The provisions of paragraphs (*b*) and (*c*) of this Article do not apply to Siam. In Siam new planting shall be permitted during the period the 1st January, 1939, to the 31st December, 1943, on a percentage of the total planted area as given in paragraph (*e*) of this Article equivalent to the highest percentage which may be granted to any other territory or group of territories under paragraphs (*b*) and (*c*) of this Article, and in any case on an area not less than 31,000 acres.

(*e*) The total planted areas of the territories to which this Agreement applies shall for the purposes of this Article be deemed to be as follows :—

	Total planted area. (*In acres.*)
Straits Settlements, Federated Malay States, Unfederated Malay States and Brunei	3,273,100
Netherlands India	3,214,900
Ceylon	605,200
French Indo-China	314,200
India	128,000
Burma	104,400
State of North Borneo	126,600
Sarawak	228,000
Siam	312,000

(*f*) New planting rights not used in the period referred to in paragraph (*b*) above or in any of the periods fixed by the International Rubber Regulation Committee under paragraph (*c*) shall be automatically cancelled.

(*g*) " Replanting " shall be permitted unconditionally, but the Committee shall have the power to review the position and limit replanting after the 31st December, 1940, if this should seem advisable.

(*h*) " Supplying " shall be permitted unconditionally.

(*i*) The contracting Governments undertake to furnish to the International Rubber Regulation Committee not later than the 1st May of each Control Year accurate statistics showing separately the total areas replanted and new-planted in the preceding Control Year divided into areas planted with bud-grafted rubber, high yielding clonal seed and seedling rubber.

ARTICLE 13.

(*a*) The exportation from a territory or group of territories of rubber plants shall be prohibited under penalties that shall be effectively deterrent, except to any other territory or group of territories to which this Agreement applies. In the case of territories to which this Agreement applies it is contemplated that

except where commercial or administrative considerations in the territory of origin render this undesirable, export of rubber plants should be permitted from any such territory or group of territories to any other such territories or group of territories.

(*b*) In the case of any such export to other territories to which this Agreement applies, a return showing the amount exported or imported during that Control Year, and the territories to which they were exported or from which they were imported, shall be sent by the Administrations of both the territory of export and the territory of import to the International Rubber Regulation Committee at the end of each Control Year.

ARTICLE 14.

The contracting Governments and the Administrations of the territories or group of territories to which the present Agreement applies will co-operate with each other to prevent smuggling evasions and other abuses of the Regulation.

ARTICLE 15.

(*a*) An International Committee to be designated " The International Rubber Regulation Committee " shall be constituted as soon as possible.

(*b*) The said Committee shall be composed of delegations representing the territories or group of territories to which the present Agreement applies, and the numbers of the respective delegations and the numbers of the persons who may be nominated as substitutes to replace members of delegations who are absent shall be as follows :—

	Members.	*Substitute Members.*
(1) Straits Settlements, Federated Malay States Unfederated Malay States, Brunei ...	4	2
(2) Netherlands India	4	2
(3) Ceylon	2	1
(4) French Indo-China	2	1
(5) India	1	1
(6) Burma	1	1
(7) State of North Borneo ...	1	1
(8) Sarawak	1	1
(9) Siam	1	1

(*c*) The Government of the United Kingdom shall be informed as soon as possible by the other contracting Governments of the persons first designated as members of delegations representing their respective territories. All subsequent changes in the membership of delegations shall be notified by communications addressed to the Chairman of the Committee.

(*d*) The Government of the United Kingdom will convoke the first Meeting of the Committee as soon as possible, and may do so when the members of six delegations have been designated.

(*e*) The principal office of the Committee shall be in London. The Committee shall make such arrangements as may be necessary for office accommodation, and may appoint and pay such officers and staff as may be required. The remuneration and expenses of members of delegations shall be defrayed by the Governments by whom they are designated.

(*f*) The proceedings of the Committee shall be conducted in English.

(*g*) The Committee shall at its first meeting elect its Chairman and Vice-Chairman.

(*h*) The Chairman and Vice-Chairman shall not be members of the same delegation.

(*i*) Meetings shall be convened by the Chairman, or in his absence by the Vice-Chairman. Not more than three calendar months shall elapse between any two consecutive meetings. An extraordinary meeting shall be convened at any time at the request of any delegation within fourteen days of the receipt of the request by the Chairman.

(*j*) The Committee shall perform the functions specifically entrusted to it under the subsequent paragraphs of this Article and Articles 3 (*c*), (*e*), (*f*), (*g*) and (*i*), 4 (*c*), 5 (4), 6, 7, 12 (*c*), 17, 18 and 19 of this Agreement, and shall, in addition, collect and publish such statistical information and make such other recommendations to Governments relevant to the subject-matter of this Agreement as may seem desirable, in particular, with reference to the disposal of any rubber which may come into the ownership of any Government as the result of the carrying out of Articles 9 and 10 of this Agreement. The Committee shall do all such other lawful things as may be necessary, incidental or conducive to the carrying out of its functions, and give such publicity to its actions as it may deem necessary or desirable.

(*k*) Each delegation shall vote as one unit. In case of delegations composed of more than one member, the name of the member entitled to exercise the vote shall be communicated in case of the first meeting to the Government of the United Kingdom and thereafter to the Chairman of the Committee. The voting member may in case of absence, by communication to the Chairman, nominate another member to act for him.

(*l*) Each delegation shall possess a number of votes calculated on the basis of one vote for every complete 1,000 tons of the basic quota of the control year for the time being for the territory or group of territories represented by that delegation, and for the purpose of voting the territory of French Indo-China shall be deemed to have a basic quota of 80,000 tons for each of the control years 1939-1943.

(*m*) The presence of voting members of at least four delegations shall be necessary to constitute a quorum at any meeting: provided that if within an hour of the time appointed for any meeting a quorum as above defined is not present, the meeting may be adjourned by the Chairman to the same day, time and place in the next week, and if at such adjourned meeting a quorum as defined above is not present, those delegations who are present at the adjourned meeting shall constitute a quorum.

(*n*) Decisions shall be taken by a majority of the votes cast: provided that—

(1) A decision recommending amendments to the present Agreement under paragraph (*i*) of Article 3, or fixing or varying the permissible exportable percentage of the basic quotas under Article 4, or fixing the percentage of the permissible new planting area, or limiting replanting under Article 12, or varying the rate of the uniform cess under Article 19, or making or modifying or abrogating the rules of procedure, shall require a three-fourths majority of the total votes which could be cast by all the delegations entitled to vote whether such delegations are present or not.

(2) The delegation representing French Indo-China shall only be entitled to participate in any discussion or vote on the permissible exportable percentage of the basic quotas if and so long as exports from this territory exceed 60,000 tons (of 2,240 English pounds) in a control year.

(*o*) The Committee shall at the beginning of each control year draw up its budget for the forthcoming year. The budget shall show under appropriate headings and in reasonable detail the estimate of the Committee of its expenses for that year. The budget shall be communicated to the contracting Governments and to the Administrations of the territories or group of territories to which the present Agreement applies, and shall show the share of the expenses falling upon each territory or group of territories in accordance with the provisions of Article 16.

As soon as possible after the end of each control year the Committee shall cause to be drawn up and audited by a duly qualified chartered accountant a statement of account showing the money received and expended during such years. The statement of account shall be communicated to the contracting Governments and to the Administrations of all territories or groups of territories to which the present Agreement applies.

(*p*) The Committee may draw up, put into force, modify or abrogate rules for the conduct of its business and procedure as may from time to time be necessary provided that its rules of procedure shall be at all times in conformity with the preceding provisions of this Article.

ARTICLE 16.

The expenses of the International Rubber Regulation Committee shall be defrayed by the Administrations of all territories or group of territories to which the present Agreement applies. One-half of the contribution for the whole year of each territory or group of territories, as shown in the budget drawn up by the Committee, shall be paid immediately on receipt of the budget by the contracting Governments, and the balance of such contribution not later than six months after this date. The contribution of each territory or group of territories shall be proportionate to their respective basic quota for the control year to which the budget relates. The basic quotas of French Indo-China for this purpose shall be those specified in Article 15 (*l*).

ARTICLE 17.

(*a*) The Administrations of each of the territories or group of territories to which the present Agreement applies shall, not later than the 1st January, 1935, communicate to the International Rubber Regulation Committee a declaration showing the total ascertained area in the territory or group planted with rubber on the 1st June, 1934.

(*b*) Each Administration will furnish to the International Rubber Regulation Committee all reasonable assistance to enable the Committee properly and efficiently to discharge its duties. Such assistance shall include annual reports on the working of the Regulation in the territory or group of territories and all necessary statistical information, including information as to costs of production collected by the organised associations of rubber producers. Each Administration shall grant ample facilities to duly accredited agents of the Committee for the investigation of the manner in which the regulation is being carried out in the territory.

ARTICLE 18.

The International Rubber Regulation Committee shall be empowered to, and shall within one month after the date of its first meeting, arrange for the nomination of four persons representative of the consumers of rubber, of whom two shall be representative of such consumers in America, and such representatives shall form a panel who will be invited to tender advice from time to time to the International Rubber Regulation Committee as to world stocks, the fixing and varying of the permissible exportable percentage of the basic quotas, new planting, replanting and cognate matters affecting the interests of rubber consumers.

ARTICLE 19.

(1) As from the 1st October, 1936, a uniform cess shall be levied and collected by the Governments concerned on the net exports from each of the territories or group of territories to which this Agreement applies at the approximate rate of 1*d.* per 100 lbs., or at such other higher rate as the Governments concerned may decide from time to time on the recommendation of the International Rubber Regulation Committee, provided that : (*a*) in the case of Singagpore and Penang, this provision applies to rubber produced in these territories and included in the permissible exportable amount as defined in paragraph 3 of Article 5 ; (*b*) this provision does not apply to exports from Sarawak prior to the 1st January, 1939 ; (*c*) in the case of Siam, this provision is not obligatory but may be accepted at any time without retrospective effect by the Government of Siam.

(2) That part of the proceeds of the levy of the above-mentioned cess which comes from British (including India),

Dutch and French territories respectively shall be paid to the British Rubber Research Board, the Crisis Rubber Centrale, and by way of subvention to the Institut francais du Caoutchouc, and devoted to research with a view to the development of new applications of rubber and to propaganda for the extended use of rubber which may be conducted through national propaganda institutions.

If the Government of Siam decides to levy the above-mentioned cess, it may levy it at whatever rate it decides, and the distribution of the proceeds of the levy in Siamese territory shall be left to the decision of the Siamese Government.

(3) The Governments of the French Republic, the United Kingdom and the Kingdom of the Netherlands agree that the national rubber research institutions will co-operate in the constitution and maintenance of an International Rubber Research Board and an International Propaganda Committee to co-ordinate the research and propaganda work of the three national research institutions and the national propaganda institutions.

ARTICLE 20.

(*a*) If, as the result of a recommendation of the International Rubber Regulation Committee under paragraphs (*c*) or (*i*) of Article 3 and the acceptance of such recommendation by the contracting Governments under paragraphs (*d*) or (*f*) of that Article, a non-signatory Government is invited to accede to the present Agreement, the Government of the United Kingdom shall communicate to the Government invited to accede a copy of the present Agreement as amended in accordance with all declarations issued under paragraph (*e*) of Article 3 up to date.

(*b*) The Government so invited may then accede by the deposit with the Government of the United Kingdom of an instrument of accession accepting this Agreement as set out in the copy thereof communicated by the Government of the United Kingdom.

(*c*) The Government of the United Kingdom shall communicate to the other contracting Governments and to the International Rubber Regulation Committee copies of the instrument of accession.

ARTICLE 21.

(*a*) Any contracting Government may at any time, if it considers that its national security is endangered and that the continuance of its obligations under this Agreement would be inconsistent with the requirements of its national security, give notice to the Government of the United Kingdom that it desires the suspension for the period of the emergency of all its rights and obligations under the Agreement (except those set out in Articles 12 and 13 in regard to new planting and the export of planting material respectively), and all such rights and obligations shall thereupon be suspended until the Government which has given notice informs the Government of the United Kingdom of the termination of the emergency.

(*b*) The Government of the United Kingdom shall immediately inform all the other contracting Governments on receipt of any notice of suspension under the first paragraph of this Article, and each of the other contracting Governments shall have the right to notify the Government of the United Kingdom within one month of the receipt of this information that, in the circumstances, it desires to suspend its rights and obligations (other than those set out in Articles 12 and 13).

(*c*) If notifications of suspension are received under paragraph (*b*) from two or more contracting Governments, the Agreement shall be suspended (except for Articles 12 and 13) in respect of all contracting Governments until the suspension is terminated by the Government which first gave notice under paragraph (*a*). Otherwise the Agreement will remain in full force between the contracting Governments who have not given notice of suspension.

ARTICLE 22.

All declarations drawn up by the Government of the United Kingdom certifying the terms of a recommendation under Article 3 (*c*), and all copies of the present Agreement communicated by the Government of the United Kingdom under Article 20 (*a*), shall be in English and French, both texts being equally authentic.

FIRST PERIOD OF INTERNATIONAL RUBBER REGULATION.

1934—1938.

NAMES OF MEMBERS.

BRITISH.

MALAYA :

Sir John Campbell, K.C.M.G., C.S.I.	...	Economic and Financial Adviser to the Colonial Office (1930-1942). Chairman of the International Tin Committee (Chairman of the Committee and voting member of the Malayan delegation).
Sir John Hay	...	Chairman of Guthrie & Co., Ltd.; Chairman and Director of Rubber and Palm Oil Companies ; Director of Ocean Marine Insurance Co., Ltd., and of Mercantile Bank of India Ltd. ; Chair- of Rubber Growers' Association (1930-1931) ; President of the Association of British Malaya (1936-1937).
H. Eric Miller, Esq.	...	Chairman of Harrisons and Crosfield, Ltd. ; Chairman and Director of Rubber Companies; Chairman of Rubber Growers' Association (1924-1925) ; Chairman of the International Rubber Research Board ; Chairman of the British Rubber Producers' Research Association.
V. A. Lowinger, Esq., C.B.E.	...	Surveyor-General F.M.S. and S.S. (1922-1932) ; Agent for Malaya in U.K. (1933-1938) ; member of the International Tin Committee ; Chairman International Tin Research Council.

Alternates :

G. L. M. Clauson, Esq., C.M.G.	...	Assistant Under-Secretary of State for the Colonies since 1940, previously Assistant Secretary at the Colonial Office.
J. E. Nathan, Esq.	...	Rubber Controller in Malaya (1922-1923) ; Chairman of the Rubber Trade Association of London (1937-1938).

CEYLON :

E. B. Alexander, Esq., C.M.G.	...	Controller of Revenue Ceylon (1924-1927) ; Acting Colonial Secretary (1925-1927) ; Acting Governor (Oct./Nov. 1925) ; Member of International Tea Committee. (Voting member of the Ceylon delegation).
Sir Clifford H. Figg	...	Chairman of Thomson, Alston & Co., Ltd. ; Chairman and Director of Rubber and Tea Companies ; Director of Mercantile Bank of India, Ltd. ; President of the Ceylon Association in London (1937); Member of International Tea Committee ; Business Adviser to the Secretary of State for the Colonies since 1939.

Alternate :

A. C. Matthew, Esq.	...	Chairman and Director of Rubber and Tea Companies ; President of the Ceylon Association in London (1938-1939) ; Chairman of the Rubber Growers' Association (1941-1942); Member of the International Tea Committee.

NORTH BORNEO :

Sir Andrew McFadyean	...	Director of the British North Borneo (Chartered) Company ; Director of Rubber and Other Companies ; Commissioner of Controlled Revenues, Berlin (1924-1930). (Voting member).

Alternate :

W. O. Pidgeon, Esq.	...	Secretary of the British North Borneo (Chartered) Company.

SARAWAK :

(1) F. F. Boult, Esq.	...	Retired Sarawak Government Official. (Voting member until his resignation in 1936.)
(2) C. Armine Willis, Esq.	...	Governor, Upper Nile Province, Sudan (1926-1931) ; member of Mui Tsai Commission (Colonial Office) (1936). (Voting member from his appointment in 1936).

Alternate :

H. D. Aplin, Esq.	...	Secretary to the Sarawak Government in London.

DUTCH.
N.E.I.

Prof. J. van Gelderen (Deceased)	...	Head of the Economic Section of the Netherlands Ministry for the Colonies ; Vice-Chairman of the International Tin Committee ; member of the League of Nations' Committee for the Study of the Problem of Raw Materials (1937). (Vice-Chairman of the Committee and voting member of the Netherlands Indian delegation).
Prof. L. P. le Cosquino de Bussy	...	Director of the Netherlands Colonial Institute.
D. Bolderhey, Esq.	...	Managing Director of the N.V. Handelsvereeniging " Amsterdam," Amsterdam.

Alternates :

E. Enthoven, Esq.	...	Managing Director of the Deli-Maatschappij, Amsterdam ; Chairman and Director of Rubber and Other Companies; one of the founders of civil aviation in the Netherlands and in the N.E.I.

Pangeran Ario Soejono (Deceased)	...	Late Minister without portfolio in the Dutch Government.

INDIAN.

INDIA AND BURMA :

The High Commissioner for India in London (Voting Member).

(1) Sir Bhupendra Nath Mitra, K.C.S.I., K.C.I.E. (1934-1936).

(2) Sir Firozkhan Noon, K.C.I.E. (1936-1938).

Alternate :

(1) Sir Harry Lindsay, K.C.I.E.		Government of India Trade Commissioner in London (1923-1934) ; Director of Imperial Institute since 1934.
(2) Sir David Meek, C.I.E., O.B.E.	...	Director General of Commercial Intelligence and Statistics Government of India (1926-1935) ; Government of India Trade Commissioner in London since 1935 ; member of International Tea Committee, International Sugar Council, Wheat Advisory Committee.

FRENCH.

INDO-CHINA.

Col. F. Bernard.	...	Chairman of the French Rubber Planters' Association (Voting member).

Alternate :

Mons. Ph. Langlois	...	President of the French Rubber Institute.

SIAMESE.

SIAM :

His Excellency the Siamese Minister in London (Voting member).

(1) Phya Supan Sampati (1934-1935).

(2) Phya Rajawangsan (Deceased) (1935-1938).

Alternate :

The First Secretary of the Siamese Legation in London.

(1) Luang Siri Rajmaitri (1934-1935).
(2) Phra Bovara Sneha (1935-1937).
(3) Luang Bhadravadi (1937-1938).
(4) Khun Bibidh Virajjakar (1938).

ADVISORY PANEL OF MANUFACTURERS.

U.K. :

Sir J. George Beharrell, D.S.O.	Chairman Dunlop Rubber Co., Ltd. ; President Institution of Rubber Industry (1934-1937) ; President Federation of British Industries (1932-1933) ; Member of Prime Minister's Advisory Panel of Industrialists (1938).

Alternate :

F. D. Ascoli, Esq., C.I.E. ...	Indian Civil Service (1907-1926) ; Director, Dunlop Malayan Estates Ltd. ; Rubber Director, Ministry of Supply since 1942.

U.S.A. :

(1) Col. A. F. Townsend (Deceased) ...	Chairman of Raybestos-Manhattan Inc., resigned from Committee in 1937.
(2) A. L. Viles, Esq. ...	President of the Rubber Manufacturers' Association Inc. ; Consultant to the Rubber Reserve Company.

Alternates :

Wm. de Krafft, Esq. ...	Former Chairman of the U.S. Rubber Co.'s Finance Committee and now Chairman of the de Krafft Corporation, N. York.
J. J. Newman, Esq. ...	Vice President, B.F. Goodrich Co.
A. B. Newhall, Esq. ...	Late Vice-President B.F. Goodrich Co., Vice-President Talon Inc. ; Co-ordinator for Rubber under W.P.B.

S. G. Carkhuff, Esq.	...	Secretary, Firestone Tire & Rubber Co.
J. J. Blandin, Esq.	...	Vice-President, Goodyear Rubber Plantations Company.
EUROPE (Germany);		
Herr Otto Friedrich	...	Managing Director of the Reichsverband der Deutschen Kautschukindustrie.

SECRETARY OF THE COMMITTEE.

A. G. Pawson, Esq., C.M.G.		Governor, Upper Nile Province, Sudan (1931-1934).

SECOND PERIOD OF INTERNATIONAL RUBBER REGULATION

NAMES OF MEMBERS.

BRITISH.

MALAYA:

*Sir John Campbell, K.C.M.G.	...	Chairman of the Committee (Voting member)
*Sir John Hay.		
*H. Eric Miller, Esq.,		
J. C. Innes, Esq., O.B.E., (Deceased)	...	Former Malayan Rubber Planter, Chairman-designate of the Rubber Growers' Association.

Alternates:

*G. L. M. Clauson, Esq., C.M.G.
*J. E. Nathan, Esq.

CEYLON:

*E. B. Alexander, Esq., C.M.G.	...	(Voting member)
*Sir Clifford Figg.		

Alternate:

*A. C. Matthew, Esq.

NORTH BORNEO :

'Sir Andrew McFadyean	...	(Voting member)
Alternate :		
E. Bateson, Esq.,	...	Former Controller of Rubber in North Borneo.

SARAWAK :

Capt. B. Brooke	...	Tuan Muda of Sarawak brother of the Rajah. Special Commissioner for the Sarawak Government (Voting member).
Alternate :		
*H. D. Aplin, Esq.		

DUTCH.

N.E.I. :

Dr. G. H. C. Hart, (Deceased)	...	Secretary-General of the Netherlands Ministry for the Colonies (Vice-Chairman of the Committee and voting member of the N.E.I. delegation until his death in September, 1943).
*Prof. L. P. le Cosquino de Bussy		
*D. Bolderhey, Esq.		
*Pangeran Ario Soejono.		
Alternates :		
*E. Enthoven, Esq.		
P. van Leeuwen Boomkamp, Esq.		Director of Amsterdam Rubber Maatschappij.

(N.B.) Since the invasion of Holland the Dutch Delegation has been as follows :—

Dr. G. H. C. Hart. (Deceased)		
P. H. Westermann, Esq.	...	Head of the Economic Section of the Netherlands Ministry for the Colonies (Vice-Chairman of the Committee and voting member of the N.E.I. delegation since September, 1943).

A. A. Pauw, Esq. ... Managing Director of the N.V. Netherlandsche Handel Maatschappij.

W. Daukes, Esq. ... Chairman and Managing Director Anglo-Dutch Plantations in Java.

Alternate :

W. van de Stadt, Esq. ... Manager, Netherlands Trading Society (East) Ltd.

INDIAN.

INDIA :

The High Commissioner for India in London—(Voting member)

(1) *Sir Firozkhan Noon, K.C.I.E., (1939-1942).

(2) Sir Muhammad Azizul Huque, C.I.E., D.Litt., (1942-1943)

(3) Sir Samuel Runganadhan (1943)

Alternate :

(1) *Sir David Meek, C.I.E., O.B.E. (1939-1943).

(2) S. Lall, Esq. C.I.E. (1943) ... Deputy High Commissioner for India in London.

BURMESE.

BURMA :

W. J. C. Richards, Esq. ... Director of Plantation and Mining Companies ; Formerly member of the Burma Legislative Council, Indian Legislative Assembly, Burma Legislative Assembly ; Chairman, Burma Planters' Association. (Voting member.)

Alternate :

*Sir Harry Lindsay, K.C.I.E.

FRENCH.

INDO-CHINA :

*Col. F. Bernard

Mons. Paul Devinat ... Director of Economic Affairs in the French Colonial Office. (Voting member).

Alternates :

*Mons. Ph. Langlois (retd.)

Mons. R. M. E. Michaux ... Vice-President of the French Rubber Institute.

SIAMESE.

SIAM :

His Excellency the Siamese Minister in London. (Voting member)

(1) *Phya Rajawangsan (Deceased) (1939-1940)

(2) Phra Manuvedya Vimolnart (1940-1941)

Alternate :

The First Secretary of the Siamese Legation in London.

*Luang Bhadravadi.

ADVISORY PANEL.

U.K. :

*Sir J. George Beharrell, D.S.O.

Alternate :

*F. D. Ascoli, Esq., C.I.E.

U.S.A. :

*A. L. Viles, Esq.

A. N. Other ... An American Government representative for whom, at the request of the U.S. Government, provision was made in the renewed Agreement in 1938, no appointment was made.

Alternates :

*Wm. de Krafft, Esq.

*J. J. Newman, Esq.

*A. B. Newhall, Esq.

*S. G. Carkhuff, Esq.

*J. J. Blandin, Esq.

(Note : The following gentlemen also attended meetings of the Committee :

P. W. Litchfield, Esq. ... Chairman of the Board of the Goodyear Tire & Rubber Co

F. B. Davis, Esq. ... Chairman of the Board of the United States Rubber Co.

Wm. O'Neil, Esq. ... President of the General Tire & Rubber Co.)

EUROPE (Germany) :

*Herr Otto Friedrich

OBSERVER ON BEHALF OF THE FRENCH NATIONAL COMMITTEE.

Baron F. de Langlade ... Director of several French Rubber Companies.

Alternate :

Mons. M. Fogt ... Head of the Economic Department of the Colonial Commissariat.

SECRETARY :

A. G. Pawson, Esq., C.M.G.

* See under 1934-1936.

COSTS OF PRODUCTION.

At the first meeting of the International Rubber Regulation Committee on the 8th May, 1934, it was agreed that the Internationale Vereeniging voor de Rubbercultuur and the Rubber Growers' Association should be invited to consult together in order to prepare and determine a basis on which to compile statistics of costs of production.

A request was made to both organisations and as a result the following report, which was drawn up by a sub-committee of the Rubber Growers' Association and agreed by the Internationale Vereeniging voor de Rubbercultuur, was presented to the Committee.

THE RUBBER GROWERS' ASSOCIATION (INCORPORATED).

REPORT TO THE COMMERCIAL RESEARCH COMMITTEE BY THE RUBBER PRODUCTION COSTS SUB-COMMITTEE.

Terms of Reference.—To suggest a costing formula which would form a suitable basis for the collection of costs to determine what is a " fair and equitable price level which will be reasonably remunerative to efficient producers," the investigation to relate only to a period in which production is being regulated and to be confined to British countries.

For the purpose intended, costs obviously fall into two main divisions—Capital and Revenue.

CAPITAL COSTS.

The par capitalisation per acre of rubber producers differs greatly, in part due to issues of shares at a high premium. For other reasons, such as size and situation of property, labour rates at time of opening up and nature of equipment provided, the capital cost of plantations also varies to a considerable extent. With hesitation, your Sub-Committee decided as their guiding principle that the Capital cost on which the reasonably remunerative return expected should be calculated is neither the issued capital not the actual capital expenditure but to-day's cost of bringing into bearing a fully equipped " average " estate. Since

new plantings are prohibited under the Regulation Scheme and the recent past is considered to be an abnormal period, such a basis is of necessity theoretical. It was agreed that each member of the Sub-Committee should write to his Eastern Agents requesting estimates of Capital cost on the following basis :—

Assume :—

1. A fair-sized estate, according to the custom of the country, and opening up at normal capacity from virgin jungle. In Malaya these were respectively assumed to be 3,000 acres and 1,000 acres per annum, and in Ceylon and elsewhere much less.
2. An unbudded estate, and attach a separate estimate of additional expenditure consequent on bud-grafting.
3. Usual premium and quit rent of $2 per acre per annum.
4. Salary, leave pay, passages, etc., according to present standards, assuming there has been a revision recently.
5. Contract and wage rates at a " normal " figure, i.e., more than slump and less than boom standards.
6. Average configuration, i.e., not entirely flat nor entirely hilly.
7. Proper conservation of top soil by most approved methods.
8. Permanent buildings to modern standards.
9. Equipment for sheeting all standard grades and creping own lower grades only. More elaborate equipment must look for its justification to obtaining a premium over sheet for its product.
10. Cultivation expenditure on modern commercial lines.

The result was as follows :—

	Cost per Acre.		
	Highest.	Lowest.	Average.
	£	£	£
Malaya	47.94	35.33	41.92
Ceylon } One set of Estimates	50.34	50.34	50.34
India } One set of Estimates	51.85	51.85	51.85
Borneo } One set of Estimates	29.04	29.04	29.04

The additional expenditure consequent on bud-grafting was estimated to be :—

	Cost per Acre. Highest.	Lowest.	Average.
	£	£	£
Malaya	10.18	2.17	5.60
Ceylon { One set of Estimates	3.39	3.39	3.39
India { One set of Estimates	4.55	4.55	4.55
Borneo { One set of Estimates	4.59	4.59	4.59

No charge has been made for interest on Capital employed during the period of immaturity, and your Sub-Committee are not in favour of making such a charge.

Your Sub-Committee recommend that the average costs per acre of an unbudded estate as shown above be taken as the Capital Costs for each of the countries mentioned in order to determine the capital figure on which the reasonably remunerative return is to be obtained.

REVENUE COSTS F.O.B.

1. *Apportionment of Overheads between Capital and Revenue.*

The most contentious question about Revenue Costs has always been the apportionment between Capital and Revenue of Overheads or General Charges as they are often called. The usual collection of General Charges is too heterogeneous to permit of any scientific apportionment on one basis, but the usual rubber estate does not employ a skilled costing clerk, so that the best possible compromise is all that can be achieved. There are two main systems of apportionment—the " unit basis " and the " Estate labour wages " basis. In theory the latter is slightly sounder, in practice the former is easier to apply. It is believed that the " unit system " originated as giving a rough-and-ready approximation to the results obtained on the " Estate labour wages " basis. Numerous tests were made by your Sub-Committee and it was found that the results arrived at by both methods were still very little different. Therefore, your Sub-Committee decided to recommend the " unit basis." By it :—

Every mature acre = 1 unit.
Every immature acre = ½ ,,
Every acre of new clearings, i.e., first year work = 1 ,,

and the total " General Charges " are apportioned accordingly. Your Sub-Committeee are clearly of opinion that a simple apportionment on the acreage basis throws too heavy a burden on Capital.

It was further decided to recommend :—

(*a*) That all areas for which an exportable allowance is obtained under the Regulation Scheme should be regarded as mature.

(*b*) That General Charges should be apportioned on the unit basis even though the immature area on an estate was a small proportion of the mature.

(*c*) That upkeep of all buildings should be charged to Revenue, on the ground that the equipment required for an immature estate is relatively negligible.

(*d*) That Quit Rent, including quit rent on reserve lands, should be apportioned on the unit basis, as it would obviously lead to an overvaluation of the asset to add quit rent on unopened areas entirely to the price paid for the land.

2. *Other Apportionments.*

(*a*) Quit Rent, Passages and other heavy occasional payments should in the opinion of your Sub-Committee be divided into equal monthly amounts over the period covered by the charge and debited to Revenue accordingly. Any additional cost resulting from the incidence of leave pay should also be charged, or reserved, over the appropriate period in equal monthly instalments.

(*b*) Export duty should be calculated on the amount of rubber packed each month.

(*c*) Your Sub-Committee consider that the line indicated in the International Rubber Regulation Agreement between supplying and replanting should be adhered to and that the cost of planting any number up to 30 trees per acre be a Revenue charge and that the cost of planting more than 30 trees per acre be a Capital charge.

3. *Accounts.*

A summarised form of Estate Revenue expenditure accounts is appended. Your Sub-Committee recommend that it be adopted as the standard for compiling the cost figures to be returned by producers. It includes all expenditure up to F.O.B. usual port of shipment.

4. *Return of Costs by Producers to R.G.A.*

Your Sub-Committee are of opinion that :—

(*a*) Producers should be asked to make a return each month.

(*b*) The cost returned should be F.O.B. cost per lb. for that month only.

Certain other details are required for a proper appreciation by the R.G.A. of the cost figure and should be given in addition. A suggested form of the Return is appended.

Revenue Costs " All In."

Your Sub-Committee are of opinion that all items of cost after F.O.B. and up to "All In " should be calculated by the Staff of the R.G.A. and added to the F.O.B. figure returned by producers. Reasons for this opinion are given in the appropriate sections hereafter. These items are :—

1. Freight and Selling.
2. Head Office Expenses.
3. Depreciation or Wear and Tear.
4. Profit Sharing Arrangements.
5. Amortization of Estate.

1. *Freight and Selling.*

Owing mainly to the different selling methods adopted by producers any return by producers of this item would be liable to serious error. Your Sub-Committee consider that the cost " Landed London " should be taken as the standard and that a reasonable addition, after allowing for the freight increase on 1st October, 1934, to cover this item would be .60 pence. Future changes in freight, etc., should obviously be incorporated as and when effective.

2. *Head Office Expenses.*

In general it can be said that the larger Companies are cheaper in this respect than the smaller. The maximum variation is high. Your Sub-Committee consider than an adequate addition to cover this item would be .40 pence.

3. *Depreciation or Wear and Tear.*

Owing to the wide divergence in the total cost of buildings and machinery and the even wider divergence in the annual charge for Depreciation made by producers, it is considered by

your Sub-Committee that individual producers should not include in their costs anything for Wear and Tear or Depreciation of Buildings and Machinery. On reference to the estimated Capital Costs, it emerged that on the average the totals could be divided into :—

	Cost per Acre.	
	Buildings and Machinery.	Estate.
	£	£
Malaya	6.94	34.98
Ceylon	10.60	39.74
India	9.04	42.81
Borneo	4.77	24.27

Your Sub-Committee recommend that the above costs per acre of Buildings and Machinery be adopted as standard Capital costs for the purpose of charging Wear and Tear or Depreciation. Your Sub-Committee consider that 7½ per cent. on the above original standard capital costs of Buildings and Machinery should be charged each year to cover Wear and Tear or Depreciation. This is intended to cover cost of Renewals which should therefore be excluded from the Cost of Production. Repairs are as already indicated a proper charge against Revenue. This charge per acre should be turned into a charge per pound for each month on the output per acre found by dividing acreage into crop as returned by the producer.

4. *Profit Sharing Arrangements.*

Strictly speaking, no form of profit sharing, bonuses dependent on profits or taxation of profits is an item of cost. It is, however, the case that lower salaries and fees are accepted in consideration of a right to share in profits, and also these shares in profit are payable before the dividend to shareholders. For these reasons your Sub-Committee recommend that for the present an addition to costs be made of .20 pence to cover staff commission, bonus or additional contributions to Provident Fund dependent on profits, Directors' Special Remuneration and any other form of profit sharing. Such items must, therefore, be rigidly excluded when arriving at F.O.B. costs. Taxes on profits are in the opinion of your Sub-Committee not an item of cost and should be entirely excluded.

5. *Amortization of Estate.*

A rubber estate is undoubtedly a wasting asset. Therefore, some provision for capital replacement should be made or dividends should be high enough to compensate. Your Sub-Committee prefer the former method and suggest that a charge of 4 per cent. per annum on the Costs per acre of estates shown in paragraph 3 of this section be made in respect of this item. This would be turned into a charge per pound as in the case of Depreciation.

OUTPUTS.

Your Sub-Committee would point out that Cost of production unrelated to output is useless as a basis for determining the price which will be reasonably remunerative to an efficient producer. It will be some time before average output figures under the Regulation Scheme are available. Meantime the statistical service of the R.G.A. has given us past average output figures as follows :—

	1929.
Malaya	399
Ceylon	418
India	301
Borneo	310

It appears earlier in this Report that except in Borneo, Maximum Capital Costs to-day are not very different in the above countries. It can be presumed that the costs of production to be returned by producers will not be least in the countries with low average outputs. Therefore, through the mere fact of difference in output a price which would be reasonably remunerative to a producer of average efficiency in, say, Malaya will be unremunerative to an equally efficient producer in, say, South India. The converse would hold with equal force. There can be only one price for rubber. Therefore, some one set of figures must be taken as the standard. On account of the fact that the Malayan quota is 80 per cent. of the total of all British quotas your Sub-Committee recommend that average Malayan figures be taken as the British standard for :—

(1) The Capital on which the reasonable return is to be earned, as set out in this Report.

(2) The F.O.B. and "All In" Costs to be arrived at on the lines set out in this Report.

(3) The average output per acre, kept up-to-date by reference to Producers' returns.

Signed:—CHAS. MANN.
J. L. MILNE.
GEORGE A. J. BARRON.
A. H. DOHERTY.

LONDON,
14*th September*, 1934.

APPENDIX 1.

SUGGESTED FORM OF ESTATE REVENUE EXPENDITURE ACCOUNTS.

GENERAL CHARGES.

I. *Local Direction and Inspection.*
   (*a*) Agency Fees.
   (*b*) Visiting Fees.
   (*c*) Audit Fees.

II. *Supervision on Estate.*
   (*a*) Salaries, Allowances, and Provident Fund.
   (*b*) Leave pay and passages.
   (*c*) Estate Office Expenses and Telephones.

III. *Sundry Labour Charges.*
   (*a*) Medical and Anti-Malarial expenses.
   (*b*) Recruiting and Immigration expenses
   (*c*) School.
   (*d*) Workmen's compensation.
   (*e*) Loss on Rice.

IV. *Sundries.*
   (*a*) General Transport.
   (*b*) Upkeep of Live and Rolling Stock.
   (*c*) Watchmen, Gardeners and Sweepers.
   (*d*) Fire Insurance (Buildings).
   (*e*) Contingencies.

V. *Quit Rent.*

_____

_____

Whereof to Capital .....% _____

,, ,, Revenue.....% _____

Analysis of Revenue Expenditure.

Per Pound.

Upkeep of Buildings, Communications and Equipment.

(Other than Manufacturing items) including repairs to bungalows, lines, hospitals, wells, furniture, motor cars and general motor lorries. Also upkeep of roads, bridges and surface drains.

Upkeep of Mature Rubber.

Soil conservation (including Cover Crops, Silt Pits, Terracing and aeration Drains).

Weeding (including care of Boundaries and Ravines).

Tree Hygiene (including Sulphur Dusting, Disease, Pests and Pruning).

Census, Thinning out and Supplying.

Manuring.

Miscellaneous.

Collection.

Tapping and Marking (cost of labour only).

Tapping Tools and Equipment and Transport to Factory.

Miscellaneous.

Manufacture.

Factory Labour and Supervision (including Engineers, Smoke House and Packing).

Chemicals and Fuel.

Factory, Buildings and Equipment (including Repairs, Lubricants and all running costs).

Rubber Chests (or other packages).

Insurance (of Equipment, Factory Building, Smoke House Packing and Drying Sheds and Stocks therein, also standing charges).

Miscellaneous.

Distribution.

Transport, Forwarding and Weighing.

Export Duty (including Cess).

Shipping Charges.

Miscellaneous. _____

Total Direct Charges _____

General Charges (proportion applicable to Revenue) _____

Total F.O.B. per pound _____

APPENDIX 1.

SUGGESTED MONTHLY RETURN OF COSTS WHICH PRODUCERS SHOULD BE ASKED TO SEND IN TO THE R.G.A. (COMPILED ON THE BASIS OF APPENDIX 1.)

Rubber Production Costs.

Code number allotted to your Company .....
Return for the month of..... 193

1. Country and State, District or Province in which estate is situated. ....
2. Acreage in respect of which standard production has been received. ..... acres.
3. Crop for month. ..... lbs.
4. F.O.B. cost per lb. ..... d.

NOTE.—The above f.o.b. cost should not include the following items :—

1. Freight and marketing charges.
2. Head Office administration.
3. Wear and Tear or depreciation.
4. Amortization.
5. Staff Bonus or Commission.
6. Directors additional remuneration.
7. Any other payment contingent on profits.

From January, 1935, onwards monthly costs of production returns were received from the Rubber Growers' Association but on the 29th May, 1936, the following letter was sent by the Secretary of the International Rubber Regulation Committee to the Secretary of the Rubber Growers' Association.

"*29th May*, 1936.

DEAR SIR,

Since January, 1935, your Association has been kind enough to forward to us, each month, a return of rubber production costs, collected from representative rubber plantations operating in Malaya.

These costs are calculated according to a formula, devised by a Sub-Committee of your Association. Their terms of reference were as follows :—

'To suggest a costing formula which would form a a suitable basis for the collection of costs to determine what is a "fair and equitable price level which will be reasonably remunerative to efficient producers," the investigation to relate only to a period in which production is being regulated, and to be confined to British countries.'

The International Rubber Regulation Committee much appreciate and gratefully acknowledge the assistance which your Association and its Committee have already rendered in this matter, and they feel confident that, in the same helpful spirit, your Association will be kind enough to consider what I am now instructed to place before them.

Your returns of rubber production costs now cover the whole of 1935, and some part of 1936. Since these returns are based on a formula which, in its precise terms, is not in actual practice employed by any of the operating companies, it is appreciated that your returns of costs cannot coincide exactly with the costs as given in the published accounts of rubber plantation companies. But the disparity between the two sets of figures, which has by no means lessened during the interval which has elapsed since these returns were first made, is now found to be so wide that it is difficult to reconcile them, or to rely on either set of figures with convincing effect. I am therefore to suggest that, as a first step, the present formula, and the method of its application, should now come under review.

I understand that the method employed by your Association, in collecting and collating the returns of costs, is briefly as follows :—

You receive from plantation Companies their f.o.b. figure, and to that figure you add five items, which are specified on pages 4 and 5 of your Sub-Committee's report. On the assumption that the f.o.b. costs so returned are in strict accord with the figures appearing in the returning Companies published accounts, the divergence alluded to above between the two sets of figures must occur in consequence of the addition of the five items to which I have referred. The International Rubber Regulation Committee fully appreciate that the figure given for each of these five items is not the exact cost of any particular Companies, but it is put forward as the average standard cost incurred by Companies operating with average efficiency. Whatever the theoretical merits of these additions may be, my Committee is doubtful whether the ultimately resulting cost figures will be

accepted, without serious challenge, unless they find some close reflection in the published accounts of representative plantation Companies.

Item No. 5, namely, "Amortization of Estates," is probably the heaviest item. To cover this, your Sub-Committee recommended that a charge should be made of 4 per cent. per annum on the cost of estates, based on the capital cost shown in paragraph 3 of that section of their report. With no desire to contest the point that there is need for amortization, it may be pointed out that, so far as my information goes, it is not the practice of British Companies, at least, to make any such charge against their profits. If the answer to that is that such provision is made indirectly, by transferring profit to reserve, I would suggest that that operation is not noticeably a common feature in the recently published accounts of Rubber Companies. You will appreciate that, on making this specific reference to amortization it is not intended to imply that the other four items should be subject to any less severe scrutiny.

Your Sub-Committee's terms of reference are a clear indication of the purpose to which my Committee desires to put the returns. Your Association will appreciate that, whatever the theoretical merits of the formula employed may be, unless it becomes quickly evident that there is sound warrant for it in the practice of the rubber Companies themselves, the returns will always be open to serious challenge, and their usefulness will thereby be materially diminished.

It is the realisation of this difficulty which prompts the present letter. My Committee feel sure, therefore, that you will take it into careful consideration and will be good enough to advise them in what manner, and to what extent if any, you would now recommend a change in the costing formula, and in its application ; or, alternatively, whether you would advise my Committee to rely on the published accounts of representative rubber companies, for figures of the costs of production.

If there is any way in which I can be of assistance in this enquiry or any further information which your Association may require, I am ready at all times to put myself and staff at your disposal and help in any way that I can.

Yours faithfully,

The Secretary, A. G. PAWSON, *Secretary.*

THE RUBBER GROWERS' ASSOCIATION,
19, FENCHURCH STREET, E.C.3."

As a result of this letter the following supplementary report on costs of production was furnished to the International Rubber Regulation Committee by the Rubber Growers' Association.

THE RUBBER GROWERS' ASSOCIATION
(INCORPORATED).

REPORT TO THE COUNCIL BY THE AD HOC COMMITTEE APPOINTED BY THE COUNCIL ON 6TH JULY, 1936.

Terms of Reference.—To consider the letter of 29th May, 1936, from the Secretary of the International Rubber Regulation Committee and to report to Council thereon.

The essence of the letter in question was that unless the discrepancy between costs as returned to the I.R.R.C. by the R.G.A. and costs as published by individual producers could be either eliminated or accounted for, the correctness of the former would always be open to doubt and their authority would thus be greatly lessened.

COSTS FORMULA.

Your Committee have made a close examination of the formula used to compile the costs as returned to the I.R.R.C. and compared the returns for 1935 with a representative selection of actual costs. As a result they report that in their opinion the present formula is correct in principle and true in fact. The individual items and your Committee's comments thereon are as follows :—

1. *Capital Cost.*

The details of the estimates on which were based the costs of £6.94 per acre of Buildings and Machinery and £34.98 per acre of the Estate were examined and it was agreed that these figures were reasonable. They are, beyond challenge, below average expenditure in the past and, probably, below the actual costs which would have to be incurred to-day.

2. *Revenue Cost F.O.B.*

The principles prescribed to be followed in compiling F.O.B. costs are standard practice. From the internal evidence given by the consistency of the monthly returns, your Committee are satisfied that producers as a whole are compiling and returning their costs in the approved manner.

3. *Freight and Selling*

Your Committee are satisfied that the method prescribed for estimating this item and the amount estimated are correct.

4. *Head Office Expenses.*

There is a wide variation in the cost of this item as between Companies. In view of the tendency towards larger units it was decided to recommend that the addition for this item should be reduced from .40 pence per lb. to .30 pence per lb. It was also agreed to suggest that producers be asked to return to the R.G.A., their actual costs for this item when their Accounts are published. Monthly collection of actual figures was ruled out on the ground that it would tend to inflate the item unduly owing to the high, and in the opinion of your Committee uneconomic, cost of this item in the case of numerous Companies. It was however felt that a running comparison of the estimate with actual costs would be a useful check in many ways.

5. *Depreciation or Wear and Tear.*

A comparison with actual rates of depreciation at present in force on estates convinced your Committee that the rate of 7½ per cent. now in use was a moderate writing off, even after taking into account the tendency to erect a more permanent type of building.

6. *Profit Sharing Arrangements.*

For the reasons given in the previous Report and having in view the purpose of the Return, your Committee agree that this is an item of cost. From the data collected, it is apparent that there is no uniform practice of profit sharing in the industry. The year 1935 was unfortunately not a profitable one and figures drawn from that and many preceding years are little guide as to what this charge would be when a fair and equitable price level which will be reasonably remunerative to efficient producers has been attained. Timely collection of actual payments is impracticable. In these difficult circumstances your Committee decided to recommend that the present charge of .20 pence per lb. be reduced to .10 pence per lb. as being a safe minimum figure.

7. *Amortization of Estate.*

Your Committee are agreed that a rubber estate is indubitably a wasting asset and that therefore a true statement of the cost of production must include a provision for this item. Their enquiry was accordingly directed to two questions :—

(*a*) Could the life of a rubber tree be estimated with any certainty and if so what would it be ?

(*b*) Should the provision to be made take the form of a straight write off over the life or be based on sinking fund principles?

With regard to the former, your Committee are agreed that conclusive proof of the life is unobtainable and that therefore any estimate is liable to be disputed. Nevertheless they think that from the following facts a conclusion does emerge :—

(*a*) Deterioration of planted areas is notorious and widespread. Your Committee have a considerable body of evidence to show that much rubber planted in 1910 and previously and a considerable area planted since then yield so poorly that in free competition it would not pay to tap it at any probable price.

(*b*) Admitting that such rubber was in early days very heavily tapped, it is the case that since 1918 the rubber industry in Malaya at least, has been on unrestricted production for only five years.

(*c*) Past cultivation methods are now suspect and data so far collected suggest a doubt as to whether present methods are much better.

(*d*) Modern planting material gives yields so much higher than hitherto customary that much seedling rubber is thereby rendered economically obsolete. In addition, even in improved stock, the pace of improvement is such that many earlier clones are already discarded.

(*e*) Replanting programmes of many producers on analysis show that much of the rubber being cut out is under 25 years old.

As supporting, though indirect, evidence they mention :—

(1) The long established practice of the taxation authorities in the Netherlands Indies of allowing the development costs of rubber estates to be written off over a productive life of 25 years.

(2) The permission in the International Agreement of replanting at the rate of 20 per cent. in 4½ years.

Your Committee recognise that there are small areas of rubber older than 30 years which are still producing well. These, however, are not representative of the bulk and on enquiry would probably be found to owe their present condition to some special,

favourable soil condition or situation. Your Committee are definitely of opinion that their concern is not with the life of the rubber tree as a plant but as an economic producer. On that ground obsolescence through improved planting material must be taken into account. They further consider that it would be unsound to assume that progress will not be accelerated. It is also at least doubtful whether improved planting material will have the stamina of the original stock.

For all these considerations your Committee unanimously decided that the existing recommendation to assume a productive economic life of 25 years, i.e., 30 years from date of planting, should be approved.

Your Committee were in considerable doubt as to the adoption of sinking fund methods. In theory there can be no argument but that a sinking fund is correct. But all such funds presuppose from their very nature a definite known date of termination. The previous section of this Report will at least demonstrate that this vital factor is non-existent in the case of a rubber estate. Certain members of Council gave your Committee their views on this question in favour of the establishment of a sinking fund. Your Committee are unable to see any difference in principle between the establishment of a sinking fund for amortization of the estate and of a sinking fund for depreciation of buildings and machinery. In this respect the practice of the critics of the straight write off is at variance with their theories. The reason undoubtedly is that sound practice in this case is so well established that the critics have never thought to question it. In both cases the sum reserved is not likely to be accumulated but is almost certain to be spent on renewals of buildings and machinery in the one case and on replanting or extensions in the other, so that in fact there would be little or no interest earned and available for accumulation. These Items of expenditure are excluded from costs of production as returned by producers to the R.G.A.

Through one of its members your Committee was favoured with the views of a recognised authority on Cost Accounting in Industry. In all his experience he has never known sinking fund principles employed, for the reason that a developing company is fully justified in digging back into its business money which has been put aside for writing off depreciating assets. If this were not done the only alternative would be to obtain fresh

outside capital. With one dissentient (Mr. F. E. Maguire) your Committee is unable to approve a course which their experience of their own industry teaches them would be unsound and which is at variance with current practice in any industry. Accordingly they recommend a continuance of the straight write off.

Form of Return.

Your Committee thoroughly examined the present form of Return to the I.R.R.C. and are satisfied that the figures as returned are true averages of the various Groups and that the final figure is a true average of the whole. To make the position clear to all, it is recommended that in future the return show the charges per pound for Depreciation and Amortization separately. The other costs are then merely the actual F.O.B. plus certain additions per pound for Freight and Selling. Head Office Expenses and Profit Sharing, which are disclosed in this Report, are non-variable except in the event of a change in freight and are based on actual outlays.

Discrepancy between returned costs and Actual Costs.

Your Committee are satisfied that with the two minor changes recommended the discrepancy on the average is only in the charges for Depreciation or Wear and Tear and Amortization of the Estate.

It is the case that many Companies make no annual charge for Depreciation or Wear and Tear and accordingly show a lower cost of production. This came about as follows :—Prior to the slump many Companies had created large reserves either from profits or from the issue of shares at high premiums. There is no legal obligation on a Company to provide for loss of fixed assets before paying a dividend, but nevertheless it is customary to provide for Wear and Tear and any Company which does not, usually receives a qualified Certificate from its Auditors. It is perfectly competent for any Company to meet the charge for Wear and Tear either from current or accumulated profits. As accumulated profits were so much greater than current profits in recent years, many Companies chose to debit Wear and Tear to the former and to save the trouble of an annual charge, with

a recurring explanation, wrote off the whole balance in the Buildings and Machinery account in one amount. This purely financial arrangement makes not the slightest difference to the actual rate at which Depreciation or Wear and Tear is occurring on the estates. It is this actual rate of depreciation to-day which is the true current cost and that is the charge which your Committee have investigated and approved. It is impossible to reconcile published costs of such Companies with the true current cost. In effect their published costs are understated and to that extent they are living on their accumulated fat, which is not necessarily an unhealthy proceeding. Your Committee trust if they have not reconciled they have at least accounted for this decrepancy adequately.

The letter from the Secretary of the I.R.R.C. is correct in stating that it is not the practice of British Companies to charge Amortization of the Estate against their profits. It is also true that transfers from profits to Reserve have not been a noticeably common feature of recent Accounts. It is even more evident, to producers at least, that the price has not risen to that level which covers cost and is reasonably remunerative. Until that state has been reached, producers can only choose between various deserving causes.

On the assumption however that the price will rise to the necessary level, the question of providing for Amortization requires serious attention. Hitherto the rubber industry has been constantly expanding and it has been possible to argue that such plantings in as far as they were done from reserves were a provision for Amortization. That method is now closed and failing replanting, which in British territories is not being undertaken at anything like the permitted rate, it is only a question of a comparatively short time (see paragraph on Amortization) before the whole capital assets of a Company have been consumed.

In the Report of the original Costs Sub-Committee it was pointed out that there were two ways of Amortization, either by provision for Capital replacement or by the payment of high dividends. The latter is the common method of Mining Companies and any one investing in such Companies is presumed to regard his dividends as being partly a return of Capital. This has not been the common attitude towards Rubber Companies, partly because the life is uncertain and mainly because it was a young and expanding industry. Some commonly accepted

policy is desirable to escape otherwise inevitable misunderstanding. To pronounce on this question is not within the terms of reference of your Committee, but they would say that it is only by adopting one particular policy that the discrepancy to which the I.R.R.C. refer can be ended. They commend this point to your careful consideration.

Signed:— CHAS. MANN (Convener).
F. D. ASCOLI.
T. B. BARLOW.
G. A. J. BARRON.
DAVID CARRUTHERS.
G. C. DENHAM.
A. H. DOHERTY.
F. E. MAGUIRE.
A. C. MATTHEW.
J. L. MILNE.
R. STEWART.

LONDON,
24th September, 1936.

AGREEMENT BETWEEN THE GOVERNMENTS OF THE UNITED KINGDOM AND THE UNITED STATES OF AMERICA FOR THE EXCHANGE OF COTTON AND RUBBER. (TREATY SERIES No. 31 (1939.))

London, 23 June, 1939.

The Government of the United Kingdom of Great Britain and Northern Ireland and the Government of the United States of America, desiring to make arrangements for the exchange of cotton and rubber, have agreed as follows :—

ARTICLE 1.

The United States Government will supply to the Government of the United Kingdom, delivered on board ship, compressed to high density, at New Orleans, Louisiana, and at other Gulf and Atlantic deep water ports to be agreed upon between the two Governments, 600,000 bales of raw cotton of the grades and staples which will be specified by the Government of the United Kingdom. The United States Government will make available in adequate quantities for such purpose cotton from the stock on which the United States Government has made advances to growers.

(*a*) The price will be fixed on the basis of the average market price as published by the Bureau of Agricultural Economics for middling $\frac{7}{8}$-inch cotton during the period January 1st-June 23rd, 1939, for spot delivery at New Orleans, plus 0.24 cent per lb. for cost of compression and delivery on board ship, with adjustments in price for other grades and staples according to differences above or below middling $\frac{7}{8}$-inch quoted in that period.

(*b*) The cotton will be inspected to determine its classification in accordance with the Universal Cotton Standards for grade and the official standards of the United States for staple, and shall be accepted, by experts appointed by the Government of the United Kingdom. Any disputes which may arise will be settled by Boards of Referees constituted of three members of whom one shall be nominated by the Government of the United Kingdom.

(*c*) Samples representing the cotton of the grades and staples specified by the Government of the United Kingdom will be made available for inspection and acceptance during a period of six months beginning 15 days after the entry into force of this Agreement, and such inspection and acceptance will be made within a reasonable time after the cotton is so made available. Delivery at the warehouse at the port of sailing with provision for free delivery on board ship at high density will be made within 15 days after inspection and acceptance, and storage and insurance charges will be borne by the United States Government for a period of two weeks but no more after delivery at the warehouse at the port of sailing.

(*d*) All cotton will be invoiced and accepted on gross weights at the time of delivery.

ARTICLE 2.

The Government of the United Kingdom will supply to the Government of the United States, delivered on board ship at Singapore and, by agreement between the two Governments, at other convenient ports, rubber in bales, of the grades which will be specified by the Government of the United States, to a value equivalent to that of the total value of the cotton to be supplied in accordance with Article 1 of this Agreement. In determining such equivalent value, the rate of exchange between Straits Settlements dollars and United States dollars shall be deemed to be the average of the buying rate during the period January 1st-June 23rd, 1939, in the New York market, at noon, for cable transfers payable in Straits Settlements dollars, as certified by the Federal Reserve Bank to the Secretary of the United States Treasury and published in Treasury Decisions.

(*a*) The quantity of rubber will be calculated upon the average market price, as published by the Department of Statistics in the Straits Settlements, for No. 1 ribbed smoked sheets, during the period January 1st-June 23rd, 1939, for spot delivery at Singapore plus 0.25 Straits Settlements cent per lb. for cost of baling and delivery on board ship, with adjustments in price for other grades according to differences quoted in that period.

(*b*) The rubber will be inspected and accepted by experts appointed by the United States Government. Any disputes will be settled in accordance with the normal custom of the trade.

(*c*) The rubber will be made available for inspection and acceptance by experts appointed by the Government of the United States during a period of six months beginning at a date to be agreed upon by the two Governments, and such inspection and acceptance will be made within a reasonable time after the rubber is so made available. Delivery at the warehouse at the port of shipment with provision for free delivery on board ship will be made within a period of 15 days after inspection and acceptance, and storage and insurance charges will be borne by the Government of the United Kingdom for a period of two weeks but no more after delivery at the warehouse at the port of shipment.

ARTICLE 3.

If either Government should find that delivery in accordance with the arrangements specified in Articles 1 and 2 is likely to restrict supplies available to commercial markets unduly or to stimulate undue price increases, the two Governments shall consult with a view to postponing delivery or taking other action in order to avoid or minimise such restriction of supplies or such price increases.

Article 4.

The intention of the Government of the United Kingdom and of the United States Government being to acquire reserves of cotton and rubber, respectively, against the contingency of a major war emergency, each Government undertakes not to dispose of its stock (otherwise than for the purpose of replacing such stocks by equivalent quantities in so far as may be expedient for preventing deterioration) except in the event of such an emergency. If, however, either Government should at any future date decide that the time has come to liquidate its stock of cotton or rubber, as the case may be, it may do so only after (*a*) consulting the other Government as to the means to be employed for the disposal of such stock, and (*b*) taking all steps to avoid disturbance of the markets. In no case may either Government dispose of such stocks, except in the case of a major war emergency, before a date seven years after the coming into force of this Agreement.

ARTICLE 5.

The Government of the United Kingdom will use their best endeavours to secure that the export is permitted under the International Rubber Regulation Scheme(*) of an amount of rubber approximately equivalent to the amount of rubber to be supplied to the United States Government under this Agreement in addition to the amount of rubber which would, under the normal operation of the Scheme, be released to meet current consumption needs.

ARTICLE 6.

Each Government undertakes, in shipping to its own ports the stocks of cotton and rubber, respectively, provided for in this Agreement, so far as may be possible to distribute the tonnage equally between the ships of the two countries, provided that the shipping space required is obtainable at reasonable rates. Consultation for the purpose of giving effect to this Article shall be between the Board of Trade and the Maritime Commission.

ARTICLE 7.

Should the United States Government, before the delivery is completed of the cotton provided for in Article 1 of this Agreement, take any action which has the effect of an export subsidy, they will deliver to the Government of the United Kingdom an additional quantity of cotton proportionate to the reduction in price below that provided for in Article 1 of this Agreement caused by such action.

ARTICLE 8.

The present Agreement shall come into force on a date to be agreed upon between the two Governments.

In witness whereof the Undersigned, duly authorised thereto, have signed the present Agreement and have affixed thereto their seals.

Done in London in duplicate this 23rd day of June, 1939.

(L.S.) OLIVER F. G. STANLEY.

(L.S.) JOSEPH P. KENNEDY.

(*) Treaty Series No. 74 (1938).

MEMORANDUM OF AGREEMENT.

29 June, 1940.

Memorandum of Agreement dated as of 29 June, 1940, between Reconstruction Finance Corporation (herein called the "Corporation"), RUBBER RESERVE COMPANY, a corporation created by the Reconstruction Finance Corporation (herein called the "Company"), and THE INTERNATIONAL RUBBER REGULATION COMMITTEE (herein called the "Committee").

ONE.

(*a*) In order to aid in the National Defense Program, the Corporation agrees that it will make a loan or loans to the Company upon satisfactory terms and conditions, in such amount as may be necessary, and the Company undertakes, with the proceeds thereof, to acquire by purchase a reserve stock of crude plantation rubber (Hevea Brasiliensis) of a minimum quantity of 100,000 tons and a maximum quantity of 150,000 tons for shipment prior to 31 December, 1940, such rubber to be designated a reserve stock.

(*b*) In addition, the rubber manufacturers as represented by the Rubber Reserve Company will endeavour to continue their current purchases of crude rubber within the range price hereinafter mentioned in such volume as will be necessary to meet current requirements and to maintain within the United States during the period that the reserve stock is being accumulated a normal stock for current requirements and purposes. Such a stock shall be interpreted as a quantity of plantation rubber of 150,000 tons and shall be in addition to the reserve stock above referred to.

(*c*) To the extent that the manufacturing rubber industry fails to maintain its stock at the figure aforementioned, the Rubber Reserve Company to that extent undertakes to increase its purchases above the maximum of 150,000 tons, provided that any rubber so purchased above said maximum may be released to manufacturers within the United States and shall not be subject to the provisions of paragraphs Six and Seven hereof.

TWO.

In consideration of the undertakings above described, John George Hay, Kt., agrees, on behalf of the Committee that the Committee in exercise of the powers conferred upon it by Article 4, Treaty Series No. 74, 1938, will permit the release of the quantity of rubber which may be necessary for the accomplishment of the purposes herein described as well as for all other known demands.

THREE.

If, notwithstanding the action of the Committee, acting in full accord with the provisions of this agreement, the supply of rubber or the facilities for the transportation thereof should be inadequate for the accomplishment of the purposes herein set out within the period named, purchases shall continue nevertheless for shipment subsequent to 31 December, 1940, as may be necessary for the accumulation of the reserve stock of crude plantation rubber of 150,000 tons.

FOUR.

(*a*) It is understood that during the period necessary for the purchase and accumulation of the reserve stock of rubber hereinabove mentioned, such rubber shall be purchased at not less than 18 nor more than 20 cents (United States dollars) a pound c.i.f. New York for standard smoked sheet, packed in cases or in bales at seller's option, with the usual differential for other qualities and other forms of purchases, *exempli gratia Ex. Godown*, f.o.b. landed.

(*b*) Purchases, sales and deliveries shall be made under contracts adopted and now in use by recognised Rubber Trade Associations and any claims or disputes arising regarding insurance, shipment, packing, quality, payment, freight and cognate matters shall be settled in accordance with the recognised customs of the rubber trade.

FIVE.

The Committee, represented by John George Hay, Kt., undertakes to encourage producers of rubber to be ready sellers at the range between the two prices mentioned in Paragraph Four hereof, 18 to 20 cents per pound c.i.f. New York, payable in dollars, New York Exchange. The Company undertakes to use its best endeavours so to arrange its purchases that the market price will be maintained within the range specified.

SIX.

The Company agrees that as the reserve stock is acquired it will be held separate from the normal trade stocks and will not be disposed of (otherwise than for the purpose of replacement through equivalent quantities as may be expedient for the prevention of deterioration and in such manner that the quantity thereof will at all times be maintained intact) except as required by the Government of the United States of America for its Defense Program or in the event of normal supplies being interrupted through hostilities, or any similar emergency. In such latter event, releases from the reserve stock will be permitted only to the extent necessary to maintain trade stocks at their normal level.

SEVEN.

Subject to the provisions of Paragraph Six, the Company agrees that the reserve stock shall be held intact until 31 December, 1943, thereafter to be liquidated at not more than 100,000 tons per annum and in such manner as least to disturb the world price of crude rubber. The Company undertakes to inform the Committee of its intentions to liquidate the reserve rubber supply in accordance with this provision and to keep the Committee informed as to the progress of such liquidation.

EIGHT.

In the event of circumstances under which the decisions of the Committee, through causes beyond its control, cease to be operative in the territories of the Netherlands' East Indies or in the territories commonly known as British Malaya, then the Committee agrees to consult immediately with the Corporation and the Company for the purpose of determining what action shall be taken with respect to the provisions of this memorandum.

RECONSTRUCTION FINANCE CORPORATION.

By (Signed) Emil Schram,
Chairman.

RUBBER RESERVE COMPANY,
By (Signed) H. J. Klossner,
President.

INTERNATIONAL RUBBER REGULATION COMMITTEE,
By (Signed) J. Geo. Hay.

APPROVED:
(Signed) Jesse H. Jones,
Federal Loan Administrator.

MEMORANDUM OF AGREEMENT.

15 *August*, 1940.

WHEREAS, By Memorandum of Agreement dated 29 June, 1940, between RECONSTRUCTION FINANCE CORPORATION (herein called the "Corporation"), RUBBER RESERVE COMPANY, a corporation created by the Reconstruction Finance Corporation (herein called the "Company") and THE INTERNATIONAL RUBBER REGULATION COMMITTEE (herein called the "Commitee"), terms were agreed upon for the acquisition of a reserve stock of 150,000 tons of plantation rubber for shipment prior to 31 December, 1940; and

WHEREAS, It is now desired further to aid the National Defense Program by increasing such reserve stock to 330,000 tons the parties to such Memorandum of Agreement have now agreed further as follows:

ONE.

(*a*) As soon as the 150,000 tons of rubber mentioned in the Memorandum of Agreement hereinabove referred to have been purchased the Corporation will make a further loan or loans to the Company upon satisfactory terms and conditions and the Company will, with the proceeds thereof, increase its reserve stock of crude plantation rubber to 330,000 tons by the purchase of an additional 180,000 tons for shipment as far as may be practicable according to the following schedule:

From 1 January to 31 March, 1941 ...	70,000 tons
From 1 April to 30 June, 1941	50,000 tons
From 1 July to 30 September, 1941 ...	35,000 tons
From 1 October to 31 December, 1941 ...	25,000 tons

(*b*) The rubber manufacturers as represented by the Company will endeavour to continue their current purchases of crude rubber within the price range as hereinafter mentioned to the extent necessary to meet current requirements and to maintain within the United States during the period that such additional reserve stock herein referred to is being accumulated a normal privately owned stock for current requirements and purposes.

Such a normal stock shall be interpreted as a quantity of plantation rubber of 150,000 tons and shall be in addition to the total reserve stock of 330,000 tons.

(*c*) To the extent that the rubber manufacturing industry fails to maintain its normal stock at the figure mentioned in the preceding sub-paragraph, the Company will increase its purchases above 330,000 tons, provided that any rubber so purchased above said quantity may be released to manufacturers within the United States and shall not be subject to the provisions of SEVEN and EIGHT hereof.

TWO.

The Committee, represented by John George Hay, Kt., in exercise of the powers conferred upon it by Article 4, Treaty Series No. 74, 1938, will permit the release of the quantity of rubber which may be necessary for the accomplishment of the purposes herein described as well as for all other known demands.

THREE.

If, notwithstanding the action of the Committee, acting in full accord with the provisions of this agreement, the supply of rubber or the facilities for the transportation thereof should be inadequate for the accomplishment of the purposes herein set out within the periods named, purchases shall continue nevertheless for shipment for such subsequent period as may be necessary for the accumulation of the reserve stock of rubber in the aggregate quantities set forth in ONE (*a*) hereof.

FOUR.

(*a*) During the period necessary for the purchase and accumulation of the additional reserve stock of rubber hereinabove mentioned such rubber shall be purchased at not less than 17 nor more than 18½ cents. (U.S.A. currency) per pound F.O.B. trans- oceanic ships, Asiatic ports, for Standard Ribbed Smoked Sheets packed in cases or in bales at seller's option with the usual differentials for other quality types and other forms of purchases; for example, Arrival and/or Delivery and C.I.F., U.S.A. ports.

(*b*) Purchases and sales as herein provided for shall be made under the terms and conditions of contracts approved by recognized rubber manufacturing or trade associations, or as may be agreed upon by buyers and sellers, and any claims or disputes arising regarding quality, packing, insurance, payment and cognate matters shall be settled in accordance with customary practices applicable to the pertinent form of contract.

FIVE.

The Committee, represented by John George Hay, Kt., will encourage producers of rubber to be ready sellers at the range between the two prices mentioned in FOUR hereof. The Company will use its best endeavours so to arrange its purchases that the market price will be maintained within the range specified.

SIX.

The Company will inform the Committee at the end of each month during the period of purchasing hereunder, of the amount of rubber purchased and the parties hereto will consult each other from time to time regarding the rate of release and the progress of purchase, and particularly will give consideration to the question of whether or not the rate at which such additional reserve stock is to be purchased should be modified as a result of changing circumstances which may affect the parties hereto.

SEVEN.

As the reserve stock is acquired it will be held separate from the normal trade stocks and will not be disposed of (otherwise than for the purpose of replacement through equivalent quantities as may be expedient for the prevention of deterioration and in such manner that the quantity thereof will at all times be maintained intact) except as required by the Government of the United States of America for its Defense Program, or in the event of normal supplies being interrupted through hostilities, or any similar emergency. In such latter event, releases from the reserve stock will be permitted only to the extent necessary to maintain trade stocks at their normal level.

EIGHT.

Subject to provisions of SEVEN, the additional reserve stock herein referred to will be held intact until 31 December, 1943, thereafter to be liquidated in conjunction with the reserve

stock of rubber provided for in the Memorandum of Agreement between the parties hereto dated 29 June, 1940, at a combined rate of not more than 100,000 tons per annum and in such manner as least to disturb the world price of crude rubber. The Company will inform the Committee of its intention to liquidate the reserve rubber supply in accordance with this provision and to keep the Committee informed as to the progress of such liquidation.

NINE.

In the event of circumstances under which the decisions of the Committee, through causes beyond its control, cease to be operative in the territories of the Netherlands' East Indies or in the territories commonly known as Malaya, then the Committee will consult immediately with the Corporation and the Company for the purpose of determining what action shall be taken with respect to the provisions of this memorandum.

RECONSTRUCTION FINANCE CORPORATION,
By (Signed) Emil Schram
Chairman.

RUBBER RESERVE COMPANY,
By (Signed) H. J. Klossner
President.

INTERNATIONAL RUBBER REGULATION COMMITTEE,
By (Signed) J. Geo. Hay.

Approved:
(Signed) Jesse H. Jones,
Federal Loan Administrator.

MEMORANDUM OF AGREEMENT.

7 *March*, 1941.

WHEREAS, By Memorandum of Agreement (herein called "the First Agreement"), dated 29 June, 1940, between RECONSTRUCTION FINANCE CORPORATION (herein called the "Corporation"), RUBBER RESERVE COMPANY (herein called the "Company"), a corporation created by the Corporation, and THE INTERNATIONAL RUBBER REGULATION COMMITTEE (herein called the "Committee"), terms were agreed upon for the acquisition of a reserve stock of 150,000 tons of plantation rubber for shipment prior to 31 December, 1940, or subsequent thereto if necessary; and

WHEREAS, By Memorandum of Agreement (herein called "the Second Agreement"), dated 15 August, 1940 between the Corporation, the Company and the Committee, terms were agreed upon for the acquisition of an additional reserve stock of 180,000 tons of plantation rubber for shipment as far as practicable during specified periods between 1 January and 31 December, 1941; and

WHEREAS, In his letter of 5 November, 1940, addressed to John George Hay, Kt. (representative of the Committee), Jesse H. Jones (the Federal Loan Administrator) referred to the desirability of the Committee's increasing the exportable percentage and in connection therewith stated that the Company would be willing to increase its agreed purchases by 100,000 tons; and

WHEREAS, In his telegram of 29 November, 1940, addressed to A. L. Viles (Chairman of the Company's Buying Committee), John George Hay, Kt. referred to the action taken by the Committee at a meeting held on 28 November, 1940, fixing 100 per cent. of the basic quotas for 1941 as the permissible exportable amount of rubber for the first quarter of the calendar year 1941 and indicated that the Committee proposed to hold in reserve the offer to purchase said additional 100,000 tons to be utilized in order to make possible a gradual diminution of exports after the accumulation of the aforesaid reserve stock and to ameliorate the harsh effects in the producing territories which might otherwise be consequent upon an abrupt and steep decline in the exportable percentage; and

WHEREAS, In his telegram of 25 February, 1941, addressed to A. L. Viles, A. G. Pawson (Secretary of the Committee) referred to the action taken by the Committee at a meeting held on that date fixing 100 per cent. of the basic quotas for 1941 as the permissible exportable amount for the second quarter of the calendar year 1941 and indicated that the Committee proposed to accept the offer to purchase said additional 100,000 tons, subject to confirmation that the same was predicated upon the terms and conditions set forth in the First Agreement and Second Agreement ; and

WHEREAS, In his telegram of 26 February, 1941, addressed to Sir John Campbell (Chairman of the Committee) H. J. Klossner (President of the Company) transmitted such confirmation and, in accordance with the suggestion contained in A. G. Pawson's telegram aforesaid, indicated that a written instrument embodying the agreement would be prepared and transmitted to the Committee ; and

WHEREAS, In accordance with the foregoing, it is now considered desirable to reduce to writing the aforesaid agreement concerning the purchase of said additional 100,000 tons ;

NOW, THEREFORE, the Corporation, the Company and the Committee hereby agree further as follows :

ONE.

As soon as the aggregate reserve stock of 330,000 tons have been purchased pursuant to the First Agreement and the Second Agreement, the Corporation will make a further loan or loans to the Company, upon satisfactory terms and conditions, and the Company will, with the proceeds thereof, increase said reserve stock by the purchase of an additional amount of plantation rubber not to exceed 100,000 tons, the periodic purchases and the shipments thereof to be in such amounts and at such times, respectively, as the parties hereto may approve for the purpose expressed in the fourth WHEREAS clause hereof.

TWO.

The additional reserve stock of rubber mentioned in paragraph ONE hereof shall be purchased at not less than 17 nor more than 18½ cents (U.S.A. Currency) per pound f.o.b. transoceanic ships, Asiatic ports, for Standard Ribbed Smoked Sheets, packed in

cases or in bales at seller's option, with the usual differentials for other quality types and other forms of purchases (for example arrival and/or delivery ; and c.i.f., U.S.A. ports).

THREE.

Except to the extent otherwise herein expressly provided, the purchase of the additional reserve stock mentioned in paragraph ONE hereof shall be subject to all of the terms and conditions set forth in the First Agreement and the Second Agreement, and said terms and conditions shall be construed, *mutatis mutandis*, as if expressly made a part hereof.

RECONSTRUCTION FINANCE CORPORATION.
By (Signed) Emil Schram,
Chairman.

RUBBER RESERVE COMPANY,
By (Signed) H. J. Klossner,
President.

THE INTERNATIONAL RUBBER REGULATION COMMITTEE,
By (Signed) J. Campbell,
Chairman.

(Signed) John G. Hay.

Approved :

(Signed) Jesse H. Jones,
Federal Loan Administrator.

MEMORANDUM OF AGREEMENT.

13 *December*, 1941.

WHEREAS, RECONSTRUCTION FINANCE CORPORATION (herein called the " Corporation "), RUBBER RESERVE COMPANY (herein called the " Company ") and THE INTERNATIONAL RUBBER REGULATION COMMITTEE (herein called the " Committee ") have heretofore entered into agreements (evidenced by a Memorandum of Agreement (herein called the "First Agreement") dated 29 June, 1940, a second Memorandum of Agreement (herein called the " Second Agreement ") dated 15 August, 1940, and a third Memorandum of Agreement (herein called the " Third Agreement ") dated 7 March, 1941, covering the acquisition by the Company of reserve stocks of crude plantation rubber (herein called " Rubber ") aggregating 430,000 long tons, which by the terms of such agreements were to be physically segregated and maintained apart from other stocks of Rubber belonging to and maintained by various rubber manufacturing companies, rubber importers and rubber dealers in the United States ; and

WHEREAS, The British, Netherlands and American governments, as well as the Company and the Committee, entered into a further agreement (evidenced by certain cablegrams exchanged between them during April, May and June of 1941) under which the Company became the sole importer into the United States of Rubber exported from the Far East ; and

WHEREAS, It is now recognised (*a*) that the Company could not continue to keep the aforesaid reserve stock physically segregated from its total Rubber imports because of periodical allocations by the United States government of part thereof for manufacturing purposes in the United States, and (*b*) that the Company will nevertheless continue to accumulate and hold in the United States a reserve supply of Rubber (herein called the " Reserve Stock ") ; and

WHEREAS, It is now deemed necessary to increase the amount of the Reserve Stock to approximately 800,000 long tons ;

NOW, THEREFORE, It is hereby mutually agreed by and between the parties hereto as follows :

1. The Company will purchase during each month of the Calendar year 1942 approximately 100,000 long tons of Rubber

at 18½ cents (U.S. currency) per pound, f.o.b. transoceanic ships, Asiatic ports, for Standard Ribbed Smoked Sheets packed in cases or in bales at seller's option with the usual differentials for other quality types and other forms of purchases. Such purchases shall be made under the terms and conditions of contracts approved by recognized rubber manufacturing or trade associations, or as may be agreed upon between the Company and the various sellers; and any claims or disputes arising regarding quality, packing, insurance, payment, and cognate matters shall be settled in accordance with the customary practices applicable to the pertinent form of contract.

2. The Corporation will make such loan or loans to the Company as may be necessary to enable the Company with the proceeds thereof to pay for all purchases made pursuant to this agreement.

3. The Committee, represented by John George Hay, Kt., in exercise of the powers conferred upon it by Article 4, Treaty Series No. 74, 1938, will (*a*) permit the release of the quantity of Rubber which may be necessary for the accomplishment of the purposes herein described as well as for all other known demands, and (*b*) encourage producers of Rubber to be ready sellers thereof at the price specified herein.

4. The Company will inform the Committee at the end of each month during 1942 of the amount of Rubber purchased, the amount of Rubber shipped and the amount of Rubber sold in the United States by it during such month, and the probable rate of future sales; and will furnish such additional information as may be necessary to enable the Committee to form a just and true estimate of the Company's continued requirements, both in respect of the Reserve Stock and the needs of American manufacturers. In addition, the parties hereto will consult from time to time regarding the rate of purchase and the progress of all purchases and shipments and particularly will give consideration to the question of whether or not the rate at which the Reserve Stock is being accumulated should be modified as a result of changing circumstances which may affect the parties hereto.

5. The Company will not liquidate any part of the Reserve Stock prior to 1 January, 1944, after which date the Reserve Stock may be liquidated at a rate of not more than 200,000 long

tons per year and in such manner as will accord with the objectives hereinafter set forth in paragraph 7. The Company will give the Committee 3 months' notice of its intention to liquidate the Reserve Stock in accordance herewith, and will keep the Committee regularly and fully informed as to the progress of such liquidation ; and will consult with the Committee from time to time as may be necessary or expedient regarding the measures to be taken in connection therewith.

6. In the event of circumstances under which the decisions of the Committee, through causes beyond its control, cease to be operative in the territories of the Netherlands East Indies or in the territories commonly known as Malaya, or in the event of circumstances under which the Company, through causes beyond its control, is unable to obtain deliveries into this country of Rubber, as contemplated by this agreement, then the Company, the Corporation, and the Committee shall consult immediately with one another for the purpose of determining what action shall be taken with respect to the provisions of this agreement.

7. The parties hereto recognise the general desirability of the continuance of a stable market for Rubber, both during the time the Company is purchasing Rubber pursuant to this agreement and during the time the Company is liquidating the Reserve Stock ; and to the attainment of such ends :

(*a*) The Committee, with a view to avoiding or mitigating the hardship and disorganization which would otherwise follow in producing territories consequent on a too rapid transition from a high to a low rate of permitted export release, may, to the extent that general circumstances and its undertakings warrant it, reduce by gradual and successive stages the amounts of Rubber permitted to be exported, provided that no such action shall be taken by the Committee without prior consultation with the Company.

(*b*) The Corporation and the Company will co-operate with the Committee in the maintenance of a reasonably stable world market for Rubber that will enable the producers thereof to operate at a reasonable profit.

8. Notwithstanding anything to the contrary contained in this agreement :

(*a*) During the continuance of hostilities, the Reserve Stock shall be disposed of in such manner as may be required by the United States government for purposes of its national defense or for meeting any emergency which may arise in its prosecution of the war.

(*b*) Following cessation of hostilities, the Reserve Stock may be used to maintain trade stocks at their normal levels in the event that normal deliveries of Rubber into this country are interrupted through a lack of shipping facilities or any other cause resulting from hostilities.

9. The First, Second and Third Agreements are hereby superseded, as are also all other understandings as may exist between the Corporation, the Company and the Committee which are inconsistent with the provisions hereof.

RECONSTRUCTION FINANCE CORPORATION.
By Charles B. Henderson,
Chairman.

RUBBER RESERVE COMPANY.
By H. J. Klossner,
President.

THE INTERNATIONAL RUBBER REGULATION COMMITTEE.
By J. Geo. Hay.

Approved :
Jesse H. Jones,
Federal Loan Administrator.

STATISTICAL SUPPLEMENT.

TABLE 1.

TOTAL ACREAGE UNDER RUBBER IN REGULATED AREAS.

As at end 1940	Malaya	N.E.I.	Ceylon	India	Burma	North Borneo	Sarawak	Siam (*d*)	Indo China (*d*)	Total
Total acreage ...	3,480,989	3,373,492	639,075	136,627	110,615	132,972	239,557	419,254	*330,526*	*8,863,107*
of which Estate *	2,107,003	1,566,976‡	359,404	83,119	68,115	74,190	18,008	—	*310,772*	*4,587,587*
and Native...	1,373,986	1,806,516†	279,671	53,508	42,500	58,782	221,549	419,254	*19,754*	*4,275,520*
Estate Rubber.										
Seedling	1,671,633	1,007,654‡	321,553	70,549	65,648	69,537	*16,082*	—	*165,077*	*3,387,733*
of which 0 to 5 yrs.	74,156	76,178	4,184	1,225	527	2,670	*596*	—	*173*	*159,709*
5 to 10 years	15,501	18,065	907	32	790	21	*787*	—	*2,345*	*38,448*
10 to 15 years	265,469	149,889	22,712	12,516	14,817	14,508	*2,108*	—	*103,389*	*585,408*
over 15 years	1,316,507	763,522‡	293,750	56,776	49,514	52,338	*12,591*	—	*59,170*	*2,604,168*
Budded	388,978(*a*)	559,322	37,143	11,456	1,158	3,882	*1,781*	—	*145,695*	*1,149,415*
of which 0 to 5 yrs.	169,681	204,989	31,010	5,901	256	1,487	*1,781*	—	*37 752*	*452,857*
5 to 10 years	64,516	91,153	3,710	1,773	480	566	—	—	*86,632*	*248,830*
10 to 15 years	104,854	234,437	2,330	3,644	422	1,784	—	—	*21,311*	*368,782*
over 15 years	49,927	28,743	93	138	—	45	—	—	—	78,946
Clonal Seed ...	46,392	(*b*)	708	1,114	1,309	771	*145*	—	(*c*)	*50,439*
of which 0 to 5 yrs.	42,759	(*b*)	708	888	1,309	771	*145*	—	(*c*)	*46,580*
5 to 10 years	3,297	(*b*)	—	—	—	—	—	—	(*c*)	*3,297*
10 to 15 years	336	(*b*)	—	*226*	—	—	—	—	(*c*)	*562*
over 15 years	—	(*b*)	—	—	—	—	—	—	(*c*)	—
Native Rubber.										
Seedling	1,366,740	1,761,616†	272,801	52,238	42,377	58,782	*220,345*	*419,254*	*18,513*	*4,212,666*
of which 0 to 5 yrs.	72,517	55,356	17,704	2,206	604	3,010	*10,973*	120,297	—	*282,667*
5 to 10 years	27,702	81,692†	16,638	630	1,253	924	*7,980*	*66,729*	*263*	*203,811*
10 to 15 years	184,346	894,534†	62,549	28,594	15,591	35,000	*114,671*	*180,617*	*11,607*	*1,527 509*
over 15 years	1,082,175	730,034†	175,910	20,808	24,929	19,848	*86,721*	*51,611*	*6,643*	*2,198,679*
Budded	6,199	4,759	6,292	1,030	123	—	—	—	*1,241*	*19,644*
of which 0 to 5 yrs.	5,906	4,759	6,292	995	123	—	—	—	*1,018*	*19,093*
5 to 10 years	293	—	—	10	—	—	—	—	*223*	*526*
10 to 15 years	—	—	—	24	—	—	—	—	—	24
over 15 years	—	—	—	1	—	—	—	—	—	1
Clonal Seed ...	1,047	40,141	578	240	—	—	*1,204*	—	(*c*)	*43,210*
of which 0 to 5 yrs.	1,047	40,141	578	240	—	—	*1,204*	—	(*c*)	*43,210*
5 to 10 years	—	—	—	—	—	—	—	—	(*c*)	—
10 to 15 years	—	—	—	—	—	—	—	—	(*c*)	—
over 15 years	—	—	—	—	—	—	—	—	(*c*)	—

Note: The figures in italics are estimated or partly estimated.

* Estates of 100 acres and over are classified as " Estate " rubber, all other holdings are regarded as " Native " rubber.

‡ Including 6,919 acres of *Ficus elastica* and 178 acres of *Manihot glaziovii*.

†Official estimate see footnote on page 83.

(*a*) This area contains 77,616 acres of mixed budgrafts and seedlings of which it is believed 45,190 acres are budded.

(*b*) Included in the seedling areas.

(*c*) Included in the budded areas.

(*d*) Owing to the fact that Siam occupied part of Indo-China in 1940 there may be some duplication in the figures given for the planted areas of these two territories at the end of 1940. In the case of Indo-China the last official figure received gave the acreage at the end of 1938, the figure given at the end of 1940 is the end 1938 figure plus the new planting in 1939/1940 permitted to Indo-China under the Agreement. This estimated acreage at the end of 1940 has been divided between Estate and Native in the same ratio as the area at the end of 1938.

TABLE 2.

New Planting and Re-Planting Statistics, 1934-40 (In Acres).

	1934	1935	1936	1937	1938	Total during 1934-38	Total permitted during 1934-38	1939	1940	Total during 1939-40	Total permitted during 1939-40	Total during 1934-40	Total permitted during 1934-40
New Planting:													
Malaya	600	417	1,177	3,541	2,358	8,093	8,221	139,799	23,848	163,647	163,655	171,740	171,876
N.E.I.	738	871	1,742	2,005	2,539	7,895	8,020	95,103	65,129	160,232	160,745	168,127	168,765
Ceylon	9	36	81	62	112	300	1,510	9,667	24,735	34,402	30,260	34,702	31,770
India	—	1	3	2	277	283	321	3,089	3,143	6,232	6,400	6,515	6,721
Burma	—	—	—	10	—	10	265	1,019	1,182	2,201	5,220	2,211	5,485
North Borneo ...	—	—	—	—	21	21	317	4,740	1,592	6,332	6,330	6,353	6,647
Sarawak... ...	—	—	—	4	5	9	574	7,519	3,881	11,400	11,400	11,409	11,974
Siam	—	8,006	20,800	2,160	—	30,966	31,000	—	22,000	22,000	31,000	52,966	62,000
Indo-China ...	15	120	152	225	386	898	785	*10,000*	*5,710*	*15,710*	15,710	*16,608*	16,495
Total ...	1,362	9,451	23,955	8,009	5,698	48,475	51,013	*270,936*	*151,220*	*422,156*	430,720	*470,631*	481,733
Re-Planting:													
Malaya	838	3,621	20,831	31,848	24,297	81,435	657,711	47,276	63,052	110,328	U	191,763	
N.E.I.	954	11,954	31,451	30,514	36,037	110,910	641,576	39,390	66,157	105,547	N	216,457	
Ceylon	291	761	4,379	6,162	5,342	16,935	120,822	4,560	5,205	9,765	L	26,700	
India	—	97	633	1,308	963	3,001	25,656	1,146	1,178	2,324	I	5,325	
Burma	—	—	22	214	144	380	21,228	118	119	237	M	617	
North Borneo ...	—	30	109	142	128	409	25,328	164	1,063	1,227	I	1,636	
Sarawak... ...	—	1	—	6	13	20	45,887	1,621	1,624	3,245	T	3,265	
Siam	—	—	—	16,157	—	16,157	56,551	45,180	14,000	59,180	E	75,337	
Indo-China ...	735	1,041	3,040	3,680	1,746	10,242	62,784	*1,745*	12,259	*14,004*	D	*24,246*	
Total ...	2,818	17,505	60,465	90,031	68,670	239,489	1,657,543	*141,200*	164,657	*305,857*	—	*545,346*	—

Note.—The figures in italics are estimated or partly estimated.

TABLE 3.
NET EXPORTS OF CRUDE RUBBER—LONG TONS.

Country of Origin.	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
Malaya	6,313	11,485	21,147	33,378	46,652	70,599	97,848	134,788	107,691	199,545	174,322	151,000	212,388	181,698	175,996	210,915
N.E.I.	2,724	2,218	4,254	6,951	10,079	19,617	33,094	44,889	43,345	88,189	75,522	72,245	102,548	137,096	150,502	193,589
Ceylon	1,698	3,061	6,628	11,325	15,336	21,787	24,334	32,290	20,665	45,010	39,532	39,342	46,694	37,418	37,036	45,619
India...	137	332	643	1,040	1,343	2,161	2,781	3,992	4,377	6,554	6,376	5,305	4,854	3,755	4,532	6,305
Burma														2,662	3,165	3,777
North Borneo	24	66	184	457	613	1,051	1,937	2,444	2,593	3,939	4,105	3,120	3,749	4,239	4,621	5,424
Sarawak	10	29	93	151	270	545	1,003	1,733	1,490	2,244	1,593	2,102	3,771	5,705	6,699	8,413
Siam	13	63	102	92	56	84	42	43	29	54	44	412	736	1,718	2,962	5,377
Indo-China	173	241	228	211	190	371	540	916	529	2,902	3,122	3,561	4,473	5,103	5,809	7,886
Philippines	—	—	—	—	2	32	13	29	34	85	59	40	—	38	76	139
Papua	2	4	3	2	3	8	43	85	145	207	242	220	85	57	304	511
Timor																
Fiji	—	—	—	—	2	13	26	38	42	56	66	30	4	40	71	65
Samoa	—	2	24	20	41	67	62	70	17	—	—	—	—	—	—	3
Brazil	37,938	35,970	41,619	35,659	33,001	34,610	30,997	33,461	22,303	32,726	23,216	17,164	16,391	14,117	20,061	23,158
Bolivia	3,068	3,587	4,015	5,062	4,413	4,975	4,838	5,751	4,219	5,263	3,700	2,798	3,028	2,932	3,008	3,339
Peru	2,258	2,048	2,770	2,737	2,236	3,347	2,768	3,242	1,709	3,181	1,455	149	599	576	441	258
Ecuador	544	540	524	191	145	252	374	406	98	396	137	32	190	611	327	1,316
Colombia	601	568	495	301	196	296	585	990	1,021	395	342	277	295	323	253	609
Venezuela	316	401	442	170	112	138	138	181	36	186	150	22	—	51	244	51
British Guiana	3	1	1	1	1	2	7	7	11	8	9	1	—	—	2	4
Surinam	—	—	—	—	—	—	—	—	—	—	5	3	3	1	1	3
Mexico	17,481	14,482	11,636	5,785	551	2,294	1,739	1,691	2,775	1,513	1,384	29	442	1,239	1,385	3,795
Nicaragua	217	343	151	218	141	220	291	291	73	133	49	10	4	18	13	138
Panama	151	50	107	181	16	47	76	49	8	27	3	—	—	—	5	23
Costa Rica	83	73	77	47	17	54	68	43	11	24	8	10	2	3	1	4
Guatemala	150	137	121	86	13	42	59	55	5	6	3	2	1	4	—	—
Honduras	30	30	46	26	14	16	31	33	—	8	2	—	—	—	—	32
British Honduras	7	10	6	6	2	1	1	10	—	—	—	—	—	—	—	—
Salvador	41	29	39	20	7	22	30	22	10	20	10	—	4	1	—	1
Trinidad	3	2	3	3	2	2	5	10	18	22	13	5	2	27	38	49
Nigeria (incl. British Cameroons since 1922)	1,176	966	705	511	167	248	396	392	157	398	492	85	124	214	522	950
Gold Coast (incl. British Togoland since 1922)	1,439	1,191	889	588	292	289	989	1,322	621	322	134	46	7	140	121	490
Sierra Leone	21	19	10	6	3	1	10	1	95	13	1	—	—	—	—	—
Kenya	86	60	76	58	64	25	50	64	83	110	129	35	50	196	273	389
Uganda	45	15	14	13	10	26	32									
Tanganyika	658	819	1,203	1,366	812	—	—	—	252	173	107	196	33	97	79	435
Nyasaland	27	21	27	29	16	20	31	27	16	54	57	20	40	56	77	72
South Africa (incl. Rhodesia)	3	20	70	62	20	7	12	9	2	10	12	—	—	—	—	—
Liberia	—	46	40	—	—	—	—	31	—	127	57	6	—	3	4	197
Belgian Congo	3,363	3,347	3,454	3,565	2,213	2,144	2,969	2,828	1,727	1,520	1,104	778	1,089	438	560	757
French Equat. Africa	1,632	1,671	1,691	1,725	592	1,346	2,008	2,948	1,841	2,488	2,090	1,410	697	2,144	1,386	1,682
Cameroons (French Mandate since 1922)	1,927	2,665	2,767	2,832	331	—	—	152	—	320	563	460	477	748	953	742
French West Africa	4,564	3,579	3,731	2,552	1,052	1,735	1,750	1,285	1,264	800	758	310	319	1,320	1,262	1,702
Togoland (French Mandate since 1922)	133	142	163	89	18	8	41	63	2	77	17	1	—	7	13	51
Madagascar	1,108	789	834	319	70	39	98	31	10	49	14	15	2	59	37	21
Port. Guinea	347	245	348	191	66	149	286	201	147	66	86	44	36	73	96	240
Angola	3,231	2,498	2,693	1,970	1,589	2,045	1,660	1,028	885	425	721	216	78	88	16	30
Port. East Africa	372	180	184	98	29	53	38	58	17	56	49	20	5	1	9	15
TOTAL	94,117	94,045	114,257	120,094	122,798	170,788	214,100	277,999	220,373	399,701	341,860	301,521	403,220	405,016	422,960	528,576

NOTES:

(1) No allowance has been made for moisture and impurities in the export of wild rubber.

(2) Up to and including 1923 no allowance has been made for moisture and other impurities in the N.E.I. native rubber imported into Singapore. This native rubber did not become important until 1919 but after a sharp decline in 1920 and 1921 it increased considerably. The figures for the net exports from Malaya understate the net exports of dry rubber and those of the N.E.I. overstate them. The discrepancy for 1923 amounted to about 20,000 tons for each country. For the years 1923 to 1928 no allowance has been made for rubber smuggled out of Malaya when the Stevenson Scheme was operative. This rubber was afterwards imported into Malaya as N.E.I. native rubber.

(3) Figures in italics have been estimated or partly estimated.

(4) From 1934 onwards the figures for regulated territories represent net exports under the Scheme.

TABLE 3—*Contd.*

NET EXPORTS OF CRUDE RUBBER—LONG TONS.

Country of Origin.	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
Malaya	276,996	232,402	294,446	455,545	442,714	422,001	405,707	445,127	480,469	369,925	358,782	492,754	345,301	361,598	540,856	*575,000*
N.E.I.	207,919	231,531	228,297	255,150	240,921	257,215	211,094	281,176	379,722	287,216	310,609	433,630	300,918	369,853	537,465	635,981
Ceylon	58,857	55,831	57,271	80,342	75,602	62,296	49,272	63,809	79,056	54,229	50,135	70,054	49,282	61,569	88,413	102,351
India	6,536	6,959	7,234	7,872	6,822	5,358	1,143	1,438	6,028	8,146	8,624	10,017	8,036	9,725	13,023	4,103
Burma	3,338	4,362	3,556	5,495	5,189	4,493	2,980	3,805	6,342	4,905	5,819	7,219	6,731	6,616	9,783	8,827
North Borneo	6,079	6,602	6,698	7,381	7,115	6,247	5,379	7,555	11,102	8,869	8,177	13,213	9,512	11,864	17,623	*20,000*
Sarawak	9,382	10,923	10,087	11,313	10,310	10,451	6,960	10,874	17,815	19,087	21,013	25,922	17,792	24,544	34,636	*35,000*
Siam	4,028	5,472	4,813	5,052	4,349	4,514	3,555	7,373	17,714	28,327	34,578	35,551	41,618	41,753	43,940	*45,000*
Indo-China	8,801	9,475	9,638	10,146	10,288	11,812	14,372	16,939	19,559	28,677	40,769	43,374	59,156	65,219	64,437	*50,000*
Philippines	225	292	309	312	379	44	—	245	450	371	383	411	651	622	1,181	*825*
Papua	642	761	811	470	764	785	806	976	993	1,057	1,112	1,246	1,178	1,383	1,338	*1,250*
Timor					17	13	7	21	33	64	60	48	37	47	47	*50*
Fiji	104	99	42	3	3	—	—	—	—	—	—	—	—	14	68	75
Samoa	33	158	167	110	101	41	6	—	—	25	52	61	49	48	61	75
Brazil	21,408	25,619	17,645	18,147	11,809	10,344	5,647	7,993	8,151	10,412	13,271	15,140	13,529	14,092	18,607	16,494
Bolivia	3,058	3,803	3,442	3,044	2,582	1,780	756	1,803	818	745	1,109	671	899	1,170	965	1,138
Peru	460	438	416	292	127	35	30	92	65	320	148	99	81	128	71	96
Ecuador	1,071	1,026	318	183	142	2	—	—	211	1,063	1,765	1,421	1,547	1,599	1,485	1,751
Colombia	427	359	78	33	157	184	94	3	104	16	168	234	194	77	62	63
Venezuela	33	56	95	43	—	—	—	—	—	—	—	—	—	—	—	—
British Guiana	15	17	7	—	2	—	—	—	—	—	—	—	—	—	—	—
Surinam	5	5	6	5	—	—	—	—	—	—	—	—	—	—	—	—
Mexico	4,421	5,065	3,076	1,275	1,095	—	—	—	398	459	1,274	3,427	2,758	2,861	4,619	5,311
Nicaragua	142	39	19	2	—	—	—	—	2	1	53	183	149	103	73	54
Panama	16	20	5	—	—	—	—	—	—	—	—	2	—	6	—	—
Costa Rica	14	5	1	2	—	—	—	—	—	—	—	16	33	52	46	54
Guatemala	14	—	—	—	—	—	—	—	—	—	1	1	—	—	1	2
Honduras	18	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—
British Honduras	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Salvador	29	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Trinidad	73	63	32	29	5	—	—	—	32	67	46	78	71	94	98	66
Nigeria (incl. British Cameroons since 1922)	1,594	1,997	2,294	1,974	2,177	1,821	845	1,007	1,613	2,059	2,173	2,573	3,135	2,824	2,903	2,055
Gold Coast (incl. British Togoland since 1922)	633	318	254	290	241	99	11	23	121	291	431	477	533	678	959	720
Sierra Leone	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4
Kenya / Uganda	621	653	505	368	285	60	—	16	146	371	572	573	664	2 / 726	2 / 513	7 / 483
Tanganyika	413	126	42	14	1	—	—	—	—	12	24	17	19	7	13	7
Nyasaland	61	91	52	77	42	—	—	32	10	59	92	91	71	59	73	92
South Africa (incl. Rhodesia)	—	—	4	3	16	20	—	—	—	—	—	—	—	—	—	—
Liberia	212	172	94	229	96	145	—	28	63	815	1,582	2,251	2,929	5,435	7,222	8,371
Belgian Congo	1,111	1,228	1,045	836	503	245	91	139	312	804	816	1,013	1,136	1,123	1,230	1,298
French Equat. Africa	1,556	1,735	1,419	1,048	732	819	818	804	571	620	760	1,089	1,020	1,052	652	588
Cameroons (French Mandate since 1922)	1,021	876	778	930	510	85	66	100	368	737	1,178	1,328	1,748	2,017	1,649	1,039
French West Africa	1,867	1,256	904	452	283	168	161	119	197	344	565	1,577	649	512	595	1,824
Togoland (French Mandate since 1922)	44	14	6	2	3	—	—	—	10	1	5	6	8	—	11	13
Madagascar	115	12	2	4	1	—	—	—	—	—	20	39	—	—	—	—
Port. Guinea	261	79	49	42	12	16	—	—	3	86	30	158	67	244	202	291
Angola	201	114	41	13	6	5	—	—	—	—	122	302	51	—	70	149
Port. East Africa	52	15	1	2	—	—	—	—	—	—	1	—	—	—	—	—
TOTAL	623,906	610,074	656,000	868,530	825,401	801,098	709,800	851,497	1,032,478	830,180	866,319	1,166,266	871,552	989,716	1,394,992	*1,500,000*

NOTES:

(1) No allowance has been made for moisture and impurities in the exports of wild rubber.

(2) Up to and including 1923 no allowance has been made for moisture and other impurities in the N.E.I. native rubber imported into Singapore. This native rubber did not become important until 1919 but after a sharp decline in 1920 and 1921 it increased considerably. The figures for the net exports from Malaya understate the net exports of dry rubber and those of the N.E.I. overstate them. The discrepancy for 1923 amounted to about 20,000 tons for each country.
For the years 1923 to 1928 no allowance has been made for rubber smuggled out of Malaya when the Stevenson Scheme was operative. This rubber was afterwards imported into Malaya as N.E.I. native rubber.

(3) Figures in italics have been estimated or partly estimated.

(4) From 1934 onwards the figures for regulated territories represent net exports under the Scheme.

TABLE 4.

SUMMARY OF EXPORT DISTRIBUTION BY PRODUCING AREAS.

Year	South East Asia (a)		Oceania (b)		South America (c)		Central America (d)		Africa		Total	
	Long tons	%	*Long tons*	%	*Long tons*	%	*Long tons*	%	*Long tons*	%	*Long tons*	%
1910 ...	11,092	11·79	2	0·00	44,731	47·53	18,160	19·29	20,132	21·39	94,117	100·00
1911 ...	17,495	18·60	6	0·01	43,117	45·85	15,154	16·11	18,273	19·43	94,045	100·00
1912 ...	33,279	29·13	27	0·02	49,869	43·65	12,183	10·66	18,899	16·54	114,257	100·00
1913 ...	53,605	44·64	22	0·02	44,124	36·74	6,369	5·30	15,974	13·30	120,094	100·00
1914 ...	74,539	60·70	48	0·04	40,106	32·66	761	0·62	7,344	5·98	122,798	100·00
1915 ...	116,215	68·05	120	0·07	43,622	25·54	2,696	1·58	8,135	4·76	170,788	100·00
1916 ...	161,579	75·47	144	0·07	39,712	18·55	2,295	1·07	10,370	4·84	214,100	100·00
1917 ...	221,095	79·53	222	0·08	44,048	15·84	2,194	0·79	10,440	3·76	277,999	100·00
1918 ...	180,719	82·00	238	0·11	29,415	13·35	2,882	1·31	7,119	3·23	220,373	100·00
1919 ...	348,437	87·18	348	0·09	42,177	10·55	1,731	0·43	7,008	1·75	399,701	100·00
1920 ...	304,616	89·10	367	0·11	29,027	8·49	1,459	0·43	6,391	1·87	341,860	100·00
1921 ...	277,087	91·90	290	0·10	20,451	6·78	51	0·02	3,642	1·20	301,521	100·00
1922 ...	379,213	94·05	89	0·02	20,508	5·09	453	0·11	2,957	0·73	403,220	100·00
1923 ...	379,394	93·68	135	0·03	18,638	4·60	1,265	0·31	5,584	1·38	405,016	100·00
1924 ...	391,322	92·52	451	0·11	24,375	5·76	1,404	0·33	5,408	1·28	422,960	100·00
1925 ...	487,305	92·19	718	0·14	28,787	5·45	3,993	0·75	7,773	1·47	528,576	100·00
1926 ...	581,936	93·27	1,004	0·16	26,550	4·26	4,654	0·75	9,762	1·56	623,906	100·00
1927 ...	563,557	92·38	1,310	0·22	31,386	5·14	5,135	0·84	8,686	1·42	610,074	100·00
1928 ...	622,040	94·83	1,329	0·20	22,039	3.36	3,102	0·47	7,490	1·14	656,000	100·00
1929 ...	838,296	96·52	895	0·10	21,776	2·51	1,279	0·15	6,284	0·72	868,530	100·00
1930 ...	803,310	97·32	1,264	0·15	14,824	1·80	1,095	0·13	4,908	0·60	825,401	100·00
1931 ...	784,387	97·91	883	0·11	12,345	1·54	—	—	3,483	0·44	801,098	100·00
1932 ...	700,462	98·68	819	0·12	6,527	0·92	—	—	1,992	0·28	709,800	100·00
1933 ...	838,096	98·43	1,242	0·15	9,891	1·16	—	—	2,268	0·26	851,497	100·00
1934 ...	1,017,807	98·58	1,476	0·14	9,381	0·91	400	0·04	3,414	0·33	1,032,478	100·00
1935 ...	809,381	97·49	1,517	0·18	12,623	1·52	460	0·06	6,199	0·75	830,180	100·00
1936 ...	838,506	96·79	1,607	0·19	16,507	1·91	1,328	0·15	8,371	0·96	866,319	100·00
1937 ...	1,131,734	97·04	1,766	0·15	17,643	1·51	3,629	0 31	11,494	0 99	1,166,266	100·00
1938 ...	838,346	96·19	1,915	0·22	16,321	1·87	2,940	0·34	12,030	1·38	871,552	100·00
1939 ...	952,741	96·26	2,114	0·22	17,160	1·73	3,022	0·31	14,679	1·48	989,716	100·00
1940 ...	1,350,176	96·79	2,695	0·19	21,288	1·53	4,739	0·34	16,094	1·15	1,394,992	100·00

NOTES :

(a) South East Asia is comprised of the territories participating since 1934 in the International Rubber Regulation Agreement.
(b) Oceania includes the Philippines and Portuguese Timor.
(c) South America includes Trinidad.
(d) Central America includes Mexico.

TABLE 5.

SUMMARY OF EXPORTS UNDER THE SCHEME FROM QUOTA COUNTRIES—LONG TONS.

		Malaya	N.E.I.	Ceylon	India	Burma	North Borneo	Sarawak	Total (excl. Siam)	Siam (*b*)	Grand Total
1934(*a*)	Basic Quota	504,000	352,000	77,500	6,850	5,150	12,000	24,000	981,500	15,000	996,500
	P.E.A. @ 87½ per cent.	256,200	178,933	39,395	3,483	2,617	6,100	12,200	498,928	—	498,928
	Net Exports	243,981	180,452	39,378	3,298	2,804	6,396	10,736	487,045	12,326	499,371
	Carry-over	+12,219	—1,519	+17	+185	—187	—296	+1,464	+11,883	—	+11,883
1935	Basic Quota	538,000	400,000	79,000	12,500	8,000	13,000	28,000	1,078,500	40,000	1,118,500
	P.E.A. @ 67½ per cent.	363,150	270,000	53,325	8,437	5,400	8,775	18,900	727,987	30,000	757,987
	P.E.A. + Carry-over	375,369	268,481	53,342	8,622	5,213	8,479	20,364	739,870	30,000	769,870
	Net Exports	369,925	287,216	54,229	8,146	4,905	8,869	19,087	752,377	28,327	780,704
	Carry-over	+5,444	—18,735(*c*)	—887	+476	+308	—390	+1,277	—12,507	+1,673	—10,834
1936	Basic Quota	569,000	500,000	80,000	12,500	8,500	14,000	30,000	1,214,000	40,000	1,254,000
	P.E.A. @ 62½ per cent.	355,625	312,500	50,000	7,812	5,313	8,750	18,750	758,750	34,000	792,750
	P.E.A. + Carry-over	361,069	312,500	49,113	8,288	5,621	8,360	20,027	764,978	35,673	800,651
	Net Exports	358,782	310,609	50,135	8,624	5,819	8,177	21,013	763,159	34,578	797,737
	Carry-over	+2,287	+1,891	—1,022	—336	—198	+183	—986	+1,819	+1,095	+2,914
1937	Basic Quota	589,000	520,000	81,000	12,500	9,000	15,500	31,500	1,258,500	40,000	1,298,500
	P.E.A. @ 83½ per cent.	493,287	435,500	67,838	10,469	7,537	12,981	26,381	1,053,993	36,000	1,089,993
	P.E.A. + Carry-over	495,574	437,391	66,816	10,133	7,339	13,164	25,395	1,055,812	37,095	1,092,907
	Net Exports	492,754	433,630	70,054	10,017	7,219	13,213	25,922	1,052,809	35,551	1,088,360
	Carry-over	+2,820	+3,761	—3,238	+116	+120	—49	—527	+3,003	+1,544	+4,547
1938	Basic Quota	602,000	540,000	82,500	13,000	9,250	16,500	32,000	1,295,250	40,000	1,335,250
	P.E.A. @ 55 per cent.	331,100	297,000	45,375	7,150	5,088	9,075	17,600	712,388	40,000	752,388
	P.E.A. + Carry-over	333,920	300,761	42,137	7,266	5,208	9,026	17,073	715,391	41,544	756,935
	Net Exports	345,301	300,918	49,282	8,036	6,731	9,512	17,792	737,572	41,618	779,190
	Carry-over	—11,381	—157	—7,145	—770	—1,523	—486	—719	—22,181	—74	—22,255
1939	Basic Quota	632,000	631,500	106,000	17,500	13,500	21,000	43,000	1,464,500	54,500	1,519,000
	P.E.A. @ 58½ per cent.	371,300	371,006	62,275	10,281	7,931	12,338	25,263	860,394	41,000	901,394
	P.E.A. + Carry-over	359,919	370,849	55,130	9,511	6,408	11,852	24,544	838,213	40,926	879,139
	Net Exports	361,598	369,853	61,569	9,725	6,616	11,864	24,544	845,769	41,753	887,522
	Carry-over	—1,679	+996	—6,439	—214	—208	—12	0	—7,556	—827	—8,383
1940	Basic Quota	642,500	640,000	107,500	17,750	13,750	21,000	43,750	1,486,250	55,300	1,541,550
	P.E.A. @ 83½ per cent.	538,094	536,000	90,031	14,866	11,516	17,587	36,640	1,244,734	46,314	1,291,048
	P.E.A. + Carry-over	536,415	536,996	83,592	14,652	11,308	17,575	36,640	1,237,178	45,487	1,282,665
	Net Exports	540,856	537,465	88,413	13,023	9,783	17,623	34,636	1,241,799	43,940	1,285,739
	Carry-over	—4,441	—469	—4,821	+1,629(*d*)	+1,525(*d*)	—48	+2,004	—4,621(*d*)	+1,547	—3,074(*d*)
1941	Basic Quota	648,000	645,500	109,000	17,750	13,750	21,000	44,000	1,499,000	55,700	1,554,700
	P.E.A. @ 105 per cent.	680,400	677,775	114,450	18,638	14,437	22,050	46,200	1,573,950	58,485	1,632,435
	P E.A. + Carry-over	675,959	677,306	109,629	20,125	15,589	22,002	48,204	1,568,814	60,032	1,628,846
	Net Exports	*575,000*	635,981	102,351	4,103	8,827	*20,000*	*35,000*	*1,381,000*	*45,000*	*1,426,000*
	Carry-over (*e*)	*+100,000*	+41,325	+7,278	+16,022	+6,762	*+2,000*	*+13,000*	*+187,000*	*+15,000*	*+202,000*

NOTES:

(*a*) The figures given for the P.E.A. (Permissible Exportable Amount), net exports, and carry-over refer only to the last seven months as regulation was introduced on the 1st June, 1934. The basic quotas refer to the whole year, however, so that the basic quotas for the last seven months were seven-twelfths of those given.

(*b*) In the case of Siam the Agreement was not ratified until 1935, and the P.E.A. and carry-over are not included for 1934. The exportable percentages allotted to Siam during the first period of regulation were: 1935—75 per cent.; 1936—85 per cent.; 1937—90 per cent; 1938—100 per cent. During the second period of regulation Siam was allotted a minimum P.E.A. of 41,000 tons per annum.

(*c*) The I.R.R.C. decided that there would be no deduction from the N.E.I. P.E.A. for 1936 on account of the carry-over at the end of 1935.

(*d*) Under Article 5 (2) of the International Agreement exporting territories were only permitted to carry forward 10 per cent. of their P.E.A. in any year. For this reason India was only permitted to carry forward 1,487 tons to 1941 and Burma 1,152 tons, although their carry-overs were 1,629 and 1,525 tons respectively.

(*e*) The large carry-over in most of the regulated countries, particularly in Malaya and the N.E.I., at the end of 1941, was at least partly due to the interruption of transport owing to the outbreak of war against Japan. In the case of India, however, it was mainly due to her increasing domestic consumption.

TABLE 6.

NET IMPORTS OF CRUDE RUBBER—LONG TONS.

Country.	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
U.S.A.	42,210	41,728	55,937	51,987	62,265	98,990	117,611	179,251	143,382	238,407	249,521	179,736	296,394	301,746	319,103	385,596
U.K.	20,455	16,736	18,724	25,365	18,570	15,072	26,760	25,947	30,044	42,671	56,844	42,087	11,724	12,700	—11,550	4,930
Austria	1,603	1,810	2,142	1,973	1,494	547	569	169	—	273	1,328	2,290	2,184	1,883	1,914	2,004
Belgium	2,238	1,986	2,468	3,596	1,500	—	—	—	—	3,995	3,400	1,705	172	2,184	2,693	2,908
Bulgaria	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Czecho-Slovakia	—	—	—	—	—	—	—	—	—	9	567	569	557	1,128	1,370	1,558
Denmark	78	149	87	111	125	316	344	120	6	673	479	251	87	354	474	483
Esthonia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9
Finland	49	94	55	72	81	135	55	51	30	150	117	73	168	385	354	346
France	3,740	5,307	5,577	5,849	4,377	9,495	12,784	16,613	14,213	17,685	13,885	15,135	24,352	27,392	30,446	32,956
Germany	13,731	15,125	15,396	16,264	*11,000*	*4,000*	*2,000*	*2,000*	—	*4,500*	11,890	21,920	27,546	18,519	22,727	33,936
Greece	—	3	3	5	2	3	2	—	—	4	—	—	—	—	—	7
Hungary	369	452	507	779	374	—	—	—	—	11	20	116	351	438	710	386
Ireland	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Italy	1,825	2,361	3,287	2,505	2,739	4,956	4,768	5,594	7,140	9,894	6,123	3,906	6,430	8,490	8,764	11,412
Latvia	—	—	—	—	—	—	—	—	—	—	—	—	—	44	313	243
Lithuania	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	2
Netherlands	1,822	1,444	1,415	2,390	1,799	2,899	206	—13	—4	2,771	5,510	1,022	—3,806	792	—807	876
Norway	268	301	377	338	286	661	346	191	208	401	241	178	321	449	661	691
Poland	—	—	—	—	—	—	—	—	—	—	17	86	181	309	166	402
Portugal	33	44	48	46	45	70	73	52	39	51	123	36	103	67	40	36
Roumania	—	—	—	—	—	—	—	—	—	—	—	1	44	23	99	29
Spain	431	501	437	647	594	986	1,671	1,316	829	2,418	2,008	2,245	589	630	944	1,155
Sweden	813	885	990	924	873	991	1,000	461	500	1,932	1,455	777	1,202	1,340	1,689	1,621
Switzerland	169	180	205	187	127	182	205	219	134	441	190	193	201	247	288	462
Turkey	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
U.S.S.R.	7,233	6,649	9,197	12,561	11,646	14,203	11,182	8,849	*2,000*	75	62	165	2,493	2,986	2,346	7,088
Yugo-Slavia	—	—	—	—	—	—	—	—	—	—	7	72	45	42	2	19
Argentina	6	11	18	34	24	33	62	73	181	99	152	118	101	123	161	125
Australia	252	707	512	776	888	1,043	1,192	1,156	2,684	1,002	1,802	1,014	2,643	1,642	3,123	3,500
Canada	1,317	1,629	2,395	2,065	1,134	3,232	3,906	3,998	6,921	6,395	11,746	8,124	9,207	13,277	14,299	19,683
Japan	694	907	888	1,188	1,021	1,727	2,937	3,718	7,246	9,753	5,297	21,713	15,934	15,372	19,571	11,117
South Africa	—	—	—	—	—	—	—	—	—	—	—	—	3	145	170	179
Brazil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	238
Chile	—	30	45	18	19	7	42	25	23	28	37	20	28	29	44	45
China	19	20	16	16	24	22	20	—	19	40	50	117	340	541	634	475
Cuba	1	13	—	—	—	1	—	12	142	63	30	51	3	14	88	13
Egypt	—	—	—	—	—	—	—	—	—	4	1	4	6	2	6	9
Hong-Kong	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mexico	—	—	—	—	—	—	—	—	—	65	9	36	8	71	76	95
New Zealand	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10
Others	—	—	—	—	—	—	—	—	—	*50*	*100*	*150*	*200*	*250*	*250*	*506*
Total	99,356	99,072	120,726	129,696	121,007	159,571	187,735	249,802	215,737	343,860	373,011	303,910	399,811	413,614	421,169	525,144

NOTES:

(1) No allowance has been made for moisture and impurities in wild rubber imported and scrap rubber and related materials have been included.

(2) Net imports into Brazil represent exports from Amazon Ports to South Brazil.

(3) Allowance has been made under "Others" for imports into some of the small also included. (The latter quantity is small compared with their imports).

(4) Figures in italics have been estimated or partly estimated.

and in the case of several countries, particularly in the earlier years, imports of reclaimed

producing countries and the estimated absorption of their home produced rubber is

TABLE 6—*Contd.*

NET IMPORTS OF CRUDE RUBBER—LONG TONS.

Country.	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
U.S.A.	399,972	403,471	407,572	528,602	457,423	476,179	393,731	398,326	439,162	455,756	475,563	592,528	406,330	486,348	811,564	
U.K.	84,934	59,843	4,388	122,807	120,002	85,187	43,561	73,423	156,906	126,764	—7,439	91,011	132,044	69,235		
Austria	1,781	2,910	3,043	3,324	2,365	2,964	1,957	2,770	3,417	3,650	3,445	3,773	7,781	1,101		
Belgium	2,498	6,491	7,958	9,445	10,740	11,009	9,519	11,167	9,116	7,593	9,627	14,969	11,310	9,612		
Bulgaria	—	6	22	45	84	188	439	259	47	108	265	724	*750*	*1,000*		
Czecho-Slovakia	1,753	2,715	3,138	4,650	4,532	7,717	9,463	10,402	10,999	11,226	8,772	13,063	9,936	*5,000*		
Denmark	575	573	560	799	1,149	969	902	1,827	2,209	3,257	3,164	2,587	2,880	2,892		
Esthonia	5	7	14	41	43	66	63	42	85	82	90	106	140	113		
Finland	556	671	594	976	1,262	781	681	850	1,889	2,388	1,815	3,319	2,846	718		
France	34,240	34,274	36,498	59,342	68,503	46,466	40,948	61,953	49,560	51,450	57,032	59,072	58,148	64,377		
Germany	22,775	38,892	37,855	49,078	45,488	39,688	45,019	54,120	59,330	62,899	71,793	98,170	90,200	*75,000*		
Greece	36	15	20	127	150	173	172	245	316	340	338	759	828	725	420	50
Hungary	562	1,048	1,375	1,367	1,376	1,333	1,266	1,533	2,379	1,857	2,850	3,444	3,135	2,604	2,722	
Ireland	—	—	—	—	—	—	—	—	—	399	1,163	1,509	1,360	1,850		
Italy	10,041	11,290	12,433	17,167	18,570	10,096	15,289	19,349	21,403	25,400	16,023	23,980	28,170	17,995		
Latvia	311	533	915	953	737	283	351	552	693	562	640	739	738	*1,000*		
Lithuania	4	6	11	4	3	3	1	62	242	86	327	210	*200*	*400*		
Netherlands	2,671	636	2,243	3,214	2,924	2,220	2,846	1,243	3,758	4,068	2,888	4,343	5,092	7,050		
Norway	608	623	721	813	1,143	818	1,425	1,052	953	1,354	1,557	2,062	2,010	2,642		
Poland	618	991	1,850	3,942	3,040	2,293	2,541	3,369	5,031	4,296	4,794	6,052	7,849	*6,000*		
Portugal	27	19	30	20	9	4	5	17	39	200	350	400	500	500		
Roumania	82	49	50	150	338	381	352	370	1,239	773	1,253	1,806	2,033	1,268	1,443	
Spain	1,133	1,322	2,126	2,142	3,267	2,576	4,342	5,520	6,899	8,554	6,648	*2,400*	*2,400*	*4,500*		
Sweden	959	2,160	2,278	3,857	4,416	3,798	4,256	4,103	7,366	4,878	4,594	6,693	8,304	*9,500*		
Switzerland	418	489	566	653	808	846	613	803	1,599	1,463	1,650	2,250	2,570	2,535		
Turkey	—	—	—	—	3	5	40	220	240	180	200	220	300	340		
U.S.S.R.	6,528	12,695	15,134	12,624	16,149	27,764	30,047	30,849	47,271	37,572	30,967	30,462	26,811	*30,000*		
Yugo-Slavia	27	287	1,096	308	249	293	634	1,193	1,554	1,996	1,658	2,901	2,934	1,906		
Argentina	170	266	592	618	765	2,759	2,671	3,608	5,399	5,445	5,642	9,547	7,653	9,552	9,142	11,513
Australia	9,021	9,490	8,430	15,886	5,354	7,649	12,576	13,534	9,642	9,977	14,423	19,257	12,309	15,426	19,044	
Canada	20,216	26,397	30,788	35,270	28,707	25,261	19,926	19,289	28,439	26,868	27,867	36,087	25,696	32,508	52,567	66,612
Japan	18,124	20,521	25,621	34,284	32,731	43,483	56,028	66,831	69,934	57,589	61,701	62,205	46,307	42,351		
South Africa	124	191	528	261	223	268	312	1,006	1,846	1,553	4,098	6,200	5,549	9,765	9,130	
Brazil	202	357	720	544	681	580	764	1,152	1,045	1,994	2,234	2,839	3,057	5,403	6,991	9,739
Chile	75	107	137	170	179	72	56	49	57	60	234	198	247	331	421	
China	281	141	228	1,139	621	2,935	4,716	5,719	5,387	4,886	8,034	6,167	3,039	4,967	6,682	
Cuba	34	4	16	23	13	40	89	58	111	173	95	125	117	158	128	
Egypt	3	2	1	—	14	25	34	41	42	45	49	64	142	174	150	
Hong-Kong	—	—	—	—	452	779	823	624	1,700	848	1,465	1,228	1,194	2,196	2,320	
Mexico	98	150	390	509	385	712	857	1,975	3,782	1,935	2,680	4,173	2,894	5,101	3,440	
New Zealand	31	58	80	107	107	101	279	307	268	237	250	300	67	560	813	
Others	*500*	*500*	*500*	*500*	*500*	*750*	*1,000*	*1,000*	*1,250*	*1,500*	*1,500*	*2,500*	*2,500*	*3,000*		
Total	621,993	640,200	610,521	915,761	835,505	809,514	710,594	800,812	962,604	932,261	832,299	1,120,442	928,370	937,703	*1,300,000*	*1,450,000*

NOTES:

(1) No allowance has been made for moisture and impurities in wild rubber imported and scrap rubber and related materials have been included.

(2) Net imports into Brazil represent exports from Amazon Ports to South Brazil.

(3) Allowance has been made under "Others" for imports into some of the small and in the case of several countries, particularly in the earlier years, imports of reclaimed also included. (The latter quantity is small compared with their imports).

(4) Figures in italics have been estimated or partly estimated.

producing countries and the estimated absorption of their home produced rubber is

TABLE 7.

ABSORPTION IN IMPORTING COUNTRIES—LONG TONS.

Year	U.K.	U.S.A.	Europe	Rest of World	Total
1914	17,206	62,265	37,062	3,110	119,643
1915	14,987	98,990	39,444	6,065	159,486
1916	22,889	117,611	35,205	8,159	183,864
1917	20,073	157,371	35,622	8,982	222,048
1918	31,211	160,000	25,095	17,216	233,522
1919	35,503	215,000	45,283	17,499	313,285
1920	24,352	206,000	47,422	19,224	296,998
1921	18,097	177,772	50,740	31,347	277,956
1922	10,304	301,499	63,220	28,473	403,496
1923	26,954	319,422	67,702	31,466	445,544
1924	21,914	328,769	75,194	38,422	464,299
1925	30,138	388,481	98,629	35,989	553,237
1926	39,702	366,158	88,208	48,879	542,947
1927	44,800	373,000	118,702	58,184	594,686
1928	48,504	437,000	130,530	68,031	684,065
1929	72,023	467,400	175,041	89,311	803,775
1930	74,760	376,000	187,348	70,732	708,840
1931	76,583	355,193	162,734	85,414	679,924
1932	78,561	336,738	173,171	100,131	688,601
1933	79,504	412,365	213,870	115,193	820,932
1934	90,059	462,480	237,634	128,902	919,075
1935	94,981	491,544	236,631	113,110	936,266
1936	99,251	575,000	233,903	130,272	1,038,426
1937	114,628	543,600	*286,013*	150,890	1,095,131
1938	106,915	437,031	*279,225*	110,771	933,942
1939	122,715	592,000	*250,628*	131,492	1,096,835
1940		648,500			*1,100,000*
1941					*1,200,000*

Notes to Table 7.

(1) Figures in italics have been estimated or partly estimated.

(2) Figures for U.K. from 1914 to 1933 represent net imports corrected for change in warehouse stocks. It will be obvious that in some of the years particularly in 1928 and 1929 changes in stocks in the hands of manufacturers would have to be considered before arriving at a true estimate of absorption. Since 1934 the figure represents 100 per cent. absorption estimated on the basis of returns received by the I.R.R.C. from the majority of U.K. rubber manufacturers.

(3) Figures for the U.S.A. from 1917 onwards have been obtained from official publications of the U.S. Department of Commerce; for the three years 1914 to 1916 the figures given are merely the net imports.

(4) The figures given for Europe and the Rest of the World are merely the aggregates of the net import figures given in Table 6; no other figures are available.

TABLE 8.

ABSORPTION IN PRODUCING COUNTRIES*—LONG TONS.

Year	Malaya	N.E.I.	India	Indo-China	Total
1930	1,795	—	116	—	1,911
1931	1,521	—	165	—	1,686
1932	2,395	—	137	—	2,532
1933	2,878	—	510	—	3,388
1934	872	64	1,105	—	2,041
1935	593	439	3,188	—	4,220
1936	435	1,285	5,676	—	7,396
1937	576	2,043	7,172	111	9,902
1938	512	2,308	5,660	172	8,652
1939	511	3,210	7,012	250	10,983
1940	1,382	3,688	11,047	*500*	*16,600*
1941	*2,000*	*4,500*	13,249	*600*	*20,000*

Notes to Table 8:

(1) Figures in italics have been estimated or partly estimated.

(2) The figures given for India represent net imports of foreign rubber up to 1934; from 1934 to 1937 they are the net imports of foreign rubber plus coastwise exports of domestic rubber, and from 1938 onwards they represent Indian absorption as reported in the quarterly returns received by the I.R.R.C. from the Controller of Rubber in India.

* Figures for Agreement Countries only. Absorption in other producing countries has been allowed for in the Rest of World column in Table 7.

TABLE 9.

PRINCIPAL WORLD STOCKS OF RUBBER (OUTSIDE REGULATED AREAS)—LONG TONS.

At the end of	Singapore and Penang	Under Customs' Control	Para and Manaos	London and Liverpool	U.K. Manufacturers	U.K. Government Stocks	U.S.A. Trade Stocks	U.S.A. Barter Stocks	U.S.A. Reserve Stocks	Stocks Afloat	Total excl. U.K. Manufs.	Total
1913 ...	NOT AVAILABLE	—	NOT AVAILABLE	5,985	NOT AVAILABLE	—	NOT AVAILABLE	—	—	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE
1914 ...		—		7,349		—		—	—			
1915 ...		—		7,434		—		—	—			
1916 ...		—		11,305		—		—	—			
1917 ...		—		17,179		—		—	—			
1918 ...		—		16,012		—		—	—			
1919 ...		—		23,180		—	54,274	—	—	37,000		
1920 ...		—		55,672		—	97,794	—	—	37,000		
1921 ...		—		79,661		—	99,758	—	—	32,000		
1922 ...		—		81,081		—	94,653	—	—	45,000		
1923 ...	36,349	—	3,000	66,828		—	76,758	—	—	50,000	*232,935*	
1924 ...	20,594	—	2,500	32,425		—	56,080	—	—	53,000	*164,599*	
1925 ...	23,364	—	2,500	6,328		—	51,215	—	—	65,000	*148,407*	
1926 ...	30,153	—	3,000	51,320		—	72,510	—	—	77,000	*233,983*	
1927 ...	27,483	—	3,500	66,261		—	99,282	—	—	67,000	*263,526*	
1928 ...	36,905	—	4,438	22,603		—	65,454	—	—	118,000	*247,400*	
1929 ...	37,157	—	3,750	73,253		—	122,062	—	—	96,000	*332,222*	
1930 ...	41,575	—	5,132	118,562		—	201,000	—	—	87,000	*453,269*	
1931 ...	49,570	—	5,576	127,149		—	322,000	—	—	85,000	*589,295*	
1932 ...	30,927	—	5,552	92,674		—	379,000	—	—	81,000	*589,153*	
1933 ...	44 884	—	2,981	86,505		—	365,000	—	—	117,000	*616,370*	
1934 ...	62,142	1,321	3,293	134,927	43,175	—	355,000	—	—	126,000	*682,683*	725,858
1935 ...	28,304	4,965	4,683	164,295	44,666	—	312,000	—	—	86,000	*600,247*	644,913
1936 ...	26,969	5,935	2,454	78,462	24,376	—	223,000	—	—	103,000	*439,820*	464,196
1937 ...	44,792	8,208	1,771	57,785	22,126	—	262,200	—	—	135,000	*509,756*	531,882
1938 ...	27,084	9,722	1,319	86,853	18,631	—	231,500	—	—	90,000	*446,478*	465,109
1939 ...	15,299	8,194	5,336	28,222	24,331	—	124,427	1,373	—	152,000	*334,851*	359,182
1940 ...	26,753	8,998	2,165	20,339	35,412	40,548	176,054	72,667	40,143	245,000	*632,667*	668,079

NOTE:—Detailed figures for stocks outside regulated areas at the end of 1941 are not available but their total at that date amounted to approximately one million tons.

TABLE 10.

CRUDE RUBBER STOCKS INSIDE REGULATED AREAS (EXCL. SIAM)—LONG TONS

At the end of	1934	1935	1936	1937	1938	1939	1940	1941
Malaya :								
On Estates ...	12,500	23,434	26,044	24,488	47,670	48,020	33,436	28,650(*a*)
With Dealers ...	16,440	10,465	9,101	21,246	10,130	6,848	15,351	21,675(*a*)
Total ...	28,940	33,899	35,145	45,734	57,800	54,868	48,787	50,325
N.E.I. :								
On Estates ...	6,607	17,407	10,298	20,665	31,829	24,698	23,560	21,768(*b*)
With Dealers :								
Estate rubber...	4,913	5,010	3,641	6,388	10,017	7,210	5,346	7,032(*b*)
Native rubber...	16,453	5,987	7,539	13,758	13,611	17,212	19,765	19,095
Total ...	27,973	28,404	21,478	40,811	55,457	49,120	48,671	47,895
Ceylon :								
On Estates ...	—	3,823	3,190	4,979	5,739	5,359	6,044	8,171
With Dealers ...	6,804	4,794	5,161	5,632	6,120	5,149	5,806	16,559
Total ...	6,804	8,617	8,351	10,611	11,859	10,508	11,850	24,730
India :								
On Estates ...	—	1,150	1,500	2,500	3,667	2,300	1,286	1,487
With Dealers ...	—	1,150	2,550	5,000	4,214	4,250	4,432	5,779
Total ...	—	2,300	4,050	7,500	7,881	6,550	5,718	7,266
Burma :								
On Estates ...	—	593	1,150	811	1,093	750	786	733(*c*)
North Borneo :								
On Estates ...	749	546	868	831	2,384	2,152	1,340	1,048(*b*)
With Dealers ...	63	22	16	22	0	75	337	176(*b*)
Total ...	812	568	884	853	2,384	2,227	1,677	1,224
Sarawak :								
On Estates ...	144	150	238	181	180	128	73	103(*c*)
With Dealers ...	820	988	2,498	1,290	294	365	447	1,020(*b*)
Total ...	964	1,138	2,736	1,471	474	493	520	1,123
Total excl. Indo-China	*65,493*	*75,519*	*73,794*	*107,791*	*136,948*	*124,516*	*118,009*	*133,296*
Indo-China :								
On Estates ...	—	2,246	1,064	4,365	5,403	5,353	N.A.	N.A.
With Dealers ...	165	40	134	1,598	1,430	1,830	N.A.	N.A.
Total ...	165	2,286	1,198	5,963	6,833	7,183	N.A.	N.A.
Grand Total ...	65,658	77,805	74,992	113,754	143,781	131,699	N.A.	N.A.

Note.—" Estates " as usual mean " Estates of 100 acres and over " but the figures for India also include stocks on small holdings. In the case of Malaya stocks on estates include rubber in process of preparation, this usually amounts to 20 to 25 per cent. of the total. Stocks on estates in other territories are " ready " rubber. In the N.E.I. and Ceylon stocks with dealers include rubber under Customs' control and in India stocks with agents and manufacturers are also included.

(*a*) At 31st October. (*b*) At 30th November. (*c*) At 30th June.

N.A.—Not Available.

TABLE 11.

HIGHEST, LOWEST, FLUCTUATION AND AVERAGE PRICE PER LB. OF STANDARD QUALITY RUBBER IN LONDON AND NEW YORK.

	Year	LONDON				NEW YORK			
		Highest	Lowest	Fluctuation	Average	Highest	Lowest	Fluctuation	Average
		s. d.	s. d.	s. d.	s. d.	Cents	Cents	Cents	Cents
	1910 ...	12 9	5 7	7 2	8 9	288	141	147	
	1911 ...	7 3	4 6	2 9	5 5½	184	114	70	
	1912 ...	5 9	4 1	1 8	4 9	140	108	32	
	1913 ...	4 6½	2 0	2 6½	3 0¼	113	59	54	
	1914 ...	3 0	1 11½	1 0½	2 3½	93	56	37	
	1915 ...	4 1½	1 11¾	2 1¾	2 6	79	58½	20½	
	1916 ...	4 3½	2 1¾	2 1¾	2 10¼	102	55	47	
	1917 ...	3 4½	2 2¾	1 1¾	2 9¾	90	52	38	
	1918 ...	2 6¼	2 0	6¼	2 2½	70	40	30	
	1919 ...	2 10½	1 7	1 3½	2 0¾	57	38½	18½	
	1920 ...	2 10¼	9	2 1¼	1 10½	56½	16	40½	
	1921 ...	1 2	7	7	9 9/16	21¼	11½	9¾	16·35
	1922 ...	1 3	6¾	8¼	9 5/16	28⅜	13⅝	14¾	17.34
	1923 ...	1 6⅝	1 1¼	5⅜	1 3 5/16	37½	24¾	12⅝	29·55
	1924 ...	1 8	9½	10½	1 1⅞	39⅜	18¾	21¼	26·07
	1925 ...	4 8	1 4½	3 3½	2 11 1/16	123	34¼	88¾	72·46
	1926 ...	3 9¾	1 6	2 3¾	1 11¾	91	36¾	54¼	49·36
	1927 ...	1 8½	1 3¾	4¾	1 6 7/16	42¼	33	9¼	37·81
	1928 ...	1 8	7¾	1 0¼	10¾	41¼	16¾	24½	22·33
	1929 ...	1 1⅜	7⅝	5¾	10¼	26⅞	15½	11⅜	20·48
	1930 ...	8 7/16	3 9/16	4⅞	5 15/16	16⅜	7⅛	9	10·24
	1931 ...	4¼	2¼	2	3⅛	8½	4 5/16	4 3/16	6·12
	1932 ...	3¼	1⅜	1⅝	2 5/16	4¾	2⅛	2⅛	3·43
	1933 ...	4⅜	2	2⅜	3¼	9¾	2⅞	6⅞	5·90
	1934 Pre-Regn.	7¼	4 3/16	3 1/16	5⅛	15½	8¾	6¾	11·02
REGULATION	1934 Regn. ...	7⅝	5 3/32	1 27/32	6 13/16	15⅞	11 13/16	4 1/16	13·90
REGULATION	1934 ...	7⅞	4 5/16	3 7/16	6¼	15⅞	8¾	7¼	12·94
REGULATION	1935 ...	6 13/16	5 3/16	1⅝	6	13 11/16	10⅜	3 5/16	12·32
REGULATION	1936 ...	11⅛	6¼	4⅞	7¾	23	13½	9½	16·43
REGULATION	1937 ...	1 1¾	6¾	7	9⅛	26⅞	14	12⅞	19·37
REGULATION	1938 ...	8 9/16	5¼	3 5/16	7 7/32	17⅛	10¼	6⅞	14·56
REGULATION	1939 Pre-war	8⅞	7⅝	1¼	8 5/32	16 13/16	14⅞	1 15/16	16·11
REGULATION	1939 War prd.	1 0 1/32	9 5/16	2 23/32	10 23/32	24	18	6	20·19
REGULATION	1939 ...	1 0 1/32	7⅝	4 13/32	9	24	14⅞	9⅛	17·47
REGULATION	1940 ...	1 2	10⅞	3⅛	1 0 1/16	23⅞	18½	5¾	19·90
REGULATION	1941 ...	1 2 9/16	1 0	2 9/16	1 1 19/32	24¾	19	5¾	22·11

NOTES:

(1) London prices for Standard Crepe from 1910-1917 thereafter for Standard Quality Ribbed Smoked Sheet.

(2) New York prices for Plantation Ribbed Smoked Sheets are taken from publications of the U.S. Department of Commerce as far as available. In regard to the 1941 prices the Rubber Reserve Company's Selling price to the trade was fixed at 22½ cents per. lb. for No. 1-X Ribbed Smoked Sheets on the 6th August and this fixed price has been included for the last five months in calculating the average for the year.